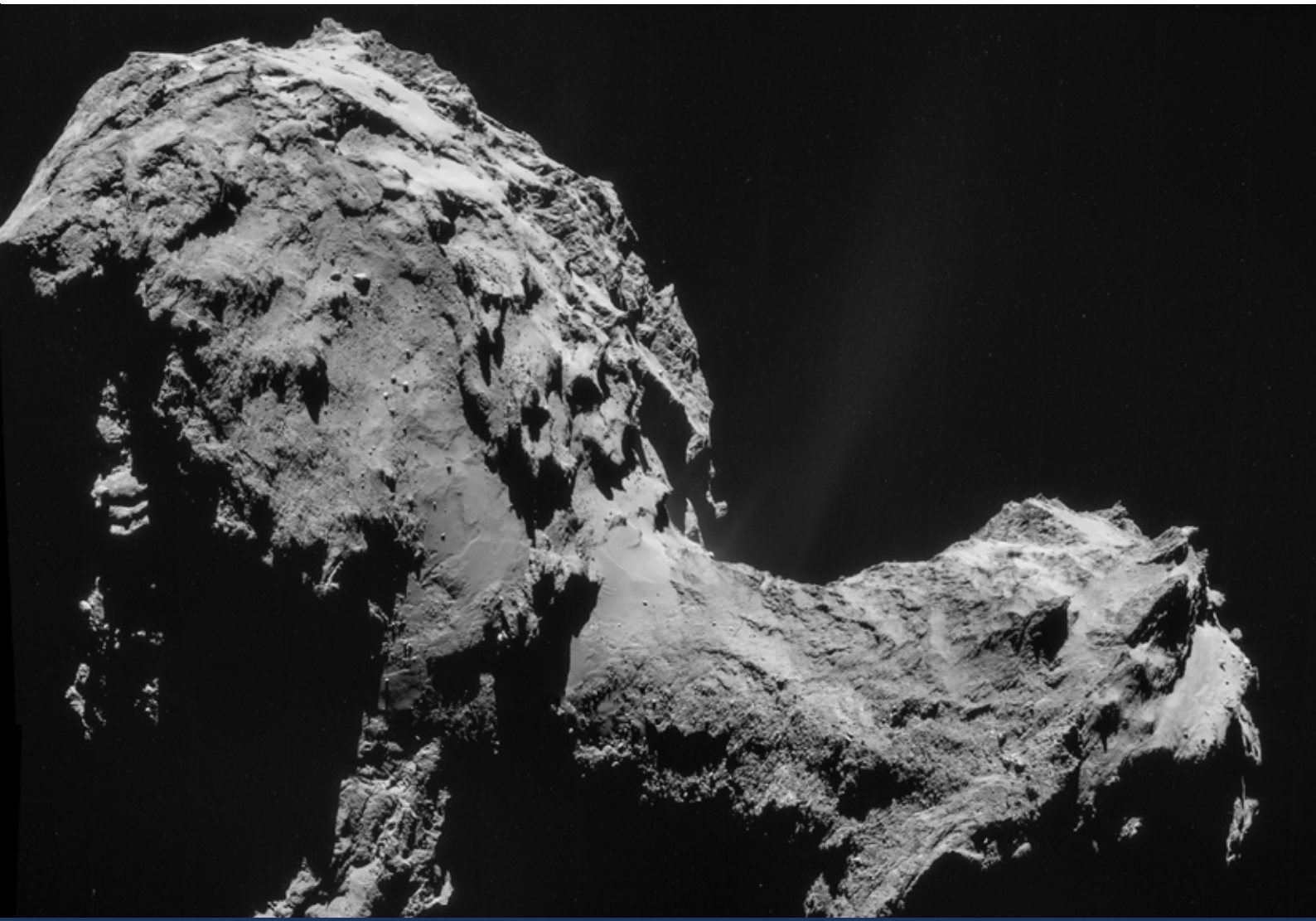
SPACE GENERATION
ADVISORY COUNCIL

ANNUAL REPORT



SPACE GENERATION ADVISORY COUNCIL 2014

In support of the United Nations Programme on Space Applications

SPACE GENERATION
ADVISORY COUNCIL

In support of the United Nations Programme
on Space Applications

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Acknowledgements

The SGAC 2014 Annual Report was compiled and edited by Minoo Rathansabapathy *(South Africa/Australia)*, Andrea Jaime *(Spain)*, Laura Rose *(USA)* and Arno Geens *(Belgium)* with the assistance of Candice Goodwin *(South Africa)*, Justin Park *(USA)*, Nikita Marwaha *(United Kingdom)*, Dario Schor *(Argentina/Canada)*, Leo Teeney *(UK)* and Abhijeet Kumar *(Australia)* in editing. The SGAC Executive Committee is grateful to the editors for donating their time. Members of the Space Generation Advisory Council worldwide were the primary contributors to the content of the report.

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B. SPONSORS and PARTNERS

The Space Generation Advisory Council (SGAC) is very grateful for the continued generous support of sponsors and partners. This year SGAC's sponsors and partners expanded both their financial and intellectual contributions. This has played an important role in the improved quantity and quality of SGAC's output in 2014.

SGAC would like to thank all sponsors and partners once again for their contribution to one of the most successful years in SGAC history.

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Sapienza Aerospace Students Association

Students in Aerospace

Skyward Experimental Rocketry

Space News

SpaceRef

Toronto Students for the Advancement of Aerospace

United Kingdom Students for the Exploration and Development of Space

University of Toronto Aeronautics Team

Women in Aerospace – Europe

World Space Week Association

Young European Space Agency

The Council of Young Ukranian Space Industry Workers

Yuri's Night

1. INTRODUCTION

1.1 ABOUT THE SGAC

The Space Generation Advisory Council (SGAC) in support of the United Nations (UN) Programme on Space Applications is a non-governmental organisation that aims to represent university students and young space professionals to the United Nations, nation states, and all other actors in the international space arena.

SGAC has permanent observer status to the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS). SGAC has a long history and was conceived at the Third United Nations Conference on the Exploration and Peaceful Uses of Space (UNISPACE-III) in Vienna in 1999. The SGAC Executive Council is made up of representatives from each of the six UN regions. Its focus is on pragmatic advice to space policy makers, based on the interests of the global community of university students and young professionals with an interest in space activities. SGAC's network includes over 4000 university students and young professionals from approximately 90 countries.

1.2 LETTER FROM THE CO-CHAIRS

Dear members, colleagues and supporters,

The Space Generation Advisory Council is now in its 15th year since its inception at UNISPACE III in Vienna in 1999 and we are very proud of the current state of the organisation. Through good teamwork and determination we have brought together some of the most passionate and enthusiastic young people in the world consolidating our goal of representing the space generation in the space sector.

2014 was a busy and exciting year for us working on various activities with remarkable success! We organised several young professional workshops, worked on papers reflecting the current development of an entire region and developed a new regional event, the first Asia Pacific Space Generation Workshop.

Our major event in the first half of the year was the third edition of the Space Generation Fusion Forum, which served as a forum to discuss new disruptive developments in the space sector with professionals and key players of the sector. Thanks to the substantial support of our partners, the Fusion Forum format has grown to an event we are eagerly looking forward to every year.

In the second half of the year we hosted our annual event, the Space Generation Congress, which was held in Toronto, Canada. Students and Young professionals from around the globe could work together in finding recommendations to current space related issues guided by high profile space professionals. The event concluded with a memorable night where we commemorated our 15th anniversary. We were honoured to have a very long and distinguished list of attendees including Bob Richards, one of the founders of SGAC. During the evening the attendees could also listen to inspiring speeches made by NASA Administrator Charles Bolden, Lockheed Martin Vice President John Karas, and the United Nations Office for Outer Space Affairs Director, Simonetta di Pippo.

Thanks to the generous support of Lockheed Martin, our 15th anniversary will be remembered with a set of 25 SGAC flags, which were on board the Orion EFT-1 capsule on its maiden flight!

Our anniversary is also marked by a significant change in leadership - SGAC would like to thank Andrea Jaime Albalat *(Spain)*, SGAC's Executive Director, for almost four years of leadership and passion. At the same time it is our pleasure to welcome Minoo Rathnasabapathy *(South Africa/Australia)* who will take office in January 2015.

Thank you to all of our volunteers, supporters and friends that made 2014 such a successful and amazing year! We are looking forward to another exciting year ahead.

Ad Astra!

Chris Vasko
SGAC Chair

Victoria Alonsoperez
SGAC Co-Chair

1.3 LETTER FROM THE EXECUTIVE DIRECTOR

Dear SGAC members, partners, supporters and friends,

2014 has been an amazing year. Many positive changes were implemented in the organisation, which reinforced the trend of continued development and growth of SGAC that we have been seen for the past years.

The key metrics that SGAC uses to measure its growth - number of delegates attending SGAC events, donation revenue, number of scholarships, partnerships with other organisations, SGAC events and contributions to the international space community- have reached a new record. The SGAC Team is very proud our achievements through the continued hard work and dedication of our volunteer members.

The SGAC has continued supporting the United Nations by participating actively at COPUOS meetings and by bringing forward young, fresh ideas from the many SGAC project groups and NPoCs. The project groups, now eight of them, have continued to publish educational and technical material on hot space topics throughout the year. The impact of these reports has brought numerous opportunities for SGAC members to present their work through attending conferences and events around the world.

SGAC has continued to prioritise scholarship opportunities for its members. Over 71 scholarships and awards were give this year to SGAC members, a number, which we hope to grown in 2015! These included full scholarships to attend the Space Generation Congress, and the Space Generation Fusion Forum, SGAC's annual events that are growing in their successes.

With agreements with new partners, SGAC organised new events in different regions around the world this year, such as the Asia Pacific Space Generation Workshop, Young Space Professionals in Europe Workshop, the Satellite 2014 Mentoring Event, and many more, totalling an astounding nine events fully organised and supported by SGAC!

SGAC celebrated its 15th anniversary in 2014, and reached new heights has we were given the opportunity to send 25 SGAC flags to space on board of Orion EFT-1. Now, it is time to look forward to 2015 with a new Executive Director, Minoo Rathnasabapathy, who will not only keep the steady growth of SGAC, but also bring new ideas, motivation and energy to the organisation.

On behalf of the Executive Council, I would like to recognise all its members, and the hard work of the young volunteer professionals and students that made 2014 a success.

Thank you SGAC, and thank you to all space professionals who trust on our organisation to increase the visibility of the next generation of space leaders within the space community.

Best Regards,

Andrea Jaime
SGAC Executive Director

1.4 SGAC OUTPUT AT A GLANCE

SCHOLARSHIPS AND AWARDS (75)

- Australian Youth Aerospace Association Australian Futures Award *(4)*
- German Aerospace Center (DLR) Standout Student Scholarship *(4)*
- Japanese-SGC Scholarship *(1)*
- New Ukrainian Space Generation Scholarship *(2)*
- OHB - Move an Asteroid Technical Paper Competition *(1)*
- SGAC-IAASS Space Safety Paper Competition *(3)*
- $pace is Business Paper Competition *(2)*
- Space Generation Advisory Council Global Grants Programme *(4)*
- Space Generation Advisory Council Young Leader Awards *(2)*
- Space Solar Power Design Competition *(1)*
- SSPI Satellite Futures Scholarship *(2)*
- United Nations/International Astronautical Federation (UN/IAF) Workshop Scholarship *(1)*
- NASA SCaN Scholarship *(2)*
- SATELLITE 2014 Complimentary Registrations *(25)*
- Space Symposium Complimentary Registrations *(17)*
- SpaceOps Complimentary Registrations *(4)*

CONFERENCES AND WORKSHOPS SUPPORTED (9)

- Asia-Pacific Space Generation Workshop, Japan
- ESA Ministerial/White Paper Workshop, Canada
- Reach for the Stars, Belgium
- SATELLITE 2014 Speed Mentoring Event, USA
- SGAC Roundtable on Space Security and Governance, Canada
- Space Generation Fusion Forum (SGFF), USA
- Space Generation Congress (SGC), Canada
- Space in Austria Get Together (SAGT), Austria
- Young Space Professionals in Europe Workshop, The Netherlands

FORMALISED PARTNERSHIPS (17)

- AIAA Sapienza Aerospace Student Association (SASA)
- AMSAT-DL
- Czech Space Office (CSO)
- Embry-Riddle Aeronautical University
- Hungarian Astronautical Society (MANT)
- International Development Alliance
- Night Sky Magazine
- SATELLITE 2014
- Skyward Experimental Rocketry
- Students in Aerospace
- Swiss Space Systems (S3)
- The International Astronautical Federation (IAF)
- The Netherlands Space Society (NVR)
- Toronto Students for Advancement of Aerospace (TSAA)
- UK Students for the Exploration and Development of Space (UKSEDS)
- University of Toronto Aerospace Team (UTAT)
- Von Karman Institute, QB50

PAPERS, PRESENTATIONS, AND PUBLICATIONS (20+)

PROJECT GROUPS

Space Safety and Sustainability Project Group:

- M Emanuelli *(Italy)*, G Federico *(Italy)*, J Loughman *(USA)*, D Prasad *(India)*, T Chow (USA), M Rathnasabapathy *(Australia)*. *Conceptualizing an economically, legally, and politically viable active debris removal option.* Acta Astronautica 2014;104(1):197–205.
- SA Nasseri *(Canada/Iran)*, C Borriello *(Italy)*, A Hussein *(Iraq)*, F Kebe *(France)*. *Active Debris Removal Mapping Project.* 65th International Astronautical Congress, September 29-October 3, 2014. Toronto, Canada.
- J Lousada *(Portugal)*, A Malcolm (UK), H Gamal *(Egypt)*, R Rajput *(India)*, M Emanuelli *(Italy)*, A Nasseri *(Canada/Iran)*. *Report on National Research on Space Debris, Safety of Space Objects with Nuclear Power Sources on Board and Problems of their Collision with Space Debris.* 52nd UN OOSA Scientific and Technical Subcommittee, October 2014, Vienna, Austria.

Commercial Space Project Group:

- P Maier *(Germany)*, N Bernede *(Germany)*, S Schmidt *(The Netherlands)*, J Svoboda *(Czech Republic)*. *The Structure of the European Space Industry – Current and Historical Analysis of Industry Clusters in Germany.* 65th International Astronautical Congress, September 29-October 3, 2014, Toronto, Canada.

Space Exploration Project Group:

- A Calzada-Diaz *(Spain/UK)*, M Dayas-Codina *(Spain)*, JL MacArthur *(UK)*, DM Bielicki *(UK)*. *Role of the youth within the Space Exploration Sector.* Space Policy 2014,30(3):178-182.
- A Calzada-Diaz *(Spain/UK)*, DM Bielicki *(UK)*, M Dayas *(Spain)*, JL MacArthur *(UK)*, KA Gray *(UK)*. *The Global Exploration Roadmap - a global strategy from SGAC's point of view.* 65th International Astronautical Congress, September 29-October 3, 2014, Toronto, Canada.

Youth for the GNSS Project Group:

- J Duran *(Spain)*, E Offiong *(Nigeria)*, OT Isaiah *(Nigeria)*, S Wan *(USA)*. *Challenges Faced by GNSS Today: an Overview.* 65th International Astronautical Congress, September 29-October 3, 2014, Toronto, Canada.
- S Wan *(USA)*. *The contribution of SGAC by the YGNSS.* International Committee of GNSS, September 9-November 14, 2014, Prague, Czech Republic.
- B Meskoob *(Iran)*. *Introduction on SGAC and YGNSS working group.* International Summer School on GNSS, 28 July-2 August, 2014, Tokyo, Japan.
- S Tanbakouei *(Iran)*, M Rezaei *(Iran)*. *SGAC and YGNSS.* World Space Week, October 4-10, 2014, Isfahan, Iran
- W Qazi *(Pakistan)*. Introduction to Remote Sensing. International Space Apps Challenge, April 12-13, 2014, Pakistan.

Near Earth Object Project Group:

- S Tanbakouei *(Iran)*, M Rezaei *(Iran)*. *NEO group projects of SGAC*, "5th Anniversary of Launching the First Iranian Satellite", Tehran, Iran.
- S Tanbakouei (Iran), M Rezaei *(Iran)*. *NEO group projects of SGAC and FAA.* Outreach event at the University of Arsanjan, Arsanjan, Iran.
- S Tanbakouei (Iran), M Rezaei (Iran). *NEO group projects of SGAC.* Astronomy Day, May 10, 2014, Isfahan, Iran.

Other:

A Jaime *(Spain)*. *Aerospace Engineering: Management and Policy*, Open Lecture, FH Wiener Nuestadt.

S Tanbakouei *(Iran)*, M Rezaei *(Iran)*. *SGAC and its goals*, Outreach event in Adib Astronomy Center, Isfahan, Iran

S Tanbakouei *(Iran)*, M Rezaei *(Iran)*. *Cubesats, Nanosats and SGAC*, Astronomy Day, Tabriz, Iran.

SG Diaz *(Austria)*, E Braegen *(Australia)*, T Hobbs *(USA)*, LP Serra *(Spain)*. *Knowledge management and know-how transfer in the space industry. An effective way to adapt to the employment patterns of the next generation*. 65th International Astronautical Congress, September 29-October 3, 2014. Toronto, Canada.

J Svoboda *(Czech Republic)*, SG Diaz *(Austria)*, LP Serra *(Spain)*, T Hobbs *(USA)*, E Braegen *(Australia)*. *Entrepreneurship thinking, customer focus and lessons learned from related industries-Ways to foster Newspace Industry*. 65th International Astronautical Congress, September 29-October 3, 2014. Toronto, Canada.

A Nasseri *(Iran)*. *The Space Generation Advisory Council (SGAC).* ISU Space Studies Program 2014, Montreal, Canada.

A Nasseri *(Iran)*. *The SGAC Space Safety and Sustainability Project Group.* ISU Alumni Conference, Montreal, Canada.

A Nasseri *(Iran)*. *Performance Mapping of Space Debris Removal Concepts.* 65th International Astronautical Congress, September 29-October 3, 2014, Toronto, Canada.

J Hacker *(Australia)*. *SGAC: Beyond a Network.* SpaceUp, October 18, 2014, Stockholm, Sweden.

A Dorina *(Romania)*. *A worldwide survey on the Regulatory and Economical Aspects of Nano-Satellites.* 6th European Cubesat Symposium, October 14-16, 2014, Estavayer-le-Lac, Switzerland.

SGAC Position Paper on European Space Agency's Evolution. SGAC Workshop on the ESA Council at Ministerial Level's participants, Toronto, Canada

SGAC Annual Report 2014

SGAC Executive Summary of the Annual Report 2014

SGAC Monthly Newsletters

Space Generation Fusion Forum 2014 Final Report

Space Generation Congress 2014 Final Report
- Including five Working Group individual reports and the ESA Ministerial/White paper Workshop and the SGAC Roundtable reports

40+ presentations including posters, papers and panels by SGAC members at this year's IAC

SGAC's UN Involvement Video

SGAC 15 Anniversary Video

Space Generation Fusion Forum 2014 Summary Video

Space Generation Congress 2014 Highlights Video

SGAC Statement at the Scientific and Technical Subcommittee of UNCOPUOS Video

SGAC Technical Presentation at the Scientific and Technical Subcommittee of UNCOPUOS Video

CONFERENCES AND EVENTS WITH OFFICIAL SGAC REPRESENTATION (29)

6th European CubeSat Symposium, Estavayer-le-Lac, Switzerland

7th IAASS Conference: Space Safety is not an Accident, Munich, Germany

9th Meeting of the International Committee on Global Navigation Satellite Systems (ICG), organised by the European Commission (EC), the International Conference on Global Navigation Satellite Systems (ICGNSS), and the European GNSS Agency (GSA), Prague, Czech Republic

12th Reinventing Space Conference, London, UK

21st Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-20), Tokyo, Japan

24th UN/IAF Workshop on Space Technology for Economic Development, Toronto, Canada

30th Annual Space Symposium in Colorado Springs, Colorado, USA

36th International School of Young Astronomers, Chiang Mai, Thailand

57th Annual Meeting of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), Vienna, Austria

51st Session of the Scientific and Technical Subcommittee of UNCOPUOS, Vienna, Austria

53rd Session of the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space (UNCOPUOS), Vienna, Austria

65th International Astronautical Congress (IAC), Toronto, Canada

American Institute of Aeronautics and Astronautics SpaceOps Conference, USA

Annual ESPI Autumn Conference, Vienna, Austria

Brazilian Colloquium on Orbital Dynamics (CBDO), Sao Paulo, Brazil

European Space Expo, Craiova, Romania and in Genoa, Italy

European Space Expo, Genova, Italy

IAF Spring Meetings, Paris, France

International Project/Programme Management Committee (IPMC) Workshop, Toronto, Canada

ISU Southern Hemisphere Summer Space Programme, Australia

ISU Israel Alumni Meeting, Tel Aviv, Israel

SATELLITE 2014, Washington DC, USA

Space in Austria Get Together, Vienna, Austria

SpaceUp Vienna, Vienna, Austria

SpaceUp Sweden, Stockholm, Sweden

SpaceUp Bremen, Bremen, Germany

SpaceUp Australia

SpaceUp NL, ESTEC

SpaceUp Toulouse

SpaceUp UK

Space Studies Programme 2014, International Space University, Montreal, Canada

United Nations Office for Outer Space Affairs (UNOOSA) to hand-over the OeWF TiuTerra crystal to director Simonetta Di Pippo, Vienna, Austria

UN/Mexico Symposium on Basic Space Technology, Ensenada, Mexico

World Space Week Celebrations around the world

Although they are not all listed here, SGAC members have also attended and helped to organise numerous events in their home countries, especially for World Space Week and Yuri's Night.

2. SGAC BACKGROUND

2.1 HISTORY OF THE SGAC

In December 1997 the UN Office of Outer Space Affairs (UN OOSA) Secretariat invited the International Space University (ISU) to organise a forum for young adults as part of the UN Committee on the Peaceful Uses of Outer Space (COPUOS). The ISU solicited alumni volunteers to plan, organise and conduct the Space Generation Forum, in parallel with other UNISPACE III activities. The Space Generation Forum was attended by 160 participants from 60 countries. Their expertise covered all fields of space, including science, engineering, technology, law, ethics, art, literature, anthropology and architecture. These participants developed ten recommendations that were combined into the "Space Generation Forum: Visions and Perspectives of Youth".

Of these ten recommendations, five were integrated into the Vienna Declaration. One of the recommendations was "To create a council to support the United Nations Committee on the Peaceful Uses of Outer Space, through raising awareness and exchange of fresh ideas by youth. The vision is to employ the creativity and vigour of youth in advancing humanity through the peaceful uses of space".

From this directive the Space Generation Advisory Council was established. Since then, SGAC has developed into an organisation with thousands of members in over 90 countries. SGAC has grown by establishing Permanent Observer status to UN COPUOS in 2001, earning consultative status with the United Nations Economic and Social Council in 2003, opening its headquarters in the European Space Policy Institute in 2005, and hiring its first paid employee in 2006. Since its inception SGAC has attracted young dedicated space professionals who are passionate about bringing their generation into space.

Many of our founding principles are encapsulated in our current logo:

This logo takes elements from the previous SGAC logo, such as: the laurels, most commonly associated with the United Nations, representing peace and unity; an abstract rendition of three space explorers, now forming part of the Earth; and three stars to represent space itself. The keywords of "diversity, internationality, professionalism, youth, space exploration and passion" were kept in mind when designing this logo. Strong lines make up the three figures of the logo. These intertwining lines incorporate a sense of teamwork and cohesion and reference professionalism and shared interest. Colour is used to distinguish the shapes, while symmetry brings together their likenesses. Uniformly, the mark is balanced yet dynamic, like the varying minds and backgrounds within members of SGAC. The original elements are simplified but dynamic to show the seriousness and energy of the organisation.

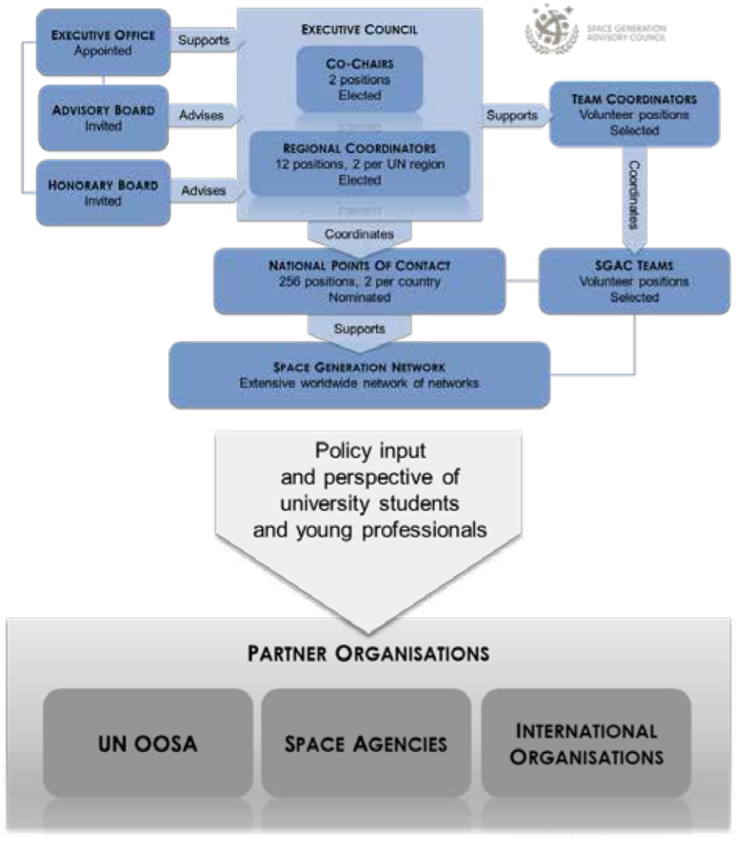
For more information about UNISPACE III please visit:
http://www.un.org/events/unispace3/

For more information about the International Space University please visit:
http://www.isunet.edu/

For more information about the Vienna Declaration on Space & Human Development *please visit: http://www.unoosa.org/pdf/reports/unispace/viennadeclE.pdf*

2.2 LEADERSHIP AND STRUCTURE

SGAC has a clear and solid structure that has been consolidated through the past years.



The SGAC Teams are comprised of volunteers who are in charge of running certain aspects of the organisation, such as Copy Editing, Website, PR & Communications, Project Groups, Competitions and Scholarships, Events Managing, and Strategic Partnership Coordination.

2.3 PROGRAMME

SPACE POLICY

Past SGAC achievements include contributions to the Vienna Declaration (1999), the creation of the Latin American Space Association (ALE) (2000), the Space Association of Turkish States (SATS) (2001), the Space Policy Summit (SPS) (2002), the EU Green Paper Submission (2003) and "The Youth Space Vision for the Next Decade" (2009).

In 2014, SGAC continued to hold an observer presence and provided input to the 51st Session of the Scientific and Technical Subcommittee, the 53rd Session of the Legal Subcommittee, and the 57th Session of UN COPUOS. SGAC also was represented at the 9th Meeting of ICG in Prague, Czech Republic, and the Action Team 14 (AT14) group meeting, the United Nations group that works on Near-Earth Objects.

SPACE EDUCATION & OUTREACH

Space education and outreach programmes were once again a primary SGAC activity, uniting members worldwide. In our quest to increase young input and engagement on international space issues, SGAC works to provide financial support for key initiatives. As our membership is globally diverse, one of our key goals is to allow our members to take part in the international space policy creation process, from attendance and presentations at UN COPUOS, to participating in our annual events, the International Astronautical Congress (IAC), the Space Symposium (SS) and issue-specific seminars around the world. Many SGAC members participated in and/or organised space education and outreach events in their respective countries, and – as in former years – SGAC was able to provide funding for several students and young professionals from developing countries to attend international conferences and workshops. Such activities included organising SGC 2014 in Toronto, Canada and SGFF 2014 in Colorado Springs, USA. In total SGAC was able to give 75 scholarships and awards to SGAC members to attend several international meetings. Additionally, SGAC co-hosted and supported several events, including SATELLITE 2014 Speed Mentoring, the Asia-Pacific Space Generation Workshop and many others. SGAC also actively participated in World Space Week and Yuri's Night.

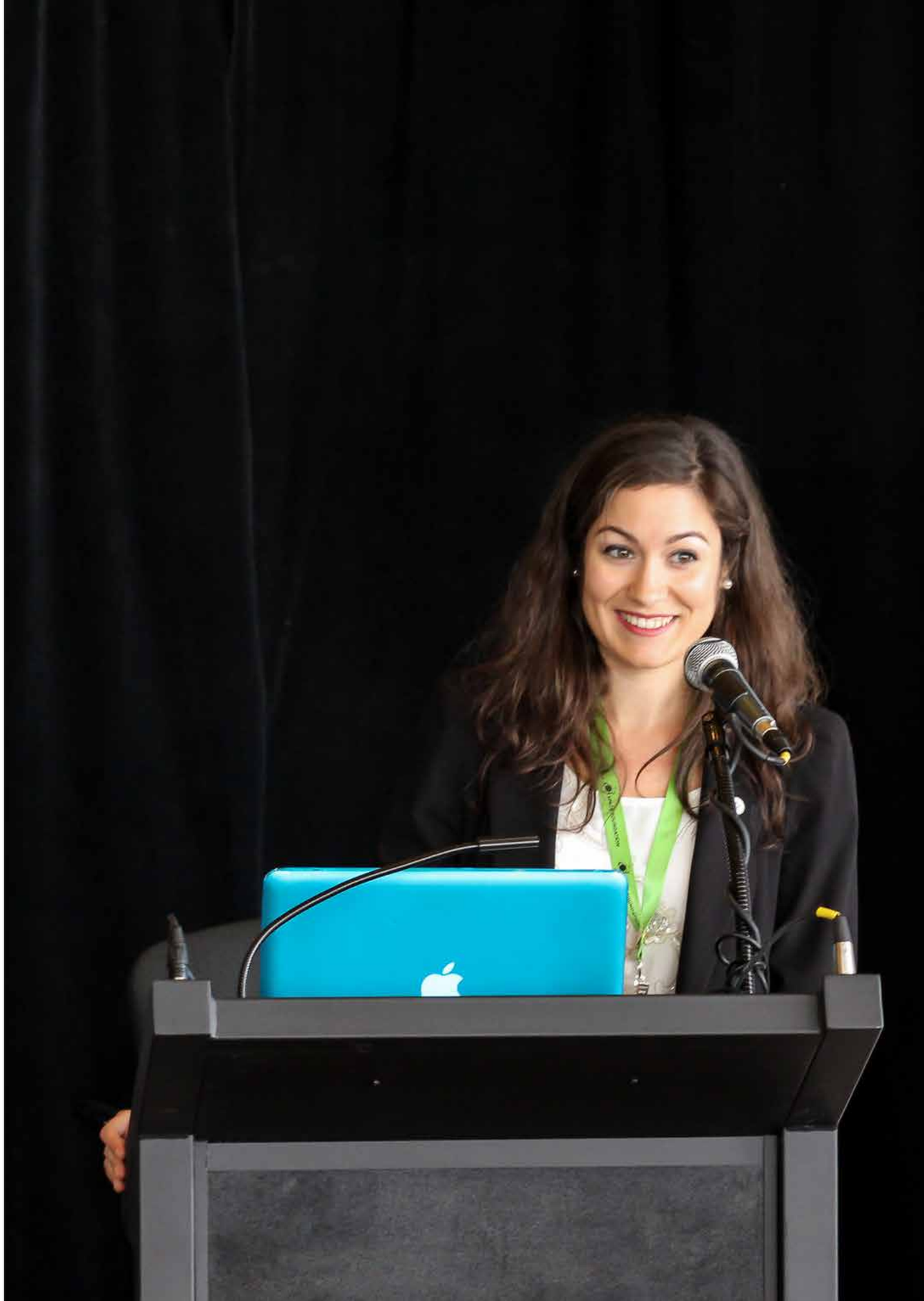
SGAC also conducts outreach in its various project groups including: Commercial Space, Space Technologies for Disaster Management, Space Safety and Sustainability, Near Earth Objects, Small Satellites, Youth for GNSS Project Group and Space Law.

INTERNATIONAL COOPERATION

SGAC strives to promote international cooperation in all of its activities. SGAC members have worked together on projects to save time and money. Our global network has enabled many proven concepts to be brought from one country to another and has enhanced international collaboration. In addition, SGAC has formalised partnerships with 17 international space organisations in this year alone.

SPACE GENERATION NETWORK

The SGAC network is the organisation's strongest asset. Through projects, events and information resources, SGAC aims to be the premier linking organisation of young space professionals and students in the world. SGAC continues to expand with the addition of many new National Points of Contact (NPoCs). At the end of 2014, the SGAC network had more than 4000 active members, and NPoCs represented more than 90 countries.



3. THE ORGANISATION IN 2014

3.1 GOAL ACHIEVEMENT REVIEW

OVERVIEW

The SGAC Strategic Plan 2014 outlined nine goals for the year ahead. This section of the Annual Report is the Executive Office´s self-assessment of how SGAC met these goals. It is further intended to provide an additional view of the aims of SGAC´s activities throughout the year and serves to inform readers about the development of the SGAC Strategic Plan for 2015.

STRATEGIC GOAL REVIEW

1. Continuation of efforts towards financial stabilisation

Output: *Improve financial stability by maintaining strong relationships with sponsors and seeking additional funding resources. Report on the first crowdsourcing campaign for SGAC, evaluating the feasibility of this approach for the organisation's short-term financial support. Develop concise individual budgets for Project Groups and Competitions. Attract new sponsors from new areas of the space sector, such as the telecommunication companies and organisations.*

SGAC operated on a strong financial base with all accounts paid on time. SGAC welcomed new sponsor organisations and supporters. The space sector demonstrated its continued interest in young professionals and students, leading to 16 new relationships with MoUs by the end of the year. This growth of the SGAC network is partially due to the 2014 creation of a strong Strategic Partnerships Team (SPT), which we consider one of this year's highlights. The aim of the SPT is to seek new sponsors and supporters in different regions and to coordinate with the SGAC office to extend and consolidate existing relationships of the network.

Another aspect of this objective is to save sufficient funds to maintain a balance in excess of SGAC's immediate operational needs. This objective is yet to be realised. The location of the 13th annual Space Generation Congress in Canada increased spending by a significant margin compared to previous years, despite capping delegate numbers to lower general expenses. Even with these expenses, sufficient funds are available to support a paid Executive Director and Deputy Executive Director position (for limited time), two interns and an office space over the course of the year. Operational costs for at least one year in the future were also secured.

2. Successful execution of the Space Generation Fusion Forum 2014

Output: *Report on a successful execution of the SGFF 2014. Success will be assessed by the funds raised, scholarships awarded along with the demographics of attendees, quality of discussions, calibre of speakers and engagement of SGFF during the 30th Space Symposium. Engage new SGAC members into the preparation and participation of SGFF. Establish potential partnerships for the continuation and development of this event within the general framework and purposes of SGAC's development and growth.*

The event gathered 53 young professionals and students from 18 countries, who discussed this year´s theme, "Disruption: How the business of utilizing space is changing". Five SGAC members were invited to join the SGFF through the Global Grant scholarships, with winners selected based on experience and background.

SGAC was highly visible during the 30th Space Symposium following SGFF: SGAC Chair Chris Vasko was featured as Master Moderator and was judge of Space Technology Hall of Fame; Executive Director Andrea Jaime and SGFF Congress Manager Lewis Groswald co-moderated the Report of the 3rd Space Generation Fusion Forum. SGAC representation was well received, with all three invited as guests to all the main dinners and events of the symposium.

3. Successful continuation of the Space Generation Congress

Output: *Report on a successful SGC event, which is measured by the number of delegates, diversity in backgrounds and country of origin, number of scholarships and quality of the final SGC presentations and SGC Final Report.*

The Space Generation Congress (SGC) held in Toronto, Canada in September 2014 was an overwhelming success, and was the first sold out congress. The organisational committee worked very hard to ensure that everything was according to plan and successfully hosted the first SGC in Canada. The SGC gathered 128 delegates coming from 40 different countries, with diverse backgrounds and professional statuses. SGAC was able to award 25 scholarships to participants coming from 8 different countries. This year's Gala Dinner was also sold out with over 260 participants and featured exciting speeches by our founders, supporters and a keynote speech from NASA Administrator Charles Bolden. The evening culminated in the announcement of SGAC flags being flown to space as a courtesy by SGAC partner Lockheed Martin.

4. Strengthen relationships with partner organisations and create new ones

Output: *Formalise the relationship with existing and new partner organisations, especially the IAF, through Memoranda of Understanding. These outline long term benefits of collaboration and provide better visibility of SGAC in the space sector, especially where SGAC is not yet known, such as the telecommunications sector.*

This year was a fantastic year, with 16 MoUs signed to formalise relationships (See SGAC Highlights Section in the Executive Summary for the complete list of all signed agreements). SGAC is in the process of consolidating relationships with companies in other areas of the space industry and even other industries.

A major accomplishment was signing of an MoU with the International Astronautical Federation (IAF), confirming SGC as an associate event of the IAC. SGAC also organised the SATELLITE 2014 Mentoring Event, which enhanced SGAC's visibility within the satellite communications sector. The event was so successful that SGAC is planning another event for the SATELLITE 2015 Conference.

5. Consolidation of the SGAC membership database

Output: *Work on a technical solution to improve the existing databases, and make a clear distinction between active members, members and former members of SGAC.*

SGAC contracted a professional webpage developer to improve the SGAC website for members. This platform serves to integrate all membership data obtained over the years and update it together with actual information on website usage by members. Updates will allow an up-to-date record of all SGAC members and offer a more user-friendly display. The site will further be optimized for display on mobile devices, a requirement identified by many of our members. It also has an integrated blog function, comparable to social media sites, to allow better communications between SGAC members. The platform has already been BETA tested in November 2014, and will go live January 2015.

6. Development of the SGAC Alumni database as part of the member

Output: *Create a member database including former members, their activities and involvement with SGAC. Reactivate relationships with members that have been out of contact, particularly in the context of SGAC events or on-going projects.*

The new web platform allows SGAC to keep record of the former SGAC members. The SGAC membership is being restructured, which will include SGAC Alumni and past SGC and SGFF delegates. This new structure will be voted upon at the 2014 General Assembly. This year, SGAC has also been regaining contact with many of past active members, especially past Chairs and Officers.

7. Recognition of SGAC through an award

Output: *Report to SGAC's Executive Council on the organisation's eligibility and competitiveness for available awards, including an exhaustive compilation of main achievements and main representatives of the organisation since its inception.*

The SGAC Executive has requested that the Advisory Board help to identify available awards for SGAC. In this year, SGAC have not yet found any good options or applied for any specific award, however the search is on-going. Despite the unavailability of awards, SGAC has compiled the SGC history for the past 13 congresses, which is now available on the website. SGAC also published four episodes summarising the main accomplishments and achievements since its inception in 1999 to celebrate its 15th anniversary.

SGAC has applied to obtain NGO-granted free software, and was approved to receive a free Salesforce account, valued to 16,200EUR, and a discounted Gotomeeting account, valued at 200EUR.

8. Smooth, seamless leadership transition

Output: *Complete handover of tasks, organisational relationships and responsibilities from Andrea Jaime to the incoming new Executive Director.*

After carefully interviewing several well-qualified candidates, Minoo Rathnasabapathy *(South Africa/Australia)* was selected to be the Deputy Executive Director. She has been working in the Vienna Headquarters since September 2014 with the Executive Director, Andrea Jaime *(Spain)*, and the transition has been successful. Minoo took charge of tasks immediately and is ready to take over as Executive Director of SGAC in January 2015.

9. Strengthen relationship with UNOOSA

Output: *Establish periodic meetings at the UNOOSA outside of annual COPUOS meetings to establish a closer relationship with the new UNOOSA director appointed in 2014. Update and improve maintenance of the SGAC UN Involvement Webpage on the SGAC website.*

The SGAC, the Executive Director and the new Deputy Executive Director have personally established a closer relationship with the new UNOOSA director, and the request for periodic meetings was well-received by the director. SGAC invited the new UNOOSA Director as featured speaker to the SGC closing gala dinner in Toronto, Canada, as an appreciation and intention to strengthen the collaboration. SGAC updated the UN Involvement Website, which now includes activities available for SGAC members (such as UN symposiums), and general information about the Regional Centres.

SGAC members, as well as SGAC Executive Office members attended several UNOOSA events throughout the year (i.e. UN/Mexico Symposium, ICG, etc.), solidifying SGAC's strong relationship with the UN and the new UNOOSA Director. SGAC also published a summary video of the SGAC's UN Involvement, available in the SGAC YouTube Channel.

3.2 SGAC ACTIVITY HIGHLIGHTS

GENERAL HIGHLIGHTS

Christopher Vasko *(Austria/Hungary)* succeeded Chijioke CJ Nwosa *(Nigeria)* as the new Chair of SGAC.

SGAC welcomed a new Co-Chair, Victoria Alonsoperez *(Uruguay)*.

SGAC welcomed a new Deputy Executive Director, Minoo Rathnasabapathy *(Australia/South Africa)*.

SGAC appointed Jack Yeh *(New Zealand)* as the new Executive Secretary.

SGAC welcomed two interns, Luisa Carbone *(Italy)* and Reinhard Tlustos *(Austria)*.

SGAC celebrated 15 years with a special event at the SGC Gala Dinner in Toronto, Canada, and a series of articles on the website.

The main SGAC website pages is now available in the six UN languages.

SGAC partnered with Lockheed Martin and ULA to send 25 SGAC flags into space on board of the EFT-1 Orion Capsule.

SGAC organised the following events through the year:

- Young Space Professionals in Europe Event in cooperation with Young ESA and ESTEC Staff Committee, at the European Space Agency, Noordwijk, The Netherlands.
- SGAC Mentoring Event at the SATELLITE 2014 Conference, Washington DC, USA.
- Reach for the Stars, together with the European Commission and Airbus, Belgium.
- Reinventing Space Careers, in conjunction with the 12th Reinventing Space Conference, organised together with UKSEDS and ISU, in London, UK.
- 1st Regional Asia Pacific Space Generation Workshop was held in Japan, entirely organised by SGAC volunteers in the region, in conjunction with the Asia-Pacific Regional Space Agency Forum (APRSAF).
- 3rd Space Generation Fusion Forum, with 53 delegates from 18 countries.
- Space Generation Congress, receiving 250 applications from 58 countries with 128 delegates accepted from 40 countries.

SGAC provided funding for attendance to global space events:

- In partnership with Beihang University, SGAC offered two full-year scholarships to study a Masters degree in Beijing, China

SGC and the SGC Gala Dinner were both sold out, with the dinner being the largest ever organised at 260 guests.

SGAC launched a project group on Space Exploration to investigate the future of space exploration and the international roadmap.

SGAC achieved remarkable participation at the IAC 2014 in Toronto, Canada. SGAC members presented more than 40 technical papers covering varying areas of interest, and participated in panel discussions and organised incredibly successful outreach events. These included the Roundtable on Space Governance, the ESA Ministerial Workshop, SGAC Next Gen Reception (together with the ISU and Work-force Development/Young Professionals Programme (WD/YPP) Committee), and the Global Networking Forum Panel Launching Minorities into the Space Sector. Members also participated in events such as the Next Generation Plenary, and several IAF Committees.

SGAC expanded its social media activities with new and more active Twitter, Facebook and Flickr accounts.

The Name an Asteroid Campaign resulted in six new asteroids named by SGAC members.

EXECUTIVE OFFICE HIGHLIGHTS

SGAC Executive Director Andrea Jaime *(Spain)* presented SGAC's general statement at the 57th Session of UNCOPUOS in Vienna in June to detail SGAC's activities during the past year. She also presented SGAC's general statement, covering SGAC's developments, at the 51st UNCOPUOS Scientific & Technical Subcommittee in February 2014.

SGAC delivered two technical presentations at the UNCOPUOS meetings, one of them by the SGAC Chair Chris Vasko *(Austria/Hungary)*.

SGAC Executive Office members attended the 53rd Session of the Legal Subcommittee of UNCOPUOS.

SGAC Executive Director Andrea Jaime *(Spain)* participated at the IAF Spring Meetings (Paris, France), contributing to five technical committees of the IAF.

SGAC Deputy Executive Director Minoo Rathnasabapathy *(Australia/South Africa)* contributed to a panel on space education organised by Beihang University at the Global Networking Forum of the IAF.

SGAC Deputy Executive Director Minoo Rathansabapathy *(Australia/South Africa)* moderated a panel at the Global Networking Forum of the IAF discussing the role of students and minorities in the space sector.

SGAC Executive Director Andrea Jaime *(Spain)* presented, together with Lewis Groswald, at the Space Generation Fusion Forum Panel at the 30th Space Symposium.

SGAC Chair Chris Vasko *(Austria/Hungary)* was the master moderator for one day of the 30th Space Symposium.

SGAC Executive Director Andrea Jaime *(Spain)* moderated a panel at the Reach for the Stars event in Brussels, Belgium, also attended by SGAC Chair Chris Vasko *(Austria/Hungary)*.

SGAC Executive Director Andrea Jaime *(Spain)* and Deputy Executive Director Minoo Rathnasabapathy *(Australia/South Africa)* organised and presented, respectively, at the 1st Space in Austria Get Together.

SGAC Chair Chris Vasko *(Austria/Hungary)* and Co-Chair Victoria Alonsoperez *(Uruguay)* were panellists at the Next Generation Plenary of the International Astronautical Congress in Toronto, Canada.

The IAF awarded Executive Director Andrea Jaime *(Spain)* the 2014 Young Space Leaders Award.

Executive Director Andrea Jaime *(Spain)* and SGAC Co-Chair Victoria Alonsoperez *(Uruguay)* participated at the UN/Mexico Symposium on Basic Space Technology in Ensenada, Mexico.

Deputy Executive Director Minoo Rathnasabapathy *(Australia/South Africa)* attended the 9th Meeting of the International Committee of GNSS in Prague, Czech Republic.

SGAC Executive Director Andrea Jaime *(Spain)* was invited to give a lecture at the FH Schule, Wiener Neustadt.

AFRICA REGION HIGHLIGHTS

CJ Nwosa *(Nigeria)* completed his tenure as a Co-Chair.

Minoo Rathnasabapathy *(South Africa/Australia)* was appointed SGAC Deputy Executive Director.

Beza Tesfaye *(Ethiopia)* and Suki Dauda Sule *(Nigeria)* were appointed as Regional Coordinators.

Akinsanmi Babatunde *(Nigeria)* and Nebiyu Suleyman Mohammed *(Ethiopia)* were appointed as NPoCs to replace vacancies following Regional Coordinator appointments, along with Patrick Essien *(Ghana)*, Idriss Sisaid *(Morocco)* and Ahmed Saad *(Sudan)*.

SGAC wholly or partially organised World Space Week (WSW) events in Ghana, Ethiopia and Nigeria as well as in Zimbabwe with its first WSW activity.

SGAC members celebrated Yuri's Night in Ethiopia, Nigeria, and Kenya.

SGAC African members attended international conferences including SGC 2014, IAC 2014, GLAC 2014 and COSMOS 2014.

ASIA PACIFIC REGION HIGHLIGHTS

Jack Yeh *(New Zealand)* was welcomed as Executive Co-Secretary.

Nine NPoCs were appointed in the region: John Furness *(Australia)*, Khaza Anuarul Hoque *(Bangladesh)*, Kenta Sada *(Japan)*, Altynay Demeubayeva *(Kazakhstan)*, Hasan Murtaza (Pakistan), Peerapong Torteeka *(Thailand)*, Wasanchai Vongsantivanich *(Thailand)* and Dao Thu Ha & Nguyen Tran Hoang *(Vietnam)*.

The 1st Asia Pacific Space Generation Workshop in partnership with Keio University was held November 29-30, 2014, in Yokohama, Japan as an official side event of the 21st Asia Pacific Regional Space Agency Forum (APRSAF-21), December 2-5, 2014, in Tokyo, Japan.

SGAC members from India, Sri Lanka, Philippines and Thailand named four of the six asteroids identified during the Find an Asteroid 2014 Campaign run by the SGAC Near Earth Object Project Group.

SGAC members celebrated Yuri's Night across the region with programmes to engage students and young professionals.

The first Australian SpaceUp was held in the lead up to the ASSC, September 28, 2014.

An official Chinese version of the SGAC website was launched.

International Space App Challenges were held in the region.

EUROPEAN REGION HIGHLIGHTS

Reinhard Tlustos *(Austria)* and Vinita Marwaha *(UK)* began tenure as SGAC Public Relations and Communications Coordinators.

Matteo Emanuelli (Italy) was appointed as Regional Coordinator.

13 new NPoCs were welcomed in 2014: Simon Vanden Bussche *(Belgium)*, Robert Terlevic *(Croatia)*, Michael Kunes *(Czech Republic)*, Sissi Enestam *(Finland)*, Emmanuelle David *(France)*, Lucie Poulet *(France)*, Adrianos Golemis *(Greece)*, Amalia Dimopoulou *(Greece)*, Dorottya Milankovich *(Hungary)*, James Harpur *(Ireland)*, Valentina Boccia *(Italy)*, Roger Birkeland *(Norway)*, Alina-Mihaela Badescu *(Romania)*, Marina Baldina *(Russia)*, Nemanja Jovanovi *(Serbia)*, Lluc Palerm *(Spain)*, Akash Trivedi *(UK)* and Kate Gray *(UK)*.

Jan Svoboda *(Czech Republic)* was appointed manager for 2015 Space Generation Congress.

SGAC signed six MoUs with European space organisations.

European SGAC members organised and contributed to many local events, including SpaceUp events in Vienna, London and Stockholm; Get Together in the Netherlands and Austria; SGAC Meets ESA Workshop at ESTEC; and the 5th Edition of the Space Challenges Programme.

European Regional Coordinators organised the SGAC Workshop on ESA Council at Ministerial Level in Toronto, Canada after SGC.

European NPoCs published a position paper on ESA's Evolution.

MIDDLE EAST REGIONAL HIGHLIGHTS

H Aziz Kayıhan *(Turkey)* ended his four-year term as Middle East Regional Coordinator.

Five new NPoCs were appointed including Daniel Brack *(Israel)*, Amal Al Shaikhah *(Palestine)*, Ece Gülfem Dağdeviren *(Turkey)*, Burak Yağlıoğlu *(Turkey)* and Tareq Ahmed Abdo Hassan *(Yemen)*.

Nine delegates from the Middle East attended SGC 2014 in Toronto, Canada.

Arif Göktuğ Karacalıoğlu *(Turkey)* won the 3rd SGAC-IAASS paper competition and participated in the 7th International Space Safety Conference in Friedrichshafen, Germany.

Pouyan Azari *(Iran)* was awarded an IAF-ESL scholarship.

Behnoosh Meskoob *(Iran)* was awarded a scholarship from PNT, Japan to participate in the International Summer School on GNSS in Tokyo, Japan.

Tayebe Namayeshi *(Iran)* won the best graduate student paper award of IAC 2014.

Ali Nasseri *(Iran)* participated in a simulated mission at MDRS.

Foad K and Homa Samanabadi *(Iran)* identified asteroid 3988 HUMA through the Name an Asteroid Campaign.

The NPoC for Israel met with the head of the Israeli Space Agency and presented the SGAC and the SGC, to be held in Jerusalem, Israel in October 2015.

NPoCs from Iran addressed a congress, held on the 5th anniversary of Iran's first satellite launch, covering SGAC, NEO project groups and how to join SGAC to become part of the space world.

The first Aerospace Student Festival was held at Tehran University.

A team from ITU UYARI placed first among 39 teams at the American Astronomical Society (AAS)/AIAA Annual Cansat Competition.

The first high school student CubeSat, Duchifat1, launched and began operations. Its successor Duchifat2 is under development as part of the QB50 project and several high school student experiments have been launched to the ISS.

Egyptian aerospace students were awarded third place in the Mars Rover competition in Poland, and a second team achieved 9th place in the University Rover Challenge (URC) competition in USA.

NORTH, CENTRAL AMERICA AND THE CARIBBEAN REGIONAL HIGHLIGHTS

Five new NPoCs were welcomed including John Shorter *(Jamaica)*, Yitzhak Alexander Henry *(Jamaica)*, Alejandro Cordova Lopez *(Mexico)*, Mario Aleman *(Nicaragua)* and Charlotte Kiang *(USA)*.

The Space Generation Congress was held in conjunction with the International Astronautical Congress in Toronto, Canada.

The Space Generation Fusion Forum was held in Colorado Springs, USA in conjunction with the Space Foundation's Space Symposium, and managed by Stephen Ringler *(USA)*.

SGAC hosted a SATELLITE Mentoring Event in conjunction with SATELLITE 2015, in Washington DC this March to connect SGAC members with senior industry and agency mentors.

Yuri's Night was held in Up Park Camp, Jamaica on the grounds of the Jamaica Defence Force and attracted many members of the defence force and visitors from the public.

SGAC members attended the International Space University Space Studies Program in Montreal, Canada.

The UN/Mexico Symposium on Basic Space Technology was held in Ensenada, Mexico in October of this year.

A special edition of the New Space Journal, focusing on the new space generation, was published featuring insights from several SGAC members.

SOUTH AMERICAN REGIONAL HIGHLIGHTS

Daniel Konrad *(Brazil)* and Bruno Sarli *(Brazil)* were appointed as Regional Coordinators for South America.

New NPoCs were welcomed including Brehme DR de Mesquita *(Brazil)*, Federico Perazzo *(Argentina)*, Diego AA Gonzalez *(Columbia)* and Giancarlo Villena *(Peru)*.

South American members introduced SGAC in outreach events to students, researchers and other institutions including São Paulo State University at Guaratinguetá (FEG/UNESP), Federal University of São Paulo (UNIFESP), Federal University of ABC (UFABC) and Instituto Nacional de Pesquisas Espaciais (INPE).

Giancarlo Villena de la Cruz *(Peru)* introduced SGAC to a group of software engineering students at the Universidad Alas Peruanas.

Bolivian SGAC member participated in the Space Apps Challenge, sponsored by NASA.

Benjamin Pinaya Gutierrez *(Bolivia)* participated in a project group that started the design, construction and socialisation of Bolivia's first nano satellite.

The Peruvian satellite by the name of UAPSAT-1 was sent into space aboard Orbital Sciences' Antares rocket. The pico satellite UAPSAT-1 was designed and programmed by students of Universidad Alas Peruanas.

3.3 SPACE GENERATION FUSION FORUM REPORT

The 3rd annual Space Generation Fusion Forum was held May 18-19, 2014 at the Broadmoor Hotel, in Colorado Springs, Colorado, US. It brought together top students and young professionals from all over the world to focus on key space topics. The forum was hosted by the Space Foundation in conjunction with the Space Symposium, and nearly all of the forum participants attended the symposium along with more than 9,000 international space professionals. The Fusion Forum participants were invited to dedicated New Generation events held throughout the week.

The Fusion Forum began with the Opening Ceremony, where participants made introductions and heard from keynote speaker Chris Andrews of United Launch Alliance. Space Generation co-founder Bob Richards moderated a panel about entrepreneurship, where senior space industry professionals presented their views and shared advice with delegates. The first day concluded with a networking reception attended by participants and the speakers with the relaxed atmosphere allowing exchange of ideas and continuation of discussions with the speakers throughout the day. On the second day, delegates attended panels on the following topics:

- Small Satellites: Benefits and Risks
- Innovating in Aerospace: Barriers and Opportunities
- Emerging Spacefarers: New Entrants to Space in Africa, Asia and Latin America
- Human Spaceflight: Potential Architectures and Goals for Exploration

The delegates' interest in these topics was reflected in audience participation, including extensive discussions along with question and answer sessions. The Fusion Forum concluded with a lunch reception, featuring keynotes from Sandy Magnus, former National Aeronautics and Space Administration (NASA) astronaut and current Executive Director of the American Institute of Aeronautics and Astronautics (AIAA). Following the conclusion of the Fusion Forum, many delegates took part in the opening ceremony and reception for the 30th Space Symposium.

Speakers and Moderators

Ben Brockert	Founder and CEO, Able Space Corporation
Bob Richards	Co-Founder & CEO, Moon Express
Bradley Cheetham	Chief Operating Officer, Black Swift Technologies
Carissa Christensen	Managing Partner, The Tauri Group
Jeff Greason	CEO and Chairman of the Board of Directors, XCOR Aerospace
John C Andrews	Director, Strategic Planning and Business Development, United Launch Alliance (ULA)
Joshua Brost	Business Development Manager, SpaceX
Laurence A Price	Deputy Programme Manager, Crew Exploration Vehicle, Lockheed Martin Space Systems Company
Peter Platzer	CEO, NanoSatisfi
Phillip Larson	Senior Advisor, Space and Innovation, Office of Science and Technology Policy, The White House
Sam Scimemi	Director of the International Space Station at NASA Headquarters
Sandra H Magnus	Executive Director, American Institute of Aeronautics and Astronautics
Steve Eisenhart	Senior Vice President for Strategic & International Affairs, The Space Foundation
William J Pomerantz	Vice President for Special Projects, Virgin Galactic

Please see
www.youtube.com/user/spacegeneration
for selected presentations.

FUSION FORUM
PANEL DISCUSSIONS

PANEL 1 – SMALL SATELLITES: BENEFTS AND RISKS

Small satellites are increasingly important to global space activities. The relatively low cost of these systems lowers the barrier for use, thereby allowing smaller nations, private organisations, university groups and others to develop and operate small satellites. The capabilities of these small satellites have been steadily improving, providing a wide range of potentially meaningful contributions to global space activities. The panel examined the benefits of small satellites, both in terms of their practical applications and use for capacity building, and how the capabilities of small satellites compare to those of larger, more complex satellites. The panel also addressed the challenges of this growing trend and identified risks posed by the proliferation of small satellite technology, particularly for maintaining a safe space environment. They discussed potential actions to encourage the responsible and sustainable use of space by an increasing number of actors and methods to avoid extensive space debris creation.

The main conclusions of the panel were:
Although small satellites offer a number of benefits to the space community, there are also a number of potential drawbacks that must be addressed. This technology can pose challenges to the safety and security of the space environment. These risks require a coordinated and sensible response from the international community. The goal of the space community must be to continue to raise awareness of the need for a safe and sustainable space environment, and to promote its establishment. The inclusion of small satellite technology into the discussions about the long-term sustainability of outer space is therefore an important goal to establish a safe and secure space environment.

PANEL 2 – INNOVATING IN AEROSPACE: BARRIERS AND OPPORTUNITIES

The Innovating in Aerospace panel investigated the role of innovation and entrepreneurship in the industry. The panel comprised of members from the aerospace and energy industries to compare practices across sectors. The discussion pulled from the perspectives of industry stakeholders to examine how their current efforts facilitate the innovation process. Drawing from parallels in other technical industries, the panel explored novel initiatives, game-changing technologies, the impact of potential new entrants into the space arena, how the space industry perceives risk and how these influences can shape the trajectory and development of an entrepreneurial ecosystem.

Led by moderator Phillip Larson, Senior Advisor to the Office of Science and Technology at The White House, the Innovating in Aerospace panel investigated the following four broad areas: the role of government and agency in fostering innovation, lessons from parallel technical industries to promote an entrepreneurial culture, novel engineering and organisational practices including the assessment of risk and the opening of space to potential new players at varying stages of the innovative process.

The main conclusions of the panel were:

The space industry is at the dawn of a new space age. The Innovating in Aerospace panel investigated the current efforts and progress of innovation by the major stakeholders, and also proposed new directions and ideas towards sustaining this trend. Initiatives such as the COTS programme have demonstrated the success of the public-private partnership model and the panel expects future developments to continue in this direction. The inadequacies of the current regulatory framework, however, do raise some concerns that need to be addressed in collaboration with all stakeholders. Drawing from the insights of other industries, the panel examined various strategies and practices of the innovative process, and highlighted risk assessment as a key factor in both the developmental and operational phases of a space mission. Growth in the industry is enabled by innovation, and by extension, risk. In developing new solutions to serve the existing market or in the creation of new markets, the potential financial gain incentivises new entrants into the fold, and stimulates further growth.

Space is a multidisciplinary endeavour. As the sector progresses, the panellists envisioned further integration of new technologies and principles from other industries, and greater cooperation throughout. Space is a universal resource; its utilisation should be determined by the voices of all stakeholders, and strive for a stable balance between regulation and innovation.

PANEL 3 – EMERGING SPACEFARERS: NEW ENTRANTS TO SPACE IN AFRICA, ASIA, AND LATIN AMERICA

Space activities now touch every part of the world. No country—no matter how small its economy— can afford to ignore developments in space. At the same time, every major space agency and company sees partnership and market opportunities across the globe. In spite of these changes, discussions of international space affairs often overlook countries in Africa, Latin America, and Asia. This panel aimed to address that gap.

Panellists explored how governments and markets in these developing countries are changing the global space sector. They highlighted trends taking shape across these new entrants, including the growth in demand for satellite hardware, communications services, and remote-sensing data in some of the world's least-developed countries. The panel also examined how developments in the global space sector affect the choices before governments and companies in developing countries. Among these were choices about whether and how to allocate scarce public resources to space activities and at what opportunity costs. This discussion allowed participants to re-evaluate familiar claims about whether and how space activities contribute to development.

The panellists contributing to this discussion brought perspectives from their experiences working in the Mexican Space Agency, the Boeing Company and Lockheed Martin Corporation in the United States, and academic research in Ghana.

A recurring theme throughout this panel discussion was the suitability of space technologies as solutions to problems in the developing world. As the panel participants noted, decisions about allocating public resources to space activities must incorporate a comparative analysis of less costly, more reliable, and more economically sustainable terrestrial alternatives. As one panellist observed, "we should not advocate space-based solutions solely because they are space-based."

PANEL 4 – HUMAN SPACEFLIGHT: POTENTIAL ARCHITECTURES AND GOALS FOR EXPLORATION

The International Space Exploration Coordination Working Group (ISECG) has developed the Global Exploration Roadmap (GER) as an outline for the world's space agencies to collaboratively plan for exploration Beyond Earth Orbit. The ISECG Mission Scenario represents a baseline framework for the world's space agencies to incrementally and collaboratively develop Mars exploration capabilities through missions to near-Earth asteroids and the Moon. The growth of privately owned space ventures, changing geopolitics, and new scientific discoveries on other worlds (especially Europa, Titan, Enceladus and increasing numbers of ever smaller exoplanets) may have disruptive implications to current exploration architectures. This panel discussed how the future of human spaceflight might differ from the baseline scenario.

The main conclusions of this panel were:

While the ISECG Mission Scenario is likely to remain the baseline plan for national space agencies like NASA, increasing capabilities by private industry and non-governmental organisations have the potential to enhance that strategy or render it obsolete. As private capabilities in cis-lunar space evolve and national space budgets tighten, public-private collaboration is a likely requirement to sustain political, public, and financial support for human space exploration.

FUSION FORUM STATISTICS

Fifty-three students and young professionals from eighteen different countries participated in the third Fusion Forum, along with speakers, moderators and industry professionals who formed the discussion panels. Sixteen of these young delegates were members of the organising team. Four participants from four different countries were given scholarships to attend the Fusion Forum, helping broaden the international network of the SGAC and allowing delegates to interact with people from a variety of backgrounds. Of the delegates, 43% were female and 57% male.

The majority of the attendees were Bachelors (32%) or Masters level (59%), while 9% of the participants were PhD level. The young professional attendees came from a variety of space-related fields including aerospace medicine, space law, space policy, engineering and science. Delegates represented commercial and non-profit organisations, space agencies and universities.

Of the eighteen countries represented at the Fusion Forum, the highest percentage of delegates came from the USA, followed by Spain. Participants represented nations with both developed and developing space programmes:

USA	**33**
Spain	**3**
Australia	**2**
Canada	**2**
Germany	**2**
Mexico	**2**
Austria	1
Austria/Hungary	1
Costa Rica	1
Ethiopia	1
Ghana	1
India	1
Iran	1
New Zealand	1
Pakistan	1
Vietnam	1

59%
Master or equivalent

32%
Bachelor or equivalent

9%
PhD

3.4 SPACE GENERATION CONGRESS REPORT

The Space Generation Advisory Council (SGAC) aims to hone and promote the voice of the next generation of space sector leaders on topics relating to international space development. The Space Generation Congress (SGC) is SGAC's annual meeting in support of the United Nations (UN) Programme on Space Applications. Top university students and young professionals with a passion for space travelled from 40 countries to attend three days of SGC 2014. The 128 delegates enjoyed an inspiring and resourceful engagement with their peers at the congress, held at the Holiday Inn hotel in Toronto, Canada on September 20th to 23rd in the days prior to the 65th International Astronautical Congress (IAC).

Delegates gained perspectives on space issues from the world's leading space organisations, including: the International Astronautical Federation (IAF), National Aeronautics and Space Administration (NASA), and the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS).

In demonstrating the symbiotic relationship, leaders from these space organisations gained fresh, innovative and bold perspectives from the incoming space generation on the five main themes of SGC 2014: exploration, earth observation, small satellites, on-orbit servicing and entrepreneurship. Several sponsors along with a committee of volunteers supported the activities at SGC 2014. Without supporters and dedicated volunteers, the 2014 SGC would not have been possible, and SGAC would like to express its sincere gratitude and appreciation.

Speakers

Robert Bell	Executive Director, Society of Satellite professionals International (SSPI)
Charles Bolden	NASA Administrator
Chris Boshuizen	Co-Founder and CTO of Planet Labs
Jason Crusan	Director, Advanced Exploration Systems Division at NASA
Simoneta di Pippo	Director of United Nations Office for Outer Space Affairs
Berndt Feuerbacjer	Former IAF President
Mike Hawes	Vice President and Orion Programme Manager at Lockheed Martin
Yasushi Horikawa	Technical Counselor, JAXA. Chairperson, UNCOPUOS
Scott Madry	Executive Director of the Global Space Institute
Sandy Magnus	Executive Director of the American Institute of Aeronautics and Astronautics (AIAA)
Daniel Rey	Head of Systems Engineering for the Space Exploration Branch of the Canadian Space Agency
David Revay	$pace is Business Competition Winner
Clemens Rumpf	2014 Move and Asteroid OHB-SGAC Competition Winner
Sam Scimemi	Director for International Space Station at NASA Headquarters
Thomas Sinn	Space Solar Power Competition Winner
Erik Seedhouse	Norwegian-Canadian Suborbital astronaut
Thomas Sinn	Space Solar Power Competition Winner
Jan Wörner	Chairman of the Executive Board of the German Aerospace Center (DLR)
Jack Yeh	$pace is Business Competition Winner
James Zimmerman	President of International Space Services, Inc.

CONGRESS THEMES AND RECOMMENDATIONS

At the core of SGC 2014 were the Working Groups, where delegates discussed their views on the development of space and prepared a set of recommendations to be published internationally by SGAC. Each Working Group has produced a report on their discussions and recommendations, which will be shared with the United Nations as well as SGAC sponsors, members and alumni from around the world. SGAC would like to thank the key session supporters, NASA SCaN, Secure World Foundation and SGAC's Anonymous Donor, for making these SGC working groups possible.

Entrepreneurship and Its Role in Space Industry

Supporter: N/A
Subject Matter Experts: Ken Davidian *(USA)*, Chris Boshuizen *(Australia)*
Moderator: Jan Svoboda *(Czech Republic)*

Sustained development of the commercial space sector hinges on a thriving entrepreneurial environment. Start-ups foster market diversity, competition and technological evolution leading to profitable innovation. Whilst innovation occurs at the level of the individual, entrepreneurship requires both personal initiative as well as a fertile socioeconomic environment. Consequently, factors such as the existence of poor cultural perceptions, perceived technical risk and general lack of awareness may negatively impact entrepreneurial development and growth of the commercial space sector.

At the 2014 Space Generation Congress, the Entrepreneurship Working Group investigated space entrepreneurship at three levels:

- Microscopic: perspectives and challenges faced by the individual entrepreneur;
- Mesoscopic: impact of start-up accelerators and events that serve to create awareness and unite like-minded individuals into communities;
- Macroscopic: impact of culture on willingness to enter space, the role of government policy in enabling entrepreneurship and the interactions between competing businesses.

The challenge of UNCOPUOS, space industry and governments lies in development of an optimal environment to support entrepreneurs and their companies. To this end, the Entrepreneurship Working Group identified the following key implementations:

- Promote the creation of incubation centres that allow entrepreneurs free after hours access to meeting rooms, resources and equipment. Each centre should be focused on a relatively narrow purpose to gather like-minded individuals.
- Promote organisation of conferences and events to allow further network development, such as regularly offering Hackerspace or SpaceUp events and training courses.
- Improve education through university and school curriculum modifications to include training or information relevant to entrepreneurial activities, and promote new training courses and mentoring programs.
- Improve information accessibility for entrepreneurs by creating databases of companies, people and resources involved or interested in NewSpace activities.
- Encourage funding sources through university grants, crowd sourcing programs and competitions. Funding should also be provided through alternate means such as financing use of open access laboratories or offering a three-month funding trail where a company can prove the viability of a product into the market.
- Create public and business awareness programmes in mainstream and social media, focusing on the benefits of entrepreneurship and challenges or barriers facing entrepreneurial activities.

Based on above the entrepreneurship working group made the following recommendations to UNCOPUOS at the 2014 Space Generation Congress:

- **UNCOPUOS should support programmes developed to create successful entrepreneurial environments.**
  There are many pre-existing organisations, such as the not-for-profit eSpace, already offering programs that support creating and developing entrepreneurial space companies. UNCOPUOS should assist these organisations, ensuring all conditions required for a successful entrepreneurial environment are in place.
- **UNCOPUOS should provide incentives to organisations that encourage support of new entrepreneurial activities.**
  Companies and organisations can support entrepreneurs and start-up companies through mentoring, financial assistance and access to resources. To encourage greater support from established organisations and companies, UNCOPUOS should provide incentives such as awards and appreciation of support, ensuring that the efforts of these companies are widely recognised.
- **UNCOPUOS should support and facilitate removal of entry barriers into space entrepreneurship.**
  An intellectual property archive that lists previous and current technology successes and failures mitigates failure rate of new entrants. Allowing an open network of international entrepreneurs to exchange facility or innovation spaces and information could save entrepreneurs time and money in start-up hurdles and allow them to more efficiently develop ideas.
- **UNCOPUOS should create a platform for international entrepreneurial collaboration.**
  By promoting collaboration on an international entrepreneurial level, the cross-cultural exchange of how failure is accepted and how successful start-ups are structured and managed will enable a more open platform to learn how to develop ideas, overcome barriers and "leap-frog" their technology.
- **UNCOPUOS should help disadvantaged countries by leveraging local facilities.**
  International collaboration and joint government and academic funding for local business development will foster entrepreneurial spirit in countries new to space activities.

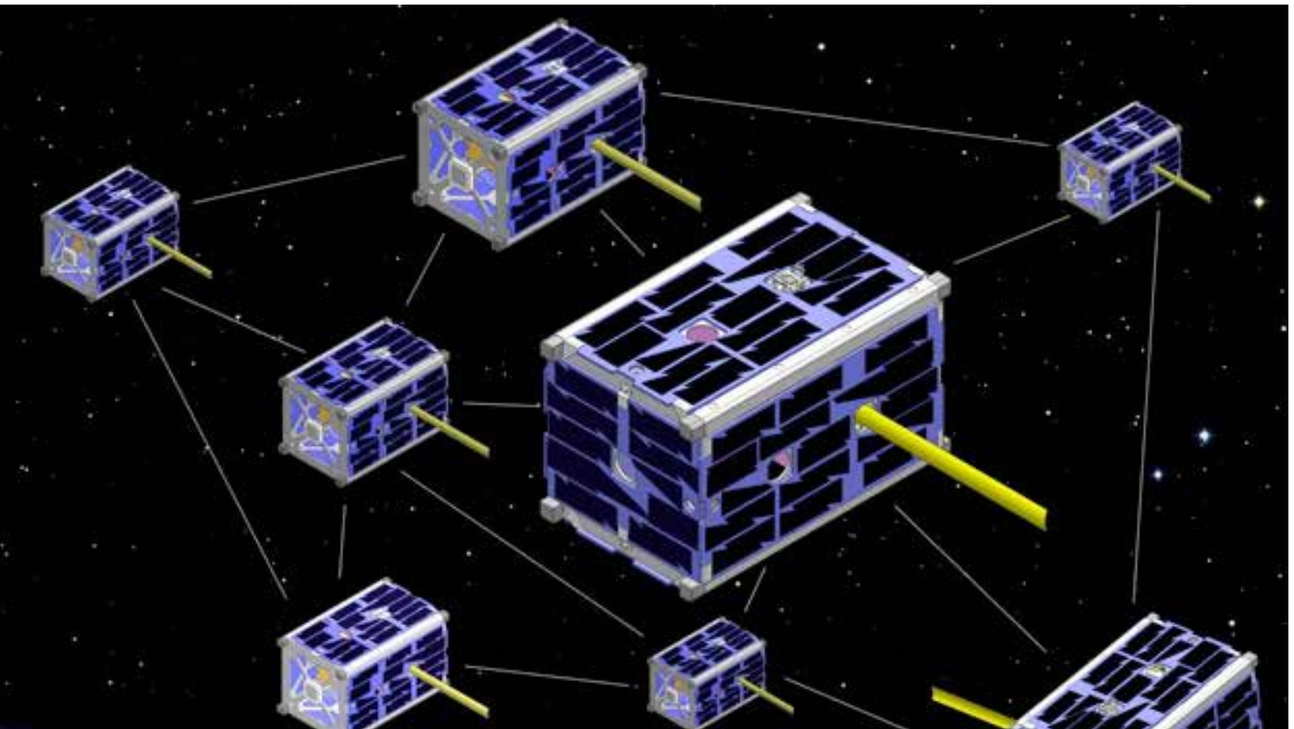
CubeSat Swarms – Communication Networks and Policy Challenges

Supporter: NASA SCaN
Subject Matter Expert: Stephanie Wan *(USA)*
Moderator: Andreas Hornig *(Germany)*

The "CubeSat" standard started as a joint project between Cal Poly State University and Stanford University in 1999. There was much skepticism at the time about the reliability and lifetime of such small satellites for serious scientific and commercial tasks. However, since then universities and industry have demonstrated the advancement of CubeSat capabilities along with the immense amount of invaluable science and data collection that is possible with these cost effective satellites. The popularity and commercial interest in CubeSats is quickly growing, and therefore the amount of these small satellites in Lower Earth Orbit (LEO) is concurrently on the rise. Throughout the past year, 81 CubeSats have been launched; 51 of which are commercial satellites and utilise high-frequency communication links. An example of a CubeSat swarm is the world's largest constellation of Earth-imaging satellites, Flock-1, created and deployed by Planet Labs.

At the 2014 Space Generation Congress, the CubeSat Swarms Working Group investigated the communication networks and policy challenges pertaining to the current global situation of increases in small satellite development and deployment through the following focal points:

- Legal standards defining e.g. frequency bands;
- Frequency allocation and registration for short lifetime projects;
- Data collection and data transmission policies regarding ground stations;
- Limitations of link budgets for small satellite missions that restrict the amount of science and bus telemetry that can be obtained from the devices;
- The effect of large satellite constellations on the space debris environment;
- Short-term and long-term timeframes for system development and management.



The challenge of the UNCOPUOS, space industry, and governments lie in the development of an optimal environment that both enables and facilitates sustainable development in the field of small satellite swarm operations. To support the development and management of this environment, the CubeSat Swarms Working Group made the following recommendations to UNCOPUOS at the 2014 Space Generation Congress:

- Promote the development of a global space network of CubeSats that consists of essentially an infinite number of satellites and ground stations that can register and gain access to the space network analogous to the structure of the Internet. The main global network will be comprised of ground stations and multiple CubeSat swarms consisting of smaller individual networks within each swarm.
    - Establish four main types of data links within the recommended network architecture: CubeSat to Ground, Swarm to Ground, CubeSat to CubeSat, and Swarm to Swarm.
    - Utilise existing Space Data Link Protocols in order to route transmissions from one node to another within a network similar to how Internet Protocol is used for the Internet.
    - Explore the technological capabilities of optical communications in order to enable larger bandwidths, reduce spectrum and security issues, and fulfill a need for high-speed, seamless, and reliable communications.
    - Utilise space-based communication relays and explore the utilisation of delayed-tolerant networks (DTN) in order to minimise the loss of data and make the current communication links more reliable.
- Establish a communication network architecture as described above consisting of intra-swarm and inter-swarm constellations in order to provide sustainable communications and an organised network.
    - Intra-Swarm Constellation: the CubeSats that form a single swarm of small satellites in orbit.
        - Implement a mother-daughter communication framework for intra-swarm communications in which a registered swarm contains a "mother" satellite that is slightly larger with greater capabilities than the "daughter" satellites and will act as a trunk provider for communications with various ground stations and other swarms.
    - Inter-Swarm Constellation: the collection of various swarms of CubeSats in orbit.
- Promote net neutrality within a seamless network that can grow as new technologies are developed for small satellites.
- Streamline the registration process for all users of the global space network in order to reduce the registration time and alleviate the costly burdens associated with filing to add a new satellite.
- Work with an organisation such as the CCSDS, the IOAG, and/or the ITU in order to standardise the space network protocols, enable interoperability across the international space community for CubeSat technology, and standardise the assignment of a unique identification number given to each registered satellite that systematically links the user to their CubeSat and places the satellite into a particular swarm's network.
- Require the use of an autonomous kill switch to robustly stop transmission from a satellite at the end of its life in order to free bandwidth and circumvent satellite malfunctions that may prevent a satellite from being switched off.
- Require compliance to the standard 25-year guideline by ensuring pre-mission measures are taken into account or that small satellites are deployed in orbits that have a natural lifetime of less than 25 years in order to minimise space debris.

On-Orbit Servicing: Commercial Opportunities With Security Implications

Supporters: Secure World Foundation
Subject Matter Experts: Chris Johnson (SWF), Daniel Rey (CSA), Robert Bell (SSPI)
Moderator: Adam Vigneron *(Canada)*

The On-Orbit Servicing (OOS) Working Group discussed legal and political implications of OOS industry development. The group considered the benefits that OOS and Active Debris Removal (ADR) offer the satellite industry, as well as potential disadvantages to relations between space faring nations.

To gain an accurate perspective of relevant stakeholders, the group held mock hearings for OOS licensing. Members were assigned to represent stakeholders and were required to submit their case to a domestic regulatory panel comprised of other group members representing government ministers. The hearing highlighted challenges that OOS and ADR endeavours face, as well as benefits of regulation. The group outlined a number of recommendations to ensure practicality of OOS and encourage licensing and regulation of such activities, including the following:

- Short-term government agency responsibility for licensing OOS and ADR, mimicking the American Federal Aviation Administration's (FAA) expanded responsibility to cover licensing of commercial space transport.
- Long-term responsibility of United Nations (UN) to regulate OOS and ADR.
- Government support of OOS and ADR to create continued demand, including leading by example on government satellites and potential launch levies to enable on-going ADR funding.
- Prevention of space weaponisation through transparency of OOS and ADR operations.
- Initiation of international cooperation on active debris removal.

OOS and ADR will ensure sustainable use of satellites, particularly in highly crowded and highly valuable orbits, for the coming decades. Transparency, economic stimulation and effective regulatory systems ensure the success of future OOS and ADR endeavours.

Ethics and Policy of New Human Space Exploration Strategies

Supporters: N/A
Subject Matter Experts: Erik Seedhouse *(Canada)*, Annelie Schoenmaker *(Spain)*
Moderator: Michael Deiml *(Germany)*

Governments are no longer the only players engaged in human space exploration. Recent non-governmental space exploration activities include orbital tourism, stratospheric balloons, one-way tickets to Mars and asteroid mining missions. Organisations entering human space flight are employing new exploration and business strategies. As the tolerance for risk increases compared to previous space exploration, many proposed missions include increased potential risk to human life.

The Working Group discussed expansion of current policies and establishment of new regulations to support new human space exploration strategies while addressing ethical concerns that arise from increased risk associated with proposed missions. The working group developed the following recommendations:

- The United Nations (UN) should advocate that countries use the Multilateral International Space Station Agreement as a model for cooperation and accessibility agreements in future multi-party missions. The proposed risk-sharing policies could be constructed similar to the United States Launch Indemnification Policy and would better reflect complexities, share liability and address other issues that increasingly multi-national exploration endeavours face.
- UN Educational, Scientific and Cultural Organisation (UNESCO) should extend World Heritage status to protect valuable sites in outer space. Such designation could prevent contamination of scientific sites to facilitate research and discovery, as well as destruction of areas potentially able to support human colonies such as those with water.
- The International Court of Justice should be given jurisdiction over international space legal issues to establish liability. The UN should also set up a Space Science Committee and Space Ethics Committee to review space exploration legal cases.

Earth Observation for Maritime Services

Supporter: SGAC's Anonymous Supporter
Subject Matter Experts: Scott Madry *(USA)*, Su-Yin Tan *(Canada)*
Moderator: Noemie Bernede *(France/Germany)*

Space technology undeniably provides valuable contributions to diverse applications in the maritime domain, contributing to ship routing, environmental monitoring, law enforcement and humanitarian matters. These increasingly important Earth Observation (EO) applications cover scientific as well as operational activities, and involve a wide range of stakeholders from the institutional and commercial sectors.

At the 2014 Space Generation Congress, the Earth Observation Working Group addressed space-based remote sensing for maritime services, analysed use of active and passive Earth observation sensors and investigated possible synergies between satellite-based telecommunication and navigation services. The working group discussed the following aspects of the remote sensing applications for maritime services:

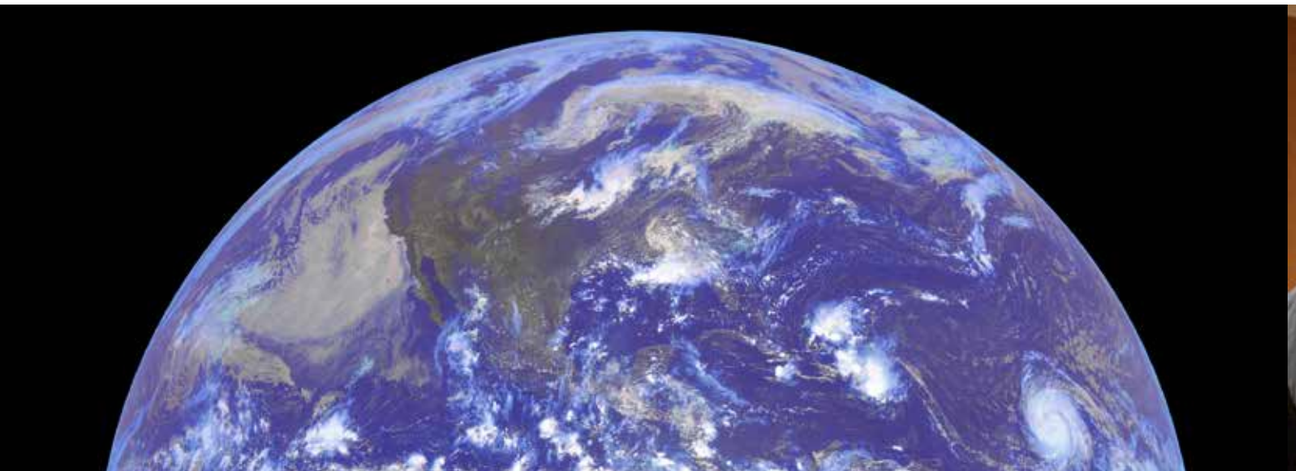
- Existing maritime applications and their users;
- Stakeholders in the sector;
- Current space capabilities and technologies, and their potential use in maritime monitoring;
- Benefits of space technology in the field;
- Challenges in development and use of space capabilities for maritime applications;
- Data access policies and their implication for various stakeholders.

The challenge of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), space industry and government lies in development of an optimal environment to support space-based remote sensing applications for maritime services. To this end, the working group identified the following key items to be implemented:

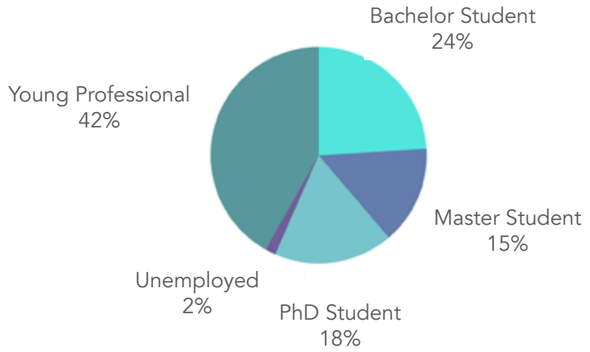
- Development of a satellite constellation(s) with both Synthetic Aperture Radar (SAR) and optical sensors to establish a data source at a reasonable cost, to meet the need for high resolution and near real time data delivery.
- Interaction of policy makers, end-users and decision makers in a stakeholder engagement cycle to support effective communication, and subsequent development of efficient policy and monitoring.

Based on the above discussion, the Earth Observation Working Group made the following recommendations to UNCOPUOS at the 2014 Space Generation Congress:

- **UN COPUOS should enable a forum where policy makers can meet international organisations and other stakeholders to encourage information exchange.**
  Each stakeholder group already has mechanisms in place to identify the most urgent and compelling data needs of their respective members. There must be a platform for these stakeholder groups to share their ideas. Such meetings will allow groups to identify the short and long-term Earth Observation maritime needs.
- **UNCOPUOS should support space agencies to compile user needs and strengthen the relationship between data users and data providers.**
  Space agencies should be able to forward data user requests to appropriate data providers. If data already exists, the space agency's role should be to connect users with the data provider. If the data does not exist, the space agencies should facilitate collaborative data source development between various stakeholders.
- **UNCOPUOS should facilitate stakeholder interaction at the international level to share and gain access to foreign Earth observation data and maritime technology.**
  Stakeholders must not only communicate at the national level, but also at international forums to develop partnerships between countries. This will allow Policy Makers to assess which stakeholders have access to data, who owns it and what legal requirements have to be satisfied.
- **UNCOPUOS should encourage policy makers to develop regulatory structures with input from data users and data providers. Policy makers are responsible for the final decision in many situations, and should take into consideration the position of all the partners.**
  The policy makers' role will be to convince decision makers, on behalf of data users and data providers, to allocate necessary resources and funds to build new technology and/or acquire EO data. The decision makers will be interested in seeing return-on-investment. As a result, policy makers must ensure data users can obtain requested data and are able to use it. In essence, the policy makers must enforce a feedback loop to confirm data providers and data users use resources allocated by decision makers to benefit involved nations.



CONGRESS STATISTICS



SGAC closed registrations for the Space Generation Congress with more than 250 applications from 55 different countries.

After a diligent selection process, a total of 128 delegates participated in SGC 2014, together with 14 speakers and 10 Subject Matter Experts, making this SGC one with the highest attendance. Of those 128, 25 participants from 8 different countries received scholarships with assistance from SGAC and its partners to attend SGC 2014 in Canada. There was a relatively even distribution of genders amongst final delegates, with 39% women and 61% men, an achievement that is uncommon for events in the space sector. Delegates came from vast and varying backgrounds, with 24% undergraduate students, 15% masters students, 18% PhD students, 42% young professionals. SGAC believes that these statistics truly demonstrate SGAC's international influence, and that it continues to grow. This development gives SGAC the momentum to establish a distinct and highly representative network of young space professionals and university students.

SGAC is also pleased to have welcomed a diverse representation of delegates from an array of countries and regions. SGC 2014 attendees came from more than 40 countries across six continents. This internationalism is a major contributor to the development of a truly international voice of the space generation that SGAC strives to epitomise.

Representatives from 40 countries participated in SGC 2014. The highest percentage of delegates came from United States of America, followed by Australia, Canada, and Germany.

250 applications

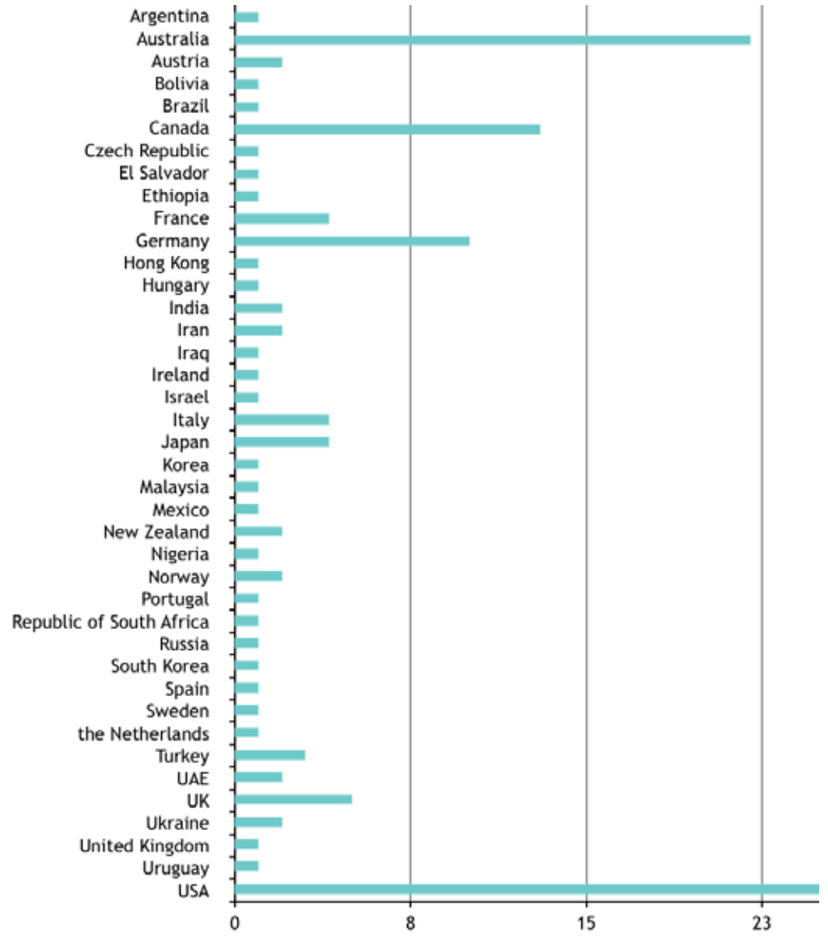
128 delegates

40 countries represented

25 scholarships

14 speakers

10 subject matter experts



3.5 UNITED NATIONS REPORT

UN COPUOS AND SUBCOMMITTEES

The United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) was established by the General Assembly in 1959 to review the scope of international cooperation in the peaceful uses of outer space, to devise programmes in this field to be undertaken under United Nations auspices, to encourage continued research and the dissemination of information on outer space matters and to study legal problems arising from the exploration of outer space. COPUOS and its two subcommittees, the Scientific and Technical Subcommittee (S&T Subcommittee) and the Legal Subcommittee, each meet annually to consider questions put before them by the General Assembly, reports submitted to them and issues raised by the Member States. The Committee and the Subcommittees, work on the basis of consensus and make recommendations to the General Assembly.

SCIENTIFIC AND TECHNICAL SUBCOMMITTEE

As a permanent observer of the Scientific and Technical (S&T) Subcommittee of the Committee on the Peaceful Uses of Outer Space (UN COPUOS), SGAC participated in the 51st session held from the 10 – 21st of February at the United Nations in Vienna, Austria.

SGAC Executive Director Andrea Jaime, presented SGAC's general statement in which she covered SGAC's developments since the last session of S&T in February 2013. The statement highlighted SGAC's achievements in 2013, namely:

- Producing intellectually-rigorous contributions to the space community from the perspective of young people through our standing project groups
- Making key developments to strengthen the organisation for sustainability
- Enabling more young professionals and university students to participate in space conferences internationally
- Continuing positive, growing SGAC trends throughout the year and beyond

The results and recommendations of the 2013 SGC held in Beijing, China was presented as a technical presentation. In his presentation to the S&T Subcommittee, SGAC provided delegates with an overview of the Congress, noted some of the many prominent SGC speakers and presented the topics and specific recommendations from the five project groups (Industry, Agency, Society, Exploration and Outreach). SGAC also contributed to the Action Team 14 on Near Earth Objects meetings held around S&T.

LEGAL SUBCOMMITTEE

The Legal Subcommittee of UN COPUOS held its 53rd session in Vienna from the 24th March – 4th April. SGAC Space Law and Policy Project Group made a statement at this session regarding the topics they were currently working on, as well as the key recommendations from discussions pertaining to the topics relevant to the Legal Subcommittee of UN COPUOS.

GENERAL ASSEMBLY

The 58th Session of the UNCOPUOS was held on 11 – 20th June in Vienna, Austria. SGAC, which has been a permanent observer in COPUOS since 2001, contributed a general statement and presented results from the Space Generation Fusion Forum 2014.

SGAC presented an official statement for SGAC which explained broadly the activities that SGAC has engaged in during the past year since COPUOS met last June. Underlined in this speech were the number of scholarships that SGAC has provided for its members to attend conferences. The NEO, STDM, SSS, YGNSS, Space Law, Small Satellites and Commercial Space project group work, SGAC's two major events – SGC and the Fusion Forum, and the gratitude SGAC has for its committed sponsors and partners were all discussed as well.

SGAC addressed COPUOS once again with a technical presentation on the results of the 3rd Space Generation Fusion Forum, SGAC's prominent US-based annual event.

UN ECONOMIC AND SOCIAL COUNCIL

ECOSOC was established under the United Nations Charter as the principal organisation to coordinate economic, social, and related work of the 14 UN specialised agencies, functional commissions and five regional commissions. The Council also receives reports from 11 UN funds and programmes. The ECOSOC serves as the central forum for discussing international economic and social issues and for formulating policy recommendations addressed to Member States and the United Nations. It is responsible for:

- Promoting higher standards of living, full employment, economic and social progress
- Identifying solutions to international economic, social and health problems
- Facilitating international cultural and educational cooperation
- Encouraging universal respect for human rights and fundamental freedoms

It has the power to make or initiate studies and reports on these issues. It also has the power to assist the preparations and organisation of major international conferences in the economic, social and related fields and to facilitate a coordinated follow-up to these conferences. With its broad mandate, the Council's purview extends to over 70 percent of the human and financial resources of the entire UN.

Since 2003, SGAC has had Consultative status at UN ECOSOC. As such, SGAC representatives can participate in meetings of the UN ECOSOC, the UN COPUOS and also of the UN General Assembly and its Committees. It can also propose inputs when relevant. SGAC UN ECOSOC Representatives have the opportunity to participate during the fall as observers in the UN General Assembly in New York.

3.6 SGAC REGIONAL WORKSHOPS

1ST ASIA PACIFIC SPACE GENERATION WORKSHOP

Space Generation Advisory Council (SGAC) and the Graduate School of System Design and Management at Keio University held the 1st Asia-Pacific Regional Space Generation Workshop (AP- SGW) in Yokohama, Japan on November 29-30, 2014. The workshop's theme promoted regional collaboration in the space sector, targeting Asia-Pacific students and young professionals.

Participants attended from 14 countries, with strong representation from Asia-Pacific countries including China, Indonesia, Japan, Kazakhstan, Malaysia, Nepal, Philippines, South Korea, Thailand, and Vietnam. Demonstrating the international pull of SGAC, delegates also represented Brazil, Nigeria, Saudi Arabia and the United Kingdom. A total of 36 attendees from a variety of backgrounds helped strengthen the student and young professional network, and provided the next generation's perspective on promoting Asia-Pacific regional collaboration in the space sector.

The workshop was held as an official side event of the 21st Asia-Pacific Regional Space Agency Forum (APRSAF) held in Tokyo, Japan on December 2-5th. Generous support from the following organisations ensured the success of AP-SGW:

- IHI Aerospace company
- Mitsubishi Research Institute (MRI)
- PASCO corporation
- Japan Aerospace Exploration Agency (JAXA)
- Vietnam National Space Center (VNSC)
- Nepal Scientific Activities and Research Center (NESARC)
- Lembaga Penerbangan dan Antariksa Nasional (LAPAN)
- Geo-Informatics and Space T echnology Development Agency (GISDT A)

The objectives of AP-SGW were to:

- Strengthen the Asia-Pacific regional network of students and young professionals;
- Examine challenges facing the space community, specifically relating to Asia-Pacific, and provide input from the next generation of space professionals;
- Facilitate interaction between future Asia-Pacific space sector leaders and current regional professionals through cooperation with APRSAF.

AP-SGW invited Dr Yoshiaki Ohkami (Keio University) and Dr Werner Balogh (United Nations Office of Outer Space Affairs; UNOOSA) as keynote speakers. Japan's Ministry of Eductaion, Culture, Sport, Science and Technology (MEXT) supported Dr Yuri Takaya (Kobe University), Masanobu Tsuji (JAXA and APRSAF), Dr Yan Zhang (ADB Institute) and Dr Hiroaki Akiyama (UNIFORM Project) to be speakers in working groups. Participants were able to further discuss and network with invited speakers during opening dinner, cultural night and the closing gala dinner. These events also offered the opportunity to interact with invited guests, including the senior vice-president of JAXA and president of the International Astronautical Federation (IAF) Kiyoshi Higuchi.

Delegates were divided into four working groups, each addressing a key challenge for the Asia-Pacific space community. The discussions culminated in a report containing recommendations on the following topics:

- **Agency:** Investigate the feasibility of establishing an Asia-Pacific Space Agency and the paradigm of future collaboration by studying the evolution of Asia-Pacific regional space cooperation
- **Economy:** Examine how Asia-Pacific regional economic growth will affect the space sector, with a focus on the next two to three decades.
- **Technology:** Evaluate how technological advancement in the next two to three decades will affect the evolution of the Asia-Pacific regional space activities.
- **Outreach:** Suggest strategies to allow non-spacefaring countries access to space activities, particularly through collaboration with Asia-Pacific regional partners.

3.7 SGAC SUPPORTED EVENTS

In 2014, SGAC has supported several workshops and events in addition to the SGC and the SGFF. This section provides a short summary of each of these events.

SATELLITE 2014 SGAC MENTORING EVENT

SGAC organised a mentoring event, in conjunction with the SATELLITE 2014 Conference. The SATELLITE 2014, the premier event providing solutions to the global satellite end-user community, was held on March 2014 at the Walter E. Washington Convention Center in Washington D.C.

The event paired young professionals with executive leaders from across the satellite industry. SGAC received over 70 applications from participants representing 26 countries to attend the event. Some of the mentors of this year's event included Richard Dalbello, Eric Stalmer, Carissa Christensen, Myland Pride, Debra Facktor Lepore, amongst many others.

SGAC also offered 25 complimentary registrations to the main conference to the best applicants.

YOUNG SPACE PROFESSIONALS IN EUROPE WORKSHOP

Partnering up with the ESTEC Staff Association Committee (ESTEC SAC) that had scheduled an ESTEC Focus Day on Young Space Professionals, SGAC and Young ESA organised the Space Young Professionals in Europe Workshop, on the ESTEC/ESA premises in The Netherlands, last April. 30 young professionals and students attended the event, from a total of 21 countries, with very diverse backgrounds and professional statuses. Participants could enjoy speeches from many ESA employees, and visited the CDF facilities and the Erasmus Center of ESA.

REACH FOR THE STARS

The European Commission, together with Airbus, the European Youth Forum and SGAC organised an event last July in Brussels, Belgium. The event highlighted three panels with representatives of industry, space policy and young entrepreneurs, and was open to the public. SGAC Executive Director, Andrea Jaime, was moderator of one of the panels.

REINVENTING SPACE CAREERS

Last November saw the 12th edition of the Reinventing Space conference, hosted by The British Interplanetary Society (BIS) at the Royal Society in London. The conference was a unique opportunity for delegates to explore groundbreaking aerospace technologies from a number of perspectives including financial and engineering points of view.
The SGAC partnership with UKSEDS, BIS and ISU culminated in a careers event for university students and young professionals. This event featured presenters from a number of aerospace companies based in the UK and concluded with a cocktail function where students were able to connect with many of the high profile delegates in attendance.

SGAC AT THE INTERNATIONAL ASTRONAUTICAL CONGRESS

SGAC Workshop to Discuss the Upcoming ESA Ministerial

The day after the conclusion of SGC, SGAC organised a four-hour workshop at the Metro Toronto Convention Centre to discuss upcoming European Space Agency (ESA) Council Ministerial, scheduled for December 2nd, 2014, in Luxembourg. The workshop, inspired by Kai-Uwe Schrogl at ESA, focused on themes close to the younger generation, including the relevance of ESA in fostering a stronger European identity and the importance of international collaboration, especially with countries that have a strong connection to Europe but with a small or non-existent space industry.
Dr. Schrogl, ESA's Head of Relations with Member States Department in the Director General's Cabinet, provided an up-to-date overview of the agency and relationship with the European Union and the member states. More than 20 delegates, mostly from Europe, provided community perspectives on topics of importance to ministers of the ESA member states, including launchers, continuation of European commitment to the International Space Station (ISS) partnership beyond 2020 and evolution of ESA. Delegates also discussed levels of geographical return - the way ESA redistributes the projects according to contribution of each country, and the importance of the European participation in the ISS program.
The workshop produced a position paper, published and distributed to ESA officials and ministers in November. A second workshop and meeting will take place in two years, prior to the next ESA council at Ministerial level, to provide additional European space policy makers with perspectives from future space leaders.

Global Networking Forum: Launching Minorities and Students into Space Professions

This year's SGAC event at the 2014 IAC Global Networking Forum featured a discussion panel entitled 'Launching Students and Minorities into the Space Profession.' The panel, moderated by SGAC Deputy Executive Director Minoo Rathnasabapathy *(South Africa/Australia)*, explored current barriers for students and minority groups. The panel focused on women and professionals from emerging and developing countries, experts in non-traditional technology industries and students facing experiential, economic or social barriers. Panellists provided guidance for aspiring professionals to overcome these barriers and how strong equity practices strengthen the space community. Panelists included Jan Wörner, Head of DLR, Andrea Boese, Head of the Diversity and Equal Opportunities office at DLR, Jeremy Wang, Outreach Director and Rocket Propulsion Lead of UTAT, Claudia Kessler, HESpace CEO and co-founder of Women in Aerospace-Europe, Tahir Mehrali, OrbitOne CEO, Nassim Bovet, Head of Admissions Office of ISU.

Roundtable, Space Security and Governance: The need of a space policy before or after developing space activities

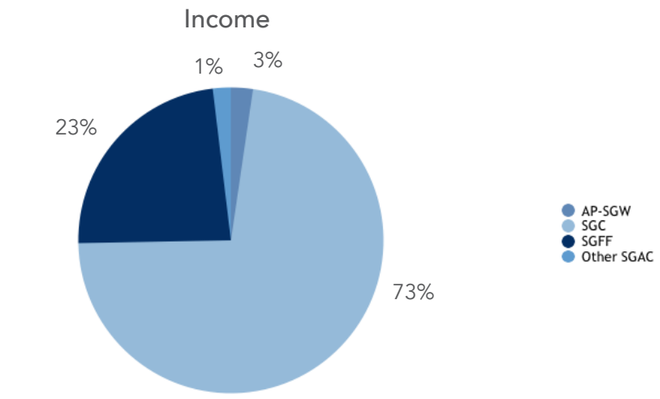
The SGAC Space Law and Policy Project Group organised a roundtable on Space Security and Governance on October 2nd, 2014 at the IAC, offering more than 14 IAC and SGC attendees the opportunity to discuss how space technologies can assist governments to address national security issues for an international audience. The roundtable consisted of a 8-member panel: Werner Balogh of UN OOSA, Enrique Pacheco of the Mexican Space Agency, Philippe Clerc of CNES, Cesar Jaramillo of Space Security Index, Stephanie Wan of NASA Headquarters, Dorina Andoni of Leiden University, Hannes Mayerand of the Institute for Canon Law, and Karl Franzens of the Institute for Public Law at the University of Graz. Project group co-lead Sandra Cabrera-Alvarado *(Mexico)* chaired the panel. The panellists discussed the following key questions:

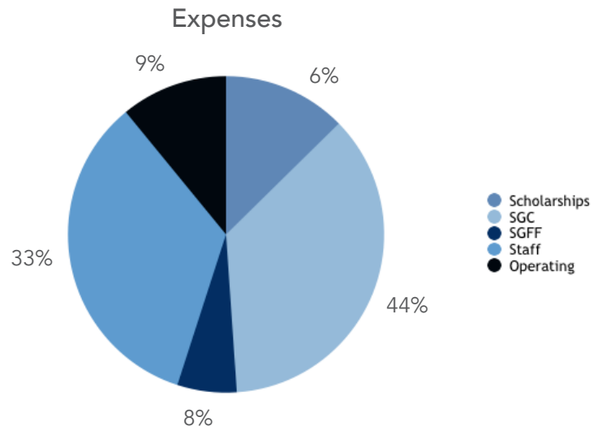
- What the term or concept 'space security' means;
- Whether space regulatory framework would ensure a responsible approach to exploration and use of outer space for the benefit of all humankind;
- How to develop and balance state legislation pertaining to national security and public interests with principles set forth in the Outer Space Treaty, and what compromises, if any, are necessary;
- Whether states should first develop a space policy and legal framework and then a space program, or vice versa, and the advantages and drawbacks of each scenario with respect to space security and governance.

The final detailed report with the results of the discussions that answered the above questions was also published in the SGAC website.

3.8 SGAC FINANCIAL SUMMARY

The financial summary was prepared by the SGAC Treasurer in accordance with required accounting principles and applicable legal requirements, to ensure transparency of the organisation at all times. They present a true and fair view of the organisation's income and expenditures.





COMMITTEE'S DECLARATION

Statement by the Executive Committee

The members of the Executive Committee of the Space Generation Advisory Council are of the opinion that:

a) The accompanying Profit and Loss Statement is drawn up so as to give a true and fair view of the operations of the Organisation for the period ended December 31, 2014

b) The accompanying Balance Sheet is drawn up so as to give a true and fair view of the state of affairs of the Organisation at December 31, 2014

c) As at the date of this statement, there are reasonable grounds to believe that the Organisation will be able to pay its debts as and when they fall due.

On behalf of the Management Committee:

Original Signed

Christopher Vasko - Chairperson
Delft, Netherlands, January, 2015

Victoria Alonsoperez – Co-Chairperson
Montevideo, Uruguay, January 2015

PROFIT & LOSS

SPACE GENERATION ADVISORY COUNCIL
FOR THE 12 MONTHS ENDED 31 DECEMBER 2014

Income	**Dec - 14**	**Dec - 13**
AP-SGW Gala Dinner	€964.26	€0.00
AP-SGW General Sponsorship	€2,385.76	€0.00
General Sponsorship	€798.12	€3,628.61
Interest Income	€4.94	€10.77
Refunds on payments	€0.00	€3,090.79
SGC Delegate Fees	€18,095.00	€10,109.29
SGC Sponsorship	€73,816.40	€79,491.20
SGFF Delegate Fees	€2,069.89	€1,908.13
SGFF General Sponsorship	€27,634.83	€28,192.11
Space Is Business Competition	€1,615.31	€1,630.77
Total Income	**€127,384.51**	**€128,061.67**
Less Cost of Sales		
Operating Expenses	€8,214.01	€8,118.76
Total Cost of Sales	**€8,214.01**	**€8,118.76**
Gross Profit	**€119,170.50**	**€119,942.91**
Less Operating Expenses		
Accounting and Bookkeeping	€182.11	€5,498.90
APSGW Congress Hosting Expenses 2014	€3,228.84	€0.00
Association membership fees	€735.00	€735.00
Bank Fees	€2,327.75	€1,996.13
Foreign Currency Gains and Losses	-€7,829.17	€2,985.29
IAC participation - registration, booth, etc	€2,324.32	€4,781.72
SGAC Projects	€0.00	€190.95
SGC 2013 Congress hosting expenses	€0.00	€15,767.02
SGC 2013 Scholarships	€4,697.05	€13,453.09
SGC 2013 Staff expenses	€0.00	€4,097.75
SGC 2014 Congress Hosting Expenses	€49,348.61	€0.00
SGC 2014 Scholarships	€4,151.99	€0.00
SGC 2014 Staff Expenses	€2,354.42	€0.00
SGFF 2013 Congress hosting expenses	€0.00	€5,318.15
SGFF 2013 Scholarship	€0.00	€7,648.25
SGFF 2013 Staff Expenses	€0.00	€1,234.21
SGFF 2014 Congress Hosting Expenses	€5,982.82	€0.00
SGFF 2014 Scholarships	€3,248.21	€0.00
SGFF 2014 Staff Expenses	€2,973.60	€0.00
Travel and Accommodation Expenses	€1,167.27	€2,972.87
Wages - Deputy Exective Director	€6,000.00	€0.00
Wages - Executive Director	€30,000.00	€30,000.00
Wages - Interns	€1,650.00	€2,000.00
Website	€715.55	€1,198.42
Total Operating Expenses	**€113,258.37**	**€99,877.75**
Net Profit	**€5,912.13**	**€20,065.16**

BALANCE SHEET

SPACE GENERATION ADVISORY COUNCIL
AS AT 31 DECEMBER 2014

Assets	**31 Dec - 14**	**31 Dec - 13**
Bank		
Bank Austria	€2,510.56	€5,758.83
BofA - Business Savings - 5236	€9,709.85	€8,539.12
BofA - Economy Chk - 8150	€58,637.82	€38,824.46
SGAC Paypal Account	€1,964.10	€8,920.73
SGAC Paypal Account USD	€4,779.92	€809.56
Total Bank	**€77,602.25**	**€62,852.70**
Current Assets		
Accounts Receivable	€10,757.99	€26,594.36
Total Current Assets	**€10,757.99**	**€26,594.36**
Fixed Assets		
Computer Equipment	€333.34	€333.34
Total Fixed Assets	**€333.34**	**€333.34**
Total Assets	**€88,693.58**	**€89,780.40**
Liabilities		
Current Liabilities		
Accounts Payable	€11,693.33	€18,017.79
Income Tax Payable	-€0.67	-€0.37
Rounding	-€4.78	-€4.80
Sales Tax	-€674.20	€0.00
Total Current Liabilities	**€11,013.68**	**€18,012.62**
Total Liabilities	**€11,013.68**	**€18,012.62**
Net Assets	**€77,679.90**	**€71,767.78**
Equity		
Current Year Earnings	€5,912.13	€20,065.16
Members' Capital	€40,022.85	€40,022.85
Retained Earnings	€31,744.92	€11,679.76
Total Equity	**€77,679.90**	**€71,767.77**

NOTES TO AND FORMING PART OF THE ACCOUNTS

1. Statement of Accounting Policy

The financial statements were prepared in accordance with required accounting principles and applicable legal requirements. They present a true and fair view of the organisation's net assets, financial position and the results of the organisation.

2. New Financial report style (Profit & Loss)

Since 2012, SGAC has fully adopted a professional accounting software that has already partially been in use in the previous years.
The new functionality improves transparency, reporting and communication within the Executive Office. For these reasons, the style of the Profit & Loss statement has been adopted. The point "Cost of Sales" has been included to reflect minimal operational costs involved with running the organisation.

3. Management Committee and Staff Members

The names of the management committee members who have held office during the year are:

Co-Chairpersons	Christopher Vasko
	Victoria Alonsoperez
Secretary	Ali Nasseri
	Jack Yeh
Treasurer	Jacob Hacker

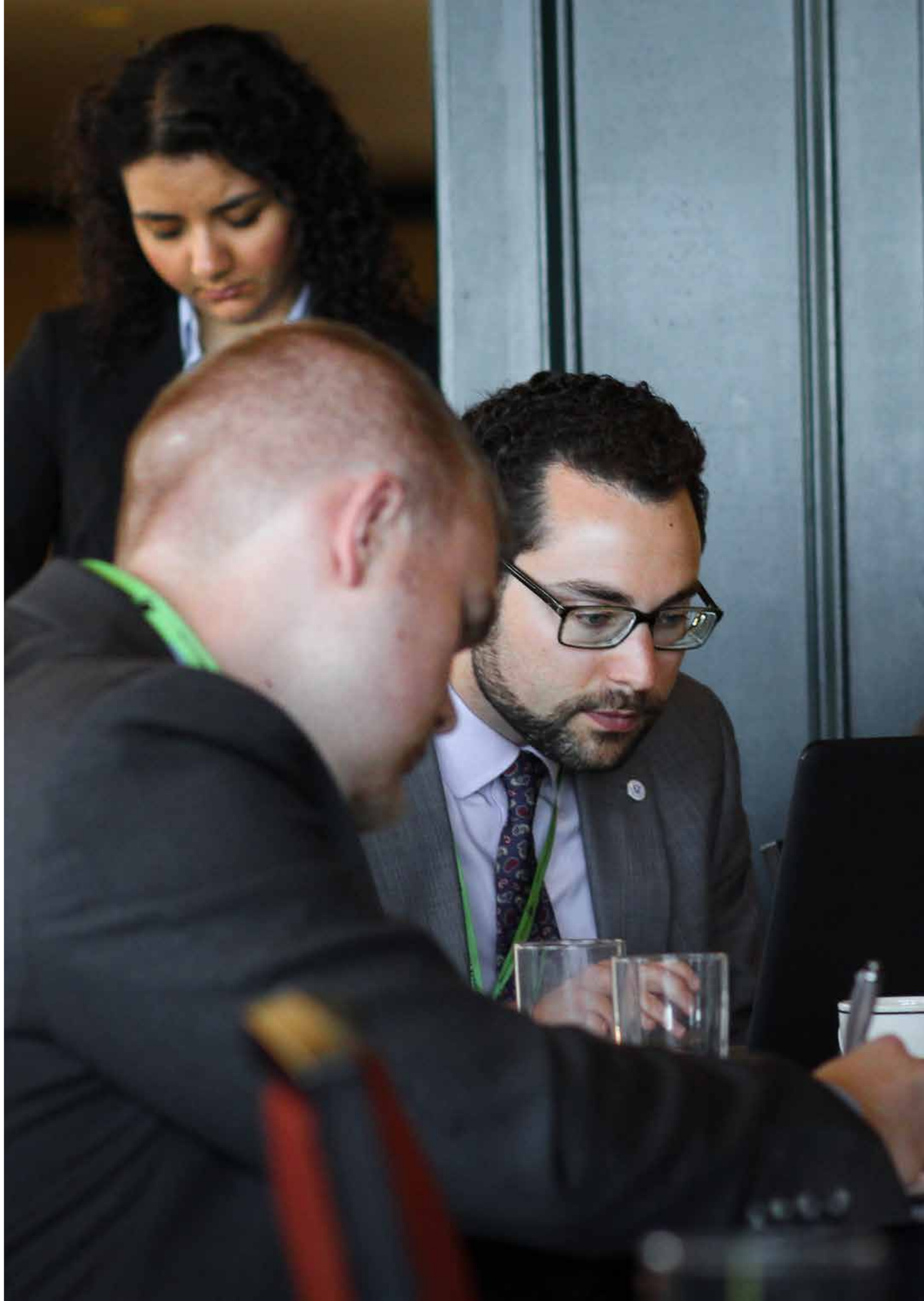
The members of the management committee did not receive remuneration through the year.

Contracted support staff engaged throughout 2014 were:

Executive Director	Andrea Jaime Albalat
Deputy Executive Director	Minoo Rathnasabapathy
Intern	Luisa Carbone
	Reinhard Tlustos

4. Definition of terms used:

SGAC	*Space Generation Advisory Council*
SGAC USA	*Space Generation Advisory Council -USA Branch. A separate legal entity to SGAC. The accounts, assets and liabilities of SGAC USA are not linked to SGAC in any way and are therefore not covered by this report. Please refer to the annual report of SGAC USA for more information.*
SGC	*Space Generation Congress SGAC's annual member's conference held alongside the International Astronautical Congress*
SGFF	*Space Generation Fusion Forum SGAC's annual member's conference held alongside the National Space Symposium*
AP-SGW	*Asia Pacific – Space Generation Workshop SGAC's new annual member's conference held alongside APR-SAF*



4. PROJECTS

4.1 SGAC PROJECT OUTCOMES AND HIGHLIGHTS

Project group activities are critical to SGAC and its mission, and provide an extremely important platform for members to bridge annual Space Generation Congress and Space Generation Fusion Forum meetings. Project groups allow members to continue their engagement with other students and young professionals, and provide a vehicle to voice opinions to international space community. Moreover, project groups offer a unique opportunity to develop expertise and gain experience that supports professional development.

Starting with the introduction of a new project group, 2014 was a year of changes for SGAC project groups. The new Space Exploration project group was officially announced in July and has already submitted a paper at the IAC and published an article in the Space Policy Journal. With the new additions, SGAC has eight project groups:

- Space Safety and Sustainability (SSS)
- Near Earth Object (NEO)
- Space Technology for Disaster Management (STDM)
- Youth for Global Navigation Satellite Systems (YGNSS)
- Small Satellite Project Group (SSPG)
- Space Law and Policy
- Commercial Space
- Space Exploration.

The groups vary in size and scope of activities but are all are led by highly committed project leads and managed by SGAC's project coordinators. Groups were introduced to two new project coordinators, Ana Raposo *(Portugal)* and Jamie Favors *(USA)*, who replaced Emmanuelle David *(France)* and Alanna Krolikowski *(Canada)* at the end of their two-year term. Four groups selected new co-leads, with complete replacement of co-leads in SSS and STDM group and new co-leads joining Space Law and Policy and NEO groups.

Several of the groups have established partnerships with external actors to expand outreach and activities. The SSPG, Commercial Space and Space Law and Policy groups collaborated with Swiss Space Systems on a project to build a survey on the regulatory and economical aspects of cubesats. The STDM group is analysing the possibility of signing a Memorandum of Understanding (MoU) with UN-SPIDER while the NEO group engaged NASA to establish a partnership with NASA's Asteroid Grand Challenge.

In 2015, the groups aim to attract more active members, increase the number of paper submissions develop partnerships with industry, non-governmental organisations and space agencies. The project coordinators and leads will continue to serve the organisation and ensure groups meet goals and that processes are continuously improved to ensure members are engage and enthusiastic about projects.

4.2 SPACE TECHNOLOGIES FOR DISASTER MANAGEMENT (STDM) PROJECT GROUP

Overview

Despite the importance of space technologies in disaster management, and the involvement of several national and international organizations in facilitating the use of space for disaster management, it is still a relatively unknown field. Members of academia, industry, governments, and the general public can benefit from addressing this gap and increasing knowledge of how space is used in preparing for, responding to, and recovering from disaster events.
The purpose of the Space Technologies for Disaster Management (STDM) group is to promote awareness of how space technologies contribute throughout the disaster management cycle. Specifically, the STDM group aims to inform the general public about the value of space-derived information in disaster management, to provide a channel for new perspectives in research efforts for space disaster management and serve as an interdisciplinary forum for those who have an interest in disaster management, space activities and their impact on society.

Accomplishments in 2014

- Appointed two new Co-Leads, Sinead O'Sullivan and Meshack Kinyua.
- Recruited 15 new members.
- Set up the following research subgroups:
    - Remote sensing and GIS for disaster management
    - Policy for space technologies in disaster management
    - Space technologies for water management
    - New technologies for disaster management
- Organised a meeting with the African Union's Disaster Risk Reduction (DRR) to see if they can provide worthwhile topics for the team to research.
- Contacted the UN-SPIDER to have an MoU signed
- Developed an introductory presentation to be shared with the new members.

Looking ahead: Activities for 2015

- Create an extensive outline document for each research subgroup.
- Produce at least one relevant paper per subgroup and present at a conference
- Create a partnership with RCMRD/SERVIR, African Union and another SGAC group for a small project.
- Form partnerships with Disaster for Risk Reduction agencies, as well as UN SPIDER.
- Organise a disaster risk conference as a follow up from the outcomes of the World Conference on Disaster Risk Reduction.

4.3 NEAR EARTH OBJECTS (NEO) PROJECT GROUP

Overview

The Near Earth Object (NEO) project group is dedicated to helping the worldwide planetary defence community meet one of nature's greatest challenges. The group provides a youth perspective to planetary defence through annual reports, competitions, conference attendance and public outreach projects related to Near Earth Objects.

Goals

1. Enable youth to present their opinions to the worldwide community on matters relating to NEOs

2. Engage students and young professionals in planetary defence research and community

3. Present an honest and balanced facts on the dangers posed by NEOs to the general public in a non-technical form.

Accomplishments in 2014

1. Selected a new co-Lead: John Conor Duggan.

2. In 2014, the group's success continued with the Move An Asteroid (MAA) technical paper competition, the Find An Asteroid (FAA) search campaign, and the conclusions of previous year's Name An Asteroid Campaign. The following are some notable results from each:

    - MAA
        - Seven quality papers were submitted by individuals around the world
        - A panel of four expert judges evaluated each submission
        - Clemens Rumpf was selected as the winner for his analysis of impact consequences as it relates to statistical probability and regional population density. He was sponsored to attend the SGC and IAC in Toronto where he gave a brief presentation on his work.
        - Received donations for the scholarship from OHB Systems, AC Charania, and others

    - FAA
        - Received applications from over 107 people in 27 different countries.
        - 65 individuals were selected to participate and then grouped into 14 teams.
        - The campaign runs through IASC and took place between mid-August and mid-September
        - The results are submitted in a series of reports submitted to IASC and MPC and now we must wait for their evaluation of the data to see how many asteroids were discovered in this year's campaign.
    - NAA
        - After receiving over 1500 submissions for asteroid names, the results were submitted to the IAU.
        - The IAU approved six of the proposed names for asteroids from the NAA campaign.

3. Partner Interaction

    - The group discussed a potential partnership and setting up a partnership with NASA's Asteroid Grand Challenge programme. That entity, however, must have the partnership established in an agreement before moving forward so the group outlining a potential Non-reimbursable Space Act Agreement that would solidify the intent to collaborate. There was some confusion about the existing relationship between the SGAC and NASA so NASA point of contact Eric Morano and SGAC chair Chris Vasko have been in communication to clear up this difficulty.
    - SGAC will be a sponsor of the 2015 Planetary Defense Conference via the NEO project group.

4. Meetings & Presentations

    - John Conor has been participating in monthly teleconferences for the 2015 Planetary Defense Conference, which will be held in Italy in April. However, he most likely will not be able to represent the group at the conference due to time and money constraints.
    - Clemens Rumpf, the winner of this year's MAA competition, attended the SGC and IAC using his scholarship award. He gave a brief presentation of his work at the SGC.

Conference Attendance

- Behnoosh Meskoob, FAA program coordinator, attended the IAC and SGC in Toronto
- Clemens Rumpf, MAA winner, attended the IAC and SGC in Toronto thanks to his scholarship award
- John Conor attended and participated in an event at NASA Ames called 'The Economics of NEOs'

Looking ahead: Activities in 2015

- Attend the 2015 Planetary Defence Conference in Italy.
- Start new MAA and FAA programmes.

4.4 SPACE LAW AND SPACE POLICY PROJECT GROUP

The Space Law Project Group was created in the spring of 2012 and is mostly comprised of students and young professionals from the law and policy fields, but all are welcome to join. The group intends to serve as a forum for young professionals and students interested in space law and looking to work cooperatively and creatively to have their voices heard in the global conversation on the intersection between space activities and their legal regulation. Tomorrow's space professionals, both legal practitioners and academics, will have much to discuss as space activities continue to evolve.

Goals

1. Develop working papers, white papers, reports and statements expressing the views of the next generation of legal professionals on various space law issues

2. Bring the views of tomorrow's space leaders to important international forums, including academic and industrial conferences and meetings

3. Develop relationships with other professional/civil society organisations and academia, including the International Institute of Space Law.

4. Encouraging SGAC and Project Group attendance at regular high-level meetings, such as the annual UN-COPUOS, its Legal Subcommittee, NASA's Advisory Council meetings. Members would act as observers, as well as to raise the profile of SGAC and to ensure that SGAC is well-informed of on-going space law developments

Accomplishments in 2014

1. Changed the name of the project group to include policy in the scope of work.

2. Created a LinkedIn page.

3. Created a library section on the project's website, where the members can include their research on space law and policy topics.

4. Organised a Round Table during the IAC Toronto on Space Security and Governance. Around 15 attendees and four panellists from space agencies, the industry and international organizations participated.

5. Prepared a paper to UNOOSA regarding SGAC's position on Definition and Delimitation of Outer Space and its connection with the issue of sub-orbital flights (not yet submitted).

Conferences and other events

1. SGAC was present at McGill's Space Governance Conference in Montreal, Canada on May 2014.

2. Lauren Napier attended the IAASS conference, where she had a poster and gave a presentation. IAASS has legal and regulatory committee that is interested in cooperation with SGAC and the Project Group. There is also the possibility of membership and participation in this committee by individual members of the Working Group, which the project group has endorsed.

3. Dorina Andoni presented at the 6th European Cubesat Symposium in Switzerland as result of a partnership between the group, the SSPG and the CSPG project groups and Swiss Space Systems.

Looking Ahead: Activities for 2015

1. Participate in the IAASS conference in Montreal, Canada, in March 2015.

2. Attend the project Symposium and Workshop in 2015 on regulatory and economical aspects of cubesats.

4.5 COMMERCIAL SPACE PROJECT GROUP

Commercial space activities have provided the space sector with a dynamic and diverse arena for competitive prices and efficient resources utilization. The communications satellite sector represents an unprecedented success in commercialising experiment, along with launch services markest and the planetary resources exploitation industry. With these game-changing development in the commercial space world, and their potential impact, the groups feels that the young generation of space enthusiasts must become familiar with this sector. The mission of this group is to equip the young generation with the knowledge, tools and networks to be active in the realm of commercial space and entrepreneurship.

Goals

1. Foster a think-tank environemnt for next generation students and young professionals to examine commercial space industry.

2. Conduct academic research on the theory of industrial practice in the commercial space sector.

3. Become the next generation authority on commercial space activities, and provide input to key decision-makers.

Accomplishments in 2014

Project Milestones:

1. Participated in the S3-cooperation on economic and regulatory aspects of nano-satellites. A survey designed was presented at the 6th European Cubesat Symposium from 14 to 16 October, 2014.

2. $pace is Business! competition 2014 successfully concluded.

3. MoU signed and website prepared for release for the 2015 $pace is Business! Competition

Conference Attendance:

1. SGC 2014: presentation of the project group by Jan Svoboda

2. SGC 2014: presentation of the $pace is Business! competition winners

3. IAC 2014: presentation of a project group paper on Space Industry Clusters in Germany by Jan Svoboda

4. IAC 2014: presentation of the $pace is Business! Competition winners

Publications & Articles:

P Maier, N Bernede, S Schmidt, J Svoboda. *The Structure of the European Space Industry – Current and Historical Analysis of Industry Clusters in Germany.* International Astronautical Congress 2014, Toronto, Canada.

Outreach Activities:

Jan Svoboda and Philipp Maier presented the group's activities at SpaceUp Sweden, in Stockholm on October 18, 2014.

Looking Ahead: Activities for 2015

1. Announcement of the 2015 $pace is Business! competition

2. Participate in SpaceUp Cologne on January 17 and 18

3. Continue Space Industry Cluster papers:
   - Complete Benelux cluster paper
   - Submit German cluster paper to NewSpace journal

4. Continue the S3 cooperation project

5. Participate in the IAF spring meetings in Paris

6. Initiate two new projects:
   - IAC 2015 – Entrepreneurship Events (SpaceUp and Panel) together with IAF IEC
   - Entrepreneurship environment country studies

4.6 SPACE SAFETY AND SUSTAINABILITY (SSS) PROJECT GROUP

Space activities have created an orbital debris environment that poses increasing collision risks to existing space systems, including human spaceflight and robotic missions. Even small and untrackable particles can cause considerable destruction to spacecraft or their subsystems. The proliferation of space debris and the increased possibilities of collision and interference raise concerns about the long-term sustainability of space activities, particularly in the Low Earth Orbit and Geostationary Earth Orbit environments. It is vital that the community act now to keep space clean, safe and useable for future generations, and the Space Safety and Sustainability project group aims to ensure the safety of valuable space facilities and people, both on the ground and in orbit, along with the security of ground and space environments.

Goals of the SSS project group

- To encourage active participation among students and young professionals in space safety and sustainability related debates and activities.
- To create an international space forum to showcase the perspectives of the next generation of space leaders on the safety and long-term sustainability of outer space activities.
- To afford current industry stakeholders access to a pool of young space enthusiasts interested in space safety and sustainability related issues.

Accomplishments in 2014

- Appointed A Nasseri and M Emanuelli as new project co-leads in May 2014
- Former SSS co-lead Minoo Rathnasabapathy appointed to SSS advisory board
- Valery Trushlyakov of Omsk State Technical University (Russian Federation) appointed advisor to ADR projects
- Began five new projects in 2014:
  - Active debris removal technical project (ADR 3.0)
  - Performance mapping of active space debris removal methods
  - Safety analysis of a One-way Human mission to Mars (OHM)
  - Educational series
  - Solar event prediction and space asset management (Space weather project)
- New webpage live on SGAC website highlighting new and completed projects

Publications and Posters:

- Publication: M Emanuelli *(Italy)*, G Federico *(Italy)*, J Loughman *(US)*, D Prasad *(India)*, T Chow *(USA)*, M Rathnasabapathy *(Australia)*. Conceptualizing an economically, legally, and politically viable active debris removal option. Acta Astronautica 2014;104(1): 197–205.
- Poster: SA Nasseri *(Canada/Iran)*, C Borriello *(Italy)*, A Hussein *(Iraq)*, F Kebe *(France)*. Active Debris Removal Mapping Project. International Astronautical Congress 2014, Toronto, Canada.
- UN Report: J Lousada *(Portugal)*, A Malcolm *(UK)*, H Gamal *(Egypt)*, R Rajput *(India)*, M Emanuelli *(Italy)*, A Nasseri *(Canada/Iran)*. Report on National Research on Space Debris, Safety of Space Objects with Nuclear Power Sources on Board and Problems of their Collision with Space Debris. UN Scientific and Technical Subcommittee (UN OOSA), October 2014.

Presentations:

- J Lousada *(Portugal)*. Report on National Research on Space Debris, Safety of Space Objects with Nuclear Power Sources on Board and Problems of their Collision with Space Debris. Space Generation Congress 2014, Toronto, Canada.

Looking Ahead: Activities for 2015

- Initiate two new projects:
  - Active debris removal using vortices (Vortex 2.0)
  - Economic analysis of first stage disposal (E1D)
- Submit abstracts for IAC 2015 for each SSS projects
- Publish remaining educational series volumes on Space debris and Space Safety

4.7 SMALL SATELLITES (SSPG) PROJECT GROUP

Over the past few years, small satellites have changed the landscape of space exploration because they are faster, more cost effective and allow reliable access to space. These features provide a potential opportunity to allow smaller projects and new actors develop their capabilities in the space domain.
Although any artificial satellite of low mass and volume can be considered a small satellite, the principles used in design of small satellites, such as off-the-shelf components, modular systems, reduced redundancy, open sourcing and incremental missions, can benefit design of larger space craft. The success of small satellites is encouraging larger spacecrafts to employ novel methods and technologies that was previously viewed as only for small satellites. The disruptive technology of small satellites ensures their value in numerous space missions.

Goals of the SSPG group

1. Provide career and project assistance for young professionals and students already active in the small satellite community

2. Offer the small satellite community current information on relevant topics, as well as recommendations for future research, development, policy and legal issues

3. Attract young professionals and students to the world of small satellites and generally to the world of space exploration.

Accomplishments in 2014

1. Launched a project group new logo at IAC.

2. Collaborated with Swiss Space Systems as part of a project on regulatory and economical aspects of cubesats, culminating with a paper submission at the 6th European Cubesat Symposium.

3. Published continuous small satellite updates on several social media sites, including Facebook, Twitter and LinkedIn.

4. Increased recognition of SSPG, which the group aims to translate into more group members and projects.

Looking Ahead: Activities for 2015

1. Continue the CubeSat survey project in cooperation with Swiss Space Systems.

2. Establish a second active project phase together with the Von Karman Institute / QB50 consortium is to create a mobile application that provides all public QB50 data available on a smartphone. This app will help amateurs and professionals alike to access information when observing a Cubesat, and is not only an excellent advertising opportunity for QB50 but also a way for SGAC to expand its presence in the field. The timetable is under development with first QB50 Cubesats scheduled to start in 2016, emphasising the high level of technical software development required. The group is currently confirming the QB50 app requirements with the Von Karman Institute.

3. Draw from student and young professional support to increase conference participation and paper publications.

4. Introduce a new co-Lead to replace current co-Lead, who is leaving the position.

5. Launch a new logo and design template.

4.8 SPACE EXPLORATION PROJECT GROUP

Space exploration increases human knowledge, establishes presence in the Solar System, and brings tangible benefits to everyday lives. The success of space exploration has its maximum benefit at the International Space Station (ISS) where sophisticated capabilities and fruitful partnerships developed. The future of space exploration will undoubtedly include robotic and human missions beyond low-Earth orbit to the Moon, asteroids and Mars. With the incredibly long time frames on such project, those who will execute these missions are currently students and young professionals.
Officially founded in 2013, the Space Exploration Project Group aims to create an international and interdisciplinary forum for students and young professionals to approach the subject from a multidisciplinary point of view and focus on eight common goals outlined in the Global Exploration Roadmap (GER):

- Develop Exploration Technologies and Capabilities
- Engage the Public in Exploration
- Enhance Earth Safety
- Extend Human Presence
- Perform Science to Enable Human Exploration
- Perform Space, Earth, and Applied Science
- Search for Life
- Stimulate Economic Expansion

Through articles, reports, meetings and conference presentations, the group aspires to integrate the perspectives of the next generation of space explorers into the GER implementation.

Goals

1. Identify current status of exploration in the international space community.

2. Revise key documents and formulate a solid opinion, such as the Global Exploration Roadmap.

3. Quantify benefits, outcomes and profitability of space exploration.

4. Establish a significant cooperation with meaningful associations, such as the Royal Astronomical Society London, or University of London.

Activities in 2014

1. Launched the official Space Exploration Group in July 2014 after almost a full year of preparations.
2. Created a logo and Facebook page to encourage new members to join.
3. Prepared a research and a survey on the Global Exploration Roadmap.
4. Published a journal article and conference abstract:
    - A Calzada-Diaz, M Dayas-Codina, JL MacArthur, DM Bielicki. *Role of the youth within the Space Exploration Sector*. Space Policy 2014;30(3B):178-182.
    - *The Global Exploration Roadmap - a global strategy from SGAC's point of view*. International Astronautical Congress 2014, Toronto, Canada

Looking Ahead: Activities for 2015

1. Launch the group's official page on SGAC website.

2. Recruit new group members.

3. Establish a significant cooperation with meaningful organisations.

4. Research the Global Exploration Roadmap and publish a paper at IAF/IAC 2015.

5. Develop and create reports on a variety of space exploration topics of considerable interest to tomorrow's space professionals (exploration technologies and capabilities, science to enable human exploration, analogue activities, etc).

6. Seek funding sources.

4.9 YOUTH FOR GLOBAL NAVIGATION SATELLITE SYSTEMS (YGNSS)

It has been an exciting year for YGNSS, with influx of new members and participation at international conferences. The group confirmed its presence on the international scene by attending the International Committee on GNSS in Prague and the International Astronautical Congress, in Toronto.

Goals

The goal of YGNSS is to educate the youth and general public about use and applications of GNSS and to promote cooperation among the youth all over the world.

Activities in 2014

1. International Presence

- International Committee on GNSS

  YGNSS co-founder Stephanie Wan, presented in Working Group C and represented SGAC at the ninth meeting of the UN International Committee on GNSS (ICG) held in Prague, Czech Republic. SGAC Deputy Executive Director Andrea Jaime also participated in promoting the SGAC activities and strengthening partnerships with various GNSS providers and organizations.

- Space Generation Congress

  YGNSS group members participated in the annual SGC activities, networking and sharing updates on new opportunities and activities. SGC also provided an opportunity to recruit new members to the YGNSS working group. The 'Agency Working Group at SGC was once again kindly sponsored by NASA Space Communications and Navigation (SCaN) Program Office, and highlighted questions surrounding Cubesat constellations with regards to space communication and policy issues.

- International Summer School on GNSS

  The International Summer School on GNSS was hosted by the Institute of Positioning, Navigation and Timing of Japan and co-hosted by Tokyo University of Marine Science and Technology. SGAC member and Regional Coordinator for Middle East, Behnoosh Meskoob, represented SGAC and participated in the GNSS Summer School in Tokyo, Japan. As a scholarship winner, she presented SGAC and YGNSS activities in the final session of the Summer School.

2. Publications

YGNSS members developed the research project 'Challenges faced by GNSS' to examine current topics driving the industry and research. The project also served to outline state of the art GNSS and provide young GNSS professionals with an overview of the industry. The results of the project were presented at the International Astronautical Congress 2014 Space Communications and Navigation Virtual Forum (Duran J *(Spain)*, Offiong E *(Nigeria)*, Isaiah, OT *(Nigeria)*, Wan S *(USA)*. *Challenges Faced by GNSS Today: an Overview*. International Astronautical Congress 2014, Toronto, Canada). The presentation was well-received by the audience and produced an eight-page paper.
The project provided YGNSS members the opportunity to work on a professional-like project and gain skills required in such an environment such as researching open access scientific sources and gain competency in GNSS technology. Finally, this project provides a starting point for future projects in 2015.

3. New Members and Leadership

YGNSS keeps growing with four new arrivals in 2014. The group gives special acknowledgements to Oniosun Temidayo Isaiah, from Nigeria, who provided great contributions to the 'Challenges faced by GNSS' project, and to Lukas Lanneau, from Belgium, who is participating in the group and has affiliation with SpaceTec GNSS Asia activities. SGAC endorsed YGNSS member, Etim Offiong, for UN/ICTP Workshop on 'Global Navigation on Satellite Systems for Satellite Applications,' held December 2014 in Trieste, Italy. New co-leads Juan Duran *(Spain)*, Etim Offoing *(Nigeria)* and Ana Perez *(Venezuala)* will share the leadership responsibilities with co-founder Stephanie Wan.

Looking Ahead: Activities for 2015

YGNSS has grown during the year 2014 and the ambitious projects planned for 2015 reflect these changes. The key project of 2015 is the organization of a workshop on Interoperability and International Cooperation, in Boulder, Colorado in November, next to ICG-10. Along with the workshop, YGNSS intends to shed some light on some of the topics raised in ICG-9 about the potential use of GNSS. Toward this, a survey about GNSS application on Farming is also scheduled for 2015. Finally, the working group has planned a research project on meteorology in 2015, in response to research needs and to explore other possible applications of GNSS.

5. SGAC REGIONAL ACTIVITIES

5.1 SGAC 2014 REGIONS AND REPRESENTED COUNTRIES

North, Central America & Caribbean

Canada
Costa Rica
Jamaica
Mexico
Nicaragua
USA

South America

Argentina
Bolivia
Brazil
Chile
Colombia
Ecuador
Peru
Uruguay

Europe

Albania
Armenia
Austria
Belarus
Belgium
Bulgaria
Czech Republic
Finland
France
Germany
Greece
Hungary
Italy
Ireland
Lithuania
Montenegro
Netherlands
Norway
Poland
Portugal
Romania
Russia
Serbia
Slovenia
Spain
Sweden
Ukraine
United Kingdom

Africa

Cameroon
Ethiopia
Ghana
Kenya
Lesotho
Nigeria
South Africa
Sudan
Zambia
Zimbabwe

Middle East

Egypt
Iran
Lebanon
Palestine
Saudi Arabia
Turkey

Asia Pacific

Afghanistan
Australia
Bangladesh
China
India
Indonesia
Japan
Malaysia
Nepal
New Zealand
Pakistan
Philippines
South Korea
Sri Lanka
Thailand
Vietnam

5.2 AFRICA

SGAC Africa had a successful year, building on the successes of 2013. Members in the region witnessed a number of achievements, despite facing challenges in 2014. Again, SGAC's visibility, as well as the number of space-related events across the African continent, increased considerably. More members joined SGAC and participated in national events, in addition to new appointments at national and regional levels and space outreach and awareness events received a big boost this year. SGAC member attendance at international events and expansion of the network across the continent is a target for future improvement, but overall there was visible progress and positive signs of growth within the organisation in Africa.

HIGHLIGHTS OF THE AFRICAN REGION IN 2014

SGAC Chair Tenure End
CJ Nwosa *(Nigeria)*, the first African representative to hold the office of Chair, successfully completed his tenure.

SGAC Deputy Executive Director
Minoo Rathnasabapathy *(Australia/South Africa)* was appointed SGAC Deputy Executive Director and also marks the first African to hold this position.

SGAC Regional Coordinators
Beza Tesfaye *(Ethiopia)* and Suki Dauda Sule *(Nigeria)* replaced previous Regional Coordinators (RC) Minoo Rathnasabapathy *(Australia/South Africa)* and James Chibueze *(Africa)*. Both new RCs were previously NPoCs of their respective countries.

SGAC National Points of Contact (NPoCs)
Nigeria and Ethiopia elected new NPoCs Akinsanmi Babatunde and Nebiyu Suleyman Mohammed respectively. NPoCs appointed in 2013 settled into their tasks this year. SGAC also received new applications for other countries, and will announce successful applicants by the end of 2014.

African Leadership Conference for Space Science and Technology (ALC) in Accra, Ghana
Several SGAC members received sponsorship or privately attended the ALC, which was held December 3-5, 2013 in Accra, Ghana. SGAC members featured heavily in the youth forum held during the conference.

Space Outreach Events
Yuri's Night activities in 2014 were more prominent than ever before and several events were held across the continent, in some cases for the first time.

Find an Asteroid Competition (FAA)
A 5-member team from SGAC-Nigeria, chaired by Abraham Akinwale Tobi, participated in the Find an Asteroid competition (FAA) in August. Other team mates were: Blessing Oyatope, George Okereka, Timileyin Ogunyemi and Sanmi Olanipekun.

Space Generation Congress 2014 and Space Generation Fusion Forum 2014
Rueben Jikeme and Kingsley Ukaegbu, both from Nigeria, won the 2014 International Astronautical Federation ESL Programme scholarship. Bezaye Getu *(Ethiopia)* won the SGAC Global Grant scholarship to attend the 3rd SGFF 2014, but could not attend due to visa constraints.

African Representation at Conferences in 2014

Space Generation Congress 2014:
African SGAC members from Nigeria, Ethiopia, and South Africa attended the SGC in Toronto, Canada. Though this represented only a small African delegation, it was fantastic to have the African continent represented at this year's SGC.

SGAC Fusion Forum 2014:
Bezaye Getu *(NPoC for Ethiopia)* attended the COSMOS 2014 in Moscow, Russia.
Beza Tesfaye *(RC for Africa)* attended GLAC 2014 in Paris, France.

Looking ahead: plans for 2015

SGAC Africa has set the following goals for the year ahead, building on the goals from 2013:

- Expand SGAC Africa network from contacts and increase awareness of SGAC in the region
- Add African countries not currently represented at SGAC
- Encourage members to be involved in SGAC projects, such as competitions and project groups
- Increase support of space outreach events, and encourage partnerships with industry and university space science and astronomy departments to make this possible
- Encourage NPoCs and members to contribute to SGAC from African perspectives by participating at conferences

CAMEROON

At the moment, there is no government body dedicated to space related activities in Cameroon and no stated intention from the government to get involved in space affairs. Within universities, there are no astrophysics, satellite systems or other space relevant departments. Cameroon is yet to build a solid space dedicated framework and the best way of developing such a framework is through universities and education.
As such, Cameroonians are mostly involved in space affairs through space programs and agencies in various countries including American and South African space agencies NASA and SANSA, rather than in Cameroon itself. Cameroonian SGAC members have, however, led a noticeable effort to create awareness of not only state of space affairs at a global level, but also how Cameroon fits in the picture. There are also efforts to demonstrate how space technology and applications can be used to solve problems that the country is facing.

SGAC activities in 2014

SGAC Cameroon members presented outreach programs in schools as main space-related activities this year, with the objective of raising awareness of space topics within high schools. Members consolidated a platform for a partnership between the University of Buea (UB) in Cameroon and the Cape Peninsula University of Technology (CPUT) in South Africa. The two universities agreed to build a ground station under the physics department of UB as part of the ground support for current and future space missions involving South Africa and other countries. Official agreements were due to be signed in November 2014, but were postponed due to the Ebola outbreak.

Looking ahead: plans for 2015

SGAC Cameroon's main goal for 2015 is to move forward in the partnership between UB and CPUT, aiming for at least a signature. SGAC will conduct a campaign for a new set of NPoCs as the current NPoC's term comes to an end. SGAC Cameroon proposes an SGAC app that can be distributed for free on the Android and iOS platforms to help Cameroonians stay up to date with space sector developments, in addition to being able to network more effectively. The app could allow members to post scholarship opportunities, enabling space activities and sponsorship from local private and public sectors.

ETHIOPIA

SGAC Ethiopia has grown significantly in recent years, successfully reaching out to many young Ethiopians who want to pursue their career in space science and related areas, and also to the space community at large. National Points of Contact (NPoC) Bezaye Getu and Nebiyu Mohammed currently represent Ethiopia at SGAC and a former NPoC of Ethiopia is currently working as a regional coordinator for the African region.

National Space Perspective

Entoto Observatory & Research Centre (EO) and Space Technology and Science Group (STSG)
EO and STSG signed an MOU agreement to train, develop, build and launch medium research satellites at Entoto Observatory.

Ethiopia Hosts East African Regional office of Astronomy for Development
The International Astronomical Union (IAU) signed an agreement with partners in Ethiopia to host an East African Regional node of the IAU Office of Astronomy for Development. This agreement was signed on January 16, 2014 in Addis Ababa.

Summer School Training
The Ethiopian Space Science Society (ESSS), in collaboration with EO, organised a three-day summer school from 18-20 July 2014 for ESSS members. The training focused on basic astronomy and space-based applications.

Entoto Observatory and Research Centre (EO) start working
The first observatory built in Ethiopia is launching a MSc and PhD program for 2015 in the field of Earth observation, satellite technology, space science, astronomy and astrophysics.

SGAC Activities 2014

NPoC Bezaye Getu along with other Ethiopian SGAC members and the regional coordinator for Africa, organised many community outreach activities.

Yuri's Night 2014 Ethiopia
SGAC Ethiopia celebrated Yuri's Night for the seventh time, in collaboration with the Russian Cultural Centre for Science. The event included public lectures, a photo exhibition of Yuri Gagarin's life, and was accompanied by a cocktail reception. Over 100 invited guests and students participated the event.

World Space Week 2014
World Space Week was celebrated at Addis Ababa on 18th October 2014, with a half-day panel discussion at Addis Ababa Institution of Technology (AAIT), followed by stargazing and presentations at Lideta Cathedral Catholic School (LCCS).

International Congress and Conferences

- **GLOBAL SPACE APPLICATIONS CONFERENCE (GLAC 2014):** The former NPoC Beza Tesfaye attended GLAC 2014, organised by the International Astronautical Federation from 2-4 June 2014 in Paris, France.

- **COSMOS 2014:** former NPoC Beza Tesfaye attended the COSMOS 2014 conference in Moscow, Russia.

- **Space Generation Congress (SGC2014):** Africa RC Beza Tesfaye (Ehtiopia) attended the 13th SGC congress in Toronto, Canada

- **International Astronautical Congress 2014:** Both the NPoC for Ethiopia and RC for Africa attended the 64th IAC congress in Toronto, Canada.

Scholarships

Bezaye Getu, NPoC for Ethiopia, received a Space Generation Fusion Forum (SGFF) Global Grant to attend SGFF and International Space Symposium in Colorado, US.

Looking ahead: plans for 2015

- Increase the number of SGAC Ethiopia members and reach out to young and inspired Ethiopians to come together and network.
- Organise Yuri's Night, World Space week, stargazing and other space themed community outreach programs, on a large scale.
- Establish a partnership of national space organisations and other local organisations that have interest and the potential to support SGAC Ethiopia.
- Establish a way to secure funding for SGAC members in Ethiopia to attend SGC, SGFF and other SGAC event based on an individual donation-based scholarship.
- Strengthen SGAC Ethiopia relations with the rest of the SGAC member countries.

GHANA

The Ghana Space Science and Technology Centre opened on 2nd May 2012 as Ghana's first space science, space exploration, astronomy, and technology institution. In September 2013, the centre expanded to become the Ghana Space Science and Technology Institute (GSSTI), with an eight-member board under the Ghana Atomic Energy Commission. GSSTI aims to become an arena of excellence in space science, space exploration and space technology through teaching, learning, private spaceflight and space research commercialisation. The institute also conducts research in natural resource management, climate modelling and impact assessments, agriculture and national security. Despite only a few years of existence, GSSTI plays a major role in space science and technology in Africa, and hosted the African Leadership Conference on Space Science and Technology in December 2013. The event welcomed space scientists from around the world, including the immediate past Director of the United Nations Office for Outer Space Affairs (UNOOSA), Mazlan Othman, and cemented Ghana's position as an emerging space leader.

One of the first major projects of GSSTI is the Ghana Radio Astronomy Project (GRAP) under the Square Kilometre Array, which began with the conversion of the abandoned Vodafone 32m antenna at Kuntunse, near Accra, to a radio telescope. Ghanaian experts of the GSSTI worked alongside experts from South Africa's space agency to replace worn out parts of the antenna. This project resulted in twelve students gaining radio astronomy training this year. A further twenty students will be trained in 2015 and thirty in 2016. This radio astronomy training is a human capacity building project, with funding from the United Kingdom (UK) Royal Society.

Ghana is reinforcing the work of SGAC with various activities conducted through the GSSTI. The Ministry of Environment, Science, Technology and Innovation is also offering scholarships in science and mathematics with free laptops to students and teachers, as part of the increasing effort to support science and technology in Ghana. The Government of Ghana has promised to promote and support research in science and technology and continue joint efforts in space exploration with South Africa and other countries. When elected from 53 participating African countries, Ghana agreed to chair the Commission on Science and Technology for Sustainable Development in the South.

SGAC activities in 2014

National Points of Contact (NPoC) Micheal Afful and Patrick Essien currently represent Ghana at SGAC. Michael is currently working as a volunteer at the African Union, where his interest lies in Satellite Engineering and manifested in his presentation during the African Leadership Conference in Ghana. Patrick holds a post-graduate degree in Satellite Communication from the African Regional Centre for Space Science and Technology Education in Nigeria, and is currently researching gravity waves in the lower Ionosphere at the Federal University of Campina Grande, Brazil.

The Ghanaian NPoCs organised a number of events in collaboration with the GSSTI, universities, Ghana Planetarium, Colleges of Education and MultiChoice. The events came to a climax during the World Space Week. Companies and organisations provided support and promotion to help organise outreach program across the country. The aim was to strengthen the connection between students and Ghanaian professionals, and to provide opportunities for students to gain experience and reference points within the space and communication industries.

World Space Week 2014 (4th to 10th October)
Nana Ama Browne Klutse at GSSTI organised an astronomy workshop prior to World Space Week for science teachers from senior high schools in Ghana. Space scientists from Spain Mirjana Povic and Ederlinda Viñuales were invited to teach through the Network for Astronomy School Education (NASE) with support from the International Astronomical Union (IAU). GSSTI also organised a number of talk shows on space science for socio-economic development at universities and local conferences.

Ghana celebrated World Space Week with a number of activities, organised in collaboration with the Ghana Planetarium and Ghana Astronomical Society. All Nations University College organised a quiz among students on October 4th. On October 10th, the Ghana Planetarium held a series of programmes that attracted media attention. Renowned Ghanaian scientist Francis Allotey spoke about 'Guiding Your Way, The Role of Ghana.' In the evening of October 10th, the University of Ghana screened a series of movies on Rocket Launching and International Space Station in collaboration with Physics Students Association of Ghana. A dinner dance was organised on October 12th with a live band to end the programme.

SGAC Ghana is looking forward to an organised series of programs on space outreach in high schools, colleges of education, polytechnics and universities. NPoCs are developing a media talk show on space science and are cooperating with GSSTI to intensify its CubeSat project, as well as strengthening the CanSat development at the All Nations University College. NPoCs will team up with Physics Students Association of Ghana and Ghana Engineering Students Association in 2015 to organise programs and projects on space applications.

Looking forward: plans for 2015

SGAC Ghana is looking forward to developing collaborations over the coming years. Members are looking to reach ordinary Ghanaians with this years goals, which are:

- Promote space education in Ghana in the form of satellite development and applications activities
- Encourage more members from Ghana to participate in space programs and pursue space science related programs
- Hold more space related events before, during and after World Space Week.
- Increase participation in all SGAC programs in Ghana

KENYA

SGAC Kenya has advanced enormously in recent years. SGAC has enabled activities in various parts of the country including seminars, outreach activities and collaboration with other organisations, among other activities. Antony Kinyili and Nichoas Muinde, the current National Points of Contact (NPoC), have worked tirelessly to involve as many members as possible and growing the SGAC Kenya family. There have been numerous activities in the country through primary schools, secondary schools, and tertiary institutions.
SGAC Kenya's official website is: www.spacegeneration.org/kenya

National Space Perspective

SGAC Kenya is undertaking several initiatives to get its members involved as many space activities as possible, coordinated by its NPoCs. For example, several Kenyans joined the African Space Group led by Timiebi Aganaba-Jeanty, a PhD Candidate at McGill University, Canada. Efforts are still underway to ensure that an African space policy is formed. SGAC Kenya is mobilising many young professionals and students to join the group, to give them a platform to air their views and ideas.

SGAC activities in 2014

SGAC Kenya held several activities in the country, despite numerous challenges. SGAC Kenya incorporate as many members as possible with the effect of popularising SGAC and achieving the set objectives.

- SGAC outreach event held at Domus Mariae School where NPoCs gave speeches to the students at the main hall.

NPoC Antony Kinyili gives presentations to learners at the Domus Mariae School in the school's Computer Laboratory on 22nd March 2014 (left). Learners pose for a photo during the event (right).

- The SGAC Kenya team collaborated with teachers and students of the Katelembu Centre for Excellence in Machakos town, Kenya, to make presentations at the institution. This event was held in conjunction with the Yuri's Night on 12th April 2014 at the institution's Hall.

NPoC Nicholas Muinde gives a presentation to the learners at the Katelembu Boys Centre for Excellence in the School's Main Hall (left). NPoC Antony Kinyili gives an award to a student during the event (right).

Looking forward: plans for 2015

- Link SGAC Kenya with more organisations in the country to enhance SGAC activities in the Kenya and East Africa region. SGAC Kenya will target several non-governmental as well as government organisations in the country to achieve its goals in space science.
- Motivate SGAC members to join the SGAC Africa working group to enable more members to have their voices heard.
- Organise outreach activities at primary schools, high schools, and tertiary institutions in the country.

LESOTHO

The National University of Lesotho does not currently offer any space related fields of study, however, there is a strong science and technology department at the university and many young people study these subjects. The government of Lesotho has a department of science and technology that facilitates most of the related activities in the country, but does not currently have a space agency and has not launched a satellite or set up any earth-based space technologies. Government departments rely on satellite data for disaster management and global warming, and many departments and citizens of Lesotho rely on satellite communications and GNSS.
SGAC Lesotho aims to link all interested stakeholders and together run a campaign to mobilise universities and young professionals to develop space research in Lesotho.

National Perspective

Science week is currently the only event that promotes science and technology in Lesotho. As the country is only minimally involved in the space sector, and has no national space agency or space policy, SGAC Lesotho members and young professionals are working hard to make sure space science gains recognition in the country.

Looking forward: plans for 2015

- Increase SGAC membership in Lesotho
- Raise awareness of space science in the country
- Celebrate World Space Week 2015
- Introduce a forum on space science, with involvement from space scientists
- Build a demonstration model for schools
- Start a space science club in collaboration with high schools

NIGERIA

SGAC Nigeria is pleased to welcome new National Point of Contact (NPoC) Tunde Akinsanmi, a staff member of Nigeria's National Space Research and Development Agency (NASRDA). Tunde took over from Suki Dauda Sule, who was elected Regional Coordinator for Africa. SGAC activities this year kicked off with efforts to establish lasting relationships with space organisations within the country at different levels of government. This approach proved successful and served as the foundation for many activities.
SGAC and the African Regional Centre for Space Science and Technology Education (ARCSSTEE) revisited their memorandum of understanding this year; a file was officially opened for SGAC within the organisation at the request of the Director. SGAC is now able to enjoy support from the organisation, with the hope that this will continue in the coming years. Equally, a Director of one of NASRDA's activity centres also pledged support for SGAC by providing a venue and staff to assist with the organisation of a space weather workshop next year. The director of CESRA of the Federal University of Technology Akure (FUTA) has also promised to host one of SGAC's activities next year within the university.

National Space Perspective

NASRDA held a one-year commemoration of the Nigeria Sat-X launch, the first satellite built by Nigerian engineers as part of the agency's capacity building and technology transfer initiative. Also in the area of capacity building, ARCCSTEE admitted its first set of students for its Global Navigation Satellite System (GNSS) and Masters programme from around Africa. Nigeria and its space agency are committed to fostering partnerships with other space organisations from around the world. This was evident in the conferences and workshops that took place this year as chronicled below:

- Conference and space weather school with the theme 'Solar-Terrestrial Sciences in National Transformation' hosted by Bells University of Technology (BUT) and co-organised by the Centre for Atmospheric Research (CAR), NASRDA, and the Atmospheric and Space Environment Research Network (ASPERN), 19th -30th Jan, 2014.
- 2014 African Geophysical Society Conference, 2nd-6th June 2014, Abuja, Nigeria
- First West African workshop on air quality, measurements and modelling, 10th-13th June, 2014, organised by the Centre for Atmospheric Research, Nigeria, and the National Centre for Atmospheric Research (NCAR), Boulder, Colorado, USA. This workshop aimed at bringing awareness of air quality studies to students, and allowing experts and researchers in the health and atmospheric sciences field to network.
- National Conference and Annual General Meeting of the Space Engineering Division of the Nigerian Society of Engineers (NSE), 23rd October 2014.
- Annual conference of the Astronomical Society of Nigeria, with the theme: African - Very Long Baseline Interferometry (A-VLBI) at NASRDA, Abuja, 29th Oct - 2nd Nov 2014.

SGAC activities in 2014

SGAC Nigeria organised Yuri's Night activities at two locations: NASRDA in Abuja on April 10th and Obafemi Awolowo University campus on April 12th. Another event at FUTA was not held due to an unfortunate incident. Both locations were well-attended with over one hundred attendees at the Obafemi Awolowo University. Activities included night sky viewing, movies, competitions and presentations.

SGAC members as well as the Teachers' Workshop, a workshop on Space Science Club for Primary School Teachers, attended the Zonal Space Education Workshops Zero Gravity Instrument project. The events were organised by ARCSSTEE in three geopolitical zones around the country.

Erinfolami Funmilayo (NPoC) attended the International Space University Space Studies Programme (SSP14) in Montreal, Canada from June 6th to August 9th, 2014.

A five-member team from SGAC-Nigeria, chaired by Abraham Akinwale Tobi, participated in the Find an Asteroid competition (FAA) in August. Team members were Blessing Oyatope, George Okereka, Timileyin Ogunyemi, and Sanmi Olanipekun.

SGAC members and university students from all over Nigeria attended this year's World Space Week celebration at the Obafemi Awolowo University, Ile-ife featuring J Akinyede. NPoC Funmi introduced SGAC, and many audience members joined SGAC at the end of this talk.

SGAC member Stanislas Nnadih attended a conference organised by the Nigerian Union of Planetary and Radio Science (NUPRS) titled 'Earth Observation Systems for National Development'. Stanislas presented an award-winning paper titled 'Mitigation of Oil pipeline vandalisation using small satellite earth observation systems.' The paper highlighted a novel strategy for monitoring oil pipelines across the country using an affordable picosatellite-based oil pipeline surveillance systems network. The conference was held between 17th -19th October.

SGAC and Astronomers Without Borders (AWB) held a joint outreach program at White Plains British Academy in Abuja, Nigeria. SGAC also supported a space science outreach event for high school students organised by the popularisation of emerging science and technology initiative (PEST), which took place at the Federal Capital Territory Abuja, Nigeria.

Stanislas Nnadih also facilitated an outreach event titled 'Space Education Program on the Recovery Systems of Spacecraft'. The program involved ten higher institutions in Nigeria where students were taught how spacecraft for both planetary and interplanetary missions are recovered.

Finally, three members of SGAC Nigeria attended the SGC congress in Toronto and participated actively in the working groups. SGAC Nigeria had a quite active year and is looking forward to more next year!

Looking ahead: plans for 2015

- Nigerian NPoCs plan to continue the expansion of the SGAC network in Nigeria by setting up collaborations with student associations of Nigerian universities to create a space group that grows future space industry leaders. The space group would be a forum where issues relating to space science, technology and policies can be discussed. The club would serve as SGAC contact with university students
- Seminars and workshops will be organised throughout the year on GNSS, space weather, telemedicine and other trending space issues within the country
- Collaborations between SGAC and other international space promoting associations with a presence in Nigeria, such as Astronomers Without Borders (AWB) and Universe Awareness (UNAWE). The aim of these collaborations is to reach a larger group of people within different age groups
- Collaboration between SGAC and other organisations and companies within the country to foster a relationship that has the potential to bring great benefits to both organisations in terms of outreach, space awareness, funding and scholarship opportunities

SOUTH AFRICA

National Space perspectives

South Africa launched its first cubesat, TshepisoSat (code named ZACUBE-1), on November 21, 2013, from a Russian Dnepr launcher. Postgraduate students at the French-South African Institute of Technology (Cape Peninsula University of Technology) built the satellite, which is currently operational in Low Earth Orbit. The construction and launch of TshepisoSat is a major milestone in the growing South African space sector and paves the way for a number of promising cubesat programmes elsewhere in South Africa, including DynaCube (Denel Dynamics) and KLETSkous (South African AMSAT project). For more information about TshepisoSat and up-to-date mission status, see www.cput.ac.za/blogs/fsati/zacube-1.

The South African National Space Agency installed a new digital Super Dual Auroral Radar Network (SuperDARN) radar at the South African Antarctic Expedition IV base (SANAE-IV) in December 2013 and January 2014. The new digital radar will provide more accurate measurements of charged particles in the Antarctic auroral regions and improve our understanding of the Earth-Sun electromagnetic environment and interaction. Details about the new radar installation are available at: www.sansa.org.za/spacescience/resource-centre/news/529-understanding-space-plasma.

A major milestone in the MeerKAT ("meer"/more Karoo Array Telescope) and SKA Africa (Square Kilometre Array) projects were reached in 2014 with the completion of the KAT-7 precursor array. The first of the MeerKAT dishes was also installed and commissioned this year, with a second nearing completion. By the end of 2015, over 30 dishes of the MeerKAT array will be complete. The MeerKAT project is a major catalyst of growth in the South African space sector, as South African space companies such as Space Commercial Services and Tellumat are doing much of the high-tech design and construction work.

Several important local and international conferences and other meetings in the space and related sectors were hosted in South Africa in 2014, including:

- Africa Aerospace and Defence (AAD) Exhibition
- Second International Africa CubeSat Workshop
- South African Women in Engineering (SAwomEng) Conference
- South Africa AMSAT Space Symposium 2014

SGAC Activities in 2014

In collaboration with the South African Space Association (SASA) and with the generous support of Denel SpaceTeq, SGAC organised the first Space Youth Congress (SYC) in 2014. SYC was hosted by the University of the Western Cape at campus in Bellville, Cape Town, on March 17 to 18, 2014. The main goal of the congress was to provide an opportunity for students and young professionals interested in space to network with established members of the space arena in South Africa. The congress also featured two panel sessions, during which participants discussed current and emerging issues in the local and international space arena. Over 30 students and young professionals from all over South Africa attended the congress, as well as established professionals from Denel SpaceTeq, South African National Space Agency (SANSA), SCS, New Space Systems, South African Astronomical Observatory, MeerKAT, the South African Space Association, Space Advisory Company, CPUT/F'SATI, UWC, University of Stellenbosch, University of Johannesburg and the University of the Witwatersrand.

The feedback from the congress was overwhelmingly positive, and SGAC South Africa hopes to host another SYC in the near future and make it an even greater success than the first.

Looking ahead: plans for 2015

SpaceUp 'unconferences' are gaining popularity: dozens have already been successfully hosted and many more are in the planning stages. The popularity is well deserved, since the gathering entitles each attendee to also give a presentation about their work and views about space affairs, thereby maximising audience participation. More South Africans are showing an interest in space affairs, and the SpaceUp format is ideal for allowing a discussion of ideas concerning all aspects of the space arena. SGAC South Africa is, therefore, studying the feasibility of hosting a SpaceUp unconference in South Africa in 2015.

SGAC South Africa also hopes to arrange funding for South African students and young professionals to attend the annual Space Generation Congress in 2015. SANSA currently provides funding for two students to attend the International Astronautical Congress, and SGAC is currently negotiating with SANSA to supplement this funding so that the awardees may also attend the SGC.

SUDAN

National Point of Contact Manahil Abdalla represents SGAC in Sudan. Since its founding in 2011, the Sudanese Society for Astronomy and Space Science (SSASS) is a driver of interest in astronomy, space science, and the universe. The SSASS plays a role in the dissemination of science education to the public in an effort to work at the Sudanese humanitarian priorities of education and combating scientific illiteracy.

National Space Perspective

Despite worldwide activity for more than 50 years, Sudan is making its first steps in space-related activities. The Remote Sensing Authority and the Sudan Institute for Natural Resources represent the majority of Sudan's governmental space program. The Remote Sensing Authority has been cooperating with the General Organisation of Remote Sensing of Syria (GORS), the Inter Islamic Network on Space Science and Technology (ISNET) and the Pakistan Space and Upper Atmospheric Research Commission (SUPARCO).

Sudan is also a member of the Arab Remote Sensing Union and the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS). Sudanese universities host some societies and departments of space and astronomy. Due to high demand, universities such as the Future University and Sudan Academy of Science have begun to award bachelor and masters degrees in geo-informatics. Future University has established a space research centre, in addition to a Faculty of Geo-informatics. This new faculty is considered the first specialised faculty of its kind in Sudan, and has begun research and awareness activities targeting youth.

SGAC activities in 2014

Members of SGAC Sudan and SSASS members met in the early morning of February 26th to take pictures as the Crescent Moon met with brilliant Venus. SGAC Sudan and SSASS members also met in Khartoum in March to observe the New Moon. Members were able to make astronomical observations and monitor constellations, Mars, Saturn, Jupiter and its moons.

Open Day in show sky
SGAC Sudan and SSASS organised two days of open day containing space exhibitions and observation activities. A large presence of students, researchers, and those interested in space topics made this event a success.

Lecture by Abdel- Malik M.Abdel-Rahman
The Faculty of Science at the University of Sudan for Science and Technology held a lecture to mark the beginning of its program of weekly seminars. Mohammed Abdul Rahman gave the lecture, titled Trying to understand the universe to a large audience on Thursday 10th April 2014.

Full Moon event
Another astronomical observation event was held for SGAC Sudan and SSASS members, who were invited to view the full Moon through telescopes.

Exhibition
Students of the Sudan University of Science and Technology held an exhibition, with seminars and an open day.

Conference
The Sudanese Society for Astronomy and Space Science organised a conference on use of space technologies.

Cubesat project
A team from the Faculty of Engineering of the University of Khartoum built the first Sudanese satellite, Ciobsat. The team used a new experimental ground station for sending and receiving signals from the satellite.

Looking ahead: plans for 2015

- Develop education and outreach activities
- Organise conferences and workshop
- Observe future astronomical events
- Hold Astronomy Day, which is intended to be an annual event to provide a means of interaction between the general public and various astronomy enthusiasts, groups and professionals
- Hold an open day for SGAC
- Start club *SGAC* for discussing space policy and technology

ZIMBABWE

National Space Perspective

Zimbabwe continues to adopt space applications year by year. This year, the Zimbabwean government commissioned the installation of a solar plant to boost energy production and launched Econet, a mobile phone service provider to track cars. Zimbabwe still faces challenges in meeting some of its Millenium Development Goals, with fewer than 500 days left before the programme comes to an end. These goals could be met using space applications. The current National Points of Contact (NPoC) for Zimbabwe are Conrade Muyambo and Constant Chuma.

SGAC activities in 2014

Building Connections & Networking
SGAC Zimbabwe continues to update space enthusiasts in Zimbabwe with information through emails. Additionally, in December last year, NPoC Conrade Muyambo was awarded a young scholarship to attend the African Leadership Conference on Space Science and Technology for Sustainable Development in Ghana.

World Space Week Celebrations 2014
SGAC Zimbabwe hosted Word Space Week Celebrations at Pathway Primary School in Chitungwiza, for the first time in Zimbabwe.

Looking ahead: plans for 2015

- Increase SGAC activities in Zimbabwe
- Increase awareness and space outreach across the country
- Partner with the Ministry of Science and Technology and other organisations to increase support and resources
- Represent Zimbabwe at Space Generation Congress

5.3 ASIA PACIFIC

HIGHLIGHTS OF THE ASIA PACIFIC REGION IN 2014

- Jack Yeh *(New Zealand)* was welcomed as Executive Co-Secretary.
- Nine NPoCs were appointed in the region: John Furness *(Australia)*, Khaza Anuarul Hoque *(Bangladesh)*, Kenta Sada *(Japan)*, Altynay Demeubayeva *(Kazakhstan)*, Hasan Murtaza *(Pakistan)*, Peerapong Torteeka *(Thailand)*, Wasanchai Vongsantivanich *(Thailand)* and Dao Thu Ha & Nguyen Tran Hoang *(Vietnam)*.
- The 1st Asia Pacific Space Generation Workshop in partnership with Keio University was held from November 29-30 2014, in Yokohama, Japan as an official side event of the 21st Asia Pacific Regional Space Agency Forum (APRSAF-21), December 2-5 2014 in Tokyo, Japan.
- SGAC members from India, Sri Lanka, Philippines and Thailand named four of the six asteroids identified during the Find an Asteroid 2014 Campaign run by the SGAC Near Earth Object Project Group.
- SGAC members celebrated Yuri's Night across the region with programmes to engage students and young professionals.
- The first Australian SpaceUp was held in the lead up to the ASSC, September 28 2014.
- An official Chinese version of the SGAC website was launched.
- International Space App Challenges were held in the region.

AUSTRALIA

Australia is active in SGAC with representatives in Executive Office and Web Team in addition to National Points of Contact (NPoC). Australian members contributed to SGAC activities at Space Fusion Forum in Colorado, USA and Space Generation Congress in Toronto, Canada. The year 2014 marked the departure of NPoC Kristian Grayson after completion of a successful term. Newly appointed John Furness joins Crystal Forrester as NPoCs to present Australia SGAC members.

National Space Perspective

Australia has a strong, connected and active group of young people working across the world in space industries, along with institutions and companies that are the mainstay of the country's space industry. Organisations that foster the younger generation, such as SGAC, Australian Youth Aerospace Association (AYAA), Space Industry Association of Australia (SIAA) and the International Space University's Southern Hemisphere Space Studies Program (ISU-SHSSP) are critical in bringing both all parties together to continue Australia's space successes.

Other notable activities include several entrepreneurial endeavours, national space conferences, launches by Australian telecommunication companies and a winning bid for the International Astronautical Congress (IAC). These successes are testimony to the power of Australia's space industry collective as it continues to find its place on the international stage.

Space in Australia 2014

Aerospace Futures Brisbane
Aerospace Futures 2014, proudly sponsored by Boeing, was a three-day conference held in Brisbane at the Stamford Plaza on July 7 - 9, with a launch night on July 6. Aerospace Futures exposes more than 150 university students to opportunities in the aerospace industry. Winners of the Young Australian Space Leadership Award are announced, giving selected delegates from Aerospace Futures the opportunity to attend SGC and IAC with financial support.

Australian Space Research Conference
The 14th Australian Space Research Conference (ASRC; formerly the Australian Space Science Conference) was held in Adelaide at the University of South Australia. This was the eighth ASRC jointly sponsored and organised by the National Committee for Space and Radio Science (NCSRS) and the National Space Society of Australia (NSSA), with the support of the Australian Space Research Institute (ASRI) and the Mars Society of Australia AMEC.

SpaceUp Australia
The first Australian SpaceUp was held in the lead up to ASSC. The 'unconference' took place on September 28th, 2014, at the Flinders University Victoria Square Campus in Adelaide. Special guests included academics, Mars One candidates, entrepreneurs and space history experts.

Engineers Australia Convention
Engineers Australia (EA), the largest professional engineering organisation in Australia, hosted the EA Convention at the Melbourne Convention and Exhibition Centre in late November, bringing all engineering disciplines together. This included a special keynote presentation titled "From ground zero to Hero" featuring Chris Hadfield, Andrea Boyd and Andrew Thomas.

Successful Bid to Host International Astronautical Congress 2017 in Adelaide, Australia
The General Assembly of the International Astonautical Federation chose Adelaide, Australia as the venue of the 2017 IAC. Roughly 3,000 international delegates are expected to attend the weeklong congress at the newly re-developed Adelaide Convention Centre, providing a significant economic boost to the local economy.

South Australian Space School
The annual South Australian Space School was hosted in Adelaide from September 29 to October 1, 2014.

International Space University/University of South Australia Southern Hemisphere Summer Space Program
Mawson Lakes Campus of the University of South Australia in Adelaide hosted the fourth ISU SH-SSP program, consisting of 35 people from eight countries. The program culminated in a white paper entitled *Our Turbulent Sun: Emerging tools for disaster management in the Global South.*

NASA-VSSEC Space Prize
The Victorian Space Science Education Centre (VSSEC)-NASA Australian Space Prize, encompassing the Engineers Australia Undergraduate Thesis Prize in Space Engineering, offers an Australian university student the opportunity to participate in a 10 week NASA Academy program and work with a lead scientist or engineer on a current NASA project related to the student's thesis project. The VSSEC-NASA Australian Space Prize is open to all Australian undergraduate students completing their final or honours year at an Australian university with this year's winner Jiro Funamoto from the University of Sydney.

Yuri's Night
Students across the country celebrated Yuri's Night. The University of Adelaide American Institute of Aeronautics and Astronautics (AIAA) Student Branch held a quiz night with the Queensland branch of the Australian Youth Aerospace Association and at the 4-Pines Brewery with Sabre Astronautics and their Space Beer Stout.

AIAA Region VII-AU Student Conference
The University of Sydney hosted the 2014 AIAA Australian-Asia Regional Student Conference in late November. The conference was open to undergraduate presentations only, with prizes given to the top three papers. The AIAA funded the winner to attend the AIAA Scitech meeting in Kissimee, USA in January 2015.

Electro Optic Systems announces partnership
On August 26, 2014 Electro Optic Systems (EOS), Canberra-based company, announced a space tracking facility to be built in Western Australia with the Lockheed Martin Corporation.

Jabiru-2 Launch - NewSat
The MEASAT-3b Satellite was launched on Ariane 5 ECA vehicle in French Guiana. This hosted the Jabiru-2 ku-band payload, which will deliver telecommunication services across Australia and the Timor Leste, Papua New Guinea and the Solomon Islands.

Optus 10 Launch – Optus Australia
The Optus 10 Satellite was launched on the same vehicle as the MEASAT-3b satellite for Optus Australia. The satellite provides telecommunication services across Australia, New Zealand and the Antarctic. Optus is the largest satellite operator in Australia and New Zealand.

Delta V SpaceHub
The first Australian space industry accelerator, Delta-V SpaceHub, was announced this year. The incubator aims to bring talent and opportunity together to foster its six focus areas that include Science, Technology, Engineering and Mathematics (STEM), robotics, space market validation and traction, sensors and systems.

LaunchBox
A team of scientists and entrepreneurs founded Launchbox to inspire young people and encourage students to pursue sciences with affordable model satellite kits for schools. The kit contains equipment to launch by balloon a cubesat with GoPro into the stratosphere.

Government Initiatives

- **Space Coordination Office**
  The space coordination office released a new government report entitled Australia and SAR: A Road Map for prospective investment into a Synthetic Aperture Radar (SAR) satellite. This builds on previous years reports, particularly the Satellite Utilisation Policy.
- **Space Environment Management Cooperative Research Centre**
  In February 2014, the Australian Government announced a Cooperative Research Centre (CRC) in Space Environment Management hosted at Mt. Stromlo near Canberra. The CRC for Space Environment Management will be managed by the Space Environment Research Centre (SERC) and was established to build on Australian and international expertise in measurement, monitoring, analysis and management of space debris and to develop technologies to preserve the space environment.

Recipients of the 2014 Young Australian Space Leader Scholarship at the Space Generation Congress in Toronto, Canada (left to right) Jessica Todd, Andrew Tasman Power, Jessica Orr and Nikita Sardesai.

NPoC John Furness presenting at SpaceUp Sweden at the KTH Royal Institute of Technology in Stockholm.

An impressive delegation of Aussies attends the gala dinner of Space Generation Congress in Toronto including Australia SGAC contributors.

Looking ahead: plans for 2015

- Promote SGAC, its objectives and events throughout the Australian space community and at the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS)
- Ensure Australian attendance at Space Generation Congress is secured by continuing the annual Young Australian Space Leadership Award in partnership with Aerospace Futures
- Strive for notable SGAC presence at all major Australian space events, particularly at Aerospace Futures, SpaceUp Australia and Australian Space Research Conference
- Purchase self-standing banners and promotional material for conference exhibitions
- Create an email database to promulgate targeted SGAC information to relevant industry and supporters

BANGLADESH

Bangladesh appointed its first National Point of Contact (NPoC) Khaza Anuarul Hoque to support SGAC activities in the country. As students and young space professionals in Bangladesh become more familiar with SGAC activities, SGAC will appoint a second NPoC to this post.

National Space Perspective

As a developing country, Bangladesh is yet to achieve its place in the space. The Bangladesh government, however, is working to launch its first satellite Bangabandhu-1 in 2016.

SGAC activities in 2014

World Space Week 2014 in Bangladesh
Bangladesh is one of the largest participating countries in World Space Week since its first celebration in 2003. The coordination of this national event is in the hands of the Bangladesh Astronomical Society, and is supported by many local and national organisations. The Copernicus Astronomical Memorial of Shahjalal University of Science and Technology (CAM-SUST) organised four large-scale celebrations in Dhaka, Mymensingh, Bogra and Narayanganj. Activities in Dhaka included a space art competition, a special lecture on our theme Space: Guiding Your Way and a prize giving ceremony. In Narayanganj, activities started with a rally, followed by a seminar and exhibition. In Mymensingh, school children participated in a space drawing competition and attended lectures on astronomy. Also in Bogra, CAM-SUST members taught children about astronomy and they even had the opportunity to look at the Moon through telescopes. This year's celebrations ended with a very large public event at Enayetpur, north west of the capital Dhaka.

Activities at Rjshahi University
Rjshahi University arranged a night sky watching activity Astronomical Observation and a scientific seminar entitled "From Big Bang to Current Universe"

NPoC Contributions
The current NPoC lives abroad, but keeps in close contact with youth of Bangladesh to promote space activities. As knowledge and interest in space activities increases, a new NPoC will be elected to assist in SGAC promotion. The NPoC represented Bangladesh at the International Space University's Space Studies Program in Montreal, Canada

Looking ahead: plans for 2015

- Arrange more SGAC outreach activity in Bangladesh to encourage students and youth to learn more about space
- Initiate a social media-based approach to engage youth in Bangladesh about space
- Represent Bangladesh and SGAC in space sector events around the world
- Contact space officials in Bangladesh

CHINA

The current National Point of Contact (NPoC) Zihua Zhu began his SGAC involvement following success of the 2013 Space Generation Congress in Beijing, China in conjunction with International Astronautical Congress. In 2014, Zihua was inaugurated as NPoC and continue promoting SGAC within the country through involvement with the organising committee of 1st Asia-Pacific Regional Space Generation Workshop. This workshop, held in August 2014, promoted the young generation's perspective on the region for the next few decades.

National Space Perspective

China continues to expand its capabilities in space by engaging a varity of national space programs in the past year.

Lunar Exploration Program

- Chang'e 3 lander and rover woke up successfully on the moon.
- Chang'e 3 lander carried an optical telescope that observed 23 stars around the constellation Draco.
- A prototype of China's manned moon rover, large enough to carry two astronauts, is unveiled.
- Tiangong 2 is under active development for launch in 2016.
- Chang'e 5 mission is on schedule for 2017.
- Return capsule lands successfully in Inner Mongolia.

Launch Activity

- A Long March 2C rocket carrying China's Shijian-11-06 experimental satellite launched from Jiuquan Satellite Launch Center in March 2014.
- Chang'e 5 test mission was successfully launched by a Long March 3C rocket from XSLC.

Ground Support Facility Construction

- World's largest radio telescope - a Five hundred-meter Aperture Spherical Telescope (FAST) is under construction in Guizhou. It will support China's deep space exploration in coming years.
- Russia and China to create working group for space cooperation projects
- Long March 4C rocket launched in July, 2014, carrying Yaogan-20 remote sensing satellite.
- A new 25m radio telescope is under construction in Xinjiang to support the third phase of lunar exploration.
- A Long March-2D rocket carrying two satellites blasted off from JSLC in September, 2014. The first, Chuangxin-1-04, is an environmental monitoring satellite while the other is a 'smart satellite' designed to conduct telecom experiments.

SGAC activities in 2014

The NPoC of China has been promoting SGAC not only in China but also worldwide. In April, the NPoC and active SGAC member Zhuoyan Lu launched an official Chinese version of the SGAC website. In July, per request from SGAC project team, the NPoC established relationships and promoted SGAC competitions to more than 10 universities and research organisations throughout China. In August, the NPoC took lead for project team of the 1st Asia-Pacific Regional Space Generation Workshop, held in Yokohama, Japan in November 2014.

Looking ahead: plans for 2015

- Increase the number of SGAC members in China and facilitate their engagement in SGAC activities
- Promote SGAC competitions and bring SpaceUp and AP-SGW to Chine
- Create Chinese online group for SGAC members, as no public page allowed according to the bylaw.

INDIA

The biggest highlight in India's 2014 space activities was its successful ascent to Mars, representing a major breakthrough in India's space program. The Indian Mars Orbiter Mission Mangalyaan successfully inserted into Martian orbit on November 5th, 2014, making India the first country to reach Mars on first attempt and the first Asian country to reach the planet. The success of this mission put India on the global space map, considering the various constraints involved in designing and planning a mission to Mars. India's space program, which started under tents with components of the rockets and satellites once carried by bullock cart and bicycles, transformed India's symbolic agriculture society to a major space fairing nation. The year 2014 saw various space activities in India, from the organisation of National Space Symposium to the various small satellite workshops and space schools.

National Space Perspective

The successful Mars Orbital insertion is an extraordinary achievement in the interest of the nation's space program. The success of this mission has put India into the hall of fame, and cements its position as a major competitor in space technology. Today, there is growing need for space technology applications in daily life of Indians, and the success of this mission established a bright path to elevate space activities in India. The success has created awareness amongst the general population, many of whom have little knowledge of the Indian space program but still benefit from it.

Space activities in 2014

No Specific SGAC Sponsored event was held in India in 2014; other the major space activities held in India are described below.

18th National Space Science Symposium (NSSS-2014)
The 18th National Space Science Symposium (NSSS-2014) was held at Dibrugarh University, in Dibrugarh, Assam on January 29th to February 1st, 2014. The bi-annual symposium is the major national space-based event in India and is jointly sponsored by Indian Space Research Organisation. Oral and poster papers were presented during the symposium followed by lectures and plenary sessions.

International Space Technology and Robotic Symposium 2014
A symposium on Space Technology and Robotics for young space enthusiasts was held February 22-24th 2014 in Bangalore, India. The symposium was jointly organised by Lab-X Foundation in collaboration with BMS College of Engineering and Space School International and included a poster competition. Several eminent people with expertise in various domains of space technology addressed the symposium.

SPACE SCHOOL 2014, Jain University
A five day short-term school based on space technology was organised at Jain University, in Bangalore, India during July 21-25, 2014 and provided hands-on training on development of an engineering model of a 1U CubeSat. The space school was held in collaboration with International Institute of Aerospace Engineering and Management at Jain University, Bangalore. Sung Wook Paek, Sanjay Nekkanti and Tom Segert gave lectures at the space school.

CANSAT WORKSHOP, IIT KHARAGPUR
The growing importance of small satellite technology in India and the need to introduce technical knowledge in students produced a one-day workshop on CANSAT. XOVIAN, a private space start up based in India at National Students' Space Challenge 2014 at IIT Kharagpur, India, organised the workshop to impart technical skills in designing and launching of CanSat. The workshop attracted a number of participants from different parts of the country and featured experts from XOVIAN including Saurabh Kaushal and his team.

National Students' Space Challenge 2015
National Students' Space Challenge is the sole technical fest of its genre dedicated to promote Space Enthusiasm in India. The Indian Institutes of Technology (IIT) organised the challenge, held on October 31-November 2nd, 2014 at IIT in Kharagpur. The challenge included several events, workshops and lectures based on space technology. One of the major highlights of the challenge was the CANSAT Workshop organised by XOVIAN. Every year the challenge attracts participants from different parts of the country interested in space technology, and its popularity is growing with the increased of awareness about space science in India.

Looking ahead: plans for 2015

2nd International Space Conference 2015 (ISC 2015)
The 2nd International Space Conference was organised by Aryavarat Space Organization during January 8-9th 2015, and hosted by Amity University. Along with providing a common platform for academics, industry, researchers and government to share knowledge and ideas for development in space sector, ISC 2015 aims to focus on promoting space applications in climate change.

Small Satellite Design and Development Workshop 2015
A three-day workshop on Small Satellite Design and Development was organised at PES University in Bangalore during January 3-5th, 2015. The workshop was jointly organised by PES University and Antariksha Labs, a private space start up based in India.

JAPAN

SGAC Japan has currently more than 30 active members throughout Japan, and has focused on communicating with each member of SGAC Japan, participants of the past SGC and the space enthusiasts of the present and next generation in Japan. As a result of these networking efforts, a scholarship program for Japanese participants of SGC was launched last year continued successfully into 2014. University student Kenta Watanabe was awarded funding to attend SGC2014 in Toronto. The remarkable aspect of this Japanese scholarship program is its support from numerous sources including Space Generation Congress (SGC), OB/OGs, individuals and private companies.

This year, SGAC Japan welcomed a new National Point of Contact (NPoC) Kenta Sada. Sada joins current NPoC Daichi Nakamura and Asia-Pacific Regional Coordinator Yusuke Muraki to represent Japan in the international space community.

National Space Perspective

Japan has its own space agency (Japan Aerospace Exploration Agency, JAXA) and has been taking an important role in the space activities. This year, Japan has accomplished several satellite launches including Advanced Land Observing Satellite (ALOS-2) and witnessed launch of start-up space companies as efforts of the private sector emerge in Japan. Space activities among the young people including SGAC are of course vigorous and passionate in Japan.

SGAC activities in 2014

SGC ROUND-TABLE TALK EVENT - May 20, 2014
Tokyo, Japan
SGAC Japan has organised the SGC round-table talk event in the past few years. This event is to disseminate SGC activities among students and young professionals in Japan who have an interest of SGAC/SGC. This helps to share the great experience at SGC to the present and next generation of space community in Japan.

NPOC JAPAN VISITS JAPAN SPACE FORUM - June 19, 2014
Tokyo, Japan
Daichi Nakamura, NPoC Japan visited Japan Space Forum (JSF) and met with Susumu Yoshitomi. JSF has one of the most active space outreach programmes, and the two met to discuss possible future collaboration between JSF and SGAC.

PRE-SGC MEETING - September 11, 2014
Tokyo, Japan
NPoC Kenta Sada held the annual pre-SGC meeting to support two first-time participants at SGC2014. SGAC Japan has held this meeting for several years to give advice how to prepare and enjoy the upcoming SGC.

SGC 2014 - September 25-27, 2014
Toronto, Canada
Five space enthusiasts from SGAC Japan programme participated in the SGC2014, along with the winner of the Japanese scholarship. This scholarship program follows last year's success in Beijing. SGAC Japan members have continuously participated to fully demonstrate Japan's contribution to the international space community.

SGC 2014 BRIEFING SESSION EVENT- October 18, 2014
Tokyo, Japan
After the successful SGC 2014, a briefing session was held to communicate SGC activities to students and young professionals in Japan. NPoC Kenta Sada and SGC participant Sota Akimoto shared the SGC experience to inspire and inform attendees. This session also offered the opportunity to publicise and promote SGAC's Asia-Pacific Space Generation Workshop held in Yokohama, Japan at the end of 2014.

SGAC JAPAN PARTY- October 30, 2014
Tokyo, Japan
Asia-Pacific Regional Coordinator Yusuke Muraki, currently based in Manila, Philippines, visited Japan and held an SGAC Japan get-together in Tokyo. More than 10 members attended and discussed how to move forward with SGAC.

Looking ahead: plans for 2015

SGAC Japan will continue to promote great experiences in SGAC to the next generation, and aims to accomplish the following goals:

- Complete a successful AP-SGW 2014 and prepare for AP-SGW 2015
- Hold Briefing Session Event for SGC 2014 and AP-SGW 2014
- Hold SGC Roundtable Talks Event for SGC 2015
- Work towards implementing a Japanese Scholarship Program for SGC
- Connect with local space organisations and find possible collaboration with SGAC

KAZAKSTAN

Kazakhstan recently joined SGAC, with newly appointed National Point of Contact (NPoC) Altynay Demeubayeva joining the SGAC organisation. As SGAC is relatively unknown in Kazakhstan, the NPoC focused on promoting the organisations and encouraging local students and young professionals to become a member. During summer of 2014, NPoC Demeubayeva held two outreach sessions in two major cities in Kazakhstan Atsana and Almaty. In Atsana, she held a mini introduction conference using an official SGAC presentation and with translated versions courtesy of Russian SGAC colleagues.

National Space Perspective

- The geostationary communication and broadcasting satellite KazSat3 was launched on April 29th, 2014
- The remote sensing satellite of high spatial resolution KazEOSat1 was put into orbit on the same day
- The Baikonur Cosmodrome also hosted multiple launches (International cooperation)
- The Tyan-Shyan Observatory is now considered a strategic object and is no longer publicly available
- Kazkosmos is no longer a space, but an Aerospace Committee under the Ministry of New Investments and Development of Republic of Kazakhstan (Kazakhstan Today). As a result of human resources structure optimisation, there was a reduction of employees by 10%
- Meeting of representatives of the executive authorities of the Commonwealth of Independent States (CIS) member states
- Meeting of the Kazakh-German Committee on cooperation in the field of space on October 15th, 2014
- Days of Kazakhstan's space-2014: international seminar held November 13-14th, 2014 in Atsana. The organisers of the seminar include Aerospace Committee Ministry of Dnvestments and development of the Republic of Kazakhstan and Kazakhstan Gharysh Sapary

SGAC activities in 2014

- The current NPoC joined SGAC in May 2014. As the first NPoC for Kazakhstan, the main goal is to establish the extent of space related activities and spread the word about the organisation in Kazakhstan. The NPoC researched the number of students enrolled in courses related to aerospace to seek out universities, clubs and students in Astana and Almaty to find potential SGAC members. One challenge to recruiting active and enthusiastic members is that aerospace is the second choice for many students in Kazakhstan, as it is not considered a competitive and challenging course and so half the students have no current interest in aerospace. During the summer, the NPoC held a mini conference in Astana for students to encouraged them to become SGAC members and inspire motivation and activity in the space community.
- Due to visa issues, the NPoC could not attend SGAC's annual meeting, Space Generation Congress. She did, however, write a related article based on an interview with SGAC outgoing Executive Director Andrea Jamie. This highlights SGC's mission, and was published in the online technology magazine Disruptive Technologists
- Finally, the NPoC gained valuable experience by participating in Find an Asteroid search campaign, volunteering at the Asia-Pacific Space Generation Workshop with the organising team and as a discussion group moderator, and attending the annual SATCON conference in November.

MALAYSIA

Since Malaysia's first astronaut was launched into space on October 10th, 2007 aboard Expedition 15, Malaysia has joined the special club of countries in space. SGAC remains active in the country with the actions of its two current National Points of Contact (NPoC) Harridon Mohd and Andrew Lee.

National Space Perspective

Malaysian National Space Agency (ANGKASA)

- ANGKASA Talk-Space: Guiding Your Way by Datuk Mazlan Othman on November 8th, 2014
- Live Streaming – Live Communication with International Space Station (ISS) 2014 on November 1st, 2014
- ANGKASA and the Japan Aerospace Exploration Agency (JAXA) have requested proposals for Try Zero G 4, an educational programme at the International Space Station
- On September 9th, 2014, the Malaysia Ministry of Science, Technology and Innovation (MOSTI) and ANGKASA held the 12th Rocket Launching Technology Competition 2014 at Planetarium Negara, Kuala Lumpur

New satellites launched

On September 12th, 2014, MEASAT Global Berhad successful launched the MEASAT-3b satellite. The satellite lifted off on an Ariane 5 ECA launch vehicle from Europe Space Port in Kourou, French Guiana. The launch was broadcasted live to 400 secondary school students who attended an event held in Malaysia's National Science Center with Government of Malaysia officials.

SGAC activities in 2014

Rocketry Workshop throughout Malaysia

Mohd Harridon bin Mohamed Suffian along with members of Astronautical Association of Malaysia (AAM) organised Advanced Rocketry Workshops throughout Malaysia in the year 2014. The workshop teaches high school students about solid fuel and aerodynamics of rockets. At the end of the workshop, students got the opportunity to launch their own rockets.

Space Workshop for Military Personnel - Space & Earth Communications
NPoC Mohd Harridon bin Mohamed Suffian delivered and conducted Space Lecture and Workshop in collaboration with a Professional Training Company called SSTC Vision Pvt. Ltd. The Space Lecture and Workshop were called "Space & Earth Communications" and were delivered to military personnel of Malaysia.

High Altitude Balloon Projects of Universiti Sains Malaysia
Mohd Harridon bin Mohamed Suffian was appointed as a Technical Reviewer of the High Altitude Balloon Projects of Universiti Sains Malaysia (USM). Norilmi Amilia Ismail from USM is the adviser for the High Altitude Balloon Projects where two teams from USM (named AUSM and Levitate) would launch the balloon at the end of December 2014. The teams had completed the Preliminary Design Review (PDR) stage and are currently developing the apparatuses of the projects based upon feedbacks from the PDR stage. The objective of the two projects is to collect environmental and scientific data at high altitude region.

Spreading knowledge of Solid Fuel at World Space Week 2014
With regards to World Space Week 2014, the National Planetarium of Malaysia in collaboration with Astronautical Association of Malaysia organised a Solid Fuel Workshop that teaches high school students the composition of Solid Fuel and its usage in the field of Rocket Science. Mohd Harridon bin Mohamed Suffian taught the students how to measure the thrust produced by the Solid Fuel.

Looking ahead: plans for 2015

- Organise Yuri's night in Malaysia
- Prepare for World Space Week 2015
- Cooperate with other Asia Pacific countries
- Increase SGAC membership in Malaysia
- Develop activities locally available for SGAC members

NEPAL

Nepal has been an active member of SGAC for a few years now and is currently represented with a regional coordinator and two National Points of Contact (NPoCs). This year, activities related to space have been gathering momentum in Nepal and apart from the awareness and telescopic observation events there were also a few important steps that are bound to set a tradition for the future. These milestones were the satellite and data reduction workshop, a physics seminar with international contributors and the first ever participation in the International Astronomy Olympiad. SGAC members organised all of these events.

National Space Perspective

Until now, space activities in Nepal have been promoted almost entirely by the private sector comprising of the various astronomy clubs within Nepal along with SGAC members and volunteers. Recently, the national observatory is looking forward to cooperating with activities conducted by SGAC members, allowing students participating in the National Astronomy Olympiad a chance to use the observatory. The first museum dedicated to science and astronomical observations has opened in Nepal and it is bound to increase interest in science. In addition, courses related to radar and GIS have also been included in the engineering curriculum of the two biggest universities in Nepal. Increasing support and investment is expected in the future.

SGAC activities in 2014

The most important activities that took place this year in Nepal are described below in chronological order.

Solar Observation & Photo Exhibition
The one-day Astrophoto exhibition and solar observation took place in Pokhara at Jyoti Kunj Seconday School on January 30th, 2014. The program was organised with the coordination of Pokhara Astronomical Society (PAS) and Nepal Astronomical Society (NASO). The solar observation and astrophoto program was a part of the three-day science exhibition at the school and there was quite a commendable participation from the students at the school.

Yuri's Night
The month of April had two big events commemorating the flight of first man in space. Continuing with tradition, Yuri's night was celebrated with regional programs at various astronomy groups within Nepal. The two major events however, were organised at the Russian Centre for Science and Culture (RCSC) on April 9th and at St. Xavier's College (SXC) on April 12th in Kathmandu, and were well participated with around 150 participants.

A Solemn Meeting to Mark the Cosmonautic Day and 80th Birth Anniversary of the First Man in Space: Yuri Gagarin
The program consisted of a short documentary on the life of Yuri Gagarin and had Nepali scientists and academicians, former Nepali Minister for Science & Technology along with the Russian chief of mission as distinguished guests. The program focused on a few anecdotes about Gagarin and the importance of space science in Nepal. The head of Nepal Academy of Science and Technology pledged to promote space related activities in Nepal and the Executive Director of the National Observatory promoted the opening of a science museum in upcoming months.

Yuri's Night Celebration with Star Party
The organisers of the second event in April were St. Xavier's Physics council, NASO and SGAC. The program started with solar observation followed by an interactive program, and concluded with telescopic observation of heavenly bodies. The senior contributors in the program were physics professors and astronomy education experts. Nepal's two NPoCs and the Regional Coordinator of Asia-Pacific represented SGAC. The program successful emphasised the importance of space activities and exploration in general, educating the participants about SGAC and how to constructively promote space related activities in Nepal. The program also raised issues on the academic curriculum of school level as well as undergraduate physics programs. Currently in Nepal, specialisation in astrophysics is only available as a master degree and the participants discussed about introducing an undergraduate program focused on astrophysics in Nepal. The former head of Central Department of Physics discussed his efforts towards this goal, and the number of students in astrophysics courses was very encouraging. This program touched a lot of interesting issues students and space enthusiast in Nepal currently face and, as it offered direct interaction with the relevant authorities, it also answered a lot of related questions. A detailed report on the program with the pictures has been added in the appendix section.

National Astronomy Olympiad (NAO) 2014
The beginning of 2014 saw the call for applications for the first Astronomy Olympiad in Nepal. The National Astronomical Society and the Espro Foundation successfully conducted this Olympiad, with the main objective of providing a platform for talented Nepali students to demonstrate their understanding of physics, mathematics and elementary astronomy. After conducting a series of tests at the beginning of June, five finalists were selected to represented Nepal in the 8th International Olympiad in Astronomy and Astrophysics (IOAA), which took place in Suceava, Romania from August 1st to 10th, 2014. SGAC Asia-Pacific RC Suresh Bhattarai and Manisha Dwa led the Nepali team. More details on the Olympiad and the winners can be found at http://www. nationalolympiad.org/.

Regional School on Astrophysical Data Reduction
Tribhuwan University in collaboration with the International Astronomical Union held a five-day data reduction workshop targeting graduate students. At the workshop, 50 students analysed data from telescopes such as IRAS, SDSS, NEWTON and NAN-TEEN using MATLAB, Origin, ALADIN and Excel. This workshop was also the first of its kind and enables students to analyse the freely available several telescopic data for their research.

International Olympiad in Astronomy and Astrophysics
Out of the five finalists of the National Olympiad, three selected students Kiran Adhikari, Regan Babu Bhatta and Prabesh Koirala along with two supervisors SGAC RC Suresh Bhattarai and Maisha Dwa represented Nepal in the 8th IOAA, which took place in Suceava, Romania. Although Nepal was unsuccessful in winning medals, it was a great learning experience for the Nepalese team. To better prepare for next years Olympiad, organising efforts for the second National Astronomy Olympiad are underway and five teachers have been short-listed to attend a teacher's training workshop in the Homi Bhabha Centre for Science Education (HBCSE) in Mumbai, India.

Let's Talk About Physics - One Day Seminar
St. Xavier's Physics Council Nepal, under the supervision of Nepal NPoCs Kishor and Ishan, organised a one-day physics seminar on August 23rd, 2014. It consisted of a presentation, conversation and Skype sessions with six professors and a researcher on topics ranging from quantum mechanics to astrophysics. The international Skype sessions were the first of such seminars in Nepal. This event was also hugely popular and had over three hundred students from five districts and 25 institutes in Nepal. It was a wonderful opportunity for students to directly interact with professors and learn about the latest advances, as well as good science practices.

Looking ahead: plans for 2015

- Expand elective courses at the Institute of Engineering to cover basic astrodynamics and control to existing radar and satellite imagery and communication courses
- Continue annual space events
- Organise local outreach workshop to further increase awareness and participation
- Conduct a workshop on CanSats and get a project running
- Work with the national observatory to organise telescopic observation and data reduction workshops

NEW ZEALAND

New Zealand has a small but passionate group of space aficionados. Despite the lack of governing space body, the country has excelled in radio astronomy and 2014 was no exception. The biggest news in New Zealand space industry came from the announcement by Rocket Lab Ltd and unveiling of their Electron launcher. In addition to this, the local outreach programme led by KiwiSpace Foundation has managed to host successful events this year. With such endeavours, space in New Zealand is slowly getting bigger and is opening up to the public.

International Space Apps Challenge, Auckland (April 2013, 2014):
The annual Space Apps challenge started by NASA, has had its second running in New Zealand this year, organised by KiwiSpace Foundation. Teams gathered from all around the country to compete at the Auckland Institute of Technology, working on challenge set out by NASA.
http://www.kiwispace.org.nz/spaceapps

NZ Rocketry Challenge '14, Auckland (May 19th):
The annual rocketry challenge occurred again and this year 18 teams of year 7 and 8 students from around the country were challenged to design, build and test model rockets. Their objective was to carry an egg to an altitude of 150 metres without damaging the payload.
http://www.rocketcontest.org.nz/

Awarua Space Operations (April 2014):
In April, Planet Labs Inc., a company started by Australians in the US, announced they were using up a ground station at the Awarua Tracking Station in the region of Southland to aid in downlink of imagery from their constellation of earth Observation satellite. This was a huge boost to the local community and for New Zealanders in the space operations arena. The Awarua tracking station has also assisted the European Space Agency (ESA) with southern hemisphere ground station support for the Ariane launcher since 2007 and recently opening it up to high school students to support outreach in space operations.
http://www.3news.co.nz/environmentsci/awarua-space-base-part-of-new-project-2014040717.
http://www.stuff.co.nz/southland-times/news/8470806/Pupils-get-grounding-in-high-level-science

High Altitude Ballooning Projects (May 2014):
This year saw two high altitude ballooning projects from Torbay School and 'The Edge' radio station. The Torbay School's main balloon launch had been delayed due to regulatory problems but ended up launching a small balloon with no payload from their school grounds.
https://www.flickr.com/photos/kiwispace/sets/72157644248387487/
On the other hand, local radio station, 'The Edge' had a campaign called the "Send your Selfie to Space" and launched a balloon from Waikato Univeristy in Hamiltion the same month.
http://www.theedge.co.nz/Jay-Jay-Mike-and-Dom-went-to-space/tabid/106/articleID/31253/Default.aspx

Radio Astronomy (July 2014):
The Warkworth Radio Astronomical Observatory north of Auckland, once operated by a local Telecommunications company and was bought by AUT in 2010, became operational on July 6th, 2014. The telescope will aid in radio astronomy work for the southern hemisphere cluster of radio telescopes.
http://www.radionz.co.nz/news/national/248980/telescope-puts-nz-at-science-frontier

National Rocket Day, Taupiri (3rd February):
Yet another spectacular event with a great public turnout including local sports car club and visitors from the length of the country. The day was punctuated by a number of launches including Jack Davies, launching homemade "Spektrum" up to 1800 feet, and Craig Packard with his five motor Big Red reaching an astonishing 13000 feet.
http://www.nzrocketry.org.nz/index.php?page=rocket-day

MOA: Microlensing Observation in Astrophysics, University of Canterbury (UC):
This is a collaboration with researchers in Japan to observe dark matter, extra-solar planets and stellar atmospheres using gravitational microlensing techniques at the Mt John Observatory in New Zealand.
http://www.phys.canterbury.ac.nz/moa/

Aurora Astronomy School, Christchucrch (6-9 April):
An astronomy outreach programme targeted year 13 students, created by the department of physics at the University of Canterbury.
http://www.kiwispace.org.nz/download/attachments/13500516/Aurora%20Astro%20School_11.pdf?version=1&modificationDate=1307671748000

Space Education (Feb 2014):
The University of Canterbury launched their first tertiary level rocketry course, with the help of local company Rocket Lab. The course fosters love of rocketry in New Zealand and will hopefully cultivate a new group of future scientists for Rocket Lab Ltd.
http://www.comsdev.canterbury.ac.nz/rss/news/?feed=news&articleId=1216

SpaceUp and SpaceEd (Feb 2014):
KiwiSpace Foundation organised the first SpaceUp event in Auckland at AUT and it was an incredible success. Backyard space tinkerers and a handful of space professionals presented and discussed their work. Prior to SpaceUp was SpaceEd, a two-day workshop for teachers organised by JAXA and hosted by KiwiSpace. The event was a huge success with workshops on robotics to CanSats and presentations from the Hayabusa-I team on their asteroid explorer mission.
http://spaceup.org.nz/

LOOKING AHEAD: PLANS FOR 2015

In 2015, SGAC will continue to focus on increasing the organisation's exposure in New Zealand through activities and the Space Generation Congress. Efforts will particularly target the youth of New Zealand by cooperating closely with local space and astronomy organisations and institutions. As New Zealand is culturally a 'do-it-yourself' community, outreach and activities will continue to move in that direction.
SGAC New Zealand will continue to use existing organisations such as KiwiSpace Foundation as a platform for exposing the local community to SGAC, and ensure to nurture the close relationship for students, young professional and industry to establish and grow the current network.
SGAC New Zealand will continue its close relationship with the Australian space community, such as Australian Youth Aerospace Association (AYAA). It will aid in promoting the Oceanic presence in both Asia and the world through the annual Aerospace Futures conference, SGC and IAC, with the eventual goal of establishing such an event in New Zealand.

PAKISTAN

This year has been another interesting year of space science and technology in Pakistan. Like every year, many volunteer groups and societies are active in promoting outreach activities related to space organised talks and astronomy nights. Since the launch of the Pakistan's geostationary communication satellite Paksat-1R in 2011, the national space agency, Pakistan Space & Upper Atmosphere Research Commission (SUPARCO), is now working towards development of a national remote sensing satellite.
SGAC remains at work in Pakistan, and welcomed a second National Point of Contact (NPoC), Hasan Murtaza. He joins current Pakistan representative Waqas Oazi.

National Space Perspective

Many regular events, and new events happened this year related to space activities.

Pakistan's national space agency SUPARCO organised the *International Conference on Space: Space for Development*, held November 2014. It allowed interaction and discussions between national and international agencies and researchers working in space technology. SUPARCO also kicked off Pakistan's first National Student Satellite Programme (PNSSP), which aims to develop a complete satellite system with different modules being developed by universities and research institutions.

People throughout Pakistan celebrated World Space Week (WSW), with the theme Space-Guiding Our Way. Dedicated activities and events for the youth were held at SUPARCO offices in Lahore and at Institute of Space Technology (IST) campus at Islamabad, among other places. Activities ranged from essay writing, planetarium visits, aero modelling and water rocket competitions to space model designs. Many young students, up to high school level, participated in these activities organised by different organisations.

The Buraq Space Camp, held in the last 10 days of December, provides a meeting points for students between the age of 14 to 16 years from all over the country who share a common interest in space and youth empowerment. Among other goals, the Buraq Space Camp aims to spread awareness, gain knowledge and understanding of significant past, present and future of space exploration. The theme for this year is *Changing Perceptions Through Visions Of Space.*

Geographic Information Systems (GIS) day was celebrated at various educational and professional organisations on November 19th with organised lectures, talks and panel discussions.

Amateur astronomy organisations held many events during the year, including a workshop on Radio Astronomy at IST on February 26 to 28th, 2014, delivered by a radio astronomy expert from NASA Jet Propulsion Laboratory (JPL).

SGAC activities in 2014

The first International Space Apps Challenge Event was organised in Islamabad on April 11-13th, and featured SGAC NPoC for Pakistan, Waqas A Qazi. He advised event managers, represented SGAC as one of the guest speakers at the opening, and was the judge of the event on the final day.

NPoC Waqas A Qazi also represented SGAC by delivering a lecture on Earth remote sensing with Synthetic Aperture Radar at Arid Agriculture University, Rawalpindi, Pakistan, on GIS Day event. A similar lecture was also delivered during the same week at Department of Space Science at the University of the Punjab in Lahore, Pakistan.

Looking ahead: plans for 2015

SGAC Pakistan is planning the following for 2015:

- Liaise with amateur astronomy societies nation-wide for SGAC participation in astronomy night activities for outreach purposes
- Increase the scale and scope of International Space Apps Challenge
- Spread information about SGAC and promote the organisation in various educational institutions

PHILIPPINES

The Philippines became active in the Space Generation Advisory Council upon the appointment of the National Points of Contact (NPoC) in February 2013. Currently, Rogel Mari Sese of Regulus SpaceTech and Pauline Pearl Divinagracia of Rizal Technological University serve as NPoCs for the Philippines. In the past, most activities are related to astronomy such as public lectures and telescope viewing. This year, there are several activities that discussed space science and its value and significance to the Philippines. SGAC NPoCs are working to further contribute and increase the number of space related activities in the country.

National Space Perspective

Currently, the country has no unified space agency that handles all issues: the responsibilities of space-related activities are currently scattered throughout various government agencies. As such, coordination of space-related activities is difficult and complex. In terms of education, the Philippines has few research activities in space science and most of them are limited to major universities such as the University of the Philippines, Ateneo de Manila University and University of San Carlos. The Rizal Technological University is currently the only university offering a formal degree program in astronomy. Finally, the Philippines has a very limited space-related industry. There are but a handful of private companies such as Asia Broadcast Satellite, PASCO Corporation and Regulus SpaceTech. Among the three, Regulus SpaceTech is the only company wholly owned by Filipino citizens.

A 10-Year Baseline Study on Space Science and Technology Applications was conducted by the Manila Observatory and funded by the Department of Science and Technology (DOST). The aim of the study is to determine where the Philippines currently stands on space science and what are the resources, both tangible and intangible, are currently available. It discussed the situation in several areas such as space law and policy, education, research and development, innovation and international collaborations. As a continuation of the Baseline SSTA study, the DOST conducted a project with Regulus SpaceTech to craft a National Space Development and Utilization Policy that will serve as the long-term strategy of the Philippines in terms of space development. In addition, it will also draft the document for the creation of a National Space Agency that would be the government's unit for all space-related affairs. By the end of the project in December 2014, The Philippine Congress will review submitted documents for legislation.

The DOST recently announced that the Philippines is aims to launch a microsatellite by 2016. The project is a partnership between the University of the Philippines, Tohoku University and Hokkaido University of Japan. The microsatellite, currently named DIWATA, will provide remote-sensing capabilities for research. Upon launch in 2016, it will be the first micro-satellite developed by Filipino scientists and engineers. Currently, the team in charge of developing the satellite is in Japan for training and initial planning of the project. In addition to the microsatellite project, the DOST is funding construction of a ground receiving station for the microsatellite. The Philippine Earth Data Resource Observatory (PEDRO) will function as the ground station for the DIWATA satellite in addition to other satellites. A tentative site in Subic Bay Freeport Zone has been selected for PEDRO. The site is near the facilities of Asia Broadcast Satellite (ABS), which operates the former AGILA-2 satellite of the Philippines.

SGAC activities in 2014

SGAC Asteroid Naming Campaign
This year, the Rizal Technological University participated in the SGAC Asteroid Naming Campaign.
The results of the 2013 International Naming Campaign of SGAC were announced in October 2014, and selected an entry from Mohammad Alon of Ateneo de Davao University of the Philippines. Anagolay, the Goddess of Lost Things in Philippine mythology, will become the official name of Asteroid 1982XB. The name was formally accepted by the International Astronomical Union and the announcement, made during the World Space Week celebration and the news was featured by GMA Network, was one of the largest media networks in the Philippines.
http://www.gmanetwork.com/news/story/382869/scitech/science/new-asteroid-named-after-philippine-goddess-of-lost-things

Participation in AP-SGW at Tokyo, Japan
SGAC NPoC Rogel Mari Sese was part of the organising committee for the Asia Pacific – Space Generation Workshop, held on November 29-30, 2014 at Keio University, Japan. He will also participate as a delegate to AP-SGW and as Co-Chair of the Space Education Working Group of the Asia-Pacific Regional Space Agency Forum.

Looking ahead: plans for 2015

As several major space activities are planned, SGAC can play a significant role to facilitate the development of the Philippines' space capabilities. For 2015, there are several objectives for SGAC.

- Increase participation and membership of Filipinos in SGAC;
- Promote SGAC through a series of public activities designed to increase space awareness among Filipinos;
- Involve SGAC with the 1st Can Satellite Competition to encourage students to take up careers in space-related fields;
- Take an active role in campaigning for the legislation of Space Policy and creation of the National Space Agency;
- Increase partnership with academia and industry to increase the space research and development capabilities of the Philippines with SGAC acting as a bridge between the two sectors.

SOUTH KOREA

National Point of Contact (NPoC) Ilji Jang has represented South Korea since October 2014, but been involved with SGAC activities since 2009 including Space Generation Congress (SGC), International Astronautical Congress (IAC) and as SGAC delegate to United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS). There are a few people in South Korea who attended the previous 2009 SGC in Daejeon, and current efforts focused promoting SGAC to young students. Currently, SGAC events notice and activities encourage students to discuss global space activities.

National Space Perspective

On May 28th, the Korea Aerospace Research Institute (KARI) announced development of new optional piloted vehicle (OPV) technology, which can be used to turn a manned aircraft in service into an unmanned aircraft by altering the control system and adding position, displacement and attitude sensors and an engine data interface. This will support the Korean government's aims to launch its own space vehicles by 2020, and send a lunar orbiter and a lunar lander for itself by 2017. In the longer term, it is planning to explore Mars, asteroids and deep space to join the ranks of space powerhouses.

The Korean government's aim to be the 7th country on the moon and its lunar exploration project took concrete shape through the preceding Roh Moo-hyun administration's Space Development Roadmap and Lee Myung-bak administration's Basic Promotion Plan for Space Development. The 2020 goal was the result of a 5 year acceleration compared to previous government road maps.

The project is divided into two phases. The first phase up to 2017 includes the orbiter and module basic technical design completion in cooperation with NASA, and development of a test orbiter. At the same time, scientific equipment to be carried in the orbiter and earth-bound control station responsible for deep space communication will be built. The second phase is for the self-production of the orbiter and module and actual launch using a Korea Space Launch Vehicle (KSLV). To this end, 15 government-funded research institutes including KARI have formed a council and conducted 31 research tasks.

SGAC activities in 2014

- As part of Move an asteroid, the NPoC introduced SGAC to Young Astronauts Korea (YAK) and Korea Aerospace Research Institute (KARI). At KARI, a printout about SGAC was distributed in the seminar.
- SGAC members and alumni who have previously attended SGC and KARI space policy research team met to discuss SGAC Korea activities and directions.
- SGAC events were announced to university students through SGAC KOREA website including SGAC Competition, Space is business and other opportunities.
- SGAC Korea members were encouraged to attend the Cube Sat and Space Safety and Sustainability working groups. The NPoC and another SGAC Korea member attended these meetings.
- The NPoC for Korea attended UN COPUOS as an SGAC delegate and met with the Korean delegate team. Discussions focused on future space activities for young students and professionals in Korea. This also provided a networking opportunity with researchers in Korea Astronomy and Space Science Institute (KASI), government and KARI.
- The NPoC gave SGAC members a report of UN COPUOS meeting and shared ideas about space issues and future space development addressed by the committee.
- The NPoC represented Korea at SGC and IAC 2014, joining the On-Orbit Servicing Working group and attending the ESA-SGAC meeting in IAC.

Looking ahead: plans for 2015

- Arrange regular social meeting for SGAC Korea members
- Provide scholarship and funding for SGAC Korea members to attend future SGC
- Introduce current SGAC working groups to SGAC Korea members
- Invite speakers from space industries and institute to symposia or forums
- Hold outreach events to introduce SGAC at Yuri's Night and university seminars
- Discuss the possibility of co-project with national institutes

SRI LANKA

A variety of space and astronomy related events took place during 2014 in Sri Lanka. These events mainly focused on education and outreach while bringing together young students from schools and universities around Sri Lanka. This report summarises important events took place with this regard from January to November 2014 in Sri Lanka. Events like these reflect the positive trend in Sri Lanka's space sector and the need for major involvement of the country's youths.

SGAC activities in 2014

Star Party 2014
Star Party is an annual astronomy observation competition held in Kandy, Sri Lanka and organised by Anandian Astronomical Association of Ananda College and Astronomical Society of Mahamaya Girls' College Kandy. This competition brings together amateur astronomers from around Sri Lanka with a focus on school-based astronomy. The participating teams go through a competitive set of astronomy observation sessions during this 12-hour-long overnight event involving hands-on skills with telescope manipulation and extraction of valuable astronomical data. The 10th consecutive annual Star Party took place on February 7th, 2014 at the University of Peradeniya, Kandy and Nalanda College with the team from the University of Colombo winning the competition.

Sri Lanka National Astronomy and Astrophysics Olympiad Competition
The 8th Sri Lankan Astronomy and Astrophysics Olympiad competition, along with 4th Sri Lankan Junior Astronomy Olympiad competition, was held on 21st of June, 2014 at the Universities of Colombo, Peradeniya, Kelaniya, Ruhuna, Jaffna, Mihinthale and Baticaloa. The team of five students with best performance in the national competition was selected to participate at the 9th International Astronomy and Astrophysics Olympiad competition held in Indonesia in 2015 and 20th International Astronomy Olympiad in Bulgaria in September 2015. This event was organised by the Institute of Physics – Sri Lanka in collaboration with the Department of Physics, University of Colombo.

Sri Lankan Student Names an Asteroid
In an international campaign carried out by SGAC's Near Earth Objects (NEO) Project Group last year, 17-year old Chanaka Perera from Sri Lanka submitted the winning entry to name an asteroid. Of the more than 1500 entries, his suggestion of Rayjay, named after physics and astronomy Professor Ray Jayawardhana, was officially accepted by the International Astronomical Union: The asteroid (4668) 1987DX5 now bears the name Rayjay.

World Space Week (WSW) 2014 – Sri Lanka
This year, the Sri Lankan edition of the WSW focused on a space educational fair and a space-themed carnival in Colombo, with the participation of state universities, leading school-based astronomical and science societies and other private institutions. The opening ceremony held on October 4th at the Russian Cultural Centre in Colombo featured chief guest Kavan Ratnatungaand, who gave a talk on space elevators. Highlights of the educational fair were the robot water rocket competition. Different schools managed stalls representing their astronomical societies, along with a kids' corner to motivate and inspire chilren for a future in space and astronomy. In addition to the events in Colombo, there were numerous other events organised by school-based astronomical societies, ranging from astronomy observation camps to lectures and talks.

Star Quest 2014
Star Quest continued with its 7th iteration. This event is an inter-school astronomy quiz competition held by the Mathematical and Astronomical Society (MAS) of the University of Colombo in November. Many amateur astronomers from around Sri Lanka and Nalanda College participated in this event with Colombo becoming champions for the second year in a row.

World Science Day Celebrations with Competitions Themed "Space Technology"
World science day celebrations were held on November 10th at Bandaranaike Memorial International Conference Hall (BMICH) in Colombo. There were several competitions with the theme of Space Technology for Benefit of the Human Being. Dananjaya Fernando of the Mathematical and Astronomical Society of University of Colombo secured first place in the digital story telling competition organised by the National Science Foundation. Eminent Sri Lankan scientist Sarath Gunapala of NASA's Jet Propulsion Laboratory was present at the celebrations as the chief guest.

THAILAND

National Space Perspective

- ASEAN Regional Center of Excellence in Space Technology – Thai youth will have the opportunity to interact with the brightest minds of the ASEAN region in space science. New research and development and conference venue is already established inside GISTDA's satellite ground station campus. This centre is prepared specially for supporting space and GIS researches.
- Thai universities led by GISTDA extend CubeSat development to a Microsatellite and Small-satellite program.
- Global Navigation Satellite System (GNSS) Continuously Operating Reference Station (CORS) to be developed for new ground based augmentation system in Thailand and will promote GNSS applications for aviation, maritime and logistics applications.
- The Space Technology Material Lab at the Space Krenovation Park will develop components for space applications and unmanned aerial vehicles should be completed in 2015 and will add a new dimension of space technology development in Thailand.

SGAC activities in 2014

- **Geo-Informatics and Space Technology Development Agency (GISTDA) Youth Space Camps:**
  The Youth Space Camp is an educational project initiated by GISTDA. During the camp, scientist and engineers from GISTDA visit and stay at the school for three to five days. During their rotation, they educate students about space related subjects in a fun and informational way. Students get to experience field work by using a global positioning system (GPS) receiver, studying maps and learning about satellite remote sensing technologies. This year, the camp made its 21st round to Nakornratchasima.
- **1st Small Satellite Symposium:**
  In August 2014, Thailand took a giant leap in its space technology development plan by hosting the first small satellite symposium. The symposium was well attended, and included international experts along with stakeholders in Thai space industry such as representative from space industry, education and government organisations in Thailand. Participants discussed current technology trends, future possibilities, partnership building and Thailand's long-term space competency plan. The final session was the work package definition and distribution of roles among the attendants in developing Thailand in the space industry.
- **GISTDA's THASA contest:**
  The Thai Youth Space Ambassador Contest (THASA) provides students the opportunity to launch a high altitude balloon with payload made by students, ranging from high school to university. As of November, 20 teams were selected to semi-final round out of the original 80 teams from around Thailand. Those include CubeSat, CanSat, biological and environmental payloads to observe and experiment in the stratosphere. In January 2015, five teams will advance to the final round and the winner will be awarded with a zero-G flight.
  https://www.facebook.com/Thasacontest
- **AXE-APOLLO contest:**
  Pirada Techavijit, a young Thai engineer, won one of 22 fully-paid opportunities to fly in 2016 aboard the Lynx XCOR II to the edge of space at 105 km from surface. As part of the promotional campaign, Techavijit gave interviews in many magazines, TV programs, news slots, event openings and brought much publicity and awareness to the space sector in Thailand.
- **CubeSat Developments:**
  King Mongkut's University of Technology North Bangkok has initiated a program to develop its own cubesat called Knacksat-1.
- **GISTDA Space Operations:**
  GISTDA is building its own capacity in space operations and developing a complete ground segment to support space based Earth-Observation missions. More information can be found on *http://skp.gistda.or.th/spaceprojects/*
- **Joint Thailand – Vietnam program:**
  Thailand and Vietnam are collaborating on space mission operations since November 2013 with the launch of VNREDSAT. The cooperation is on-going and both countries are trying to maximise the use of their use of EOS platform.

VIETNAM

The Vietnamese young generation enthusiastically join the network of students and young professionals in space careers. As the first National Point of Contact (NPoC) for Vietnam, Vu Trong Thu founded FSpace laboratory where the first pico satellite of Vietnam has been manufactured.

National Space perspective

Space activities are very new in Vietnam, both for government and for society, but all Vietnamese know importance of space exploration. With such support, Vietnam has embarked into its space journey.

SGAC activities in 2014

Vietnam Satellite Centre (VNSC) Space Day 2014
VNSC Space Day includes activities in Open Lab week of Vietnam Academic Science and Technology. Main activities are introduction to space technology and Vietnam Satellite Centre, visiting VNSC lab and the clean room where Pico dragon satellite was manufactured.

University of Science and Technology of Hanoi (USTH) Space Day
USTH Space Day is annual event held by Space Science and Applications students of USTH as a part of World Space Week (WSW) Through this event, the organisers hope to bring space closer to everyone and introduce the space study program at USTH.

World Space Week at Yen Hoa Secondary School held by Space Technology Institute (STI)
As a part of WSW 2014, STI held a program at Yen Hoa secondary high school in Hanoi. Activities included space education and a water rocket contest

Looking ahead: plans for 2015

- Expand the SGAC network in Vietnam and continue tradition by organising annual events in big cities including Hanoi, Danang and Hochiminh to attracting more participants.
- Connect the growing community of young space professionals in the Vietnam by participating in exhibitions and organising space talks at local schools and universities.
- Cooperate and integrate with international organisations to promote space activities.
- Replicate the successful events to other places in Vietnam, such as expanding USTH Space Day to other universities.
- Coordinate space agencies to increase support for space activities in Vietnam.

5.4 EUROPE

HIGHLIGHTS OF THE EUROPEAN REGION IN 2014

- 13 new NPoCs appointed in 2014
- SGAC signed six MoUs with European organisations
- SGAC co-organised several local events including SpaceUp events in Vienna, London and Stockholm, Get Together in NL and Austria, SGAC Meets ESA Workshop at ESTEC, 5th Edition of the Space Challenges Program
- SGAC Workshop on ESA Council at Ministerial Level organized in Toronto, Canada, after SGC
- Position Paper on ESA's Evolution

Accomplishments in 2014

- New Regional Coordinator (RC) Matteo Emanuelli was appointed in May
- Regional Coordinators, Guzel Kamaletdinova and Matteo Emanuelli appointed new National Points of Contact (NPoCs) in Belgium (1), Croatia (1), Czech Republic (1), Finland (1), Greece (2) Ireland (1), Italy (1), Norway (1), Russia (1), Serbia (1) UK (2).
- The European Region changed the format of its quarterly meeting. Every meeting now has a specific topic for discussion, chosen by NPoCs in advance according to their interests and needs
- SGAC signed several Memorandum of Understandings with:
  - The Sapienza AerospaceStudentAssociation (SASA) of University "La Sapienza" in Rome, Italy;
  - Hungarian Astronautical Society (MANT);
  - United Kingdom Students for the Exploration and Development of Space (UKSEDS);
  - Netherlands Space Society (NVR);
  - Czech Space Office (CSO);
  - DLR (the MoU has been extended for 6 months)
- European members were a part of the organising team for the Space Generation Fusion Forum (SGFF) and the Space Generation Congress (SGC) as well as in other international events such as the 5th International Conference Space Economy in Multipolar World, European Space Expo, Exhibition about the Exploration of the Moon during the International Lunar Observation Night, XVI International Youth Scientific and Practical Conference Human and Space
- The European Region organised a special SGAC workshop to discuss the upcoming ESA Council at Ministerial Level. Kai-Uwe Schrogl, Head of the Relations with Member States Department in the Director General's Cabinet of ESA was invited to participate. The outcome of the Workshop was the SGAC Position Paper on European Space Agency's Evolution, published in November 2014 on the SGAC website and promoted by SGAC members
- Local events:
  - SGAC meets ESA workshop in April
  - Space Get together in Netherlands and Austria
  - SpaceUp in Austria, Netherlands, France, UK, Sweden, and Germany. SGAC members organised SpaceUp in Austria, Netherlands, UK and Sweden
- NPoC of Bulgaria together with the Space Challenges Team launched the 5th Edition of the Space Challenges Program – the biggest free space and advanced technology education initiative in Europe
- SGAC network is working to support local workshops, providing lectures given by members such as Christopher Vasko and Lauren Napier were speakers during events in Budapest
- The annual European Christmas dinner was held in Germany, Cologne
- The European Facebook page showed a large degree of activity: regional information and SGAC news were given on time; the most important events happening in Europe and SGAC news were promoted extensively
- European NPoCs attended sessions at the International Space University and Singularity University. Leadership presentations were given at the International Space University Summer Programme
- European NPoCs attended the SGC and the IAC in Canada,Toronto.
- European NPoCs actively participated in Yuri's Night and World Space Week celebrations
- SGAC was represented during the UN COPUOS sessions in Vienna, Austria.
- European region representatives participated in GLAC2014 conference in Paris (May 2014)
- European members actively participated in many conferences, events including SGC, IAC, SGFF, UKSEDS annual conference, SpaceBorrel, Austrian Space Forum, space exhibition in Graz and space industry workshops all around the world, representing SGAC and SGAC working groups
- European members supported many local competitions (rockets modelling launchers, satellites, etc.) and were giving talks and presentations (including EUROAVIA in Naples, German Council for Foreign Relations etc.), lectures as well as writing blogs, tweets about space industries in their countries, where SGAC activities were promoted

Looking ahead: Plans for 2015

- SGAC Europe aims to have each European country represented with an NPoC, especially in countries that have never had an NPoC before or that are having important developments in aerospace industry such as Estonia and Switzerland
- European regional coordinators are planning to hold meetings or teleconferences with every single country in the region to help in developing local strategies for 2015
- SGAC Europe plans to coordinate and run a series of European online seminars open to the SGAC community. The topics will be prepared with the European NPoCs
- RCs want to encourage NPoCs to be more active by sharing lessons learned and successful experiences of other countries in the region. The RCs wants to help the NPoCs to build a solid network within each other
- European Region is developing strategies for communication with major players of aerospace industry, strengthening relationships with other space outreach organisations across Europe and as a result, it is planned to sign more MoUs
- RCs are going to encourage NPoCs to work on local fundraising campaigns to allow people from the region to attend the 2015 SGC and IAC
- European Region will work on promotion of SGAC news, events and working groups activities
- RCs will motivate and help NPoCs in organizing local events (e.g. SpaceUp, GetTogether etc)
- As Guzel Kamaletdinova is finishing her term as RC, a new RC election will be held

ALBANIA

SGAC launched in Albania in 2013 with the appointment of its National Point of Contact (NPoC) Vojna Ngjeqari. Currently, there are limited space activities in Albania: there is no aerospace engineering faculty in the country, however there are three institutions in charge of establishing a space research programme, the Nuclear Physics Institute, National Academy of Science, and University of Tirana Department of Physics. Equally important is the contribution of a young space organisation Universlb in cooperation with SGAC Albania to connect Albanians from around the world with an interested in astrophysics and astronomy.

National Space Perspectives

Albania does not have a long standing history of participation in space related programs and activities. There is little emphasis on the subjects of astronomy and astrophysics at the Universities in Albania. Despite limited government support, young passionate Albanians have established a space forum with more than 17,000 fans. Currently, this space club is trying to launch a civil space society to represent the thousands of Albanians with interest in astronomy and astrophysics. Inspired by William Gregory, a NASA astronaut of Albanian origin, many passionate students follow the attempt to spread the voice of SGAC and establish an astronomical society or a Department of Astronomy at the University of Tirana. Activities like SpaceUp and Yuri's Night aim to increase awareness of space and space-related careers in Albania. As the SGAC in Albania is open to any Albanian speakers, the aim is to reach to Kosovo through social media.

Accomplishments in 2014

- The NPoC of Albania Vojna Ngjeqari attended the Scientific and Technical Subcommittee (February 10-21st, 2014) and the Legal Subcommittee (March 24th-April 4th) and the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) session (Jun 11-20th, 2014)
- The NPoC for Albania assisted in the SpaceUp Vienna, held on April 12th, 2014. The Technical Museum's SpaceUp is a space unconference, where participants decide the topics, schedule, and structure of the event

Looking ahead: Plans for 2015

- Build a strong network of young people interested in space sector at the University of Tirana, Department of Physics by promoting SGAC at the university
- Prepare the Subject Access Request of Space Law at the European University, Tiran, Albania
- Prepare for a Sondage where four universities in Tirana will be asked to debate on establishment of an astrophysics department at the University of Tirana
- Negotiate to organise SpaceUP Albania 2015 with Universalb and European University
- Work with Universalb and Astronomy Club of Prishtina to provide a forum in which Albanian students and young professionals from Albania and Kosovo can expand their knowledge of international space policy issues, build networks and think creatively about the future direction of humanity's use of space
- Request the Permanent Mission of Albania in Vienna send a representative to UN COPUOS
- Expand SGAC in Albania to Kosovo

AUSTRIA

Austria is the birthplace of SGAC and home to the SGAC headquarters in Vienna. In addition, Vienna is the location of the United Nations Office for Outer Space Affairs (UN OOSA). Every year meetings of the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) take place, which SGAC attends as a permanent observer. National Points of Contact (NPoC) for Austria Julia Heuritsch and Reinhard Tlustos have successfully completed their first year.

National Space Perspective

This year has been successful for the Space Community and SGAC in Austria with the first SpaceUp unconference hosed in Vienna and co-organised by SGAC. Additionally, SGAC provided significant contribution to the first 'Space in Austria GetTogether' (SAGT). Vienna is the home to many annual meetings including UNOOSA subcommittee and COPUOS meetings in spring, which attract many SGAC members from around the world. NPoC Reinhard Tlustos participated in the February meetings as part of the SGAC delegation.

SGAC Activities in 2014

- 1st SAGT: Space in Austria GetTogether - with over 60 participants, this meeting brought together representatives from a national and international organisations operating in Austria. Spearheaded and organised by SGAC Executive Director Andrea Jaime, the University of Vienna and SGAC Austria's partner organisation the Austrian Space Forum, this meeting successfully brought together Austria's space leaders, industry and decision makers to strengthen cooperation and collaboration in the future
- 1st SpaceUp Vienna – co-organised by SGAC through NPoC Reinhard Tlustos, Chair Chris Vasko and Klaus Kornfeld, this event brought together participants from 16 nations to share ideas and strengthen international networks. SGAC was also represented in several talks and participating members
- Yuri's Night - Almost 200 people participated at the Yuri's Night in Vienna, with highlights such as an interview with Austrian cosmonaut Franz Viehböck and the handover ceremony of TiuTerra Crystals by the Austrian Space Forum. NPoC Reinhard Tlustos provided technical assistance at this event.
- Klaus Kornfeld officially took over as Small Satellites Project Group Co-Lead in January 2014 and is responsible for the paper work package and industry projects. In 2014, two long-term projects were started with Swiss Space Systems and QB50/Van Karman Institute.
- NPoC Reinhard Tlustos participated in several conferences and was part of the organising team for the Space Generation Fusion Forum in May and the Space Generation Congress in September. Additionally, he participated in the Space Symposium and the International Astronautical Congress. Furthermore, Reinhard served as SGAC's summer intern from July-October 2014.
- NPoC Julia Heuritsch coordinated use of SGAC channels to promote a space exhibition in Graz, featuring talks by prominent Austrians and a musical composition of the history of the Universe *(www.alltage.at, https://www.facebook.com/expansionoftheuniverse).*
- Austria's NPoCs are also members of the Austrian Space Forum, which performs crucial space awareness activities in Austria such as school visits, public talks and presentations that attract hundreds of people

Looking ahead: Plans for 2015

- Continue to strengthen the space network and SGAC's position in Austria
- Hold 2nd SAGT meeting
- Cooperate with Yuri's Night organisers for 2015
- Collaborate with Austrian Space Forum and other organisations to increase visibility for World Space Week activities
- Secure funding for an Austrian-based scholarship to SGAC congress through industry and government contacts
- Increase active participation in conferences world wide
- Recruit new SGAC members to strengthen the organisation's base in Austria

BELARUS

Belarus has a long-standing history of participation in space-related programs and activities as a former member of the USSR. A new era in Belarusian space industry recently began with the Belarusian Council of Ministers' approval of the space research and exploration program from 2008 to 2012. The programme aims to advance the Belarusian economy and to ensure state agencies and citizens have access to space data. Starting from January 2014, Belarus is represented by a new National Point of Contact (NPoC), Kiryl Halauko, replacing former NPoC Artiom Anisimov who is currently at Dauria Aerospace and representative to the UN (ECOSOC) at SGAC.

National Space Perspective

Belarus produces element base, devices and complete systems that are used for manufacture of space technics. The country has also previously successfully flown space equipment. Belarus's main strategic partner is the Russian Federal Space Agency Roscosmos, but it is actively cooperating in space activities with other neighbour countries and has signed an intergovernmental agreement on cooperation in the exploration and use of outer space for peaceful purposes with Russia and Ukraine. The preparation of intergovernmental agreement with the National Space Agency of the Republic of Kazakhstan is in progress.

The new Belarusian space programme, in place until 2017, was recenly adopted and focuses on development of technologies for Earth remote sensing, including data obtained by the Belarusian Spacecraft (BSC). The remote sensing program will make use of readily obtained space-qualified hardware to reduce development costs and operation risk. The main scope of work is performed by more than 20 scientific and industrial organizations in Belarus. The coordination and state regulation is performed by the National Academy of Sciences.

On January 31, 2014 Belintersat-1 project was announced, which provides for the manufacture and launch of a telecommunication satellite in cooperation with Chinese company The Great Wall who will be actual contractor of the project. The cost of the project is estimated to be around 300 million USD and this satellite will be the first step in building of Belarusian system of satellite telecommunications.

Finally, the sixth Belarusian Space Congress was held in Minsk on October 28-30th, 2014. The topics included prospective technologies, space projects and programs, satellites, Earth remote sensing, education for space personnel, and usage of space activity data in different industries.

SGAC Activities In 2014

- NPoC Kiryl visited the annual Conference on EU space policy in Brussels on January 28-29th, 2014.
- NPoC Kiryl participated in SGAC GetTogether (March 21st in Leiden) and the SGAC-European Space Agensay workshop at the end of April where he was able to meet other SGAC members and executives.
- NPoC Kiryl attended European Space Solutions Conference on June 12-13th in Prague, Czech Republic and presented SGAC's mission.

Looking ahead: Plans for 2015

NPoC Kyril recently moved back to Belarus from the Netherlands and he is working to develop a strategy for SGAC Belarus in 2015 to strengthen the space network in the country and increase awareness of SGAC.

BELGIUM

Belgium is a very fortunate country when it comes to Space related activities. The country has two astronauts: Dirk Frimout embarked on a 10-day mission with the Space Shuttle in 1992 and 10 years later in 2002, Frank De Winne became the second Belgian in space with a 10-day mission to the Internationals Space Station (ISS) followed by a 6-month stay on board the ISS in 2009. De Winne became the very first European commander of the station. As a consequence, there is a lot of interest and awareness from the public, and the government has an active space education policy. Belgium has many space enthusiast organizations along with SGAC Belgium and there are many high quality public and private initiatives and events organized by both professional and non-professional organisations. SGAC Belgium therefore focuses its efforts in providing assistance to existing organisations and welcomes new National Point of Contact (NPoC) Simon VandenBussche to continue these efforts.

National Space Perspective

- beSPACEvzw/asbl: A community of young space professionals and students who work, study or live in Belgium, founded in 2013. They meet up regularly to share experiences and help each other. *(http://www.be-space.eu)*
- Woman in Aerospace (WIA): A Brussels chapter of WIA was founded in 2013.
- Euro Space Society: Founded by Belgium's first astronaut Dirk Frimout, the organisation brings space closer to youth. A major event is the ODISSEA-Prize, awarded every year to one or more University students in their final year for outstanding space related thesis. (*http://www.eurospace.be/default.aspx)*
- Space Center: Belgium has its own Space Center, a permanent exposition and indoor theme park for families to visit and learn about all aspects of space. It also organizes Astronaut, Rocket and Space camps, stargazing events, etc. *(http://www.eurospacecenter.be/hoofd.html)*
- Euroavia: This European Aerospace student organization has two departments in Belgium, one in Leuven and one in Ostend. It organises lectures and offers visits to aerospace companies in and outside Belgium. Each year they have a very active program. *(http://leuven.euroavia.eu/ and http://oostende.euroavia.eu/)*
- Planetaria and observatories: Belgium is very rich with star-observatories that offer activities almost every week, and more on the National Stargazing days each year in February/March, and during the annual Perseid meteor shower in August. Most stargazing opportunities are announced several days in advance to promote awareness in all layers of society.
- The Belgian government announced its intention in October 2014 to create a Belgium Space Office.

SGAC Activities in 2014

SGAC NPOC for Belgium Sarah Moens attended the meeting of United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) Legal Subcommittee in March 2014 in Vienna, and read the statement by SGAC. She also attended the International Astronautical Congress in Toronto and presented a paper.

NPoC for Belgium is an active member of the SGAC space law and celestial resources working groups and was appointed as a Space Mentor to provide students with more information about a space career in Belgium.

SGAC Belgium held a presentation on applying for a Young Graduate Trainee (YGT) award at ESA. The presentation was held in November 2014 at five Belgian universities and also provided information about studying at the International Space University (ISU). This event is in cooperation with beSPACEvzw.

Looking Ahead: Plans for 2015

- Organise more information evenings at the universities in Belgium on applying for YGT and studying at ISU
- Organise a visit of an enterprise related with space in Belgium.
- Continue to provide assistance to all space related activities and organisations in Belgium
- Elaborate specific tasks as representatives of the premier linking organisation about space, for youth, as of ambassadors of Belgium in the SGAC community

BULGARIA

Bulgaria is the sixth country to launch a person in Space. Georgi Ivanov was the first astronaut who flew on Soyuz 33 in 1979 and nine years later Aleksandr Aleksandrov became the second Bulgarian to have flown in space and the first one to reach a Space station. He spent 10 days on board the Mir station in 1988. Today, private sector triggers most of the space-related developments in the country. Bulgaria is a signatory to all five UN International space law treaties and the allocation of radio frequencies and GEO slots is regulated under the Telecommunications Law. Currently, National Points of Contact (NPoC) Raycho Raychev and Rada Popova represent Bulgaria.

National Space Perspective

The highly successful educational program, Space Challenges, plays a very active role in encouraging young talented Bulgarian engineers, scientists and entrepreneurs to pursue a Space career through engaging in real Space-related projects and world renowned competitions and events such as the Global Impact Competition of Singularity University, Pioneers Festival as well as to cooperate with International Space University and Singularity University.

Bulgaria is not a member state of the European Space Agency (ESA) but in May 2014, the Bulgarian government voted a budget for the initial phase of membership and should sign a cooperation agreement with ESA in the near future. Up-to-date information will be periodically published on the website of the Bulgarian Ministry of Economy and Energy - *http://www.mi.government.bg/en*

A national law on space activities that aims to set framework for commercial space activities for Bulgarian companies has been discussed in Parliament and will hopefully be adopted in 2015.

SGAC Activities in 2014

Raycho Raychev NPoC of Bulgaria together with the Space Challenges Team launched the 5th Edition of the Space Challenges Program (October 1st-November 30th): The Space Challenges Program is the biggest space and advanced technology free education initiative in Europe. The main goal of the program is to develop a generation of young scientists and technology professionals with an entrepreneurial mindset by focusing on direct economical and social impact. The program is structured around three components: science, technology and entrepreneurship and is completely practice-oriented. The Space Challenges program has been very successful, with more than 40 core participants every year, as well as over 25,000 online lecture attendees per year.

In 2014, the Space Challenges curriculum consisted of nine thematic weeks, which cover the basics of all Space-related areas including the business side (aerospace engineering, robotics and artificial intelligence, astrophysics and space science, orbital mechanics, space applications, biotechnology, space medicine, nanotechnology, material sciences, smart materials and entrepreneurship in the Space sector). Over the two-month program, the participants worked on four team projects: data visualization, glider drone, photobioreactor, and rover.

The two NPoCs for Bulgaria and the Space Challenges team took part in organizing the European Space Expo (May 16th– 24th). The Expo gained significant public attention and was attended by a total of 35,443 visitors, including organised educational visits for students and a set of presentations on European space activities and the biggest European space projects – Galileo and Copernicus.
Aerospace business in Bulgaria: Bulgarian broadband operator Bulsatcomis is preparing to launch a geostationary communications satellite, BulgariaSat-1, in 2016 that will provide direct-to-home television (DTH) services in Southeast Europe. The aerospace company Special Concepts Ltd. is working on a number of different advanced engineering projects and successfully accomplished its fifth stratospheric flight. Former participants from earlier editions of the Space Challenges Program currently successfully develop their own ideas (Bee Smart Technology) and attended the Space Studies Program in Montreal, Canada.

Looking Ahead: Plans for 2015

- Continue to stimulate young space entrepreneurs and scientists
- Continue to inform the public on the importance of space activities in daily life
- Advocate for active cooperation between Bulgarian state government and private sector
- Educate engineers and scientists in space-related topics
- Promote activities of the European Space Agency

CROATIA

Croatia has not historically been very active in the space sector, although in recent years a few software companies have taken advantage of the relatively low barriers of entry of that particular sector such as Amphinicy and Mireo. Croatia has a small but dedicated team representing and organizing World Space Week Croatia:
(http://wsw-hr.blogspot.co.uk/p/programske-aktivnosti-world-space-week.html

National Space Perspective

Since joining the EU in July 2013, Croatian companies and research institutes received opportunities to obtain EU funds through the Horizon 2020 program, including for space-related activities. In July 2013 the Croatian media reported funding of Swiss Space Systems Croatia, a company that is looking to develop small satellites and a space tourism spaceport in the sparsely populated Croatian Lika region.

SGAC Activities in 2014

National Point of Contact for Croatia, Robert Terlevic has been appointed in 2014 after several years without SGAC representation.

Looking Ahead: Plans for 2015

- Contact Croatian space companies and space enthusiasts
- Create a network of contacts within Croatia, which might help develop the space sector in my country
- Communicate with other NPoCs and set up local regional collaboration
- Help with organizing World Space Week activities in Croatia
- Raise awareness about SGAC and its activities

CZECH REPUBLIC

Since the Czech Republic hosted Space Generation Congress (SGC) and International Astronautical Congress (IAC) in 2010, awareness of SGAC in the Czech Republic has increased and the first students and young professionals became involved in SGAC activities. Pavel Paces became the first Czech National Point of Contact (NPoC) in 2010 and Ondrej Bruna the second one in March 2011. In February 2014, Michal Kunes was appointed as a new NPoC. He works as a Space Industry and Technology Consultant at Czech Space Office (CSO), and has posted all SGAC information for students and young professionals on the CSO website – *www.czechspace.cz.*

National Space Perspective

Space research and development have a long tradition in the Czech Republic. In October 1969 the first payload developed in the former Czechoslovakia flew into space on the Intercosmos-1 satellite. When Vladimir Remek spent six days on the Salyut-6 orbital station in 1978, Czechoslovakia became the third country with a citizen who had entered space. The first Czech satellite Magion-1 reached its orbit in October 1978 and begun an era of small satellite development. Another five small satellites were developed and launched between 1989 and 2003. Since November 2008, the membership of Czech Republic in ESA has opened new opportunities. Czech space activities as a whole cover many different sectors of research, development and applications.

The main space educational and outreach efforts are carried out by CSO. CSO organises competitions, seminars and events for students and young professionals and provides information about national or international scholarships, projects and study programmes. The Czech Technical University offers three study programmes focused on astronautics – Space Master, Aircraft and Space Systems and Aerospace Engineering. Czech students and young professionals are involved in the CubeSats development. CzechTechSat is being developed at the Czech Technical University, PilsenCUBE at the University of West Bohemia and VZLUSAT-1 by consortium of Czech companies and universities. High school students from the Secondary Technical School of Electrical Engineering developed several CanSats.

SGAC Activities in 2014

Czech Republic was very active during 2014 with NPoC Michal Kunes publishing seven articles about SGAC and its activities on the CSO website. In March 2014, Michal attended a seminar on small satellites development in the Czech Republic organised by CSO. Its purpose was to provide an opportunity to present the information about current achievements and exchange knowledge. Later he attended the International Astronautical Federation (IAF) Spring Meetings and became a member of three IAF committees – Workforce Development-Young Professionals Program Committee, Space Education and Outreach Committee and International Project/Programme Management Committee.

Jan Svoboda, a very active SGAC Czech Republic member and helped with the '$pace is Business!' competition organisation and with many other projects and activities. He also participated in many events at SpaceUps. Jan and Michal both attended Space Generation Congress and International Astronautical Congress in Toronto.

Other important activities and events in the country:

- Yuri's Night, organised by Kosmo Klub
- The PEGASUS-AIAA Student Conference (23 – 25 April 2014) at the Czech Technical University
- Kosmo-News Party 2014 (25 – 27 April 2014) with Michal Kunes participation. Kosmos-News Party is a series of lectures and the biggest Central European meeting of those interested in astronautics and space activities
- A test flight on a stratospheric balloon, organised by Students at the Czech Technical University who are developing CzechTechSat, a 1U CubeSat
- PragSAT launch. PragSAT is a small satellite created by school students from the Secondary Technical School of Electrical Engineering
- European Space Expo in Prague where Michal Kunes was helping with the organisation.
- World Space Week.
- Expedition Mars - an international Czech-Slovak competition for young people interested in aerospace, astronomy and other scientific fields. The final round started on 6 November 2014. The winners will experience a 5-day astronaut training in the European Space Center in Belgium, including a simulated spaceflight

Additionally to the listed events, Michal Kunes participated in the IPMC Workshop (26 September 2014) and Jan Svoboda attended the SGAC Workshop to Discuss the Upcoming ESA Ministerial (28 September 2014) and helped with the SGAC Position Paper on ESA Ministerial.

Memorandum of Understanding
Michal Kunes mediated signature of the Memorandum of Understanding (MoU) between CSO and SGAC. The MoU is important for planned activities in 2015 and should be signed in the middle of November 2014.

Looking Ahead: Plans for 2015

- Create the national network of students and young professionals interested in space activities
- Find sponsor(s) and organise an abstract competition. The winner will receive an award in order to attend and give a presentation at the SGC and IAC in Jerusalem.
- Organise a congress focused on space activities of/for students and young professionals in the Czech Republic
- Increase the number of active SGAC members from the Czech Republic.
- Organise a networking event for students and young professionals during the Humans in Space Symposium in Prague

FINLAND

SGAC's Finnish operations started after nomination of a new NPoC Lauri Neuvonen in early fall 2013, who was joined by Sissi Enestam in the spring 2014. During the year most of the activities have been aimed at starting operations by, for example, updating the web pages, contacting relevant people and investigating what type of collaboration between Finland and other countries could be performed.

The long-term goal is to create a national space community and help bring together space minded people especially across disciplines.

National Space Perspective

Association named Spacehip organised this year's Space Apps Challenge local event as an upgraded version from last year. The event gathered more interested people than before but finding sponsors was harder, perhaps due to economic situation in Finland. An industry workshop was organised during the event and SGAC was present.

The core of Finnish space activities is formed around ESA's programmes which involve approximately 30 Finnish companies and 20 research institutes.

However, there are new winds blowing in the Finnish space industry with the launch of the first satellite Aalto-1 and plans for second one with a hyper-spectra imager.

In addition, first Finnish commercial space company has been formed called ICEYE.

SGAC Activities in 2014

During her internship at NASA Ames, NPoC Sissi Enestam made several contacts that were interested in possible collaboration with Finland in the future, most promising one of these being SSERVI while there were also several discussions with NASA.

She has also connected the people working with Finland's first satellites to commercial companies in America with the hope of collaboration. Renting out of Finnish ground stations for commercial companies has also been her goal.

NPoC Lauri Neuvonen participated on behalf of SGAC in a space industry workshop organized during the Spaceship 2014 event and has also been contacting Finnish space organizations to find ways to collaborate.

Looking Ahead: Plans for 2015

- Construct a Facebook site for Finnish Space Activities
- Collaborate between America and Finland using existing and new contacts
- Collaborate between Finland and Australia

FRANCE

France has been a major player in institutional and industrial space activities at the international level since November 26th, 1965, date of the launch of Astérix, which was the country's first artificial satellite.
The launch of Astérix made France the third autonomous space power and the fourth State to put a satellite in orbit. Thanks to its South American territory, French Guyana, where the Guyana Space Center is located, France is now the top commercial launch provider of satellites. Its contribution to the European Space Agency, in terms of funding and infrastructure, makes it one of the key players for the future of European space activities. Notwithstanding its highly competitive space industry, France has also developed a large education system in fields related to space activities.
Despite the world economic crisis, many space events and projects in connection with the aim of the SGAC were accomplished in France in 2014. Other interesting space perspectives are expected to be reached in 2015.

National Space Perspective

- **Ariane 6, the future European launcher**
  According to Vincent Lamigeon, the official launch of the Ariane 6 – the future European launcher presented by the industrialists (Airbus and Safran) and the space agencies (ESA and CNES) as being as reliable as Ariane 5, more flexible and cheaper – is expected on December the 2nd, 2014, at the Ministerial Conference in Luxembourg. Even if the calendar is kept, the first launch of Ariane 6 would not be before 2020.
  According to Vincent Lamigeon, with 62 successful launches in a row, Ariane 5 can rely on an order book equivalent to 24 launches corresponding to four years of exploitation. "Even if we can still identify slots, our launch program is filled until 2017 and even 2018 for large satellites," says Stéphane Israel, CEO of Arianespace.
- **The project of the creation of a joint venture in the field of space launchers**
  Airbus Group and Safran, which have collaborated in the space launchers' field for several years, announced mid-June the creation by the end of 2014 of a joint venture to pursue the development of the European rocket Ariane 5 and prepare the launch of Ariane 6 which should succeed Ariane 5.
  The main objective of this joint venture is to propose a new family of competitive, multi-purpose and powerful launchers to meet both the commercial and institutional needs of the market.
- **Appointments**
  On July the 30th, 2014, Airbus Group and Safran appointed Mr. Alain Charmeau to the position of CEO of the future joint venture dedicated to space launchers. The two partners also appointed Mr. Marc Ventre as chairman of the board of directors of the joint venture.

Looking Ahead: Plans for 2015

- Work with new NPoCs for France
- Develop a strategy for 2015 and ahead
- Work on opportunities to sign MoUs between SGAC and CNES and other major players of space industry
- Provide outreach activities
- Strengthen the local network

GERMANY

Sebastian Kleim and Benjamin Kraetzig represent SGAC Germany as National Points of Contact (NPoC). Both are acting in that role since December 2013 continuing the work of previous NPoC Juergen Hill. Sebastian Kleim is located in the Bonn/Cologne Area with a background in Political Science and International Relations, while Benjamin Kraetzig is located in Ontario/Canada with a background in Aerospace Engineering. Together they connect the professional and student world of space in policy and law with engineering and science as an overarching agenda for their term.

National Space Perspective

In 2014, Germany continued its contributions and leadership in the European space programmes such as the International Space Station, ESA's science and exploration missions as well as telecommunications and Earth observation. In addition, Germany executes one of the largest national space programmes in Europe, where individual contributions to international missions complement national mission and technology activities. Highlights in 2014 included the mission of German Astronaut Alexander Gerst on the ISS for six months conducting experiments, extra-vehicular activities and an extended social media activity.
The lander of the Rosetta Mission, Philae, is a main contribution of the German Space Center. After rendezvouz with the comet Churyumov-Gerasimenko, the Rosetta probe dropped Philae to land on the surface on the 12th of November. These are just a few examples that confirm the value of Germany's space sector and research community in the international space arena.

SGAC Activities in 2014

General Overview
The year 2014 was the transition year from a long NPoC term of seven years held by Juergen Hill to two young professionals Sebastian Kleim and Benjamin Kraetzig. Sebastian and Benjamin used this year to explore the scope of potential partners and collaboration opportunities in Germany and on international level. The old established network of Juergen Hill at the German space agency (DLR) could in part be continued and extended.
Sebastian focused on the outreach and introduction of SGAC to several institutions, think tanks, student groups and individuals established in industry and agency. While Benjamin interpreted the role from a distance in Canada, he explored engineering and science partners as well as technical faculties in Germany and established contacts with the Canadian Space Agency and related industry, as well as several new space initiatives.

Memorandum of Understanding SGAC & DLR//Standout Students Scholarship
This year, the Memorandum of Understanding (MoU) with DLR ran out and was extended to an additional six months to be able to send German participants to Space Generation Congress (SGC) in Toronto. The constrained scholarship value led to a partial scholarship system due to the high cost structure of the Canadian SGC. Winners were Ali Yesil (University of Stuttgart), Markus Geiss (University of Applied Sciences in Munich) and Martin Losekamm (Technical University Munich). A pilot project secured additional funding for Johanna Pardo (University of Stuttgart) through the DLR Diversity and Equal Opportunities initiative. With the four DLR students a group of ten participants from Germany marked a high in presence of German representatives. The students had the great opportunity to meet and to discuss intensely with space

leaders from around the world and establish their own role in the space generation. Johanna Pardo and Benjamin Kraetzig authored in the Position Paper on the ESA Council at Ministerial Level.

UNCOPUOS Scientific & Technical Subcommittee (10-21 February 2014)
Sebastian participated in the STSC meeting of UNCOPUOS in Vienna as part of the SGAC delegation. He took the chance to meet leading space experts and introduced the new faces of SGAC Germany to representatives of the DLR.

SpaceUp Bremen (11-12 April 2014)
A large group of SGAC members based in Bremen organised a SpaceUp in mid-April to bring together around 60 space enthusiasts for informal discussions about space-related topics. As new NPoC, Sebastian participated in this conference to familiarise the German SGAC members with the new NPoCs and to introduce SGAC to the participants through a T-5 talk.

Yuri's Night (12 April 2014)
The established group of helpers from previous NPoC Juergen Hill organised another Yuri's Night event at the Planetarium in Stuttgart under the umbrella of the Yuri's Night Deutschland e.V. Cities Darmstadt, Bremen, Rostock and Munich also held events.

Presentation at the German Council for Foreign Relations (23 June 2014)
As an active member of the youth organization of the German Council for Foreign Relations, Sebastian introduced SGAC to the participants and held a short presentation about outer space and space security during a thematical regulars' table in Bonn (Germany).

Active participation at the Space Generation Fusion Forum and Space Generation Congress:
Benjamin and Sebastian also actively participated in SGAC's major space conferences. Sebastian participated as a panelist at the 'Small Satellites: Benefits and Risks' Panel during the Space Generation Fusion Forum in Colorado Springs (USA) (18-19 May), while Benjamin was actively involved in leading the German delegation of German scholarships winners at the Space Generation Congress in Toronto (Canada) (27-28 September). During the SGC, he also participated in the 'Entrepreneurship in Space' Working Group (sponsored by Planet Labs).

Christmas Dinner in Cologne (6 December 2014)
The third edition of the annual SGAC Christmas Dinner took place in Cologne. Together with the European Regional Coordinators Guzel Kamaletdinova and Matteo Emmanuelli, Sebastian helped to organize this event, bringing together SGAC members from Europe to have a final get together before the end of this year.

Looking Ahead: Plans for 2015

- Revise and renew the memorandum between SGAC and DLR
- Establish additional funding for female participants at SGC
- Reach out to German industry for collaboration, network and funding support
- Communicate German space voice to political institutions
- Establish a better network solution for the German space community

GREECE

This report was prepared by the current National Point of Contact (NPoC) for Greece Adrianos Golemis. In May 2014, the second 2-year term of the previous Space Generation Advisory Council (SGAC) NPoC Angeliki Kapoglou came to an end. Angeliki encouraged Adrianos Golemis to apply for the Greek NPoC position – and was selected for the role one month later in June. This annual report covers the four-month period starting from the time that Adrianos was officially elected. Adrianos is currently based in Antarctica, working as a biomedical research doctor for the European Space Agency (ESA) in the space mission analogue station of Concordia. He has been living there for about a year and is expected to return to Greece around January 2015. Thus most SGAC activities so far have been web-based because of the challenges of distance – and consequently more direct actions in Greece will start in early 2015 together with the newly appointed second NPoCs, Amalia Dimopoulou.

National Space Perspective

Starting from late June 2014, the new NPoC started tasks suggested by the previous NPoC. After studying SGAC's history, the current NPoC thoroughly evaluated the current situation of space activities in Greece. One of the things that Greece is currently missing and which could help advance its space sector and bring its members closer was a single and comprehensive point of reference for all space-related activities in the country. A two-phase was adopted to resolve this. As a first step, all people or institutions (academic, amateur, state-run and industrial) were listed to create an up-to-date list of contacts. This is underway and many formerly unknown space sector initiatives have been registered. The second phase of this plan to make this list available to other members of space community to foster communication.

Another accomplishment of the year was establishing contact and scheduling a formal meeting with the Greek General Secretariat for Research and Technology (GGET), which is the country's ministerial department concerned with space activities. Similar efforts were made to contact Greece's country desk within ESA as well as representatives of the newly formed Greek space industries cluster (si-Cluster).

SGAC Activities in 2014

Small countries like Greece whose space sector is not fully developed might benefit from each other's experience on how to advance the community, and adopt actions previously shown to be fruitful. There are many such countries in the neighbouring Balkan area, so cooperation and exchange of opinions could be useful to multiple countries. In several cases, these countries were not members of SGAC, like Croatia and Yugoslavia so the Greek NPoC encouraged space enthusiast to represent their countries within SGAC. Several Balkan states are now members of SGAC.

The NPoC also contacted active amateur space and astronomy clubs in Greece to notify people interested in space about SGAC and its activities and pave the way for enhancing space outreach in Greece. From these efforts, some of these clubs participated in 2014 World Space Week. In addition, Greek organisations have been encouraged to participate in the upcoming exoplanet naming competition of the International Astronomical Union (IAU).

Looking Ahead: Plans for 2015

- Create a National Space Network website that lists all Greek space sector members including contact details, projects and areas of interest. This network of institutions or individuals would be made available to the general public, offering a gateway to the Greek space sector to all young (or older) people seeking information and advice.
- Establish formal meetings with GGET and representatives of the Greek space industry in Athens next year.
- Coordinate and increase space outreach within Greece to promote SGAC and ESA's image to the public.

HUNGARY

Hungary used to be an active member in the early 2000's, but SGAC lost contact with the National Point of Contact (NPoC) a few years later. In 2012, Hungary returned to the SGAC with a newly appointed NPoC and since then, the focus was on rebuilding the connections with the organization and presenting SGAC to as many Hungarian students and young professionals as possible. In 2014, Laszlo Bacsardi started his second term as NPoC, and was shortly joined by Dorottya Milankovich in her first term as NPoC. SGAC Hungary works in close collaboration with the non-profit Hungarian Astronautical Society (MANT).

National Space Perspective

Hungary requested to begin negotiations about the country's accession to the European Space Agency (ESA) in 2013. Following successful negotiations ending in 2014, the ESA Director General announced Hungary as a possible new member state during the first day of the 2014 International Astronautical Congress in Toronto, Canada. On October 22nd, the Hungarian government approved the proposed text of the accession agreement and authorised the Hungarian minister responsible for space activities to sign the agreement on behalf of the Government. There are still some steps, but Hungary is close to becoming a member of ESA.
Meanwhile, the second call for outline proposals under the Programme for European Cooperating States (PECS) was announced in Hungary, and several Hungarian companies and research institutes submitted their proposals to the ESA.There were several events during the year that offered possibilities for Hungarian research institutes and companies to exchange results, ideas and plans.

«Space World» ('Urvilag' in Hungarian) is a non-profit Hungarian space news portal which was established in 2002, with the main goal of bringing news, events and developments closer to the general public in Hungarian. In 2014, the portal followed the European and the Hungarian space activities and related news appeared during the whole year.

SGAC Activities in 2014

SGAC Hungary activities were carried out with collaboration and active help of the MANT. This is the oldest Hungarian non-profit space association, founded in 1956 and gathers Hungarian space researchers, users of space technology and everyone who is interested in the interdisciplinary and state-of-the-art uses and research of outer space. MANT is a voting member of the International Astronautical Federation since 1959 and members of this society participated in the UNISPACE III conference when SGAC was established.
On 13th of February, an event was organized for students and young professionals at Budapest University of Technology and Economics. The event was held on the occasion of the second birthday of the Hungarian cubesat, the Masat-1.

In May, a new Hungarian NPoC, Dorottya Milankovich, was appointed to serve Hungary.

Since 1994, a one-week-long space camp is organized every year for Hungarian students interested in space technology. In 2014, the camp was held between 22-28 June in the Hungarian village Felsotarkany. During the program of the camp, SGAC presented its mission and activities to the participants.

A four-day summer event named as the Hungarian Space Academy was planned for Hungarian university students and young professionals interested in space research. Unfortunately, the Hungarian Space Academy was cancelled, but SGAC Hungary organised a three-hour workshop on August 8th. The location was Budapest, and one of the invited speakers was Christopher Vasko, Chair of SGAC. A second workshop was organized on the 20th of November in Budapest, and one of the invited speakers was Lauren Napier from the SGAC Space Law and Policy Group.

NPoC Laszlo Bacsardi met SGAC members during the GLAC2014 conference in Paris and was an active participant of SGC 2014. Both NPoCs participated regularly in the regional Euro teleconference meetings.

MANT and SGAC Hungary negotiated a Memorandum of Understanding starting in May. It was approved in September and signed during the 2014 International Astronautical Congress in Toronto.

In the last months of the year, the two NPoCs prepared a campaign in Hungarian to introduce SGAC to students and young professionals.

Looking Ahead: Plans for 2015

- Increase the number of Hungarian SGAC members in 2015
- Organise workshops named as the Space Academy Club with a focus on students and young professionals
- Organise a Hungarian Space Academy for university students and young professionals in summer or 2015
- Present SGAC in Hungarian public space forums.
- Organise presentations for university students about international and national space research and about SGAC

IRELAND

This year marked an historic occasion for Ireland's space industry with the first Irish experiment launching into space aboard the International Space Station, coordinated by SGAC's very own National Point of Contact (NPoC) Norah Patten. Joining Norah as NPoC for Ireland is James Harpur who has recently taken over for Patrick Crowley upon successful completion of his NPoC term. The number of private companies, academic scholarships, and space events has been on the rise this year in Ireland, showing a promising future for the country.

National Space Perspective

ISU's Space Studies Program (9th June – 8th August)
The International Space University hosted this year's Space Studies Program at École de Technologie Supérieure (ETS) in Montreal, Canada. In its Masters and summer programmes, ISU offers its students a unique core curriculum covering all disciplines related to space programmes and enterprises. Enterprise Ireland offers the opportunity each year for Irish students to attend this programme.

Alpbach Summer School 2014 (July 15th–July 24th)
This year Alpbach hosted a ten-day intensive course of lectures, workshops and projects that provided in-depth teaching on space science and space technology subjects. This year's theme was Space Missions for Geophysics of the Terrestrial Planets. Enterprise Ireland currently funds Irish students to attend this annual event.

Private Industry
A plethora of private space companies have started up in Ireland in recent years, accumulating many contracts, and showing a promising future. Dublin based EnBio are currently collaborating with ESA and Airbus Defence and Space to produce the heat shield for the upcoming ESA Solar Orbiter mission. Treemetrics is a new company using data from the Sentinel missions to help forest owners manage and sustain their forest supplies. Dublin based Curtiss-Wright Controls Avionics & Electronics provide data handling electronics that are used on the SpaceX Dragon capsule.

New Academic Initiatives
In the past year, University College Dublin introduced its new Masters in Physics tailored towards space science and technology. It is the first course of its kind in the country, and will hopefully lead to many more national universities following suit. Students on the course are given the opportunity to design, build, and launch their own CanSat, to work in international teams in the design of a space mission from start to finish, and to have close access to high profile professionals. NPoC James Harpur was a student of this new course and has just recently completed the Masters.

SGAC Activities in 2014

Al Worden, Apollo 15 Astronaut in Limerick, Ireland:
On the 16th September 2014, Ireland had the privilege of welcoming an Apollo astronaut, Al Worden, to its Emerald Isle. For many, it was a once in a lifetime opportunity to meet such a hero. Al Worden was the command module pilot for the Apollo 15 mission to the moon and gave a fantastic lecture about his experience on the mission and his views of space exploration. Al spoke fondly of his time alone in the command module, while the other crewmembers David Scott (spacecraft commander) and James Irwin (lunar module commander) carried out their duties on the lunar surface. Al slept about 4 hours per night and made the most of every opportunity to gather as many photographs as possible from above the lunar surface. Norah Patten, Communications and Outreach manager for IComp/SGAC NPoC, was privileged to be invited to present the NanoRacks school project at the event.

World Space Week Ireland
This year many events took place in Ireland to celebrate World Space Week. Blackrock Castle Observatory hosted a number of events for students of all ages; Dunsink Observatory provided workshops and lectures; Astronomy Ireland provided a lecture evening; Galway Astronomy Club hosted an astronomy lecture; Action Comet workshops in Wicklow; Archaeology and Archaeoastronomy in Lough Gur; and finally a Space Party organised by Norah Patten, which facilitated informal networking of space professionals in Ireland.

UNION OF INTERNATIONAL ASSOCIATIONS (UIA) Round Table Dublin November 2014
NPoC Norah Patten represented SGAC at the UIA Round Table in November in Dublin. Participants from many different associations and foundations attended the event and it proved to be a great networking opportunity.

Astronomy Ireland
The annual Star-B-Q in August this year was a great success for Astronomy Ireland. Astronomy enthusiasts were brought together for a gathering under the stars with telescopes of all sizes, with this year's event recording its largest ever turnout. Astronomy Ireland also give monthly lectures at Trinity College Dublin, and Norah Patten gave the May lecture of this series. Astronomy Ireland have a monthly magazine that is sent to its subscription list and Norah is making contributions to the magazine, providing relevant space content.

Science week
Cork Institute of Technology (CIT) will be hosting a Cosmic Careers event, where space professionals in Ireland will sit on a panel moderated by Niamh Shaw (creator of ToSpace2014). Sitting on this year's panel is Ronan Wall (Moog), Niall Smith (CIT), Norah Patten (IComp) and Donagh O'Mahony (Tyndall National Institute). This will be a questions and answers section for students to ask people working in the space sector about their experience. Norah will also be giving a 'Build your own Moon colony' workshop to primary students in Lough Gur as part of the science week activities.

The Only Way is Up
The Only Way is Up is a project coordinated at the Irish Centre for Composites Research (IComp), which offers secondary school transition year students in Ireland the opportunity to send their research to space. The project was a first of a kind in Ireland and was co-ordinated by Norah Patten, the Communications and Outreach Manager for IComp. 140 students submitted ideas for an experiment to be sent to space and a team of judges selected one of them in January 2014. The experiment launched on the Orb-2 mission in July and was activate by Astronaut Alexander Gerst two days after arriving at the ISS. The experiment spent almost 15 weeks orbiting Earth and then on Saturday 25th October the Dragon spacecraft departed the ISS with the experiment onboard. It is now back on Irish soil in IComp, where the students will have the opportunity to use a range of testing facilities in the University to do post-analysis on the sample.

Looking Ahead: Plans for 2015

- Organise a national space conference
- Increase the number of activities and events related to space
- Increase the number of students attending the ISU Space Studies Program and the Alpbach Summer School

ITALY

In 2014, SGAC Italy elected a new National Point of Contact (NPoC) Valentina Boccia, to support its activities. Valentina, a PhD candidate in Aerospace Engineering at University of Naples, joins current NPoC Giulia Federico. SGAC activities in Italy have been coordinated with initiatives started during the previous year, with the aim of strengthening local initiatives and partnerships.

National Space Perspective

During 2014, Italy has been involved in the launch of Sentinel-1, thanks to its well-developed network of aerospace companies, research centres, and universities. The Italian Space Agency (ASI) and the Italian Centre for Aerospace Research (CIRA) have undergone a renewal of top-level management, and new activities are planned for the upcoming year. Several university spin-offs have been created all over Italy and a new enterprise, SITAEL S.p.A., has been established. SITAEL belongs to Angelo investments holding, a worldwide leading transportation and aerospace group composed of synergic high-tech companies, with more than 1000 highly skilled employees. High levels of participation from Italian students, academics, and companies have been registered during international congresses and events, for example International Astronautical Congress 2014 in Toronto, Canada.

SGAC Activities in 2014

- 2014 has been a busy and profitable year for SGAC Italy. Several activities and negotiations have been conducted, and the Italian SGAC network has increased.
- NPoC Valentina held a presentation for EUROAVIA in Naples to strengthen the relationship between the two organisations. The event was a success and SGAC is currently working to sign a Memorandum of Understanding with the Naples section of EUROAVIA.
- SGAC has also supported Space Expo in Genova by providing volunteers to organise it and presenting during the event. SGAC also connected them with industry and the press in Italy.
- SGAC Italy has also attended IAC 2014, where and met with ASI. SGAC presented a report of its activities to proceed further toward a Memorandum of Understanding with ASI in 2015.
- SGAC Italy is also very happy about the recently signed Memorandum of Understanding with the Sapienza Aerospace Student Association (SASA) of University "La Sapienza" in Rome, after negotiations successfully concluded in 2014.
- Following this exciting news, SGAC NPoC met with another local student association, Skyward Experimental Rocketry, and is currently working on an agreement in 2015.
- The ASTRO Space Team of Padova has recently contacted SGAC to explore possibility of potential collaboration and to help organise the Space Students Activities symposium to be held in December 2015. An SGAC reunion in Padova may be held in conjunction with this event.
- Finally, the NPoCs and the European Regional Coordinator are part of the organising team of SpaceUp Rome and are currently working to host this event in Rome during spring 2015.

Looking Ahead: Plans for 2015

A number of exciting activities are planned for 2015. Organisation for some events has already started and additional ones will be revealed during the next year. SGAC Italy activities planned for 2015 can be summarised as follows:

A number of exciting activities are planned for 2015. Organisation for some events has already started and additional ones will be revealed during the next year. SGAC Italy activities planned for 2015 can be summarised as follows:

- Finalise Memorandum of Understanding between SGAC and Italian Space Agency;
- Sign and announce the Memorandum of Understanding with Skyward Experimental Rocketry and EUROAVIA-Naples section;
- Support and collaborate with the SGAC partner associations in Italy;
- Strengthen the relationship with the ASTRO Space Team from Padova;
- Help the team from University of Padova to organise the Space Students Activities symposium and SGAC reunion to be held in Padova during December 2015;
- Construct SGAC members database;
- Organise SpaceUp Rome during spring 2015;
- Develop and strengthen the relationships with further aerospace associations in Italy.

LITHUANIA

The first Lithuanian National Point of Contact (NPoC) for SGAC, Laurynas Maciulis, was appointed at the end of 2011 and co-founded a non-profit organisation Innovative Engineering Projects (IEP). One of the goals of IEP is to raise interest in space sciences and technology among students and young professionals in Lithuania. NPoC Laurynas Maciulis is working as a project manager in this organisation and promotes the SGAC vision and its goals in Lithuania.

National Space Perspective

Lithuania became the third Baltic country to sign a Cooperation Agreement with the European Space Agency (ESA) on October 7th 2010 in Vilnius, which guaranteed scientific, technical and organisational assistance from ESA professionals, with no financial obligations. Lithuania's Minister of Economy signed an agreement of a European Cooperating State with ESA in Paris on October 9th 2014. Lithuania was invited to sign the agreement and join ESA programmes after ESA experts carried out a technological audit of Lithuania's research and business potential in the space field in February 2013. The experts found that Lithuania boasts strong potential in natural sciences, biotechnologies, information technologies, microelectronics and optoelectronics, mechatronics, laser science and technologies, as well as other areas. In January 2014, the first Lithuanian satellites, LituanicaSAT-1 and LitSat-1, were launched into space. The creators of the satellites have dedicated their missions to commemorate the 80th anniversary of the flight of the legendary pilots S. Darius and S. Girėnas across the Atlantic Ocean. This historical event had an important symbolic meaning, and opened possibilities for unique space experiments, and promotes development of high-tech industry in Lithuania.

SGAC Activities in 2014

The NPoC for SGAC in Lithuania supports mission operations of LituanicaSAT-1, carried out from Vilnius University Ham Radio Club. The mission is regarded as a complete success and all objectives have been accomplished. Among the most significant achievements were the first Lithuanian pictures from space and amateur radio transponder operation throughout the world. Project team members Vytenis Buzas and SGAC NPoC Laurynas Maciulis presented the first picture in a public event to Lithuanian President Dalia Grybauskaite. To commemorate the missions of the first Lithuanian satellites, LituanicaSAT-1 and LitSat-1, the Lithuanian postal service has released limited edition postal stamps and envelopes, featuring artist representations of both missions.

Based on the experience gained during the project, core members of the LituanicaSAT-1 team have established a spin-off company, NanoAvionics, which won a prize of 20,000 EUR from the Lithuanian Agency for Science, Innovation and Technology (MITA) for commercialisation of nanosatellite components.

Educational activities:

- NPoC Laurynas Maciulis, acting as project manager at Innovative Engineering Projects, NPO organised public Space Technology Lectures at Vilnius University on June 11-12, 2014. Lectures were aimed at providing basic knowledge of satellite systems engineering and design, with particular attention paid to small satellites. Jesper A. Larsen from Alborg University delivered the lectures

Public outreach activities:

- NPoC Laurynas Maciulis helped the organising committee of the international conference Space Economy in Multipolar World. Vilnius University and the Lithuanian Space Association organised the conference. One of the largest space events in the Baltics, the conference focused on space science, technologies and their commercial applications. The event brings together space scientists, businessmen, and leaders of national space programmes to discuss the latest developments in space economy each year.
- The Director of Innovative Engineering Projects (NPO) Vytenis Buzas held a lecture on robotics and spacecraft at LYS University, Copenhagen, for Lithuanian students currently living and studying in Denmark.
- NPoC Laurynas Maciulis and Vytenis Buzas held a lecture titled How to create a satellite and what to do with it at the faculty of informatics and mathematics of Vilnius University during the Spaceship Earth science festival on September 16th.
- The LituanicaSAT-1 Facebook page reached 5,372 people in Lithuania and received more than 4600 "likes" as of November 2014.
- NPoC Laurynas Maciulis presented the LituanicaSAT-1 project and its importance for Lithuania at three major events:
    - Tartu Conference on Space Science and Technology (Estonia)
    - 6th European CubeSat Symposium (Estevayer-le-Lac, Switzerland)
    - 5th international conference "Space Economy in Multipolar World" (Vilnius)

Work on the next Lithuanian satellite mission, LituanicaSAT-2, is also underway. The project is led by Vilnius University with core team members coming from LituanicaSAT-1. Critical funding was secured for the mission, both for development of the satellite and for launch. The Primary mission objective is to participate in the international scientific mission QB50.

Looking Ahead: Plans for 2015

- Support development of the second satellite of Vilnius University, LituanicaSAT-2
- Work with Vilnius University to increase the educational component of space in the university curriculum.
- Organise educational presentations in various schools all over Lithuania to promote space science and technology amongst the younger generation.
- Apply for ESA PECS funding for an educational space project in Lithuania
- Increase space awareness in society by organising public events related to space activities.

MONTENEGRO

Montenegro is a small emerging economy in south-east Europe with a limited outlook towards the space industry and space related endeavours, but with a determination to advance both scientific and research effort under the Horizon 2020 and FP-7 initiatives of the European Union. The National Points of Contact (NPoC) for Montenegro are Sanja Šćepanović and Aleksandar Jaćimović. They act within the Organization of Montenegrins Studying Abroad (OMSA) and collaborate with the National Foundation for Science Promotion (PRONA), which arranges summer and winter research camps for high school students and the Ministry of Science, which organises science promotion events and directs national agenda on Science.

National Space Perspective

National space activities are restricted to science education and promotion activities, though in the recent years a number of aerospace and defence companies chose our country for their operations, for example Tara Aerospace, and tend to collaborate with the Ministry of Defence. There are several science promotion events, which direct the science related agenda, such as the Montenegrin Open Science Days, and in which the NPoCs participate through OMSA and in collaboration with Montenegrin Ministry of Science. Currently, a major reform is under way that will provide more direct funding for research projects and that will establish a number of new research centres. As a small country, Montenegro has great potential to engage in space legislation and financial services supporting the space industry, but it is at least a decade away from any direct participation in space related endeavours.

SGAC Activities in 2014

The NPoCs participated again in science promotion events in Montenegro including a summer camp for the gifted high school students, where space related presentations, inspired by participation at the International Space University Space Studies Program (ISU SSP) 2012 and 2013, were organised. The NPoCs also worked on a science promotion event within the Montenegrin Open Science Days, as last year. This year the main team was in neuroscience, but an SSP 2012 colleague Nuno Loureiro from Portugal was involved, giving a speech about computer-brain interfaces in aircraft navigation. This year, the NPoCs had to direct their focus on the wider OMSA agenda, and hence SGAC participation suffered. One important trend the SGAC NPoCs noticed is an increased interest in the field of space law, particularly among colleagues in OMSA who study in Austria. SGAC Montenegro intends to organise a discussion at the Law Faculty of the University of Montenegro where these OMSA members could share their insights with the Montenegrin audience.

Looking Ahead: Plans for 2015

- Support efforts of PRONA in science promotion activities
- Support efforts of the Montenegrin Ministry of Science
- Participate in the Montenegrin Open Science Days 2015
- Initiate collaboration with Tara Aerospace and organise an engineering promotion event
- Initiate collaboration with the Montenegrin ITU representation
- Organise space law related outreach

THE NETHERLANDS

In 2014, National Points of Contact (NPoC) Peter Batenburg and Susanne Pieterse worked hard to accomplish the actions on the list formulated in the 2013 annual report, and many action items being completed. They completed mailing list for SGAC members based in the Netherlands in June to help share space related events and announcements. Members may join the SGAC-NL list on the following webpage:
http://lists.spacegeneration.org/listinfo/sgac-nl

NPoC Susanne used @SGACNL Twitter account to share space news but a routine for using the email address still needs to be developed. Susanne used a T-minus 5 session to present SGAC to the participants. Both NPoCs were part of the organising team of the first SpaceUp in the Netherlands and negotiated a Memorandum of Understanding (MoU) between the Netherlands Space Society (NVR) and SGAC. At the IAC in Toronto, NVR board member and advisory board member of SGAC Tanja Masson-Zwaan signed the MoU on behalf of NVR. The MoU gives members of both organisations the advantages of an even stronger network.

During IAC 2014, Peter also participated in drafting a position paper for the ESA ministerial in December. The white paper will be handed over to the Netherlands Space Office (NSO) who will represent the Netherlands at the ministerial conference.

National Space Perspective

Due to the presence of ESA European Space Research and Technology Centre (ESTEC) in the Netherlands and a large space industry in the area, there is an active Space Society that organises many events. Below are some of the events that either involved the two NPoCs for the Netherlands or were major events of the NVR.

SpaceUp NL 2014
On May 10-11, 2014, the first SpaceUp was held in the Netherlands. NPoC Susanne organised the event together with Jacco Geul, Fred Brauer, and Kartik Kumar. Leading institutes, societies, and companies in the European space industry sponsored SpaceUp NL. Participants had lunch 'At the ISS' and hosted a session 'On the Moon'. The outreach of SpaceUp NL went far beyond Space Expo Noordwijk. Talks in Ariane Hall and the Astronauts Room were broadcast via a live stream to over 300 viewers. Through social media like Twitter and Facebook, viewers were able to interact with the participants and for those not watching the live stream, the flood of tweets alone made it possible to follow the event as if present. More than 450,000 people were reached on Twitter alone. SpaceUp NL closed with drinks 'At the ISS'. The space was buzzing with enthusiastic participants. Business cards were traded, appointments for follow-ups were made, and Twitter handles were shared.

ESTEC Open Day
Every year ESTEC has an Open Day during or close in time to World Space Week. This year, the Open Day took place on October 5th.

SGAC Activities in 2014

IAC 2014 evening NL
The NVR organised an International Astronautical Cognress evening on October 30th, where a selection of the papers from the Netherlands were presented. Peter gave an introduction of the IAC and reported on the IAF Alliance and Space Society Committee developments. The MoU signing between NVR and SGAC was highlighted here as well.

SGAC Young Space Professionals in Europe Workshop at ESA ESTEC
Partnering with the ESTEC Staff Association Committee (ESTEC SAC) that had scheduled an ESTEC Focus Day on Young Space Professionals, SGAC and Young ESA organised the Space Young Professionals in Europe Workshop, on the ESTEC/ESA premises in the Netherlands.
After a full ESTEC workday, everyone could relax with a drink and network at ESCAPE social centre. The day closed with an informal dinner organised with the help of Eric Wille of Young ESA and Luisa Carbone of SGAC. More than 40 people of all ages and backgrounds with interest in space attended the gathering.

SpaceBorrel, Leiden/Delft
In March and June the Netherlands Space Society (NVR) organized the SpaceBorrel (Space social). While enjoying a drink, professionals in the Dutch space industry, SGAC members, NVR members and others interested in space have the opportunity to catch up with each other and network.

SGAC Get Together, Leiden
In March, a large group of SGAC members and NPoCs gathered in Leiden. Together with organisers Chris Vasko and Andrea Jaime, everyone had a good time and learned that a lot of Europe's NPoCs live in the Leiden/Amsterdam area. This Get Together strengthened the network.

SGAC at the Nacht van de Nacht (Night of the Night, night about light pollution)
On October 25th, the nationwide event Nacht van de Nacht was organised. During this night many events take place to draw attention to light pollution. NPoC Susanne Pieterse was in Otterlo for a large event with Natuurmonumenten, an organisation for protection of the environment, and astronomy society Astra Alteria. The booth of the astronomy society was used to also advertise SGAC.

SGAC - NVR MoU signing
Over the summer period a MoU was drafted that was intended to formalise the cooperation between SGAC (NL) and NVR. The MoU was signed during the IAC in Toronto. Using the NL talk list, the intention is make the SGAC community in the Netherlands aware the NVR activities

Looking Ahead: Plans for 2015

In the 2013 annual report, NPoCs formulated an action plan. The NPoCs have already accomplished several major action items; remaining actions include:

- Improve SGAC brand awareness
  - (Further) introduce SGAC to (potential) interested parties, including
    - Youth Association for Astronomy
    - Students of the International Institute for Air & Space Law
    - Students in space (engineering) studies at TU Eindhoven, VU Amsterdam, Universiteit van Leiden, Universiteit Twente and Universiteit Utrecht
    - EuroAvia Delft
    - Young professionals in and around ESA's ESTEC
  - Promote SGAC in the Netherlands Space Society (NVR)
- Improve communication to, from, and among Dutch SGAC members and SGAC around the world:
  - Use of social media (e.g. @SGACNL) for general announcements of SGAC announcements and events andDutch space events
  - Promotion of contacting NPoCs for question ideas etc.
- Organise or support events such as SpaceUp and Socials
- Further develop cooperation with Dutch space societies including 'VSV Leonardo da Vinci' and 'Vis Viva'

The first steps have been taken for SGAC brand awareness with NVR. For awareness among students, it is planned to have an event. This event can also be used to have closer cooperation with the VSV and other students in the Netherlands.
To improve communication a twitter account and NL email list have been established and frequent use has still to become routine.
SGAC members were invited to the Space Drinks with the Space Up event taken place in the meantime.
For the next year, the NPoCS will continue on the actions by using the newly established communications means. The major event that will be worked on with NVR (and other parties) is an evening to introduce students throughout the Netherlands to the space societies in the Netherlands.

NORWAY

SGAC is not yet well known in Norway, so the main focus for National Points of Contact (NPoC) Tale Sundlisæter and Roger Birkeland is to prepare information for students and young professionals about SGAC, as well as other relevant space related topics. The Norwegian University of Science and Technology (NTNU) started a portal web page for young people to aggregate information about space related education from high school to university level, as there is no special space education in Norway, with few exceptions. It is often hard for students to find information both about studies and later about job openings. For the international part of this, SGAC should be a natural collaboration partner. At NTNU, SGAC Norway is recruiting people for the SGAC and the Space Generation Congress as it is challenging to build awareness at universities that not yet have active members.

National Space Perspective

The government issued a report assessing the Norwegian use of space last year. This overview looked very promising, especially with regards to the use of systems surveying maritime areas. Unfortunately, the government did not follow up on the report this year: the Norwegian space centre faces reductions in funds for industry development and research and Norwegian contribution to Copernicus is gone at the moment, although this might change in the revised budget, published after the deadline of this report.
Norway is planning a series of small satellites whose main purpose is to secure shipping Automatic Identification System (AIS) services that are currently handled by AISSat-1 and 2. The AIS-payload will be the prime payload on any launch, but it could provide an opportunity for universities and companies to propose secondary payloads. NPoCs for Norway are establishing connections to continue national student satellite activities and initiatives.

SGAC Activities in 2014

Norway welcomed Roger Birkeland as NPoC this year, and together with current NPoC Tale Sundlisæter presented SGAC at NTNU to recruit more members and increase awareness of the organisation. Roger Birkeland also participated in the workshop for the SGAC ESA Ministerial Position Paper.

Looking Ahead: Plans for 2015

- Increase awareness of SGAC: find contact persons at other universities in addition to NTNU and find younger candidates for NPoCs.
- Complete the space education information portal.
- Recruit students to participate at Space Generation Congress and the International Astronautical congress.
- Investigate possibilities of organising an event.
- Cooperate with space-related institutions.

POLAND

Poland joined the European Space Agency (ESA) at the end of the 2013 and became the 20th member of the agency. Full membership in ESA gives a big boost to the space industry in Poland, mainly by giving an opportunity to participate in most of the ESA space programmes for private entities, research institutes and students.
As Poland is in the early phase of development, new space sector organisations and building cooperation is not attractive as competing countries, and so SGAC activities in Poland does not yet have a strong foundation. The National Points of Contact (NPoC) for Poland in 2014 are Jarosław Jaworski and Szymon Moliński.

National Space Perspective

Space and Politics:
- The government accepted the Polish Space Agency, POLSA. The headquarters of the agency are located in Gdańsk city
- The Ministry of Economy finally approved the Country Plan for Development of Space Sector
- Poland joined the European Southern Observatory (ESO)

Launches:
- The second satellite of the BRITE constellation, Hevelius, was successfully launched in August.

Activities:
- Polish edition of Galileo Masters Programme (ESNC – European Space Navigation Competition)
- European Rover Challenge organized by Mars Society Polska
- Many smaller conferences, workshops, seminars across Poland

SGAC Activities in 2014

Young people have few opportunities to get involve in hands-on, space-related projects in Poland and there are few active associations that lead their own projects or are involved in ESA Educational Programmes. In 2014, NPoCs for Poland participated in following events:
- Astronautical Meetings in Opole city with astronautical lectures;
- How to start acting in Polish Space Industry workshops

NPoCs worked on creating a network across Poland and helping two small new enterprises from the Earth Observation/Navigation sector.

Looking Ahead: Plans for 2015

Build a cooperation forum for Polish astronautical organisations
- Recruit new members for SGAC from Poland
- Promote SGAC competitions in Poland
- Participate in astronautical conferences and promoting SGAC

PORTUGAL

14 years have now passed since the establishment of the first Portuguese space companies, most of which were founded by young entrepreneurs. Today, the Portuguese space industry has grown and is established, recognised, and innovative, and covers all mission phases ranging from preliminary studies to hardware manufacturing or operations. A considerable number of young professionals and university students, however, leave the country at some point in their studies or professional careers to look for improved learning and enhancement of their skills. SGAC Portugal's goal is therefore to keep Portuguese students and young professionals connected and engaged, regardless of how and where they pursue their space careers.

Although the country is still recovering from the financial crisis that had some impact on nearly the entire Portuguese society, 2014 has been another year where the space sector has generally been strengthened and consolidated. Still, there is room for improvement as far as space strategic and political thinking is concerned. From the Portuguese SGAC's perspective there is still some margin for improvement regarding interaction, establishing communication links and collaboration between the main national space players, as it seems the sector to be a segmented into different sub-sets, such as: industry, academia, space policy, scientific education outreach, and general public. The younger generation can help bridge this gap.

National Space Perspective

2014 was a very active year for SGAC in Portugal. The country's industry is gaining more relevance at the European level and it is becoming a strong and reliable partner for prime companies. Portugal is now a member of ESA's Business Incubator Centres (BIC) network, an important step for the development of the national industry that will allow the continuous emergence of new companies such as Active Aerogels and Present Technologies. The national funding agency for science, research and technology (FCT) is the organisation that centres all the national space activities, and continues its charge of management of Portuguese participation in ESA.

SGAC Activities in 2014

A variety of events took place in Portugal throughout 2014 ranging from holding renowned international conferences to the creation of entities paving the way for improved space capabilities, especially in education and outreach.

Conferences

- **European Planetary Science Congress, Cascais, 07-12 September 2014**
  591 participants from 27 countries attended the European Planetary Science Congress 2014. It provided an excellent platform to present results, develop new ideas and network within the European planetary science community, covering the whole scope of planetary science
- **GNC 2014, Porto, 2-6 June 2014**
  The 9th International ESA Conference on Guidance, Navigation & Control Systems addressed international participants from the Aerospace Industry, Academia, Equipment Manufacturers and Space Agencies.
- **IAU Symposium 306: Statistical Challenges in 21st Century Cosmology, Lisbon, 25-29 May 2014**
  This Symposium helped to build bridges, establish fruitful collaborations, and to provide a natural discussion forum for both communities.

ESERO Portugal
ESA's European Space Education Resource Office (ESERO) in Portugal was founded in 2014 and marks yet another important milestone in space education and outreach in the country. It is based in the Pavilhão do Conhecimento, Lisbon, and it is co-funded by ESA and Ciência Viva (CV), the largest national science outreach entity. The office aims to provide a direct link between ESA and the national education community (students and educators), allowing the agency to support the education community with information, materials and activities geared towards science, engineering and space exploration.

5th Portuguese Space Forum
The 5th Portuguese Space Forum was held on November 5, 2014, in Lisbon, a joint initiative between FCT, Instituto Pedro Nunes (IPN) and CV with special collaboration from ESA. It aimed to showcase more than a decade of developments in science, technology and innovation in the Portuguese space sector. Underscoring this objective, the Space Forum has included the launch of the BIC initiative, targeted at promoting creation of start-ups in space technology transfer to non-space markets. Portuguese NPoC Hugo André Costa, Portuguese NPoC attended the event.

Launch of ESA BIC Portugal
IPN secured an investment of €8 Million from Coimbra, aiming to implement and coordinate the ESA BIC on a national scale. It will be developed with the support of the Science and Technology Park of University of Porto (UPTEC) and DNA Cascais. It should support 30 companies based in Portugal and foster the creation of 120 jobs over the next five years. Each start-up may be given financial, technical and business help for a maximum period of two years.

Establishment of the Astrophysics and Space Science Institute
The two largest Portuguese Research entities in Astrophysics, CAUP and CAAUL, have announced their unification originating the Astrophysics and Space Science Institute (Instituto de Astrofísica e Ciências do Espaço). This is a firm step towards the consolidation of research activities, education and outreach in astronomy and astrophysics in Portugal, while strengthening the future national participation in large international projects within the space science arena.

World Space Week 2014
World Space Week was a fertile week across the country, with many space activities. A list can be found on its webpage: *http://www.cienciaviva.pt/esero/semanaespaco/*

Galileo: new satellite tracking station implementation in Santa Maria, Azores
The latest addition to Galileo's worldwide ground infrastructure has been made in the mid-Atlantic, on Portugal's Santa Maria Island in the Azores. This new Galileo Sensor Station joins a far-flung network of stations monitoring signal quality, clock timings and positioning of the Galileo satellites orbiting Earth. Azores' Regional Secretary of Tourism and Transport Vitor Fraga and ESA's Galileo Ground Segment Procurement Manager Syvain Loddo presided over the formal opening ceremony on March 26th, 2014.

Looking Ahead: Plans for 2015

- Organise the first SpaceUp unconference in the first half of 2015 in Lisbon.
- Organise Yuri's Night in Lisbon
- Represent SGAC at CanSat Portugal 2015, May 2-3 2015, Aeródromo Municipal da Praia de Santa Cruz - Torres Vedras
- Mission X 2015
- Continue SGAC Portugal efforts to increase awareness of SGAC among the national community.

ROMANIA

Romania's involvement in SGAC is continuously increasing. This section details the events that occurred this year in Romania, including the involvement of Romania in international projects at SGAC.

National Space Perspective

- The Romanian Space Agency (ROSA) signed the Multilateral Agreement for the Euclid mission during the Science Program Committee meeting on 28th November 2013, in Paris.
- The magazine Physics World gave researchers working on the ESA Planck mission the distinction of 'Top 10 Breakthrough of the Year 2013' for the precise measurement of the cosmic microwave background. Researchers at the Institute of Space Sciences (ISS) in Magurele, Romania involved in the Planck mission are Lucia Popa and Ana Caramete.
- Three researchers from the ISS in the Platforms of Physics Magurele proposed a unique fingerprint to identify microscopic black hole decay – black holes of very small quantum, the existence of which is still hypothetical.
- On March 13th, 2014, Romania was officially accepted as a full member state of the international collaboration 'Pierre Auger Observatory.'
- A team composed of Romanian student Manuel Ciosici and three Danish students won the first prize of the third annual ESA App Camp. The event took place at ESA's European Space Research Institute (ESRIN) in Frascati, Italy and gathered twenty app developers from 11 countries.
- Marius Ioan Piso, President of ROSA, participated in the 65th International Astronautical Congress, held in Toronto, Canada, from 29th September to 3rd October.
- Romania is leading the way in an ambitious project to build an instrument to detect and monitor tiny particles suspended in the air. The new 'lidar'– the first of its kind in Europe – is set to contribute to ESA's satellites that focus on the atmosphere.

SGAC Activities in 2014

- European Space Expo (19th – 27th April 2014): The European Space Expo is a touring exhibition showcasing the flagship European Space programs: Copernicus, Galileo, the European Geostationary Navigation Overlay Service (EGNOS), and their benefits and applications. NPoCs for Romania Corina Ştiubei participated as local support, working on the language barrier between the organisers, and also acted as booking coordinator for schools in Craiova and Dolj County.
- SGAC Find an Asteroid Search Campaign 2014: NPoC Corina Ştiubei was the leader for team consisting of Ionut Cristian Perederic (Romania), Helio Dutra (Brazil) and QuyenAnh Nguyen (Vietnam). They discovery of an asteroid called CQD0002. Another team with a Romanian member also made a preliminary discovery.
- Researchers Night (26th September) was celebrated through major events in 17 cities in Romania. The event was divided into zones (Info-point, hands-on, scene, sci-fun, sports) where visitors were able to see and also perform various experiments.
- World Space Week (4th – 10th October): There were 89 Events registered in the country, most of them in schools and high schools.
- Romanian Team names Marinbica asteroid: Last year SGAC's NEO Project Group held the Name An Asteroid Campaign, which called for submissions to name an asteroid. The Romanian team named the asteroid in memory of the late professor Marin Dacian Bica, a Romanian professor of physics and astronomy, and a popular tutor to Romanian middle school students participating in International Astronomy and Astrophysics Olympiads. The team included Cristian Lazar, Ioana Tatarciuc, Daniel Cosovanu, Rares Iova, Alexandru C, Jessica A, Alina M, Roxana, Ignat O, and Simona C, all from Romania.
- Researcher of the Institute of Space Science, awarded by the European Geosciences Union (EGU): Catalin Negrea, researcher of the Institute of Space Science (ISS) within the Laboratory of Space Plasma and Magnetometry won the award for the best poster presented by a student (Outstanding Student Poster – OSP) following the annual conference of the EGU held in Vienna from 27th April to 2nd May 2014. Catalin won the OSP award with Gravity Wave Detection Methodology Using Dynasonde Data, and is the second researcher of the ISS to win this prize.

Looking Ahead: Plans for 2015

- Organise events for Yuri's night
- Organise more events for Space Week
- Attract more members and keep track of current members
- Involve and participate in more SGAC events
- Promote SGAC within the network and obtain sponsorships for organising event

RUSSIA

Many important space-related and educational events took place in Russia in 2014. Construction on the Vostochny spaceport continues, with Tsiolkovsky city also being built nearby. Ekaterina Rezugina completed her term as National Point of Contact (NPoC), having made a great contribution to development of SGAC in Russia. SGAC Russia welcomed a new NPoC, Marina Baldina.

National Space Perspective

Russia still takes the first place in executed launches of carrier rockets. In 2014, Russia was the only country to deliver crews on manned spacecraft to the International Space Station. The reform of the space industry proceeded this year, including the incorporation of state space enterprises and their transference to the United Rocket and Space Corporation. Testing of the light-class carrier rocket Angara 1.2PP also took place this year, and made a successful ballistic flight from Plesetsk spaceport to the range on Kamchatka.

SGAC Activities in 2014

CanSat Russia
CanSat Russia took place for the third time this year. It is an innovative educational project to launch school satellites. NNIIYAF MGU and the Memorial Cosmonautics Museum organised the project. The CanSat concept is a real satellite model weighing only 350 grams, composed of a power supply, satellite computer and scientific payload. Applications for the next championship closed in November. 51 school teams starting out from Yakutsk and up to Minsk participated in the 3rd Russian Championship. More information may be found at: *http://roscansat.com/cansat-russia/*

From 15th September to 12th October, the All-Russia tournament on modelling of Orbita spacecraft was held within the All-Russia Science Festival. Nearly 650 pupils from grades 8-11 from 30 regions of Russia attended the Orbita game.

RocketFests were held in the Moscow and St. Petersburg regions. Students and adults interested in amateur rocketry could launch their model rockets.
(http://raketoff.ru/)

The Fundamental and Application Space Research Conference (XI Conference for young scientists) took place from 9th to 11th of April in the Space Research Institute. *(http://kmu.cosmos.ru/)*

The 20th Scientific and Technical Conference of Young Specialists took place from 10th – 14th November at the S.P. Korolev Rocket and Space Corporation "Energia" in 2014. *(http://gagarin.energia.ru/past-future/202-xx-nauchno-tekhnicheskaya-konferentsiya-molodykh-uchenykh-i-spetsialistov.html)*

Looking Ahead: Plans for 2015

- Create a Wikipedia entry for SGAC in Russian.
- Cooperate with the Federation of Astronautics of the Russian Federation (http://fkr.spb.ru/)
- Popularise astronautics together with other space-related enthusiasts and organisations.
- Participate in the creation of the Russian Interplanetary Community.https://www.facebook.com/RussianInterplanetarySociety
- Inform more people about SGAC competitions and events SGAC through the Russian media and network resources
- Update the Russian SGAC page

SERBIA

Although there is very low interest in space and space-related sciences, efforts are underway to bring space studies into universities in Serbia. The country does not have any agencies or institutions relating to the space sector and only a few universities have courses partially related to space. Serbia, however, does have the potential to successfully engage in space technology, as there are various professionals from different fields that Serbian universities regularly produce. With some motivation and work, space can thrive in Serbia too.

SGAC Activities in 2014

To promote the space sector in Serbia, NPoCs held talks and discussions with students and professors from universities and with professionals from different technical fields. The aim was to raise interest and gather a number of people with enthusiasm for space technology and sciences but unfortunately, the number is still low.

Looking Ahead: Plans for 2015

The first step will be to continue with the search for space enthusiasts and continue regular contact. Currently, direct communication seems to be the most convenient approach, even though it is slow. With enough interested people, it would be beneficial to organise a section or association for space related matters. This should be the next step toward greater popularisation of the space field in Serbia.

SLOVENIA

Although Slovenia is one of the smallest European Union (EU) countries, its space related history is quite interesting. As early as 1928, Herman Potočnik Noordung, a Slovenian rocket engineer and pioneer of cosmonautics, published his sole book, Das Problem der Befahrung des Weltraums - der Raketen-Motor, The Problem of Space Travel - The Rocket Motor, in Berlin. In this book, Potočnik set out a plan for a breakthrough into space and the establishment of a permanent human presence there. Eight decades later Slovenia decided to continue its space adventure by joining the European Space Agency (ESA) as a cooperating State. The SGAC National Point of Contact (NPoC) for Slovenia is Žiga Valič.

National Space Perspective

In January 2010, Slovenia joined ESA as a cooperating State, but has not yet established a space program or a national space agency. Nonetheless, some activities in the field of space industry are happening. A Slovenian consortium, the Centre of Excellence Space-SI (CE Space-SI), was established the same year, consisting of many important Slovenian companies and academic institutes working in the field of space technology and science. Its primary goal is to support Slovenia in the process of joining ESA and to reduce the long lasting gap between space research and technical development levels in Europe and Slovenia. 46 researchers and engineers are working in the following fields:

- Remote sensing
- Meteorology
- Astrophysics
- Micro- and nanosatellite technologies
- Collaboration in international space missions
- Development of a multidisciplinary laboratory for testing space technologies
- Satellite communications, hybrid antennas and radar technologies
- Transfer of space technologies to terrestrial applications

SGAC Activities in 2014

SGAC Slovenia has helped a Slovenian company, the Satellite Telecommunications Network (STN), establish contact with ESA as well as with Slovenian authorities to discover new opportunities that could help the company to expand their business on a European level.

Looking Ahead: Plans for 2015

- Given the harsh austerity measures that affect space activities in Slovenia, the main objective is to raise awareness of the value of space activities
- SGAC will offer support to students and interested in space and motivate them to join SGAC
- The NPoC for Slovenia aims to bridge the gap between space sector in the country and other European organisations
- SGAC Slovenia will promote all upcoming events with students

SPAIN

SGAC Spain is made up of space university students and young professionals interested in making a contribution to the enhancement of space education and training opportunities, as well as encouraging awareness of space activities. Currently, two National Points of Contact (NPoC) represent Spain: Abigail Calzada who finishes her term as NPoC in December 2014 and Jorge Diaz. The group has an email list of members where activities and news within the country are communicated.

National Space Perspective

Spain does not have a national space agency, however, the National Institute of Aerospace Technology could be considered as its space organisation. Spain has been a member of the European Space Agency (ESA) since 1979 and the ESA European Space Astronomy Centre (ESAC) is located in Madrid. Spain participates in practically all ESA missions and technology development, among other activities.
Several aerospace companies are located in Spain: Airbus Defence and Space, Arianespace, Starsem, GMV and also at least one company working on near-space tourism, Zero2infinity.

SGAC Activities in 2014

During the first half of 2014, NPoC Abigail Calzada, SGAC Spain member Marc Dayas, and members of SGAC UK proposed an SGAC Project Group to address the future of space exploration. The creation of this group was successful and the group published an article in Space Policy Journal: Calzada-Diaz A., Dayas-Codina M., MacArthur J L., and Bielicki D M. Role of the current young generation within the space exploration sector. Space Policy. Special Issue on the Global Exploration Roadmap. 2014.

During the second semester of 2014, NPoC Abigail Calzada organised 2 outreach activities, both in the University of Oviedo:

- An exhibition about the exploration of the moon during the International Lunar Observation Night (6 September 2014).
- A talk about space exploration and remote sensing for master students.

Finally, SGAC Spain is now part of the Steering Committee of the Spanish Planetology and Astrobiology Network (Red Española de Planetología y Astrobiología: *http://www.icog.es/redespa/index.php/comite/).* Being part of this committee opens the doors to collaborations with other Spanish institutions, organisations, and universities, as well as providing visibility to our organisation.

Looking Ahead: Plans for 2015

- Hold a minimum of three outreach activities in the country.
- Improve collaboration with other student organisations, and identify and define projects for joint work.
- Establish a schedule of meetings and encourage members to participate.
- Develop a strategy to improve relationships with the private sector and space companies in the country.

SWEDEN

Sweden is a growing space nation with several companies specialising in areas from satellites to sounding rockets. The Esrange Space Center in Kiruna, in the north of Sweden, has launched over 500 sounding rockets and 550 stratospheric balloons since its founding in 1966. Sweden contributes to the European space sector through several companies working on European Space Agency (ESA) projects. SGAC Sweden hopes that the space sector will grow further in Sweden and that our work will make more people interested in space related topics.

National Space Perspective

The Swedish National Space Board is the central government agency responsible for national and international activities relating to space and remote sensing and its primary focus is on research and development within the space sector. The Swedish space program is carried out by means of extensive international cooperation, in particular through Sweden's membership of ESA. Sweden also has several space companies of which the biggest are Swedish Space Corporation, OHB Sweden, ÅAC Microtec AB, RUAG Space AB and GKN Aerospace.

On the educational side, Sweden has several universities that offer studies in space related topics including the Space Master program at the Luleå University of Technology and the Space Engineering program at the Royal Institute of Technology. The Royal Institute of Technology recently inaugurated the new KTH Space Center, which among other things is planning to build and launch the first Swedish student-built CubeSat.

SGAC Activities in 2014

Review in Populär Astronomi
From their prior contact with the Swedish space magazine Populär Astronomi, the National Points of Contact (NPoC) for Sweden reviewed two new Swedish space books for the magazine. The books, Raketer i Vildmarken and Raketernas Guldålder, are written by Swedish space pioneer Sven Grahn, who gathered information about the history of Swedish rocketry from 1961 to the present day.

SpaceUp Sweden
The NPoCs of Sweden organised SpaceUp Sweden, held at KTH Alba Nova in Stockholm on October 18th. It was the first time a SpaceUp was held in Sweden, and included great speakers, engaging topics and a diverse group of participants. The event gathered about 80 space enthusiasts.

SpaceUp was an all-day event, in which the morning was dedicated to speakers from industry and government. During the afternoon the participants, got to shine and share their thoughts and ideas in short, interesting talks and discussions in smaller groups were held. High-calibre space profiles from Sweden attended the event including:

- Swedish astronaut Christer Fuglesang
- Swedish space pioneer Sven Grahn
- General director of the Swedish National Space Board Olle Norberg

This was a great opportunity for people to visit Stockholm discover the state of the Swedish space industry, hear what it is like to perform a spacewalk from a real astronaut, and meet people that shared an interest and enthusiasm for space. SpaceUp Sweden was a great success and the participants that communicated with the NPoCs of Sweden were almost exclusively positive to the event and asked about a new event during 2015. Through sponsor contact when organising SpaceUp Sweden, the SGAC got exposure in the Swedish industry and academia. Positive voices were heard about the work SGAC was conducting in Sweden.

Looking Ahead: Plans for 2015

- Inform the public about SGAC at universities and in industry
- Inspire the younger generation towards careers in the space industry
- Continue the dialogue with space companies, research organisations and space media outlets in Sweden
- Update the Swedish SGAC webpage with an events calendar for 2014
- Help to organise SpaceUp Sweden 2015

UKRAINE

The year in Ukraine was not as easy and simple as previous years, partly due to political and economical crises and military confrontation. Conferences were partly reduced and some were changed. Despite these problems, Ukrainian students did their best to succeed at domestic and foreign conferences, competitions, seminars and forums. A new All-Ukrainian competition started this year, and allowed students and young professionals to attend the SGC and IAC. It is a great achievement, and happened due to effective work of the Council of Young Ukrainian Space Industry Workers, especially Dmytro Faizullin as the head of the international cooperation department and National Point of Contact (NPoC) for Ukraine.

National Space Perspective

Ukrainian specialists conducted an efficient year in the development of space rocket hardware, science and international cooperation in spite of internal and external problems faced by the country. The most impressive events are as follows:

- On November 6th, 2014, the commercial launch of the Dnipro launch vehicle (LV) was successfully performed from Yasny Launch Base (Russian Federation) with the Japanese ASNARO earth remote sensing satellite and 4 microsatellites.
- The International Air Show Aviasvit-XXI was held from September 24th – 27th, 2014 in the International Exhibition Centre in Kyiv. The international aerospace exhibition was held at the same time as, and in a single format with, the XI International Specialized Exhibition Arms and Security - 2014.
- On July 13th, 2014, the Antares LV was successfully launched from Wallops Flight Facility (USA). The Antares launch vehicle placed the Cygnus cargo spacecraft into orbit that delivered equipment to the International Space Station (ISS), including the equipment necessary for operation of the station. The Antares LV Stage I Core Structure is developed by Yuzhnoye State Design Office, and manufactured by Yuzhny Machine-Building Plant in cooperation with Ukrainian companies Hartron-ARCOS (Kharkov), Kievpribor (Kiev), Hartron-YuKOM (Zaporozhye), ChEZARA, RAPID (Chernigov) and others. Ukrainian specialists participated in prelaunch and launch operations.
- On June 19th, 2014, the commercial launch of the Dnipro LV was successfully performed from Yasny Launch Base (Russian Federation) with 33 satellites on board from 17 countries around the world. From this launch the first Ukrainian nanosatellite “PolyITAN-1” was successfully injected into near-Earth orbit. The PoliITAN-1 nanosatellite, developed by the National Technical University of Ukraine Kiev Polytechnic Institute, is a Ukrainian educational satellite designed for development and testing of engineering solutions, and payload testing in space.
- On May 27th, 2014, in the framework of the “Sea Launch” program, SLV Zenit-3SL was successfully launched from the floating platform “Odyssey” in the equatorial Pacific Ocean near Christmas Island. It launched the European spacecraft EutelSat-3B.

- On January 9th, 2014, the new Antares LV was successfully launched from Wallops Flight Facility (USA). The LV prime developer is Orbital Science Corporation (USA). The Antares LV put the Cygnus cargo spaceship into orbit to supply the ISS with cargo.

SGAC Activities in 2014

The National Centre of Youth Aerospace Education made an important contribution to the promotion of space science and space technology among pupils, students and young scientists. This organisation conducted the following event during 2014:

- **XVI International Youth Scientific and Practical Conference Human and Space.** This conference was held under the aegis of International Astronautical Federation from 9th – 11th April 2014. The conference organising committee received around 426 applications from prospective participants. The conference reaffirmed the high intellectual, technological and industrial potential of Ukraine and interest of youth in space science, space investigation, launch vehicle design, and work areas closely related to space.
- **The XII All-Ukrainian Research-Educational Conference of Pupils Star Way** took place at Dnipropetrovsk on April 15th, 2014. During the conference, young scientists presented and defended their original research works in various areas of astronomy, physics, natural phenomena and space ecology, technical creativity and rocket-space modelling, and computer technologies. Participants shared knowledge with their peers from different regions of Ukraine. The scope of the conference was, however, partly reduced because of the decree of the Cabinet of Ministers of Ukraine "To save public funds and non-admission of budget loss" from March 1st, 2014
- **Scientific Readings "Dneprovskaya Orbita"** took place at Dnipropetrovsk from 5th – 7th November 2014. The conference was devoted to the 100th anniversary of V.N. Chelomey's birth. V.N. Chelomy was a constructor of space-rocket hardware. There were presentations about various issues related to the humanitarian aspects of missile and space technology such as history, education, environment and the impact of space activities on human society development and worldview during the event. According to the proposal of Yuzhnoye SDO Council of Young Specialists, a new section entitled "Youth and Space" was added to the conference programme.
- Unfortunately this year, the **aerospace festivals "Suzirya-Artek" and "Suzirya-Laspi"** did not take place. One of the reasons was the festivals were conducted in Crimea, which was annexed, making the area unsuitable to hold the festivals. Another reason was again to save public funds.
- **The Council of Young Ukrainian Space Industry Workers** (CYUSIW) is an organisation that does a great amount of work to support, activate, and stimulate young professional activities and also to attract young people to space enterprises in Ukraine.
- CYUSIW and SGAC established a new Ukrainian competition entitled **"New Ukrainian Space Generation: Lift-off to International Orbits"**. Leonid Kuchma's charity fund "Ukraine" agreed to be a sponsor for the competition. Dmyro Faizullin and Mykola Gryshyn, NPoCs of Ukraine, were granted the scholarship to attend the 13th SGC and 65th IAC in Toronto, Canada.
- **IX sports contest of Ukrainian space industry enterprises youth** was held at Dnipropetrovsk. The primary contest location was the National Space Facilities Control and Test Center at Yevpatoriya (Crimea). For reasons previously listed, this location is not acceptable anymore.
- The **"Best young worker of Ukranian space industry"** competition was held to promote the best workers' professionalism and special contributions to production processes, science development, and social life of their enterprise and the Ukrainian space industry.
- The **5th photo contest among space industry enterprise worker** was held. The goals of this event were: to develop creative work and public activities of young workers, to show the life and activity of Ukrainian space industry enterprise workers, and to accumulate historical materials about them.

During the last year the following activities were held to popularise and promote SGAC:

- Reports about SGAC projects and possibilities for Ukrainian youth to participate in were presented at the Council of Young Ukrainian Space Industry Workers and Yuzhnoye State Design Office's youth council.
- Information was shared about SGAC events and programs using social networks.
- Cooperation with student's council of the leading space educational institutions in Ukraine.

Looking Ahead: Plans for 2015

Our future plans within SGAC for 2015 can be described by the following:

- To establish contacts with student's councils of Ukrainian space universities
- Looking for financial support for potential Ukrainian participants at SGC 2015
- To conduct scientific seminars, forums, sports contests and culture events in the frame of CYUSIW
- To participate at NAECY events organisation
- To present reports about SGAC and its events at the youth conferences in Ukraine

UNITED KINGDOM

The UK celebrated its 50th year as a space faring nation in 2012, and since then has been thriving. This is reflected in the space related activities, events and even academic courses offered in the UK. SGAC most definitely has a presence in the UK, but more could always be done to enhance it. The two current National Points of Contact (NPoC) are Akash Trivedi, a recent aeronautical engineering graduate and science teacher, and Kate Arkless Gray, a social media editor and freelance journalist. The UK section of the SGAC website can be found at *http://spacegeneration.org/index.php/en/sgac-regions/europe/united-kingdom*
and a UK-specific SGAC Twitter account has recently been created (@SGAC_UK).

National Space Perspective

The first British satellite was launched in 1962, and the British government's strategy for its space programme has always prioritised unmanned initiatives and space research over the human exploration of space. With the forthcoming mission of the first British ESA astronaut, Major Timothy Peake, there is likely to be a surge in interest around human spaceflight and the UK's involvement. For his first mission, Peake will spend six months on the International Space Station (ISS) from late 2015. The mission name, Principia, pays homage to another famous Brit – Sir Isaac Newton – and his Philosophiae Naturalis Principia Mathematica in which he describes the laws of planetary motion and universal gravitation.
The UK government set out a 20-year strategy to capture 10 per cent of the global space market by 2030, which is forecast to be worth at least £400bn. The UK government has also proposed its first spaceport, which will would host its first flight as soon as 2018, despite current setbacks in the commercial spaceflight domain.

The UK is also investing £25 million in an ESA mission, PLATO (PLAnetary Transits and Oscillations of stars), to seek out habitable planets around distant stars. It is likely to use British-built technology and involve several UK science teams. Another ESA mission, Rosetta, has been in the news recently: 10 years after its launch and after a three year "hibernation period", the Rosetta craft has been successfully reactivated. Rosetta's lander Philae, carrying the British Ptolemy experiment, achieved the first ever controlled landing onto a comet in November 2014, having successfully orbited its target comet, 67P, earlier in the year.

The UK Space Agency expects an increase in the number of proposals submitted by UK industry or research teams for the European Union Horizon 2020 funds. These are part of the government's ambition to significantly grow the UK space sector. This prospect is achievable given that the UK has the second largest Aerospace industry in the world.

SGAC Activities in 2014

Under the current leadership of UK NPoCs Kate Arkless Gray and Akash Trivedi, the SGAC in the UK has a growing Twitter following, an active indirect forum on Facebook, and has a fledgling presence in schools. There have been a host of space events in the past year, including some specifically aimed at the SGAC demographic and the UK has also had an input in SGAC activities internationally.

Akash's work has primarily been behind the scenes in maintaining the @SGAC_UK Twitter account and the network of university students on Facebook. In this manner, he has been able to raise awareness of SGAC goals, events and opportunities. Moreover, he has been able to promote relevant UK based events and activities to those who would most benefit from them.

In addition to this, in his role as a secondary school science teacher as part of the Teach First programme, he has been able to spread the word about the Space Generation to his colleagues around the UK and more importantly, to the next generation of SGAC members.

Kate led the organisation of the UK's first SpaceUP event in July 2014, hosting over 80 people during the weekend-long unconference in London and reaching over two million people via social media. News of the event even reached the international space station and the participants were delighted to receive a tweet from space and one from Mission Control Houston. Astronaut Tim Peake joined us remotely from Star City in Russia to answer questions on his forthcoming mission.

The UK Students for the Exploration and Development of Space (UKSEDS) held their annual conference in Leicester in March and the Royal Aeronautical Society's President's Conference focussed on space. Kate attended this conference, spoke about keeping sexism out of space at an event in London to mark International Women's Day, and also attended a couple of "Space Happy Hour" events at the US Embassy.

On the international stage, Kate attended both the Space Generation Congress (SGC) and the International Astronautical Congress (IAC) in Toronto, actively taking part in the sub-group on human exploration, policy, and ethics at the SGC. She presented a paper written by the SGAC Exploration committee at IAC, as well as a poster on a smartphone app to increase engagement with the ISS and a paper on using social media to promote space missions. Kate continues to blog about important events in space and has appeared on Sky News and the Space Boffins podcast.

Looking Ahead: Plans for 2015

- Represent SGAC at the UK Space Conference 2015
- Collaborate with UKSEDS in attracting members for both organisations and developing joint events
- Double the amount of Twitter followers on the @SGAC_UK account
- Promote the activities of the UK space industry and SGACs place in it to the next generation
- Continue to spread SGAC info, news, event details via the extensive student network assembled on Facebook
- Continue building interest and engagement around space themes, especially promoting SGAC activities
- Attend social and professional networking events and build stronger links between UKSEDS, SGAC and the public in the UK
- Actively support the SGAC Exploration group
- Become more actively involved with SGAC - offer to help develop and present documents
- Support Tim Peake's mission and its use as a tool for encouraging more people to consider STEM careers.

5.5 MIDDLE EAST

HIGHLIGHTS OF THE MIDDLE EAST REGION IN 2014

- H. Aziz Kayıhan *(Turkey)* ended his four-year term as Regional Coordinator for the Middle East
- Daniel Brack *(Israel)*, Amal A. I. Shaikhah *(Palestine)*, Ece Gülfem Dağdeviren *(Turkey)*, Burak Yağlıoğlu *(Turkey)* and Tareq Ahmed Abdo Hassan *(Yemen)* were appointed as NPoCs
- ITU UYARI Team was placed first among 39 teams at AAS/AIAA Annual Cansat Competition
- The 5th commercial communications satellite of Turkey, TURKSAT-4A, was launched on 14 February, 2014
- SGC 2014 Toronto had nine delegates from Middle East region
- Arif Göktuğ Karacalıoğlu *(Turkey)* was one of the winners of the third SGAC-IAASS paper competition and participated in the 7th International Space Safety Conference in Friedrichshafen in Germany
- Pouyan Azari *(Iran)* was granted IAF-ESL scholarship
- Tayebe Namayeshi *(Iran)* won best graduate student paper award of IAC 2014.
- Ali Nassery *(Iran)* took part in a simulated mission at MDRS
- Behnoosh Meskoob *(Iran)* was granted scholarship from PNT, Japan to participate in the International Summer School on GNSS in Tokyo, Japan
- Foad K and Homa Samanabadi *(Iran)* submitted the winning entry for Name an Asteroid Campaign: Asteroid 3988 was named HUMA.
- Israel successful launched Ofeq 10 SAR satellite this year and it is now working on the Amos 6 communications satellite
- The first high school student CubeSat Duchifat1 was launched and put in to operation, its successor Duchifat2 is being developed as part of the QB50 project and several high school student experiments have been launched to the ISS
- NPoC for Israel met with the head of the Israeli Space Agency and presented the SGAC and the SGC held in Israel in October 2015
- Egyptian government launched a new Nano-satellite with the cooperation with Russian for remote sensing
- Egyptian students of aerospace department placed third in Mars Rovers competition in Poland. Other team got the ninth place in University Rover Challenge competition in USA
- January marked the fifth anniversary Iran's first satellite launch, celebrated with a congress in Tehran and talks by Iranian NPoCs about SGAC, NEO group projects, FAA Campaign and how to join SGAC

Plans for 2015

The most important event in 2015 the Middle East region is the return of the International Astronautical Congress (IAC) after 21 years. The 66th IAC will be the second IAC organised in the region and will be the first time Space Generation Congress will be held in the Middle East. This will increase the publicity of space activities throughout the region. By leveraging the success of IAC and SGC, SGAC Middle East aims to increase activity among SGAC members and organise local space events such as SpaceUPs. In addition to SGC and IAC, the Recent Advances in Space Technologies (RAST) Conference will be held in Turkey in 2015.

EGYPT

Egypt has an ancient interested in astronomy and space, and nowadays, Egyptian students and young researchers continue these activities by participating in international initiatives relative to space and astronomy. Notably in 2014, Egypt joined African countries in developing African space policy and strategy, hosted meetings for the African union space working group in Cairo, and participated in earth observation and Afrigeoss initiatives.

Egypt joined SGAC in 2013 and is represented by two National Points of Contact (NPoC), each one with an interest in space. Ashraf Nabil is a student from Cairo University, and Ayman Mahmoud as young professional from National authority for remote sensing and space science. Each offers a unique perspective on space activities in the country as Ayman deals with professors and the national authority for remote sensing, while Ashraf interacts with undergraduate and post-graduate students.

National Space Perspective

Egyptian space activities in 2014 included:

- United Nations Office for Outer Space Affairs (UN OOSA) symposium in Mexico 2014,
- Egyptian university construction of a CubeSat for technology demonstration
- Government launch of a new Nanosatellite with Russian cooperation on remote sensing. This marks the first satellite launch since 2007.
- Engineers and professors from NARSS introduced three lectures to motivate the students in participating in the space revolution.

SGAC Activities in 2014

The Egyptian NPOC attended space science, technology and applications events including:

- UN OOSA 2013 in Dubai,
- Nano-satellite symposium 2013 in Japan
- African union space working group 2013 in South Africa
- GEO symposium 2014

NPoCs also participated in a series of space technology lectures delivered to universities students 2014. Aerospace students placed third in the Mars Rover competition in Poland and ninth at the University Rover Challenge (URC) in the United States (US). The team also participated in ARLISS in the US. Moreover, SGAC Egypt now has students representing the country in Japan at the second global UNISEC meeting and participating in Mission Idea Contest 3. Finally, the country has a new space department at the new Zewil's university, which will raise awareness of space activities among students.

Looking Ahead: Plans for 2015

- Attend UNOOSA 2015 in South Africa
- Participate in Afrigeoss implementation plan
- Help new students become acquainted with space technology
- Host an event related to space applications
- Attend GEO events
- Hold national Can-Sat competition for the students
- Improve ranking at competitions in which SGAC members participate
- Hold an event to introduce SGAC and illustrate its role to students
- Implement the final engineering model for the first based students Cube-sat in Egypt

IRAN

Safoora Tanbakoei and Mohammadreza Rezaei are National Points of Contact (NPoC) for SGAC Iran, and have conducted space outreach activities in the country. Mohammadreza is Senior Editor in Fazanavard (Astronaut), published by Astronautics Research Institute, while Safoora is Executive Secretary at online space magazine Spacemag.ir. They gave several speeches and programs in different cities to talk about SGAC and introduce themselves to Iranian students and young professionals

National Space Perspective

Iran is as a space power in the Middle East and seeks to develop a new generation of space launchers, Phoenix, that can launch between 500 to 1000 kg payload into low Earth orbit. These payloads include the communications satellites and manned spacecraft. Based on that program, Iran will send the first communications satellite into low Earth orbit within a decade and the first Iranian astronaut into space with a sub-orbital flight.

SGAC Activities in 2014

SGAC Iran members were successfully in multiple scholarship and research competitions, demonstrating the talent of the young space generation:

- Pouyan Azari won an International Astronautical Federation-ESL scholarship
- Tayebe Namayeshi won the best graduate student paper award of International Astronautical Congress 2014.
- Behnoosh Meskoob was granted scholarship from PNT, Japan to participate in the International Summer School on GNSS in Tokyo, Japan.
- S Ali Nasseri obtained a position in a simulated mission at Mars Desert Research Station (MDRS).

Name an Asteroid Campaign
The campaign to name an asteroid concluded with Homa Saman-Abadi's winning suggestions of 'Homa,' a bird that brings happiness. The NPoCS for Iran wrote about this exciting event in multiple forums including in the Astronomy (Nojum) magazine featuring an interview with SGAC's Alex Karl.

National Space Technology Day 2014
January marked the 5th anniversary of Iran's first satellite launch, and commemorated the day with a congress in Eshragh Farhangsara in Tehran. NPoC for Ian Safoura Tanbakouei talked about SGAC, Near Earth Object (NEO) group projects and introduced the FAA Campaign to public and students. NPoC Mohammadreza Rezaei gave a speech about astronauts on the International Space Station and he invited enthusiastic people to join SGAC.

First Aerospace Student Festival in Tehran University
This festival was established by the Department of Science and Technology in Tehran University from March 2nd to 4th, and included hovercraft competitions, gliders, programming and fiction. Workshops were also held on the operating principles of aircraft, navigation and image processing satellite.

13th Conference Iran Aerospace Society
The conference was held on 4 to 6 March 2014 in Tehran University. The main topics of the conference were aerodynamics and propulsion, aerospace structures, science and technology, space and aeronautics.

Public Night Sky Observation
On February 8th at the Public Night Sky Observation in Adib Astronomy Center, Isfahan, NPoCs Safoura Tanbakouei and Mohammadreza Rezayi talked to students and the public about SGAC, introduced NEO group projects, its goals and activities and the FAA Campaign. These efforts successfully recruited new students to be members of SGAC.

Student Meeting in Arsanjan
March 3rd, 2014 at the scientific congress in Arsanjan Azad University, Shiraz, Mohammadreza Rezaie talked about CubeSats and small satellite group in SGAC. Safoura Tanbakouei gave a speech about NEO group projects for university students and teachers.

Yuri's Night 2014 in Iran
This year, Yuri's Night celebrations were held in over 10 cities: Tehran, Isfahan, Shiraz, Tabriz, Ardabil, Gonbad Kavous, Sari, Delijan, Ahwaz, Yazd and Mehriz.

- NPoCs Mohammadreza Rezaie and Safoura Tanbakouei attended four programs in Iran, Tabriz, Tehran and Isfahan.
- Mohammasreza Rezaei gave a speech about Cubesats and Nanosatellites group of SGAC in Tabriz.
- In Isfahan, Adib Astronomy Center held a festival to celebrate Yuri's Night with about first astronaut Yuri Gagarin.
- At Eshragh Farhangsara in Tehran, Mohammadreza Rezaei attended the Space Society of Iran's first meeting congress highly motivated about Yuri's Night.
- In Isfahan, Safoura Tanbakouei gave a speech about NEO group projects, asteroids, FAA campaigns and how to work with Astrometrica.

World Space Week programs in Iran
World Space Week 2014 was held in Tehran, Tabriz, Kashan, Sari, Isfahan, Azerbaijan and Shiraz through congresses and space exhibitions by students, magazines, astronomy societies and groups.

- **Tehran:** Nojum (Astronomy) monthly magazine held a program with scientific journalists speeches from Cyrus Borzu, Siavash Safarianpour and Kazem Kookaram about living in space, Mars rovers, future space explorations and space crafts sent to comets. Also a space exhibition showed the space equipment of astronauts and how they live in space.
- **Isfahan:** Adib Astronomy Center had a video show about living in Mars that is a part of The Universe documentary. NPoCs of Iran also made a small booth and talked about YGNSS and navigation satellites.
- **Kashan:** Sepeher Kashan Astronomy Group had a special workshop that was about space outreach activities and the importance of aerospace engineering for universities.
- **Other cities:** Many other cities organised painting and writing matches, rocket design and contrustion, new ideas and plans in space sector with school and university students

Looking Ahead: Plans for 2015

- Hold National Space Day in Iran with special guests including Russian astronauts in February 2015
- Launch sounding rocket or satellites from Iran in February 2015
- Assist with the Iran Aerospace Society Conference in March 2015
- Participate in Yuri's night and Astronomy Day festivals in April 2015
- Hold World Space Week events in October 2015

ISRAEL

During the early years of the SGAC, Israeli members held several SGAC related activities such as Yuri's Night, however, for the past few years Israel has not been active in the SGAC due to the lack of National Point of Contact (NPoC).

National Space Perspective

Israel has a wide variety of space related activities this year: the largest satellite company successful launched Ofeq 10 SAR satellite and is working on Amos 6 communications satellite. Several other satellite projects are under development such as Venus microsatellite with the Centre National d'Etudes Spatiales (CNES), and the SHALOM hyperspectral satellite with the Italian Space Agency (ASI).
In education, the first high school student CubeSat Duchifat1 was launched and put in operation, going on four operational months, and its successor Duchifat2 is under developement as part of the QB50 project. Several high school student experiments have also been launched to the International Space Station.
Finally, Israel has the privilege of holding the 66th International Astronautical Congress on October 12-16th 2015, and the opportunity to host the International Space University's Space Studies Program in summer of 2016.

SGAC Activities in 2014

Israel appointed a new NPoC in August 2014, Daniel Brack, and he is working to rebuild the SGAC member network by networking with university students, young space professionals and the general public. He also met with the head of the Israeli Space Agency and presented the SGAC and the Space Generation Congress (SGC), planned for October 2015.

Looking Ahead: Plans for 2015

- Rebuild SGAC network and contact list by introducing SGAC to students and young professionals
- Gather a local organizing committee for SGC15
- Organise SGC15 venue, local sponsorships and local participants
- Participate in Israeli space activities such as Israeli space week, Yuri's night, and Ilan Ramon Conference
- Encourage Israeli participation in the Space Generation Fusion Forum and find sponsorship for participants

LEBANON

Lebanon has a long history of astronomy with the Phoenicians, native inhabitants of modern day Lebanon, being the first people to use the North Star to guide their exploration of the oceans and seas over 4000 years ago. With such formidable navigation skills, they were the first sailors to cross the Cape of Good Hope and make a turn around the African continent. Astronomy has long been a popular activity in Lebanon due to favourable weather that allows clear skies. Additionally, the mountains offer great observation sites with the added advantage of having no light pollution. Despite the extensive lack of resources in the country, many Lebanese have made a name for themselves in space activities at home and across the world.

National Space Perspective

From 1960 to 1966, Lebanon started its space activities with a group of young motivated scientists building and testing rockets in Haigazian College, today's Haigazian University. They formed the Lebanese Rocket Society, and following their initial success, the programme was supported by the state of Lebanon and experiments were conducted with the supervision of the Lebanese Army for security purposes. Although Lebanon has not officially been an active member in international space development due to the devastating war since the 1970's, the Lebanese diaspora across the globe has provided numerous contributions in the space field. The magnitude of Lebanon's contribution is notable especially when taking the country's small size into account. Here are only a few notable Lebanese figures in the space field:

- **Charles Elachi**, Head of NASA's Jet Propulsion Laboratory
- **Fred George**, newly appointed member of the Space Advisory Board
- **Edgar Choueiri**, noted researcher in plasma propulsion
- **George Helou**, Director of the NASA Herschel Science Center
- **Christa McAuliffe**, NASA astronaut and space shuttle Challenger victim
- **Jamal Bittar**, principal of the Tripoli Evangelical School and part-time instructor at USJ, NDU and the Faculty of Sciences III of the LU in Tripoli (North-Lebanon)
- **Mounib El-Eid**, Professor at AUB
- **Roger Hajjar**, Assistant Professor at NDU
- **Bassem Sabra**, Assistant Professor at NDU
- **Jihad Touma**, Associate Professor at AUB

Other Lebanese professors aerospace of astrophysics are enocurgaed to contact SGAC Lebanon National Points of Contact (NPoC) Rémi Kahwaji remi.kahwaji@spacegeneration.org or Hisham Deek hisham.deek@spacegeneration.org

SGAC Activities in 2014

LAU ISON Observation Night
LAU astronomy club and Photography Club held a joint observation event attended by 60 people. Using Celestron Computerized Telescopes, participants observed many celestial objects including Orion Nebula, galaxies and Jupiter. The committee and Nelly Mouawad gave short lectures related to the formation of the stars and other topics as well.

LAU Seminar – Alien Planets by Cyrine Nehme
60 students from different academic backgrounds joined the event. Nelly Mouawad provided introductions toCyrine's presentation about methods of finding habitable planets as well as the possibility of existence of life in them.

LAU and NDU Stargazing Trip – Joint Event
Committee members set up Celestron Computerized Telescope for 30 attendees to observe celestial objects such as Mars, Jupiter, Clusters and Nebulas.

LAU Lunar Observation and Movie Night

AUB Astronomy Club observation Night
Held on the slopes of Faraya, young space enthusiasts enjoyed a superb night of stargazing. The stars, snacks and friends more than balanced out the cold weather.

Any Lebanese group that wishes to promote events through SGAC Lebanon is welcome to contact NPoCs at the emails provided above.

Looking Ahead: Plans for 2015

- Reach out to more Lebanese space-professionals
- Organise events with other regional SGAC NPoCs
- Inspire and guide young students to follow their dreams with outreach events
- Diversifying events to include scientific, hands on networking activities
- Revive the Lebanese astronomy group

TURKEY

The space sector in Turkey is growing over the years, reflecting the positive attitude among young space enthusiasts, and has increased the visibility of SGAC as well. There were three delegates representing Turkey this year during Space Generation Congress (SGC) in Toronto, Canada.

National Space Perspective

Starting from the early 2000, Turkey has become capable of development, integration, testing and operations of Earth Observation satellites. As part of the governmental program, RASAT (launched 2011) and GOKTURK 2 (launched 2012) were designed and built in Turkey and they are now operational in space. With these achievements, Turkey has become one of 16 countries that are capable of producing the most advanced Earth observation satellites on their own. In the near future, several other earth observation and SAR satellites are expected in addition to a development of a national communications satellite.

Along with the governmental programs, universities are also becoming active in development of space technologies. Among these are two CubeSats ITUpSat1 and TurkSat-3USat, which have been developed and launched in 2009 and 2013 respectively. In the next years, more CubeSats are expected which are developed by the universities. Besides CubeSats, CanSat development has been widely practiced and getting more popular.

Apart from the satellite development, there are also on-going programs on the development, application and utilization of space technologies in the government, public and academic sectors.

- TURKSAT 4A, launched in February, was Turkey's fifth communications satellite.
- RASAT images can now be accessed at *www.gezgin.gov.tr* (Turkish)
- Seven teams from Istanbul Technical University (ITU), Middle East Technical University, Yildiz Technical University and City University of Istanbul participated in the AAS/AIAA Annual CanSat Competition. The ITU UYARI Team ranked first among the 39 participating teams
- The first International Aeronautics and Astronautics Conference and 8th National Aerospace Conference were held
- TUBITAK National Observation Festival was organised and accepted over 500 participants
- International Astrometry Workshop on Observations of GAIA Satellite was organised at Antalya Akdeniz University in collaboration with TUBITAK National Observatory

SGAC Activities in 2014

- SGAC members Burak Yaglioglu, Yunus Emre Arslantas and Ozan Kara participated in SGC 2014 in Canada.
- SGAC members initiated a study for the outreach program tentatively entitled Effective and Sustainable Outreach of Space Science and Technology in Middle East to study and define a productive outreach framework in the country and surrounding region while trying to find the ways of getting the attention of students and young professionals who have some interest on space. Eventually, the aim is to have people produce outputs and ideas on current problems of space science and technology development in a sustainable way.
- Turkish NPoCs Metehan Sezgin and H Tuğça Şener-Şatır retired from their positions after a successful four years of SGAC representation.
- Ece Gülfem Dağdeviren and Burak Yağlıoğlu were appointed as the new NPoCs.
- Arif Göktuğ Karacalıoğlu from Turkey was one of the winners of the third SGAC-IAASS paper competition and participated in the 7th International Space Safety Conference in Friedrichshafen, Germany.

Looking Ahdea: Plans for 2015

- Promote SGAC events, project groups, competitions and other activities in universities and conference like events related to space.
- Establish and implement a program for the productive outreach of space science and technology in Turkey and Middle East.
- Establish close connections with the institutions in the national space sector to fund a scholarship program to support students and young professionals for the events like SGC and Space Generation Fusion Forum.
- Initiate public events such as Space-Up, CanSat competition, water rocketry and observations as part of the application of productive outreach program.
- Encourage groups or people to participate in SGAC project groups, competitions and campaigns.
- Represent SGAC and submit papers to RAST 2015

5.6 NORTH, CENTRAL AMERICA AND THE CARIBBEAN REGION

HIGHLIGHTS OF THE NCAC REGION IN 2014

The North, Central America and the Caribbean (NCAC) region continues to be a leader in the space sector. The past year saw many big successes across the region. American space agency NASA awarded commercial crew development contracts to Boeing and SpaceX for developing a commercial option to get astronauts to the International Space Station. The Canadian Government approved a new national space policy framework this year, focusing on five core principles of the Canadian space program: Canadian interests first, positioning the private sector at the forefront of space activities, progress through partnerships, excellence in key capabilities, and inspiring Canadians. Mexico hosted the first Latin-American satellite communications and radio broadcast congress (LATSAT 2014). Finally, Jamaica continued to grow its interest in space by hosting astronomy public outreach events.

Accomplishments in 2014

Space Generation Congress 2014:
The NCAC region played a crucial role in the space arena this year because the International Astronautical Congress (IAC) and Space Generation Congress (SGC) were held here. 138 participants from 38 countries gathered in Toronto, Canada for SGC. Five working groups met and gave presentations on topics from CubeSat swarms to ethics and policy of human space exploration

Fusion Forum 2014:
The third Space Generation Fusion Forum, in conjunction with the Space Foundation's annual Space Symposium, was held at the Broadmoor Hotel in Colorado Springs, Colorado. The theme was Disruption: How the business of utilizing space is changing. The majority of the 50 participants were from the United States, however, the international presence strengthened its stance this year due to four Global Grants. A number of Fusion Forum delegates were featured on panels on Small satellites, innovation in aerospace, emerging spacefarers and human spaceflight architecture.

Other Major Events in NCAC:
Many other space events took place in the region this year. SGAC hosted a SATELLITE Mentoring Event in March 2014. The event took place in Washington, DC and connected SGAC members with senior industry and agency mentors. In Jamaica, Yuri's Night was held in Up Park Camp, the grounds of the Jamaica Defense Force (JDF), and attracted many members of the defense force and visitors from the general population. The International Space University held a Space Studies Program in Montreal, Canada with substantial SGAC participation. The UN/Mexico Symposium on Basic Space Technology was held in Ensenada, Mexico in October of this year. National reports provide a more comprehensive list of NCAC events.

Regional Facebook Page:
The regional Facebook page has improved substantially in the past two years and has amassed 140 followers.

2014 in Digital Print:
Regional Coordinators Alan Steinberg and Ashley Chandler Karp co-edited a special edition of the New Space journal dedicated to students and young professionals. The special edition focuses on the future of new space and includes a round table discussion with young space leaders and original research contributions by young professionals.

Looking Ahead: Plans for 2015

The IAC and SCG will return to the NCAC region again in 2016 with Guadalajara City, Mexico as the venue, while the successful Fusion Forum will continue in Colorado, USA. Goals for the upcoming year in the region are as follows:

- Increase SGAC activity in the NCAC region
- Strengthen relationships with other regional space outreach organisations.
- Increase SGAC presence in space literature
- Increase awareness of the SGAC and its goals across the region using the regional Facebook page
- Increase participation and attendance of SGAC members at national and international space conferences
- Encourage participation in and planning of space related competitions and events
- Encourage space outreach and foster space education

CANADA

Canada has been involved in the space sector since its beginnings, becoming the third state to build and operate its own satellite in 1962. The country has since remained engaged in space exploration and utilization through successes in space robotics, telecommunications, and human spaceflight. This active spacefaring role is reflected by Canada's participation in the Space Generation Advisory Council, including the hosting of SGC 2004 in Vancouver. Over 100 SGAC members live, work and study in Canada. National Points of Contact (NPoC) Adam Vigneron and Kate Howells have detailed more about Canada's space community on the SGAC Canada website, at *http://spacegeneration.org/index.php/en/sgac-regions/north-central-america-a-the-caribbean/canada*

National Space Perspective

2014 was an active year for the Canadian space community. The Government of Canada approved a new national space policy framework that focused on five core principles: ensuring priority of Canadian interests, positioning the private sector at the forefront of space activities, forming through partnerships, excelling in key capabilities, and inspiring Canadians. Within this new framework, the Canadian Space Agency (CSA) is working to grow Canadian space activities and its role in the international space community. 2014 also saw the end of the tenure of the current CSA President as Walter Natynczyk as replaced on an interim basis by Luc Brûle.

Among a number of national space activities, Canada added five spacecraft to low Earth orbit; all were built by the Space Flight Laboratory at the University of Toronto. Two high-definition cameras were also installed on the ISS under a business venture spearheaded by Vancouver-based UrtheCast.

This year, Canadian space activities were punctuated by a number of major international events. Montreal hosted the International Space University's Space Studies Program (IUS SSP), where students from around the world convened on two Montreal university campuses to participate in the nine-week intensive program. In late September, the International Astronautical Congress came to Toronto. As the largest annual gathering of space students and professionals in the world, the IAC made the Canadian space program the focus of the international space community and the Canadian public alike. In conjunction with IAC, September's Space Generation Congress brought the space leaders of tomorrow to Toronto.

SGAC Activities in 2014

NPoC Adam was active at major Canadian space events this year, serving as Teaching Assistant at the ISU SSP14 in Montreal and both local organising committee (LOC) member at SGC 2014 in Toronto and moderator of On-Orbit Servicing working group. Adam continues the former responsibility continues to present day.

NPoC Kate was also active in her first year as the Canadian National Coordinator for the Planetary Society. Among a number of successful events, she hosted We See Thee Rise in conjunction with IAC that featured a keynote from Bill Nye (Planetary Society CEO) and a live taping of Planetary Radio in the University of Toronto's Convocation Hall.

Kate and Adam both worked to connect SGAC with the Canadian Space Agency in preparation for SGC, and to promote SGC attendance among the Canadian young space community.

Joining Adam on SGC-LOC were fellow Canadians Aaron Persad, Alana Bartolini, Ali Nasseri, Dario Schor and Jeremy Wang. Through Jeremy, SGAC made valuable connections with the University of Toronto. Ali deserves further recognition for his consistent efforts as both Executive Co-Secretary of SGAC and Space Safety and Sustainability Project Group Co-Lead.

Kate and Adam also represented SGAC at conferences and events throughout the year, including the annual meeting of the Toronto Students for the Advancement of Aerospace, the International Astronautical Congress, and the Lorne Trottier Public Science Symposium.

Kate and Adam worked with SGAC to develop a mailing list for all Canadian members to provide up-to-date and comprehensive information and resources. They also developed partnerships and collaborative relationships with other organizations including the Planetary Society, the Canadian Satellite Design Challenge, and Icarus Interstellar.

Looking Ahead: Plans for 2015

- Grow Canadian SGAC membership by 50%
- Set out Memoranda of Understanding (MoU) between SGAC and two Canadian organizations
- Organize at least one SGAC event in each NPoC's home city
- Publish at least one SGAC article in each NPoC's home city / university
- Connect SGAC with universities that offer space-related programs
- Develop a relationship between SGAC and the Canadian Space Agency
- Build a list of Canadian members and their locations, fields of study/work, etc

JAMAICA

Jamaica is very young in its involvement in the space sector, and 2014 saw this tiny island's space initiative grow exponentially. Jamaica's involvement in SGAC officially commenced in 2008 with the appointment of its very first National Point of Contact (NPoC) Marc Cornwall, whose continuous hard work and determination earned him an opportunity to attend the 2011 Space Generation Congress in Cape Town, South Africa. Cornwall's visit was instrumental in forging new ties and strengthening the existing relationships between local space leaders and international counterparts. Behind Marc's outstanding efforts was the Astronomical Association of Jamaica (AAJ), the island's premier astronomy and space group and the main SGAC liaison for space and scientific education and outreach. This year, Cornwall passed the torch onto two new NPoCs: John Shorter and Alexander Henry Yitzhak who stand ready to build upon his solid foundation and expand Jamaica's involvement in space and space related research and activities to never before seen heights.

Accomplishments in 2014

The absence of a space programme in Jamaica has left space related activities centred on astronomy and the actions of the AAJ. This year commenced with a Star Party organized by the Campion College Astronomy Club on Sunday, February 16th. The sky was clear enough to view the moons of Jupiter, the Orion Nebula and other clusters and nebulae until moonrise. The night went very well and club president Sneha Nair took many pictures of Jupiter, the star clusters and the moon and even the start of a transit of a moon of Jupiter. At month's end, the AAJ held its Annual General Meeting during which Errol Rickman was re-elected as the association's president and future NPoC John Shorter was welcomed to the executive board as a cooperative member. Association membership grew rapidly this year and the annual plans were put in place.

Yuri's Night 2014
The island's sixth Yuri's Night was held on Saturday, April 12th and was an overall success. This year's venue was Up Park Camp, the grounds of the Jamaica Defense Force (JDF) and attracted many members of the defense force and visitors from the general populous. A six inch telescope was aimed at the moon with a filter that allowed viewer to see the moon's craters without cloud interference. As the night progressed, Mars in line for clear viewing but was somewhat obstructed by a dust storm. This hid the planet's distinct markings from view but did not affect its brightness. The Orion Nebula and brighter stars like Sirius and Rigel were viewed through an eight inch Newtonian reflector. The visitors and association members enjoyed the star gazing and available refreshments.

Follow up on Galileoscopes
By June, association was notified that original recipients of the Galileoscopes would have already left high school, unless they were in the ninth grade or lower at the time presentation and follow-ups were thus necessary to keep the original International Year of Astronomy (IYA2009) initiative alive. The association discussed a partnership with the Ministry of Education to rekindle past efforts and continue on the desired path of youth improvement through space and space technology.

More on Telescopes
On that note, 2014 seemed to be a year of telescopes as these instruments were the main subject of discussion at several monthly meetings. This theme began in May when members of the association viewed Eyes on the Skies and its part two feature Bigger is Better. These introduced telescopes and their role in changing the world, and several well-known specimens such as the site under development at Cerro Paranal where the European Sothern Observatory (ESO) is working on a design for the Over Whelming Large Telescope (OWL). Later on that month, AAJ President Errol received an email from Rosa Doran regarding grants and assistance from ESO for seminars.
Telescopes continued to trend at association meetings once members discovered that the Physics Department at the University of the West Indies, Mona Campus, had a telescope long out of use. The instrument in question was a 75 inch Newtonian from the 1990s with beautiful 12.5 inch mirror. The telescope suffered extensive damage due to exposure during Hurricane Ivan back in 2004, but singlehandedly refurbished by AAJ member Bobby Rodriques. This impressive instrument now stands as new as the day it was made, fully functioning and producing fantastic photos.

International Observe the Moon Night
Discussions for this annual event began in July followed by preparations to host the event at the UWI Community Film Project Office on September 9th but inclement weather prevented the viewing. On September 11th, AAJ president Rickman gave a talk on space and the importance of space awareness on the popular radio show The Morning Watch on Love 101 FM. The interview was conducted by radio host Marvia Lawes and was aimed at raising consciousness and interest in space related issues among the Jamaican people.

Space week
Space week was the association's most recent endeavour at the start of a very active month for astronomy including a lunar eclipse on October 8th, Comet Siding Springs near miss of Mars on the October 19th, the Orionids Meteor Shower on the 21st and partial solar eclipse on October 23rd. Inclement weather rendered most of these events unviewable but photos provided by international sources compensated for what Jamaicas were not able to directly observe.

Looking Ahead: Plans for 2015

Perhaps the most exciting event to expect in 2015 is the reintroduction of the Cosmology Program at the University of The West Indies. The AAJ has been driving these efforts, and the incredible and talented Alfred Chang has been selected to teach the upcoming course. This initiative aims to address the ever growing concern about the lack of space theory in the Jamaican school systems. Member Martin Rickman put together a comprehensive introductory presentation on the universe with a special emphasis on the solar system appropriate for presentations in primary and preparatory schools currently getting ready for their Grade Six Achievement Test (GSAT). Links forged with the Ministry of Education and the European Sothern Observatory planned to be exploited to the fullest for the benefit of the space cause here in Jamaica. Newly appointed NPoCs, John Shorter and Alexander Henry Yitzhak stand fully beside the AAJ and their initiatives ready to aid in any way poissble to further develop the cause for space and space driven enterprise on this island.

MEXICO

This year SGAC Mexico focused its efforts on promoting the organisation within the young professionals, students and space company sectors in Mexico. The relationship between the Mexican Space Agency (AEM) and SGAC became stronger, and provided the opportunity to plan collaborative projects. At the end of last year, Mexico National Point of Contact (NPoC) Carmen Felix organized a three-day event to promote SGAC in Mexico City. University and AEM representative as well as other members of SGAC attended this event. Alejandro Cordova was elected as NPoC to replace Jorge Vega after the successfully completion his term.

National Space Perspective

Mexico has been very active during the year, hosting conferences, signing agreements and promoting space and education throughout the country. Highlights include:

- UN/Mexico Symposium On Basic Space Technology in Ensenada, Mexico (20-23 Oct 2014)
- Mars Conference by NASA JSC representatives in Mexico City (6 Nov 2014)
- Industrial forum for Aerospace Supplies in Mexico (27-29 Oct 2014)
- First Latin-American satellite communications and radio broadcast congress (LATSAT), hosted by Mexico
- Celebration of 500 years of Science since the revolutionary Copernicus, hosting several conferences at different universities
- Education and Informative Conferences throughout the year organized by AEM
- AEM and Ukraine agreed on collaborative satellites development (November 2014)
- Major investment from the government and CONACYT to Aerospace Projects (31.7 mdl)
- Mexico will collaborate with DLR to operate a telecommunication antenna
- Meetings with international partners to discuss space technology for disaster management
- AEM Space Bootcamp in different cities of the country
- National Course CanSat Space Systems Engineering
- Major celebrations in all of Mexico for World Space Week
- First Space Art Contest
- First Mexican Space Missions

SGAC Activities in 2014

- NPoC Carmen Felix recorded Christmas Greeting for the SGAC holidays season video
- NPoC Carmen Felix organised the first SGAC Mexico Conferences in December 2013. The leader of the SGAC working groups gave an introduction video talking about what each group is doing and invited students and young professionals to join.
    - December 9: Universidad Nacional Autonoma de Mexico (UNAM). Participants: NPoC Carmen Felix, former NPoC and former Regional coordinator Israel Ojeda, SGAC member Sandra Cabrera, former SGAC Advisory Board member Sergio Camacho, AEM's representatives and university leaders
    - December 10: Universidad Autonoma Metropolitana (UAM). Participants included NPoC Carmen Felix, former NPoC and former Regional coordinator Israel Ojeda and AEM's representatives.
    - December 11: Instituto Politecnico Nacional (IPN). Participants included NPoC Carmen Felix and AEM's representatives.
- Thanks to Philipp Maier, Commercial Space, Minoo Rathnasabapathy, Space Safety and Sustainability, Klaus Kornfeld, Small Satellites, and Chris Vasko, SGAC Co-Chair, for recording the videos shown during these conferences. SGAC recruited several new members from Mexico after these events.
- NPoC Carmen Felix introduced SGAC to the Mexican Space Community and AEM representatives. AEM's John Polansky presented opportunities for masters, PhD, satellite courses and certifications to the Mexican community.
- NPoC Carmen Felix promoted AEM's activities through the SGAC network and Jovenes por el Espacio Grupo Mexico Facebook group.
- AEM contacted NPoC Carmen Felix to seek opportunities for the launch of Ulises I, the first Mexican small satellite focused on art. This project was promoted and established direct contact with Project Lead Juan Diaz Infante.
- NPoC Carmen Felix published an article about SGAC in the AEM's Digital Magazine, Hacia el Espacio.
- NPoC Carmen Felix coordinated and led the IAASS-SGAC scholarship competition. Three scholarships covered all expenses to attend and present original papers at the 7th IAASS Conference Space Safety is No Accident in Friedrichsafen, Germany.
- SGAC Executive Director Andrea Jaime, and Co-Chair Victoria Alonsoperez participated in the UN/Mexico Symposium hosted in Mexico last October.
- NPoC Carmen Felix is developing ideas to strengthen the partnership between SGAC and IAASS.

Looking Ahead: Plans for 2015

Both Mexican NPoCs, Carmen Felix and Alejandro Cordova, are planning the following for 2015:

- The first Mexico SPACE UP event in Mexico City in early March 2015. This event is mainly created and coordinated by SGAC Mexico with AEM's collaboration.
- Maintain collaboration between SGAC and AEM's Digital Magazine Hacia el Espacio.
- Increase participation of SGAC members in space related events in Mexico.
- Obtain scholarships for SGAC members to attend IAC and other congresses.
- Grow the SGAC Mexican group and brainstorm for SGC 2016.
- Present SGAC to the educational UN programs that are already established in Mexico and plan projects together.

UNITED STATES

National Space Perspective

Since the beginning of the Space Age, the United States (US) has played a major leadership role in the international space arena. As the industry turns its eye towards space commercialization and exploration beyond earth orbit, the US continues to play a crucial role in the development of technology and infrastructure.

Commercial Crew Development Program
In September, NASA awarded Boeing and SpaceX contracts, worth up to $6.8 billion combined, to launch crewed missions to the International Space Station by 2017. Each vehicle will be capable of launching up to seven astronauts to low earth orbit, or four astronauts with room for pressurized cargo. Additionally, United Launch Alliance (ULA) announced a partnership with Puget Sound-based startup Blue Origin to develop methane-based engines (BE-4) for the Atlas V rocket, the launch vehicle used for CST-100. While test flights of CST-100 are scheduled for 2017, Blue Origin's BE-4 engine is not expected to fly until 2019.

Commercial Orbital Transportation Services
In mid-2014, NASA released a call for a second round of Commercial Orbital Transportation Services (COTS) contracts to ferry unmanned cargo to the International Space Station (ISS). All first round COTS contract awardees successfully completed their demonstration flights by December 2013.
An Orbital Sciences Antares rocket, developed under the original COTS program, suffered a failure approximately six seconds after launch from NASA's Wallops Flight Facility on October 28, 2014. About 2,250 kilograms of cargo and scientific equipment were lost when the rocket exploded above the launch pad upon detecting an anomaly but no human injuries or deaths were reported.

Other Industry Affairs
In October, MIT Professor of Aeronautics and Astronautics Dava Newman was nominated as the next NASA Deputy Administrator, succeeding Lori Garver. She has extensive experience with aerospace biomedical engineering and human factors, and is perhaps best known for the BioSuit, an innovative new skin-tight spacesuit designed to give astronauts greater range of motion during extravehicular activity.
NASA recently announced a schedule slip for the Space Launch System, which is now aiming for launch in 2018 instead of 2017. Its associated capsule, the Orion Multi-Purpose Crew Vehicle, is scheduled for its first test flight on December 4, 2014. On the commercial side of industry, Virgin Galactic suffered a setback in October when its Space Ship Two broke apart during a test flight above the Californian desert. The resulting crash caused one fatality and one serious injury to the humans on board.

SGAC Activities in 2014

National Points of Contact (NPoCs)
Two NPoCs currently represent the United States: Charlotte Kiang and Stephanie Finnvik. Charlotte is an engineer with The Boeing Company in Titusville, Florida, where she works on the CST-100 spacecraft under NASA's Commercial Crew Program. She has an active interest in space human factors and habitability, and is currently working on the integration and checkout testing of CST-100's Environmental Control and Life Support (ECLS) systems. Stephanie is currently on leave from the University of North Dakota's Space Studies graduate program, where she is pursuing a master's degree. She has extensive experience with space education and outreach, and interned with the education office at NASA's Johnson Space Center as well as the educational nonprofit Universe Awareness.

Space Generation Fusion Forum (SGFF)
In 2014, SGAC successfully hosted the third edition of the Space Generation Fusion Forum in conjunction with the Space Foundation's annual Space Symposium. As in previous years, the event was held at the Broadmoor Hotel in Colorado Springs, Colorado. While the majority of participants were from the US, there was a substantial international presence this year, including four SGAC members who received Global Grants to attend. The Fusion Forum aims to give up to 50 university students and young professionals the opportunity to share ideas through panel discussions led by senior leaders in the space sector, in addition to providing a space for attendees to network with these leaders and with each other.
This year's Fusion Forum theme was Disruption: How the business of utilizing space is changing. A number of Fusion Forum delegates were featured on four panels on the topics of small satellites, innovation in aerospace, emerging spacefarers and human spaceflight architecture.

SATELLITE2014 Mentoring Event
In March 2014, SGAC hosted a mentoring event in Washington, DC, at the SATELLITE 2014 conference. Applications to the event were open to all SGAC members, and mentors included senior industry leaders from a variety of organizations, including NASA, the White House, Federal Aviation Administration (FAA), Ball Aerospace, Space News, The Tauri Group, as well as many other high-profile space industry players.

Scholarships
SGAC was able to provide some of its members with full scholarships to the SATELLITE 2014 conference in Washington, DC, as well as AIAA/JPL SpaceOps in Pasadena, California. Additionally, the NASA Space Communications and Navigation (SCaN) program, Secure World Foundation (SWF) and Future Space Leaders Foundation (FSLF) were among the organizations that provided US citizens with scholarships to the Space Generation Congress.

Other Youth-Oriented Space Activities in 2014
2014 saw the 13th edition of the Space Generation Congress (SGC), held at the Holiday Inn Yorkdale in Toronto, Canada this year in conjunction with the 65th International Astronautical Congress. This year's event sold out its capacity of 130 delegates several weeks in advance of the event. Working group topics were On-Orbit Servicing, CubeSat Swarms, Earth Observation for Maritime Services, Entrepreneurship and its role in the Space Industry, and the Ethics and Policy of Human Space Exploration.

Within the United States, SGAC members also attended a variety of other space-related events in 2014, including AIAA SPACE in Pasadena, SpaceUp Houston, the International Space Development Conference (ISDC) in Los Angeles, and New Space in Silicon Valley among many others.

Looking Ahead: Plans for 2015

While many space organisations exist in the United States, SGAC looks to grow its membership in the coming years and increase US participation in SGAC events both domestically and internationally. Of particular note is the Memorandum of Understanding (MoU) signed with Embry-Riddle Aeronautical University's Commercial Space Operations program. Through this new partnership, SGAC will seek to increase its number of members from Embry-Riddle, and also hopes to leverage the new relationship with Embry-Riddle to jointly host an event.
Additional stretch goals for 2015 include the strengthening of relationships with the US space industry through additional MoUs. Companies such as Boeing, SpaceX and Lockheed Martin have contributed to SGAC events in the past, and SGAC will seek to build on these existing relationships for future events.

5.7 SOUTH AMERICA

HIGHLIGHTS OF THE SOUTH AMERICAN REGION IN 2014

2014 was a good year in South America for space-related activities. Bolivia, Colombia and Peru had considerable advances in their space related projects. Specifically, Peru launched its first nano-satellite and is an evolving player in the space sector. Most of the other countries in South America also made significant progress with the development and construction of small satellites, generating great enthusiasm for space-related activities in the region.

The region gained four new National Points of Contact (NPoCs):

- **Argentina:** Federico Perazzo
- **Brazil:** Brehme Dnapoli Reis de Mesquita
- **Colombia:** Diego Alejandro Albarracin Gonzales
- **Peru:** Ginacarlo Villena de la Cruz

Brazil

SGAC members assisted with outreach efforts to introduce the SGAC to students, researchers and important institutions such as the São Paulo State University at Guaratinguetá (FEG/UNESP), the Federal University of São Paulo (UNIFESP), the Federal University of ABC (UFABC) and the National Institute for Space Research (INPE).

Colombia

The program Medellín Espacial , named after the second largest city in Columbia-Medellín was recently and aims to create awareness amongst Columbian nationals regarding the opportunities available in the aerospace industry at a local level. This initiative shall develop startup projects create new opportunities for local talent and foster space careers in Colombia.

Peru

- Peru's National University of Engineering (UNI) successfully launched its first nanosatellite into orbit.
- The Peruvian satellite UAPSAT-1 was sent into space aboard Orbital Sciences' Antares rocket. This picosatellite was designed and programmed by students at Universidad Alas Peruanas.
- In October 2014, NPoC Giancarlo Villena de la Cruz presented SGAC to a group of software engineering students at the Universidad Alas Peruanas.
- The first Aerospace Bolivian Conference (ABC) was held in Peru.
- Bolivia
- NASA sponsored a Bolivian SGAC member to participate in the Space Apps Challenge.
- NPoC Benjamin Pinaya Gutierrez is participating in a project group that initiated the design, construction and socialization of Bolivia's first nano satellite.

Looking Ahead: Plans for 2015

The NPoCs and Regional Coordiantors are currently developing a study group focusing on the history of space activities in South America. The findings of the study group shall be presented as a regional paper at IAC 2015. A great effort is being dedicated to prepare and organise the first South American regional event, a two-day workshop to be held in conjunction with the 8th Argentine Congress of Space Technology (8th CATE) in Buenos Aires, Argentina from May 4th - 5th 2015. The SGAC South America also continues its goals of:

- Creating more content on the Facebook regional page to comply with SGAC requirements as well as satisfy the current members in the region.
- Recruiting new members as well as NPoCs
- Promoting Yuri's Night Events and World Space Week celebrations.
- Connecting South American space universities and associations with SGAC to receive more funding for Latin American members to attend SGC 2015.

BOLIVIA

The space era in Bolivia started with the launch of its first telecommunication satellite in 2013. This historic event marked an inflection point in the history of Bolivia. Recent development has fueled SGAC Bolivia in their mission to inform the public of space technology activities and promote how knowledge of space science is relevant to their lives today and beyond.

National Space Perspective

Bolivia's recently initiated space program has encouraged people to look at the sky and see the possibilities. Universities are tailoring their programs to produce professionals with diverse resources and capabilities to develop Bolivia's space program. In the foreseeable future, Bolivia will attempt another technological leap with a remote satellite project. Because of these developments, SGAC and NPoCs have gained many new members and are focusing on developing new projects in 2015.

SGAC Activities in 2014

Solar Array Presentation
During the summer of 2013 in Bolivia, a two-day event was held at the Bolivian Society of Engineers (SIB Cochabamba), during which SGAC was invited to share information related to Solar Array Mechanisms as a Renewable Energy Source for Satellites.

April Yuri's Night
This year, for the first time in Cochabamba Bolivia, YURI´S NIGHT was celebrated by watching a video about the Apolo 11 mission and also discussing the role of the SGAC in today's world. This event took place at Saint Simon University in Cochabamba (UMSS). After a presentation discussing SGAC's purpose, four main areas of research, and presenting videos, new members joined the SGAC team. With Bolivia actively participating in space activities, interest in SGAC's projects is growing.

A SATELLITE PRESENTATION AND INTERNATIONAL SPACE APPS CHALLENGE
During the 35th Anniversary of Foundation of Electric Career at Saint Simon University (UMSS), SGAC was invited to give a presentation related to satellites. Members of SGAC Bolivia participated in the International Space Apps Challenge, taking a great place among its participants. SGAC Bolivia has also initiated a project designing the first Bolivian nanosatellite, with the help of many engineers that worked on the first telecommunications satellite "Tupac Katari".

Looking Ahead: Plans for 2015

- Promote courses, seminars and related activities within the space arena and the SGAC.
- Foster participation of students and young professionals in one of the investigation lines of the SGAC.
- Boost academic activities within the team with the participation of professionals in different areas of space technology.
- Prepare a second paper about space advancements in Bolivia.
- Recruit more new members and organize a local contest for them.
- Have some programmers help with the SGAC mobile app in 2015.
- Organise a national event for Yuri's Night.
- Solidify development of the first nanosatellite in Bolivia. This is an intensive effort and will require new SGAC members in the region. Help from SGAC's Small Satellite Working Group is also anticipated.

BRAZIL

The space activities in Brazil are mainly organized by the Brazilian Space Agency, and executed by the National Institute for Space Research (INPE), the Institute of Aeronautics and Space (IEA) with participation of many Brazilian universities. The space sector is growing in Brazil with new openings in the private and public sector and new aerospace courses at the universities. Great efforts have been dedicated to promote and grow the SGAC in the country by running seminars in the main Brazilian universities and contacting the main aerospace institutions in the country.

National Space Perspective

PREPARATION FOR SARA PROJECT ROCKET'S LAUNCH

The SARA (Atmospheric Re-entry Satellite) Project aims to develop an orbiting platform for performing experiments in micro-gravity and to operate in low orbit at about 300 km altitude for a maximum period of ten days. In the future, the device will open new possibilities in research and development in various fields and specialties, such as biology, biotechnology, medicine, materials, fuel and pharmaceuticals, among others.

SUCCESSFUL LAUNCH OF A TRAINING ROCKET FROM ALCÂNTARA LAUNCH CENTRE

The Alcântara Launch Center (CLA), in Maranhão, launched the 11th Intermediate Training Rocket (FTI) on August 21, 2014 to confirm previous actions during the launch of screening rocket VS 30. The FTI is a rocket manufactured by the domestic industry and integrates Avibrás Fogtrein Project's Training Rocket, which along with the Basic Training Rocket (FTB) aims to maintain the operability of the Brazilian launch centers, the CLA and Barreira do Inferno Launch Center (CLBI), Rio Grande do Norte.

SERPENS NANOSATELLITE APPROVED IN SAFETY TESTING

The Serpens Cubesat passed a series of tests on September 18 and 19, 2014 carried out by the Brazilian Space Agency (AEB) with a view to launch the satellite from the International Space Station (ISS). The procedures, performed by technicians from Japan Manned Space Systems Corporation (JAMSS), were aimed at checking the nanosatellite's safety items involved in the final stage of launch into space. The result was considered positive by the team of AEB scholar members of the Serpens Project.

SUCCESSFUL LAUNCH OF THE FIRST BRAZILIAN ROCKET USING LIQUID FUEL

The rocket VS V13-30, which had an active payload and a L5 motor powered by liquid propellant was launched on September 1, 2014 from the Alcântara Launch Center (CLA) in Maranhão. General coordination of the operation was the responsibility of the Department of Aerospace Science and Technology (DCTA). Raposa Operation helps the CLA achieve an even higher level of strategic importance within the Brazilian National Program of Space Activities. It has taken an essential step towards the operation of space vehicles using liquid fuel, which allows for greater load capacity and accuracy of orbit insertion, essential for activities involving the Satellite Launch Vehicle (VLS) in development and its successors.

SGAC Activities in 2014

This year, SGAC Brazil worked to introduce council members to students, researchers and important institutions such as São Paulo State University at Guaratinguetá (FEG/UNESP), Federal University of São Paulo (UNIFESP), Federal University of ABC (UFABC) and INPE. SGAC NPoCs will continue this strategy, and have more seminar planned at further institutions with an interest in space research including INPE, UFABC, the Institute of Science and Technology (ICT) at UNIFESP, the Institute of Astronomy, Geophysics and Atmospheric Sciences (IAG), the Engineering College of São Carlos (EESC) of the University of São Paulo (USP), the Engineering College of Guaratinguetá (FEG) and the Institute Geosciences and Exact Sciences (IGCE) of the São Paulo State University (UNESP). There was a great discussion amongst the regional scientific and student communities of opportunities and campaigns such as SGAC's Near Earth Object Project Group, $pace is Business!, Move an Asteroid, Space Solar Power and the 2014 SGAC Find an Asteroid Search Campaign.

Looking Ahead: Plans for 2015

Regional Coordinators for South America presented a proposal for a Latin American space conference similar to the SGC, focusing on the Latin American region during the SGC South American September Telecon. The initial idea for this conference aroused significant interest from the IAF Latin American members and the AEB. There are initiatives to introduce SGAC at important events like the Summer School in Orbital Dynamics and Planetology at FEG/UNESP, the Brazilian Colloquium on Orbital Dynamics and the Brazilian Aerospace Symposium. There are plans to create relationships with GAMAT (Group of Astronomy and Mathematics) of UNESP at São José do Rio Preto. This project of continuing education will promote the space sciences among society. There is also a strong possibility of introducing the SGAC during the 2014 Brazilian Colloquium on Orbital Dynamics in December, one of the most important events in space sciences in Brazil and South America.

CHILE

National Space Perspective

Chile has no national space agency, but as of 2013 the Chilean government held a public consultation for a National Space Policy covering 2013-2020. After change of governing coalition, this policy is under review. The ministerial council charged with the execution of this policy held session once in this year, but there is no clear insight on the next steps.
Launched in 2011, the Chilean earth observation satellite SSOT enters its third year of operations and continues to provide data for different government bodies and institutions. The lifespan of the satellite is designed to be 5 years, and has enough fuel to provide an estimated orbital lifetime of seven years. As the end of its working life approaches, discussions to replace the satellite are underway.

SGAC Activities in 2014

- Current NPoC was elected to serve a second term
- FASAT-Charlie (SSOT) the 3rd Chilean satellite, launch late 2011 has been fully operational and providing images for the government services and institutions
- There were no SGAC organized activities during the year but the NPoC held conversations with actors in Chilean space sector
- SGAC information about scholarships and events was disseminated to the students and young professionals through e-mails and website posting
- FIDAE, the biggest bi-annual aviation, space, and defense fair was held with a growing display of space

Looking Ahead: Plans for 2015

- After 3 years abroad, the acting NPoC is returning to the country for at least two years to organize diffusion activities on site.
- Recruit a second NPoC to support organisation of local events
- Participate in a regional paper, as well as support a regional SGAC event.

COLOMBIA

Columbia's long-term goals include establishing a space agency under the control of the Vice President's office. The national government aims to create a programme of space activities to support the space agency.

SGAC Activities in 2014

MEDELLIN IN SPACE:
Diego Jimenez, National Point of Contact (NPoC) for SGAC Colombia, is leading an ambitious project in Medellin, the second largest city in Colombia. The project "Medellin in Space" establishes as the main objective a mission to release two stratospheric balloons with a set of experiments and testing components for nano-satellites.

To accomplish these objectives, one of its strategies is support of innovative projects in science and technology, such as stratospheric balloons and nano-satellites, that generate a positive impact on Colombia's ecosystem, from the creation of new businesses based on innovation, all the way through cultural changes in region. The nano-satellites industry is still at an early stage, but is seen as the next space frontier, opening new opportunities in science for countries and communities that otherwise could not afford this before.

Balloon 1: carries four experiments on board, plus the required instrumentation to receive telemetry data from the balloon. The following experiments were proposed:

- Detection of Secondary Particles in Cosmic Rays. The project aims to test a low cost method of detection and measurement of particles produced in high-energy electromagnetic cascades induced in the upper atmosphere by cosmic rays.
- Photosynthetic organisms exposed to ultraviolet rays (UV). This project aims to expose a group of photosynthetic organisms to non-ozone layer filtered UV radiation.
- Tardigrades in space conditions. This experiment aims to study the biological changes of these organisms, which have shown quite extreme adaptations.
- Elementary and High School student competition. This is a separate payload in which, after conducting a school-level competition, the most innovative proposal will send its experiment alongside our mission to the edge of space.

Balloon 2: prototype of a nanosatellite with an adapted optical system using COTS technology to take imagery of the Earth surface at different altitudes. It will have positioning and attitude sensors and a power subsystem too.
A further aim is to validate how an adapted optical system using COTS technology can obtain imagery with sufficient quality to be commercialized in the remote sensing market, and to assess the potential that this technology has for making necessary improvements in Nanosatellites orbiting the Earth.

GLOBAL SPACE BALLOON CHALLENGE
In April 2014 Stanford University, MIT and the University of Michigan organized the first Global Space Balloon Challenge, which is a competitive event where many teams from around the globe compete to capture the best image form a High Altitude Balloon. Other criteria assessed are the most innovate experiment and best design of a High Altitude Balloon. Two Teams represented Colombia: Ideatech and EAFIT University.

COLOMBIAN ASTRONOMY OLYMPIADS
Once again this year, students from all over the country participated in the OAU. The five finalist students participated in the Latin American Astronomy Olympiads that took place in Bogota, Colombia. Students from Bogota, Barranquilla, Bucaramanga and Medellin participated in the competition.

ASTRONOMY FESTIVAL VILLA DE LEYVA 2014
An astronomy festival was held in Villa de Leyva, Cundinamarca from 7 – 9 February 2014. People from all over Colombia participated in the workshops, networking and conference sessions. Keynote speakers included Puerta Bogota's Planeterium Director and Angela Posada Swadford, a reporter for Muy Interesante Magazine in the US and Germany.

Looking Ahead: Plans for 2015

SGAC Colombia will continue to attend several youth events promoting the organization. The aim is to keep encouraging young people's interest in aerospace activities and explain that virtually every field has some involvement in aerospace. Other priorities are to encourage young people to take part in international events and facilitate information on scholarships.

PERU

This year proves to be a remarkable and promising year for the Peruvian Space Sector. Two nano-satellites, made by two important Peruvian universities, Universidad Alas Peruanas and Universidad Nacional de Ingenieria, were launched into space. A bilateral agreement between Peru and France, was signed to allow for building and launching Peru's first optical satellite system. Related to SGAC, software engineer Giancarlo Villena was appointed in August as new National Point of Contact (NPoC) for Peru. The new NPoC was previously involved in the design, development and launching of the Universidad Alas Peruanas's first nano-satellite and is currently working as professor at the same university.

National Space Perspective

Peru is derived from a word in the native language Quechua signifying land of abundance, and is a remarkably apt name to describe this diverse country. Regarding Space Technologies, however, Peru as a country, is more a space-based technologies user rather than developer. Over the decades, Peru was not majorly involved in space activities. Peru has access to space technologies, but this depends on agencies from other countries and foreign companies. The average Peruvian tends to believe that Peru is far away from rockets, satellites and space technologies. The public perception in the country is that it doesn't have enough capabilities or necessary skills to develop space-related technologies. In addition to that, Peru's current awareness of the benefits and opportunities of using space technologies to attend citizen's needs is very limited. The country also faces a range of underlying development constraints, for instance the level of public and private investment in research and development is marginal in comparison to leading countries of the region.

Despite our limitation and issues, Peru has recently experienced an important growth in the space sector. Only during the past few years have four Peruvian nano-satellites, made by students and professors from the three main Peruvian universities, been put into orbit. The PUCP-SAT 1 and POCKET-PUCP (Pontificia Universidad Catolica del Peru) in 2013, the UAPSAT-I (Universidad Alas Peruanas) in 2014, and the CHASQUI-I (Universidad Nacional de Ingenieria) also in 2014, represent the efforts of the academic sector for creating space capabilities and developing necessary skills within the country. The government contributed to development of a tele-detection satellite, in collaboration with the government of France, to be launched in 2016. These events marked a new beginning for the Peruvian space age.

UAPSAT-1
On January 9, 2014 from NASA's Wallops Flight Facility in the US state of Virginia, the Peruvian satellite by the name of UAPSAT-1 was sent into space aboard Orbital Sciences' Antares rocket. The pico-satellite UAPSAT-1, which weighed less than a kilogram, was designed and programmed by students at Universidad Alas Peruanas. This research allowed verification of the students' design methods and testing of the various electronics, orientation, stabilization and temperature sensing instruments.

The UAPSAT-1 project was started in 2010 and represented an investment of over 500,000 US dollars. It was Peru's third satellite, followed by PUCPSat-1 and Pocket-PUCP launched on November 2013. Finally, it is worth mentioning that UAPSAT-1 is the first Peruvian satellite to be sent into space by NASA.

CHASQUI-1
After many years of hard work on preparations, Peru's National University of Engineering (UNI) successfully launched its first nanosatellite into orbit. The Chasqui-1 satellite was launched on February 4, 2014 aboard the Russian-built "Progress M-22M" space shuttle, which blasted off from the Baikonur Cosmodrome in Russia. Progress M-22M carried Chasqui-1 to the International Space Station, where cosmonauts put it into orbit on March 2014. Its main goal is improving UNI's satellite technology and related capacities, through the design, analysis, assembly, integration, testing and operation of a small dimension satellite. The project was started in 2009 with an investment worth over 631,000 USD, financed from UNI's resources. Chasqui-1, which weighed approximately one kilogram, was intended to be used for educational and research purposes.

This project was also, from an academic point of view, a tool to facilitate collaboration between the various faculties and research institutes of the University. Students and teachers were provided with real world experience in satellite building. This project created opportunities for joint work between several universities in the world and allows technological advances in the aerospace industry in our country.

ASROSAT-300
Peru recently purchased a next generation satellite from France for $213 million, putting the country at the forefront of space development. The Asrosat-300 Airbus will be the most advanced Latin American satellite. The acquisition includes the satellite system, the ground control station, as well as technology transfer and insurance. Significant numbers of Peruvian youth in France participated in all phases of the manufacturing process of the satellite and will be trained in the operation of the system and reading the images captured. The Asrosat-300 has a collision warning system and if a collision with satellite space junk is detected from Earth the satellite may momentarily divert its route and return to orbit once the danger has passed. The satellite will be used for defense, national security, mapping as well as to monitor drug trafficking, terrorism, illegal logging, illegal mining, illegal fishing, disasters from earthquakes or floods, and climate and natural phenomena. Additionally, Peru already has images of the French constellation satellites as France facilitates Peru.

SGAC Activities in 2014

PRESENTATION AT UNIVERSIDAD ALAS PERUANAS
In October this year, thanks to the collaboration of Rafael Castañeda, Director of the Software Engineering Department at Universidad Alas Peruanas, the new NPoC for Peru Giancarlo Villena, gave a presentation to a group of software engineering students at this university. In this presentation, he discussed SGAC as an organization, its activities and the opportunities that are provided to young students who are interested in space were discussed. Finally, the NPoC for Peru encouraged the group to join SGAC and be part of our amazing network.

Looking Ahead: Plans for 2015

Goals for the upcoming year focus on expanding the SGAC network in Peru, increasing awareness of space, and encouraging the people of Peru, especially young enthusiasts, to actively participate in space activities, to demonstrate that space is not as far away as many people in Peru think and prove that amazing and great things can be achieved through perseverance, enthusiasm and innovation. With these goals in mind SGAC Peru has planned the following activities for the upcoming year:

- Organise conferences, congresses and regional expositions around the country to link university and school students and young professionals interested in space, increasing awareness of space and the SGAC, and expand the SGAC Peru network
- Use online social networking services (Facebook, Twitter, etc.) as a tool to promote a national culture of awareness and involvement in space science within Peruvian society.
- Promote activities for youth in educational institutions to encourage enthusiasm and inspire students and teenagers to pursue studies in space and science related careers
- Contribute to building partnerships with members of the international space community and international space agencies around the world, to enable collaborative endeavours, which can provide education and training opportunities for young people in the fields of space science and technology
- Disseminate on new and advanced technologies and applications, with emphasis on their relevance and implications for developing countries and increase acknowledgement of the essential role, and benefits, of space-based services to citizens, the national economy, security and commercial competitiveness
- Provide students with opportunities to interact with students from other countries and leading space experts
- Propose to the National Department for Education, the development of educational programs that promote interest in space science and technology for primary and secondary schools around the country
- Work in partnership with Peruvian universities to provide appropriate skills to meet the space sectors requirements

6. APPENDICES

APPENDIX I
ADDITIONAL WEBSITES

SGAC Websites

SGAC Official Website	*http://www.spacegeneration.org/*
Facebook	*http://www.facebook.com/spacegeneration*
Youtube	*http://www.youtube.com/spacegeneration*
Wikipedia	*http://en.wikipedia.org/wiki/Space_Generation_Advisory_Council*
Twitter	*http://twitter.com/#!/SGAC*
Linkedin	*http://www.linkedin.com/company/space-generation-advisory-council*
Flickr	*http://www.flickr.com/photos/spacegeneration/*

Events Websites

SGC	*http://www.spacegenerationcongress.org*
SGFF	*http://www.spacegeneration.org/event/sgff-2015/87-sgff/fusion-forum-2014/913-sgff-2014.html*
AP-SGW	*http://www.spacegeneration.org/event/past-events/ap-sgw-2014.html*
SATELLITE 2014: Speed Mentoring	*http://www.spacegeneration.org/event/past-events/mentoring-event-sat-2015.html*

Regional Facebook Pages

Africa	*https://www.facebook.com/pages/Space-Generation-Advisory-Council-African-Region*
Asia Pacific	*https://www.facebook.com/SpaceGenAsiaPacific*
Europe	*https://www.facebook.com/SpaceGenEurope*
Middle East	*https://www.facebook.com/pages/Space-Generation-Advisory-Council-Middle-East-Region*
NCAC	*https://www.facebook.com/pages/Space-Generation-Advisory-Council-NCAC-Region*
South America	*https://www.facebook.com/pages/Space-Generation-Advisory-Council-South-American-Region/*

Project Pages

NEO Project Group

Facebook	*https://www.facebook.com/pages/SGAC-NEO-Project-Group*
Official Website	*http://spacegeneration.org/asteroid*
Twitter	*@NEOProjectsSGAC*

Small Satellites Project Group

Twitter	*@SGACSSPG*
Facebook	*http://www.facebook.com/sswg.sgac*
Linkedin	*http://tinyurl.com/lisgacsspg*
Official Website	*http://spacegeneration.org/index.php/projects/small-sats*

Space Law Project Group

Twitter	*@SGACSpaceLaw*
Facebook	*https://www.facebook.com/SGACSpaceLawProjectGroup*
Official Website	*http://spacegeneration.org/index.php/projects/space-law*

Commercial Space Project Group

Official Website	
Blog	

Space Safety and Sustainability Project Group

Official Website	*http://spacegeneration.org/index.php/projects/space-safety-a-sustainability*
Facebook	*https://www.facebook.com/sssprojectgroup*

Space Law Project Group

Official Website	*http://spacegeneration.org/index.php/projects/space-law*
Facebook	*https://www.facebook.com/SGACSpaceLawProjectGroup*
Twitter	*@SGACSpaceLaw*

Space Technologies for Disaster Management

Official Webste	*http://spacegeneration.org/index.php/projects/space-technologies-for-disaster-mgmt*
Facebook	*https://www.facebook.com/pages/Space-Technologies-for-Disaster-Management-SGAC-Project-Group/383767891697248*
Twitter	*@STDM_SGAC*
LinkedIn	*http://www.linkedin.com/groups/Space-Technologies-Disaster-Management-SGAC-4947901*

Youth for GNSS

Official website	*http://spacegeneration.org/index.php/projects/ygnss*

APPENDIX II
EXECUTIVE TEAM

Co-Chairs

Christopher VASKO
Chairperson
Austria / Hungary
Apr 2012 - Apr 2014

Victoria ALONSOPEREZ
Co-Chairperson
Uruguay
Apr 2013 - Apr 2015

Executive Office

Andrea JAIME
Executive Director
Spain
Sep 2011 - Dec 2014

Minoo RATHNASABAPATHY
Deputy Executive Director
South Africa / Australia
Sep 2014 - Dec 2014

Jacob HACKER
Treasurer
Australia
Oct 2013 - Oct 2015

Ali NASSERI
Executive Co-Secretary
Iran / Canada
Apr 2013 - Apr 2015

Jack YEH
Executive Co-Secretary
New Zealand
Jan 2014 - Jan 2016

Noemie BERNEDE
Competition Co-Coordinator
France
Dec 2013 - Dec 2015

Philipp MAIER
Competition Co-Coordinator
Germany
Dec 2013 - Dec 2015

Jamie FAVORS
Project Co-Coordinator
USA
Dec 2013 - Dec 2015

Ana Margarida RAPOSO
Project Co-Coordinator
Portugal
Dec 2013 - Dec 2015

Lewis GROSWALD
SG Fusion Forum Manager
USA
Jan 2014 - Dec 2014

Stephen RINGLER
Strategic Partnerships Coordinator
USA
Sep 2013 - Sep 2015

Regional Coordinators (Executive Council)

Suki DAUDA SULE
Regional Coordinator Africa
Nigeria
Jul 2014 - Jul 2016

Beza TESFAYE
Regional Coordinator Africa
Ethiopia
May 2014 - May 2016

Suresh BHATTARAI
Regional Coordinator Asia Pacific
Nepal
Apr 2013 - Apr 2015

Yusuke MURAKI
Regional Coordinator Asia Pacific
Japan
May 2014 - May 2016

Guzel KAMALETDINOVA
Regional Coordinator Europe
Russia
Feb 2011 - Feb 2015

Matteo EMANUELLI
Regional Coordinator Europe
Italy
Jun 2014 - Jun 2016

Behnoosh MESKOOB
Regional Coordinator Middle East
Iran
Apr 2013 - Apr 2015

Hasan AZIZ KAYIHAN
Regional Coordinator Middle East
Turkey
Feb 2010 - May 2016

Ashley KARP
Regional Coordinator NCAC
USA
Apr 2012 - Jun 2016

Alan STEINBERG
Regional Coordinator NCAC
USA
Dec 2011 - Mar 2016

Daniel KONRAD
Regional Coordinator South America
Brazil
May 2014 - May 2016

Bruno SARLI
Regional Coordinator South America
Brazil
Mar 2014 - Mar 2016

APPENDIX III
NATIONAL POINTS OF CONTACT

Africa

Ifriky
TADADJEU SOKENG
Cameroon
Aug 2013 - Aug 2015

Getu
HAILU
Ethiopia
Dec 2013 - Dec 2015

Nebiyu
SULEYMAN MOHAMMED
Ethiopia
Dec 2013 - Dec 2015

Patrick
ESSIEN
Ghana
Jan 2014 - Jan 2016

Michael
AFFUL
Ghana
Sep 2011 - Sep 2015

Kinyili
ANTONY
Kenya
Oct 2012 - Oct 2016

Nicholas
MUINDE
Kenya
Dec 2013 - Dec 2015

Patsa
ABRAM KHOSTO
Lesotho
Jun 2012 - Jun 2016

Idriss
SISAID
Morocco
Nov 2014 - Nov 2016

Funmi
ERINFOLAMI
Nigeria
Sep 2013 - Sep 2015

Akinsanmi
BABATUNDE
Nigeria
Oct 2014 - Oct 2016

Lumka
MSIBI
South Africa
Sep 2013 - Sep 2015

Manahil
ABDALLA
Sudan
Dec 2013 - Dec 2015

Ahmed
SAAD
Sudan
Nov 2014 - Nov 2016

Constant
CHUMA
Zimbabwe
Nov 2013 - Nov 2015

Conrade
MUYAMBO
Zimbabwe
Jul 2013 - Jul 2015

Asia Pacific

Crystal
FORRESTER
Australia
Mar 2012 - Mar 2016

John
FURNESS
Australia
Jun 2016 - Jun 2016

Khaza Anuarul
HOQUE
Bangladesh
Feb 2014 - Feb 2016

Zihua
ZHU
China
Dec 2013 - Dec 2015

Aafaque R.
KHAN
India
Feb 2013 - Feb 2017

Daichi
NAKAMURA
Japan
Aug 2011 - Aug 2015

Kenta
SADA
Japan
Oct 2014 - Oct 2016

Altynay
DEMEUBAYEVA
Kazakhstan
Jun 2014 - Jun 2016

Andrew
LEE CHEE HAU
Malaysia
Dec 2013 - Dec 2015

Kishor
ACHARYA
Nepal
Apr 2013 - Apr 2015

Ishan
BASYAL
Nepal
Sep 2013 - Sep 2015

Vikram
UDYAWER
New Zealand
Feb 2013 - Feb 2017

Waqas
QAZI
Pakistan
Oct 2013 - Oct 2015

Hasan
MURTAZA
Pakistan
Mar 2014 - Mar 2016

Pauline
DIVINAGRACIA
Philippines
Nov 2012 - Nov 2016

Rogel
SESE
Philippines
Jan 2013 - Jan 2017

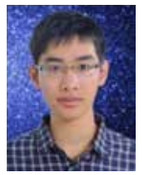
Ilji
JANG
South Korea
Oct 2013 - Oct 2015

Eranga
JAYASHANTHA
Sri Lanka
Dec 2012 - Dec 2016

Peerapong
TORTEEKA
Thailand
Jan 2014 - Jan 2016

Wasanchai
VONGSANTIVANICH
Thailand
Sep 2014 - Sep 2016

Dao Thu
HA
Vietnam
Mar 2014 - Mar 2016



Nguyen
TRAN HOANG
Vietnam
Mar 2014 - Mar 2016

Europe

Vojna
NGJEQARI
Albania
Nov 2012 - Nov 2016

Julia
HEURITSCH
Austria
Aug 2013 - Aug 2015

Kiryl
HALAUKO
Belarus
Dec 2013 - Dec 2015

Simon
VANDEN BUSSCHE
Belgium
Sep 2014 - Sep 2016

Sarah
MOENS
Belgium
Sep 2011 - Sep 2015

Rada
POPOVA
Bulgaria
Feb 2011 - Feb 2015

Robert
TERLEVIC
Croatia
Sep 2014 - Sep 2016

Michal
KUNES
Czech Republic
Feb 2014 - Feb 2016

Lauri
NEUVONEN
Finland
Sep 2013 - Sep 2015

Sisi
ENESTAM
Finland
Jun 2014 - Jun 2016

Emmanuelle DAVID
France
Dec 2014 - Dec 2016

Lucie POULET
France
Mar 2014 - Mar 2016

Sebastian KLEIM
Germany
Dec 2013 - Dec 2015

Benjamin KRAETZIG
Germany
Dec 2013 - Dec 2015

Adrianos GOLEMIS
Greece
Jun 2014 - Jun 2016

Amalia DIMOPOULOU
Greece
Oct 2014 - Oct 2016

László BACSÁRDI
Hungary
Feb 2012 - Feb 2016

Dorottya MILÁNKOVICH
Hungary
May 2014 - May 2016

James HARPUR
Ireland
Aug 2014 - Aug 2016

Norah PATTEN
Ireland
Dec 2011 - Dec 2015

Giulia FEDERICO
Italy
Oct 2013 - Oct 2015

Valentina BOCCIA
Italy
Aug 2014 - Aug 2016

Laurynas MAČIULIS
Lithuania
Oct 2011 - Oct 2015

Sanja ŠĆEPANOVIĆ
Montenegro
Jan 2013 - Jan 2017

Aleksandar JACIMOVIC
Montenegro
Jan 2013 - Jan 2015

Peter BATENBURG
Netherlands
Jun 2013 - Jun 2015

Susanne PIETERSE
Netherlands
Jun 2013 - Jun 2015

Tale SUNDLISÆTER
Norway
Oct 2011 - Oct 2015

Roger BIRKELAND
Norway
Apr 2014 - Apr 2016

Szymon MOLINSKI
Poland
Jul 2013 - Jul 2015

Hugo COSTA
Portugal
Dec 2013 - Dec 2015

Corina STIUBEI
Romania
Aug 2013 - Aug 2015

Alina-Mihaela BADESCU
Romania
Apr 2014 - Apr 2016

Aleksandr KHOKHLOV
Russia
Jul 2013 - Jul 2015

Marina BALDINA
Russia
Oct 2014 - Oct 2016

Milan MIJOVIC
Serbia
Dec 2012 - Dec 2016

Nemanja JOVANOVI
Serbia
Mar 2014 - Mar 2016

Ziga VALIC
Slovenia
Dec 2010 - Dec 2014

Lluc
PALERM
Spain
Dec 2014 - Dec 2016

Jorge
DIAZ
Spain
Jan 2012 - Jan 2016

Daniel
BRACK
Israel
Aug 2014 - Aug 2016

Hisham
DEEK
Lebanon
Jul 2013 - Jul 2015

Louise
LINDBLAD
Sweden
Jul 2013 - Jul 2015

Fredrik
PERSSON
Sweden
Aug 2013 - Aug 2015

Rémi
KAHWAJI
Lebanon
Nov 2011 - Nov 2015

Aisha
SALEOUS
Palestine
Nov 2013 - Nov 2015

Mykola
GRYSHYN
Ukraine
Sep 2012 - Sep 2016

Akash
TRIVEDI
United Kingdom
Jun 2014 - Jun 2016

Amal
A. I. SHAIKHAH
Palestine
aug 2014 - Aug 2016

Ece
GÜLFEM DAĞDEVIREN
Turkey
Jun 2014 - Jun 2016

Kate
GRAY
United Kingdom
Jun 2014 - Jun 2016

Burak
YAGLIOGLU
Turkey
Sep 2014 - Sep 2016

Tareq
AHMED ABDO HASSAN
Yemen
Oct 2014 - Oct 2016

Middle East

Ayman
MAHMOUD
Egypt
Jul 2013 - Jul 2015

Ashraf
NABIL
Egypt
Jul 2013 - Jul 2015

Mohammadreza
REZAEI
Iran
Oct 2013 - Oct 2015

Safoura
TANBAKOUEI
Iran
Jan 2012 - Jan 2016

North, Central America and Caribbean

Adam
VIGNERON
Canada
Dec 2013 - Dec 2015

Kate
HOWELLS
Canada
Dec 2013 - Dec 2015

John
SHORTER
Jamaica
Aug 2014 - Aug 2016

Yitzhak Alexander
HENRY
Jamaica
Oct 2014 - Oct 2016

Alejandro
CORDOVA LOPEZ
Mexico
Oct 2014 - Oct 2016

Mario
ALEMAN
Nicaragua
Feb 2014 - feb 2016

Charlotte
KIANG
USA
Mar 2014 - Mar 2016

South America

Federico
PERAZZO
Argentina
Nov 2014 - Nov 2016

Benjamin
PINAYA
Bolivia
Jan 2012 - Jan 2016

Josué
DOS SANTOS
Brazil
Sep 2013 - Sep 2015

Brehme
DNAPOLI REIS DE MESQUITA
Brazil
Oct 2014 - Oct 2016

Alejandro
LOPEZ
Chile
Jan 2012 - Jan 2016

Diego
JIMENEZ
Colombia
May 2012 - May 2016

Diego Alejandro
ALBARRACIN GONZALEZ
Colombia
Oct 2014 - Oct 2016

Avid
ROMAN-GONZALEZ
Peru
Aug 2013 - Aug 2015

Giancarlo
VILLENA
Peru
Aug 2014 - Aug 2016

APPENDIX IV
SGAC TEAMS

Communications and Public Relations Team

Vinita MARWAHA
Newsletter
UK

Kyle ACIERNO
Newsletter
Canada

Lauren LYONS
Social Media
USA

Arno GEENS
Material Development
Graphic Design
Belgium

Isabella STOJKOVSKI
Webnews
Germany

Reinhard TLUSTOS
Pictures & Video
Austria

Web Team

Chantelle DUBOIS
Web Editor
Canada

Ece GÜLFEM DAĞDEVIREN
Web editor
Turkey

Magni JOHANNSSON
Web Editor
Sweden / Iceland

ECOSOC Representatives

Alana BARTOLINI
Canada

Charlotte KIANG
USA

Anne WEN
Canada

Translation Team

Ana A. PEREZ
Spanish Translator
Venezuela

Klaus KORNFELD
German Translator
Austria

Editors

Laura ROSE
Canada

Justin PARK
USA

Candice GOODWIN
South Africa

Abhijeet KUMAR
Australia

Nikita
MARWAHA
UK

Dario
SCHOR
Argentina / Canada

Leo
TEENEY
UK

Strategic Partnership Team

Stephen
RINGLER
Strategic Partnerships
Coordinator
USA

Michael
BRETT
Strategic Partnerships
Asia Pacific
Australia

Weston
HANKINS
Strategic Partnerships
Europe
Mexico

Christopher
VASKO
Strategic Partnerships
Europe
Austria / Hungary

Stephanie
WAN
Strategic Partnerships
NCAC
USA

Victoria
ALONSOPEREZ
Strategic Partnerships
South America
Uruguay

APPENDIX V
BOARD MEMBERS

Advisory Board Members

The aim of the SGAC's Advisory Board is to provide strategic direction and advice to SGAC in order to help guide the organisation in its fulfilment of its goals and objectives. It provides comment primarily on the work of the organisation and suggests ways in which to improve its functions and its engagement. The board is composed of eight board members, each of whom serves for a two-year term. Our Advisory Board members are influential members of the international space community who have been strong supporters of the goals of SGAC and of the organisation itself.

Current members in alphabetical order:

Michael Brett	*Outgoing SGAC Chair 2012*
Catherine Doldirina	*Outgoing SGAC Chair 2013*
Steve Eisenhart	*Senior Vice President - Strategic & International Affairs at the Space Foundation*
Norbert Frischauf	*Future Studies Systems Engineer for Spacetec*
Yasushi Horikawa	*Technical Counsellor at the Japanese Aerospace Exploration Agency (JAXA)*
Agnieszka Lukaszczyk	*Former SGAC Chairperson and Policy Officer at the European Commission, Directorate General Enterprise and Industry, Space Policy and Research Unit*
Peter Martinez	*Chairman of the South African Council for Space Affairs*
Tanja Masson-Zwaan	*President of the International Institute of Space Law*
Clayton Mowry	*President, Arianespace, Inc.*
Enrique Pacheco-Cabrera	*Deputy Director for Space Science and Technology Affairs, Mexican Space Agency*
Nicolas Peter	*Exploration Strategy Officer in the Director General's Cabinet - European Space Agency*
Chris Welch	*Director MSc Programmes, International Space University*

Former members in alphabetical order:

Adigun Ade Abiodun	*Founder of African Space Foundation*
Ciro Arevalo	*Former Chairman of the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS)*
Ben Baseley-Walker	*Legal & Policy Advisor for Secure World Foundation & former SGAC Chair*
Yolanda Berenguer	*Space Education Programme Coordinator for the United Nations Educational, Scientific and Cultural Organization (UNESCO)*
Lance Bush	*Chief Strategy Officer, Paragon Space Development Corporation*
Sergio Camacho	*Secretary General of the Regional Centre for Space Science*
Chris De Cooker	*Head of International Relations for the European Space Agency*
Dumitru Prunariu	*Former Chairman of the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS)*

Honorary Board Members

SGAC's Honorary Board is comprised of distinguished individuals who have been of great service to our organisation or who we have wished to recognise for their continuance of goals similar to those of SGAC. The Honorary Board provides advice as appropriate to the experience of Honorary Board members.

Members in alphabetical order:

Barbara Adde	*NASA SCaN Policy and Strategic Communication*
Ciro Arevalo	*Former Chairman of the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS)*
Ben Baseley-Walker	*Legal & Policy Advisor for Secure World Foundation & former SGAC Chair*
Yolanda Berenguer	*Space Education Programme Coordinator for the United Nations Educational, Scientific and Cultural Organization (UNESCO)*
James D. Burke	*US Naval Aviator and NASA Jet Propulsion Laboratory*
Caroline Burke	*Teacher and Arts in Space Advocate*
Chris De Cooker	*Head of International Relations for the European Space Agency*
JR Edwards	*Manager, Human Space Flight Programs, Lockheed Martin, Washington Operations*
Gernot Grömer	*Professor and Researcher of Human Mars Exploration at the University of Innsbruck*
Johannes Ortner	*Former President of the Austrian Space Agency and of the International Astronautical Federation (IAF)*
Kai-Uwe Schrogl	*Director of the European Space Policy Institute*
Loretta Hidalgo-Whitesides	*Flight Director for ZERO-G*
Jim Zimmerman	*President of International Space Services, Inc. and Former IAF President*

APPENDIX VI
ACRONYMS

AAJ	Astronomical Association of Jamaica ABS Asia Broadcast Satellite
ACAE	Asociación Centroamericana de Aeronaútica y el Espacio (Central American Association for Aeronautics and Space)
ACMI	Australian Centre for the Moving Image
ACODEA	Asociacion Costarricense de Astronomia (Costa Rican Astronomy Association)
ACRS	Asian Conference on Remote Sensing
ACSER	Australian Centre for Space Engineering Research
ADR	Active Debris Removal
AEB	Agência Espacial Brasileira (Brazilian Space Agency)
AEM	Agencia Espacial Mexicana (Mexican Space Agency)
AFB	Air Force Base
AFRICSIS	African Center for Science and International Security
AGI	Analytical Graphics Inc.
AIAA	American Institute of Aeronautics and Astronautics
ALAS	Latin-American Aerospace Agencies Project
ALE	Asociación Latinoamericana del Espacio (Latin American Space Association)
ALMA	Atacama Large Milimeter/Submilimiter Array
AMEC	Australian Mars Exploration Conference
APAN	Asia Pacific Advanced Network
APRSAF	Asia-Pacific Regional Space Agency Forum
APSCO	Asia Pacific Space Cooperation Organisation
ARABSAT	Arab Satellite Communications Organisation
ARCSSTE-E	African Regional Centre for Space Science and Technology Education - in English Language
ASE	Association of Space Explorers
ASI	Agenzia Spaziale Italiana (Italian Space Agency)
ASTA	Australian Science Teachers Association
AT14	Action Team 14 (on Near Earth Objects)
ATV	Automated Transfer Vehicle
AWB	Astronomers Without Borders
AYAA	Australian Youth Aerospace Association
AYAF	Australian Youth Aerospace Forum
BANEX	Balloon Navigation Experiment
BBC	British Broadcasting Coorperation
BEXUS	Balloon Experiments for University Students
BIS	British Interplanetary Society
BSc	Bachelor of Science
CAP	Communicating Astronomy for the Public
CaSE	Campaign for Science and Engineering
CBSS	Centre for Basic Space Studies
CBU	Copperbelt University
CCD	Charged Coupled Device
CCE	Comisión Colombiana del Espacio (Colombian Space Commission)
CEO	Chief Executive Officer
CEOS	Committee of Earth Observation Satellites
CERN	Centre Européenne pour la Recherche Nucléaire (European Centre for Nuclear Research)
CERTH	Centre for Research and Technology - Hellas (Florida Tech)
CIDA-E	Centro de Investigación y Difusión Aeronáutico-Espacial (Aeronautic Space Centre of Investigation and Outreach)
CLA	Centro de Lançamento de Alcântara (Alcantara Launch Centre)
CNES	Centre National d'Etudes Spatiales (National Centre for Space Studies)
COCOA	Colombian Congress of Astronomy and Astrophysics
COE	Centre of Excellence
Comms	Communications
CONAE	Comisión Nacional de Actividades Espaciales (National Space Activities Commission)
CONASTA	Conference of the Australian Science Teachers Association
CONIDA	Comisión Nacional de Investigación y Desarrollo Aeroespacial (National Commission for Aerospace Research and Development)
COSPAR	Committee on Space Research
CRISIS	Centre for Responsive Information for Safety and Security
CSA	Canadian Space Agency
CST	Commercial Space Transportation
CTU	Czech Technical University
CYUSIW	Council of Young Ukrainian Space Industry Workers
DCTA	Departamento de Ciência e Tecnologia Aeroespacial (Department of Aerospace Science and Technology)
DLR	Deutsches Zentrum für Luft- und Raumfahrt (German Aerospace Center)
DRR	Disaster Risk Reduction
DSTO	Defence Science and Technology Organisation
DTI	Department of Trade and Industry
EAAS	East Africa Astronomical Society
EADS	European Aeronautic Defence and Space
ECI	Encuentro Scientifico Internacional
ECS	European Cooperating State
ECSL	European Centre for Space Law
EESC	Escola de Engenharia de São Carlos (Engineering College of São Carlos)
EISC	European Interparliamentary Space Conference
ESA	European Space Agency
ESERO	European Space Education Research Organisation
ESO	European Southern Observatory
ESPI	European Space Policy Institute
ESRIN	European Space Research Institute
ESSS	Ethiopian Space Science Society
ESTEC E	uropean Space Research and Technology Centre
EU	European Union
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EUROAVIA	European Association for Aerospace Students

EXA	Agencia Espacial Civil Ecuatoriana (Ecuadorian Civil Space Agency)
FAA	Federal Aviation Administration
FAC	Fuerza Aérea Colombiana (Colombian Air Force)
FACSAT-1	Fuerza Aérea Colombiana Satelite 1 (Colombian Air Force Satellite 1)
FEG	Faculdade de Engenharia Guaratinguetá (Engineering College of Guaratinguetá)
FIA	Farnborough International Airshow
FIDAE	Feria Internacional del Aire y del Espacio
FIT	Florida Institute for Technology
GAEC	Ghana Atomic Energy Commission
GEO	Geostationary Earth Orbit
GEOSS	Global Earth Observation System of Systems
GHOU	Global Hands on Universe
GISTDA	Geo-Informatics and Space Technology Development Agency
GLEX	Global Exploration Conference
GLxP	Google Lunar X-PRIZE
GMES	Global Monitoring for Environment and Security
GRULAC	Grupo Regional de la Federación Internacional de Astronáutica para América Latina y el Caribe (Regional Group for Latin America and the Caribbean)
GTTP	Galileo Teacher Training Programme HAS Hungarian Astronautical Society
HQ	Headquarters
IAA	International Academy of Astronautics
IAC	International Astronautical Congress
IAE	Institute of Aeronautics and Space
IAF	International Astronautical Federation
IAG	Astronomy, Geophysics and Atmospherical Sciences Institute
IASC	International Astronomical Search Collaboration
IAU	International Astronomical Union
ICAC	International Conference on Astrophysics and Cosmology
ICG	International Committee on GNSS
ICHEP	International Conference on High Energy Physics
ICIMOD	International Centre for Integrated Mountain Development
IDSC	International Space Development Conference
IEP	Innovative Engineering Projects
IES	Institute for Eastern Studies
IGAC	Instituto Geográfico Agustín Codazzi (Geographic Institute Agustín Codazzi)
IGCE	Geosciences and Exact Sciences Institute
IIASL	International Institute of Air and Space Law
IISL	International Institute of Space Law
INPE	National Institute for Space Research
ION	Institute of Navigation
IoP	Institute of Physics
IRF	Institutet för rymdfysik (Swedish Institute of Space Physics)
ISEB	International Space Education Board
ISECG	International Space Exploration Coordination Group
ISERV	ISS SERVIR Environmental Research and Visualisation System
ISS	International Space Station
ISSF	International Space Safety Foundation
IST	Institute of Space Technologies
ISU	International Space University
ITA	Technological Institute of Aeronautics
IWSCFF	International Workshop on Satellite Constellation and Formation Flying
ITB	Institut Teknologi Bandung (Bandung Institute of Technology)
ITCR	Instituto Tecnológico de Costa Rica (Costa Rican Institute of Technology)
ITU	International Telecommunication Union
İÜFFAAK	İstanbul Üniversitesi Fen Fakültesi Amatör Astronomlar (Amateur Astronomers Society of Istanbul University Faculty of Science)
IYA	International Year of Astronomy
JAXA	Japan Aerospace Exploration Agency
JCYCN	Jagriti Child and Youth Concern Nepal
JETS	Junior Engineers Technical Science
JWST	James Webb Space Telescope
KARI	Korea Aerospace Research Institute
KTH	Kungliga Tekniska högskolan (Royal Institute of Technology)
KTU	Kaunas University of Technology
KUACC	Kenyatta University Amateur Astronomy Club
LADA	Latin America Discovery Adventure
LAG	Lebanese Astronomy Group
LAPAN	Indonesian National Institute of Aeronautics and Space
LEO	Low Earth Orbit
LOX	Liquid Oxygen
LTU	Luleå tekniska universitet (Luleå University of Technology)
MAS	Mathematical & Astronomical Society
MAV	Museo Archeologico Virtuale (Virtual Archeological Museum)
MDA	MacDonald Dettwiler and Associates
MDRS	Mars Desert Research Station
MoU	Memorandum of Understanding
MP	Member of Parliament
MSc	Master of Science
MVP	Most Valuable Participant
MWA	Murchison Widefield Array
NAECY	The National Aerospace Educational Center of Youth
NASA	National Aeronautics and Space Administration
NASO	Nepal Astronomical Society
NASRDA	National Space Research and Development Agency
NAST	Nepal Academy of Science & Technology
NCAC	North America, Central America and the Caribbean
NEO	Near Earth Object
NESARC	Nepal Scientific Activities and Research Centre
NGC	Next Generation Canadaarm
NGO	Non-Governmental Organisation
NIFRO	Norwegian Industrial Forum for Space Activities
NOAO	National Optical and Astronomical Observatory
NPoC	National Point of Contact
NSO	Netherlands Space Office
NSS	National Space Symposium
NTNU	Norges teknisk-naturvitenskapelige universitet (Norwegian University of Science and Technology)
NUTS	Norwegian University Test Satellite
NVR	Nederlandse Vereniging voor Ruimtevaart (Netherlands Space Society)
OAU	Uruguayan Astronomy Olympiads
ÖAW	Österreichische Akademie der Wissenschaften (Austrian Academy of Sciences)
ÖWF	Österreichisches Weltraum Forum (Austrian Space Forum)
PAIIZ	Polska Agencja Informacji i Inwestycji Zagranicznych (Polish Agency for Information and Foreign Investment)
PECS	Plan for European Cooperating States
PENS	Electronic Engineering Polytechnic Institute
PhD	Philosophiae Doctor (Doctor of Philosophy)
PNAE	National Programme of Space Activities
PR	Public Relations
PSEI	Polish Space Industry Association
R3	Regional Readiness Review
RAC	Red de Astronomía de Colombia
RAeS	Royal Aeronautical Society
RAS	Royal Astronomical Society
RASC-AL	Revolutionary Aerospace Systems Concepts - Academic Linkage
RBSP	Radiation Belt Strom Probe
RC	Regional Coordinator
RCMRD	Regional Center for Mapping Resources for Development
RCSC	Russian Centre of Science & Culture
ROSA	Romanian Space Agency

S&T	*Scientific and Technical*
SAA	*Sociedad Antioqueña de Astronomia*
SAASTA	*South African Agency for Science and Technology Advancement*
SAC-D	*Satelite de Aplicaciones Cientificas-D (Satellite for Scientific Applications-D)*
SANSA	*South African National Space Agency*
SAOCOM	*Satélite Argentino de Observación Con Microondas (Argentine Microwaves Observation Satellite)*
SAR	*Synthetic Aperture Radar*
SATS	*Space Association fo Turkish States*
SCaN	*Space Communications and Navigation (NASA)*
SDF	*Space Development Forum*
SEMWO	*Space Economy in the Multipolar World*
SGAC	*Space Generation Advisory Council*
SGACG	*Space Generation Advisory Council Ghana*
SGC	*Space Generation Congress*
SGFF	*Space Generation Fusion Forum*
SH-SSP	*Southern Hemisphere Summer Space Programme*
SKP	*Space Krenovation Park*
SL	*Space Law*
SLPG	*Space Law Project Group*
SME	*Small and Medium Enterprises*
SOCRATES	*Satellite Orbital Conjunction Reports Assessing Threatening Encounters in Space*
SPACE-SI	*Slovenian Centre of Excellence for Space Sciences and Technologies*
SPU	*Space Policy Unit*
SSA	*Space Situational Awareness*
SSC	*Swedish Space Corporation (SSC).*
SSP	*Small Satellite Platform*
SSP	*Space Studies Programme (International Space University)*
SSPG	*Small Satellite Project Group*
SSPI	*Society of Satellite Professionals International*
SSS	*Space Safety and Sustainability*
STDM	*Space Technology for Disaster Management*
STEM	*Science, Technology, Engineering and Maths*
STEMnet	*Science, Technology, Engineering and Maths Network*
STK	*Satellite Tool Kit*
SUPARCO	*Space and Upper Atmosphere Research Commission (Pakistan)*
SWF	*Secure World Foundation*
SXC	*Space Expedition Corporation*
TAI	*Turkish Aerospace Industries*
TBC	*To be confirmed*
TBD	*To be decided*
TICAL	*Tecnología de Información y Comunicación para América Latina (Technology of Information and Communication for Latin America)*
ToV	*Transit of Venus*
TRAC	*Telsiz ve Radyo Amatörleri Cemiyeti (Turkish Radio Amateurs Society)*
UAE	*United Arab Emirates*
UC	*University of Canterbury*
UCC	*Universidad Católica de Córdoba (Catholic University of Córdoba)*
UCR	*Universidad de Costa Rica (University of Costa Rica)*
UdelaR	*Universidad de la República (University of the Republic)*
UFABC	*Universidade Federal do ABC (Federal University of ABC)*
UiO	*Universitetet i Oslo (University of Oslo)*
UK	*United Kingdom*
UKSEDS	*UK Students for Exploration & Development of Space*
ULA	*United Launch Alliance*
UN	*United Nations*
UN COPUOS	*United Nations Committee on the Peaceful Uses of Outer Space*
UN ECOSOC	*United Nations Economic and Social Council*
UN OOSA	*United Nations Office for Outer Space Affairs*
UN SPIDER	*United Nations Platform for Space-based Information for Disaster Management and Emergency Response*
UNESCO	*United Nations Educational, Scientific and Cultural Organisation*
UNESP	*Universidade Estadual Paulista (Paulista State University)*
UNGA	*United Nations General Assembly*
UNI	*Universidad Nacional de Ingeniería (National University of Engineering)*
UNIDROIT	*Institut International Pour L'Unification du Droit Prive (International Institute for the Unification of Private Law)*
UNIFESP	*Universidade Federal de São Paulo (Federal University of São Paulo)*
UniSA	*University of South Australia*
UNISEC	*University Space Engineering Consortium*
UNISPACE III	*Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space*
UNLP	*Universidad Nacional de La Plata (National University of La Plata)*
UTP	*Technological University of Peru*
UNOSAT	*United Nations Operational Satellite Applications Programme*
USA	*United States of America*
USP	*Universidade de São Paulo (University of São Paulo)*
UWI	*University of the West Indies*
VAST	*Vietnam Academy of Science and Technology*
VEGA	*Vettore Europeo di Generazione Avanzata (Advanced Generation European Carrier Rocket)*
VLM	*Viscous Liquid Monopropellant*
VLS	*Veículo Lançador de Satélites (Satellite Launch Vehicle)*
VNSC	*Vietnam National Space Centre*
VSSEC	*Victorian Space Science Education Centre*
WDTC	*Women Development Training Centre*
WHO	*World Health Organisation*
WLSJ	*White Label Space Japan*
WSBR	*Washington Space Business Roundtable*
WSW	*World Space Week*
YGNSS	*Youth for Global Navigation Satellite Systems*
YJC	*Young Journalists Club*
ZAMTEL	*Zambia Telecommunication Company*

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