

# ANNUAL REPORT



SPACE GENERATION  
ADVISORY COUNCIL

IN SUPPORT OF THE UNITED NATIONS  
PROGRAMME ON SPACE APPLICATIONS

# SGAC 2013





SPACE GENERATION  
ADVISORY COUNCIL

In Support of the United Nations Programme on Space Applications

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Cover page image: three nanosatellites, known as Cubesats, are deployed from a Small Satellite Orbital Deployer (SSOD) attached to the Kibo laboratory's robotic arm at 7:10 a.m. (EST) on Nov. 19, 2013. Credit: NASA.

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# Acronyms

Acronym	Definition
AAJ	Astronomical Association of Jamaica
ABS	Asia Broadcast Satellite
ACAE	Asociación Centroamericana de Aeronáutica 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/Submillimeter 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 Cooperation
BEXUS	Balloon Experiments for University Students
BIS	British Interplanetary Society
BSc	Bachelor of Science

Acronym	Definition
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 Científico 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

Acronym	Definition
ESSS	Ethiopian Space Science Society
ESTEC	European 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 Satellite 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 Atmospheric 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

Acronym	Definition
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



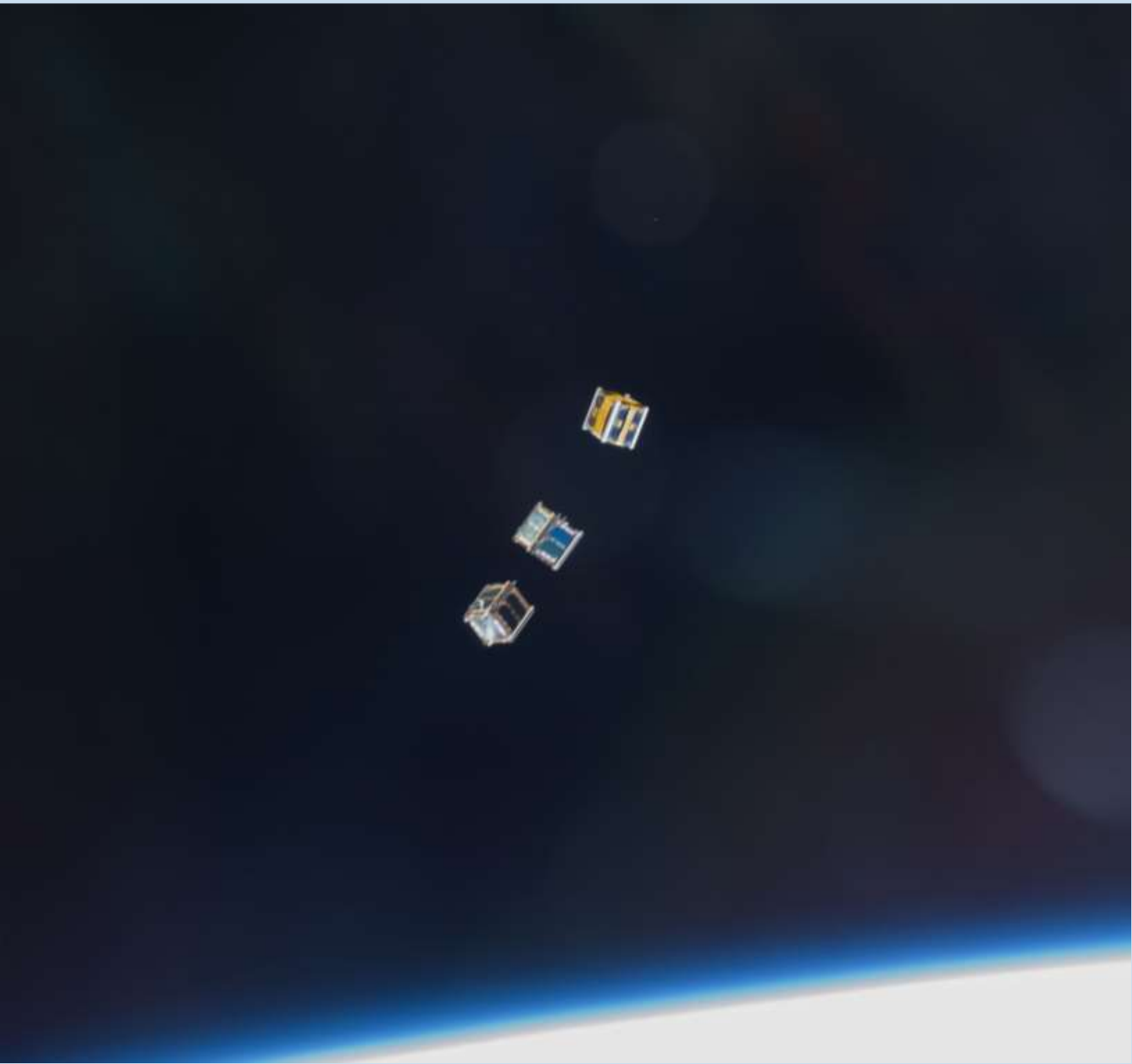
Acronym	Definition
NASA	National Aeronautics and Space Administration
NASO	Nepal Astronomical Society
NASRDA	National Space Research and Development Agency
NAST	Nepal Academy of Science & Technology
NCAC	North America, Central America and the Caribbean
NEO	Near Earth Object
NESARC	Nepal Scientific Activities 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 Storm 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 Astronomía
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

Acronym	Definition
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)

Acronym	Definition
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)
UTP	Universidad Tecnológica del Peru (Technological University of Peru)
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

# INTRODUCTION

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# 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.



SPACE GENERATION  
ADVISORY COUNCIL

# Message from the Co-Chairs

Dear supporters and colleagues,

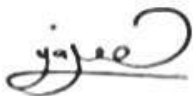
The Space Generation Advisory Council has completed another year and is proud of the achievements of the organisation and its members. The groundwork laid in previous years has opened up new opportunities to fulfil our goal of improving the youth voice in the international space industry. Despite the ever growing and changing leadership of our organisation, we are proud of the cohesion, spirit and dedication of our members that led to a remarkably successful 2013.

This year saw the second edition of the Space Generation Fusion Forum, which was again a great success, not only thanks to our generous financial supporters, but also thanks to our team of volunteers and the excellent advice and support of our partners. The event gave 47 delegates the chance to engage in the hottest space topics, to discuss with their peers and to be guided by key players of the sector. The annual Space Generation Congress – now in its 12<sup>th</sup> year – put our organisational team to the test. We faced a large cultural gap and substantial challenges in almost all areas of the organising effort but SGAC nevertheless hosted a fantastic Congress for 117 delegates from 38 countries in Beijing, China. The conference was supported by a line-up of top-level speakers and a keynote speech from NASA Administrator Charles Bolden. The quality of the Congress would not have been possible without a strong SGAC team and our supporters.

We are grateful to all those who trust in and contribute to SGAC. We would like to extend our gratitude to our supporters and partners, who provided not only the financial support that make our activities possible, but whose advice, dedication and trust are also key to our success. We would also like to offer our warmest thanks to our Executive office team, and in particular to Andrea Jaime, for running our Vienna office and our daily operations. Finally, we greatly appreciate the guidance, continued support and time invested by our Advisory Board. We are very grateful for your cooperation and look forward to strengthening our relations in the future.

SGAC is growing, our network is strong and, looking forward to 2014, we feel the organisation is ready to meet future opportunities. We are proud that SGAC has further matured this year and we are dedicated to ensuring our organisation remains professional, united and focused on representing the voice of the next generation.

So, let us keep up the good work, and stay tuned. 2014 will be a great year! Let's face it together.



Chijioke(CJ) Nwosa  
SGAC Chair



Chris Vasko  
SGAC Co-Chair

# Message from the Executive Director

Dear SGAC members, partners, supporters and friends,

2013 was a year of stabilisation, but also continuous growth and development for SGAC. Over the past few years, the organisation has built a solid foundation and 2013 marked a new high on this steadily growing trend. The key metrics that SGAC uses to measure its growth – number of delegates attending SGAC events, donation revenue, value of scholarships, partnerships with other organisations – are all showing fantastic growth.

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 seven project groups 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.

In addition, SGAC continues to give a large number of full scholarships to its members, especially to attend the Space Generation Congress and the Space Generation Fusion Forum (SGFF), which were both seen as being extraordinarily successful. The exclusive SGFF conference marked its second rendition; an important milestone in what will hopefully become a permanent annual event.

SGAC is very proud of its new partners. It is important to recognise the hard work of the young volunteer professionals and students that have made this happen. SGAC's Executive Council would like to thank our volunteers, and we look forward to more growth in 2014!

Best Regards,



Andrea Jaime

SGAC Executive Director



# Executive Summary

## ORGANISATIONAL DEVELOPMENT

Team changes:

- Chijioke CJ Nwosa (Nigeria) succeeded Catherine Doldirina (Georgia) as the new Chair of SGAC.
- SGAC welcomed a new Co-Chair, Chris Vasko (Austria/Hungary).
- SGAC welcomed two interns, Ryan Laird (UK) and Felipe Arevalo (Colombia).
- SGAC welcomed Stephen Ringler (USA) to fill a new position to the Executive Office: the Strategic Partnership Coordinator.
- SGAC included new members to its Advisory Board, comprised of influential members of the international space community, to provide strategic guidance.

*New members include:*

- Catherine Doldirina, Outgoing Chair 2013
- Steve Eisenhart, Senior Vice President, Strategic and International Affairs at the Space Foundation
- Clayton Mowry, President of Arianespace, Inc.
- Enrique Pacheco-Cabrera, Deputy Director for Space Science and Technology Affairs, Mexican Space Agency
- Chris Welch, Director MSc Programmes, International Space University.
- SGAC launched its new website with more updated content and easier navigation.

## SPACE GENERATION FUSION FORUM

- 47 delegates from 15 countries attended the 2<sup>nd</sup> Space Generation Fusion Forum (SGFF).
- SGAC supported 8 scholarships to delegates from 5 countries to attend SGFF 2013 in Colorado, USA.
- SGAC presented the outcomes of the event at the 29<sup>th</sup> National Space Symposium in Colorado Springs, USA, and at the SPACE2013 Conference in San Diego, USA.

## SPACE GENERATION CONGRESS

- SGAC attracted more than 250 applicants from 58 different countries for the Space Generation Congress (SGC) 2013. The SGC 2013 involved 116 delegates travelling from 38 different countries around the globe.
- SGAC supported 25 full scholarships to delegates from 13 countries to attend SGC 2013 in Beijing.
- SGAC continued to record and publish presentations conducted during SGC. This offers members who were unable to attend the Congress the opportunity to review and recognise the ideas discussed during the event.
- The SGC 2013 Gala Dinner was the largest ever organised, with 210 guests.
- SGAC achieved remarkable participation at the IAC 2013 (Beijing, China). SGAC members presented more than 40 technical papers covering vast and varying areas of interest, participated in panel discussions and organised incredibly successful outreach events, such as the NEO and Planetary Defense Event, SGAC Next Gen Reception (together with the Space Foundation), and participated in events such as Heads of Industry and Young Professionals Plenary, Space Outreach Panel, Space Debris Panel and several IAF Committees.



## PROJECT GROUPS

- The Project Group on Commercial Space was created and launched to explore the commercial space arena.
- SGAC expanded its social media activities with new and more active Twitter, Facebook and Flickr accounts, and the Commercial Space project group started blogging.
- The International Academy of Astronautics (IAA) selected nine SGAC members to participate in their Study Groups.
- The YGNSS and the STDM Project Group organised the successful “GNSS and Earth Observation for Disaster Management Workshop”, in Beijing, China.
- The seven active SGAC Project Groups continued to publish educational material, translate it into other languages apart of English, and present their work at international conferences.

## UNITED NATIONS WORK

SGAC was represented at the following United Nations events:

- 50<sup>th</sup> Session of the Scientific and Technical Subcommittee of UN COPUOS, Vienna, Austria
- 52<sup>nd</sup> Session of the Legal Subcommittee of UN COPUOS, Vienna, Austria
- United Nations Economic and Social Council (UN ECOSOC), New York, USA
- UN General Assembly 68<sup>th</sup> Session, New York, USA
- 56<sup>th</sup> Annual Meeting of the UN COPUOS, Vienna
- 23<sup>rd</sup> UN/IAF Workshop on Space Technology for Economic Development
- 8<sup>th</sup> Meeting of the International Committee on Global Navigation Satellite Systems (ICG), organised by the EIAST, Dubai, United Arab Emirates
- UNSPIDER-TAM mission, Accra, Ghana

## SGAC OUTPUT AT A GLANCE

Throughout the year, SGAC supported a number of scholarships, conferences and papers listed below.

### SCHOLARSHIPS AND AWARDS (42)

- AYAA Australian Futures Award (6)
- DLR Standout Student Scholarship (3)
- EIAST Scholarship (2)
- FFG/Bvmit Austria Space Applications Scholarship
- GNSS and EO for Disaster Management Workshop Scholarship
- Japanese-SGC Scholarship (2)
- OHB - Move an Asteroid Technical Paper Competition
- SGAC-IAASS Space Safety Paper Competition (3)
- \$pace is Business Paper Competition
- Space Generation Advisory Council Global Grants Programme (8)
- Space Generation Advisory Council (SGAC) Young Leader Awards (4)
- Space Solar Power Design Competition (2)
- SSPI Satellite Futures Scholarship (3)
- United Nations / International Astronautical Federation (UN/IAF) Workshop Scholarship
- Washington Space Business Roundtable Scholarship (2)
- MVP AIAA Award
- NASA SCan Scholarship

## ➤ CONFERENCES AND WORKSHOPS SUPPORTED (4)

- Space Generation Fusion Forum (SGFF), USA
- Space Generation Congress (SGC), China
- Global Navigation Satellite Systems and Earth Observation for Disaster Management Workshop, (SGAC STDM and YGNSS Project Groups), China
- Space Generation Mexico, Mexico

## ➤ PAPERS AND PUBLICATIONS (20+)

### BY PROJECT GROUPS

- Space Safety and Sustainability Project Group:
  - Conceptualising an Economically, Legally, and Politically Viable Active Debris Removal Option by Giulia Federico (Italy), Matteo Emanuelli (Italy), Joshua Loughman (USA), Deva Prasad (India)
  - Design of an Active Space Debris Removal Mission Using Modified Launch Vehicle Upper Stages by Seyed Ali Nasseri (Iran), Matteo Emanuelli (Italy), Siddharth Raval (India), Philipp Maier (Germany), Emmanuelle David (France), Vitali Braun (Germany), Christoph Becker (The Netherlands), Scott Fisher (Australia), Leila Ghasemzadeh, (Iran), Ali Alizadeh (Iran), and Andrea Turconi (UK)
  - Targets for an Autonomous Debris Removal Mission by Matteo Emanuelli (Italy)
- Youth for GNSS Project Group:
  - GNSS for Disaster Management - Technical and Policy oriented recommendations by Tejal Thakore, (UK), Stephanie Wan (USA), Katarzyna Urbanska (France), Juan Duran (France), Peetak Mitra (India), and Tale Sundlisæter (Norway)
  - Youth for GNSS Educational Flyer – Translated and published in English, Arabic and Chinese
- Space Law Project Group:
  - The Conception and Treatment of International Governmental Organisations in the Preparatory Works of the Outer Space Treaty by Christopher Johnson (USA and UK), Joyeeta Chatterjee (India), Sarah Moens (Belgium), Aleksandra Puscinska (Poland and UK), Ademir Vrolijk (Canada), and Karina Wardak (Germany)
- Commercial Space Project Group:
  - Identification and Analysis of National and Regional Industry Clusters of the European Space Industry, by Zhuoyan Lu (China), Jie Hou (China) and Vikram Udyawer (Australia)
  - Entrepreneurship and Innovation in the European Space Sector: Overview and Impacts Of European Space Agency and European Union's Initiatives, by Noemie Bernede (France)
  - A Historical Overview of Chinese Entrepreneurship and Its Cultural Impact on Space Industry Policy and Decision-Making Procedures, by Zhuoyan Lu (China)
  - Historical and Culture Assessment of Entrepreneurship and Investment in Germany, by Philipp Maier (Germany)
- Space Technologies for Disaster Management Project Group:
  - Building up national space capabilities for disaster management: analysis of a trend in emerging space nations and developing countries by Noemie Bernede (France)
  - Social media & space technologies in the disaster cycle - help or hindrance? by Natassa Antonio (Greece) and Mario Ciaramicoli (Italy)
- Small Satellite Project Group:
  - Why and How Small Satellites can be Relevant Tools for Scientific Research, by Shanti Swaroop Kandala (India), Sonam Gupta, Lucas Salvador, Ankita Upmanya (India), and Aafaque Khan (India)

## OTHER

- *From the Periphery to the Center – a Young Professional Perspective on Youth Unemployment in Europe* Presentation by Luís Ferreira (Portugal)
- SGAC Annual Report 2013
- SGAC Executive Summary of the Annual Report 2013
- SGAC Monthly Newsletters (12)
- Space Generation Fusion Forum 2013 Final Report
- Space Generation Congress 2013 - Executive Summary
- Space Generation Congress 2013 Final Report
  - Including five Working Group individual reports and the “GNSS and EO for Disaster Management Workshop” report
- In addition, more than 30 presentations including posters, papers and panels, were given by SGAC members at this year’s IAC
- Space Solar Power Video Release by SSP Competition Winners
- Space Generation Video Release by Artiom Anisimov (Russia)
- Space Generation Fusion Forum 2013 Summary Video Release by Thu Throng Vu (Vietnam)
- Space Generation Congress 2013 promotional Video Release by Reinhard Tlustos (Austria)
- Space Generation Congress 2013 Summary Video Release by Edu F. Aymerich (Spain)

## ➤ CONFERENCES AND EVENTS WITH OFFICIAL SGAC REPRESENTATION (29)

- 6<sup>th</sup> IAASS Conference: Safety is not an Option, Montreal, Canada
- 8<sup>th</sup> Meeting of the International Committee on Global Navigation Satellite Systems (ICG), organised by the EIAST, Dubai, UAE
- 23<sup>rd</sup> United Nations/International Astronautical Federation Workshop on "Space Technology for Economic Development", Beijing, China
- 29<sup>th</sup> Annual National Space Symposium in Colorado Springs, Colorado, USA
- 29<sup>th</sup> International Symposium on Space Technology and Science, Nagoya, Japan
- 50<sup>th</sup> Session of the Scientific and Technical Subcommittee of UN COPUOS, Vienna, Austria
- 52<sup>nd</sup> Session of the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space (UNCOPUOS), Vienna, Austria
- 56<sup>th</sup> Annual Meeting of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), Vienna, Austria
- 64<sup>th</sup> International Astronautical Congress (IAC), Beijing, China
- Aerospace Futures 2013 - Australian Youth Aerospace Association (AYAA), Sydney, Australia
- AIAA SPACE 2013 Conference & Exposition, San Diego, California, USA
- Annual ESPI Autumn Conference; Vienna, Austria
- European Interparliamentary Space Conference Plenary, Brussels, Belgium
- European Interparliamentary Space Conference Workshop, Brussels, Belgium
- European Space Policy Institute Event - Space Against Youth Unemployment, Vienna, Austria
- Global Exploration Roadmap Meeting, Royal Astronomical Society, London, UK
- IAF Spring Meetings, Paris, France
- IAU's 35th International School for Young Astronomers 2013, Bandung, Indonesia
- ISU Space Studies Programme, Strasbourg, France
- ISU Southern Hemisphere Summer Space Programme, Australia
- SpaceUp Paris, France
- Space Exploration, Secure World Foundation and Women in Aerospace Europe, Brussels, Belgium
- Space Studies Programme 2013, International Space University, Strasbourg, France
- Tsinghua University IAF-SUAC International Student Workshop, Beijing, China
- Toronto Students for the Advancement of Aerospace The Do-It-Yourself Innovator Conference: The Impact of Self-Innovation on the Aerospace Industry, Toronto, Ontario, Canada

- The 20<sup>th</sup> Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-20), Hanoi, Vietnam
- United Nations Economic and Social Council (UN ECOSOC), New York, USA
- UNSPIDER-TAM mission, Accra, Ghana
- World Space Week India Event, Basti, India

Although they are not all listed here, SGAC members have also attended and helped to organise numerous events in their home countries.



#### *FORMALISED PARTNERSHIPS (9)*

- Beihang University
- Future Space Leaders Foundation
- QB50 Project, Von Karman Institute
- Satellite2014
- Space Foundation
- SpaceTec
- World Space Week Association
- Young ESA
- Young Ukrainian Space Industry Workers

# Sponsors and Partners

The Space Generation Advisory Council (SGAC) is very grateful for the continued generous support of our sponsors and partners. This year our 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 2013.

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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(bmvit)



HE Space

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## Partners

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The Future Space Leaders  
Foundation



The Robert A. and Virginia Heinlein  
Prize Trust



International Association for the  
Advancement of Space Safety  
(IAASS)

Institute of Air and Space Law



International Space University



QB50 Project – Von Karman Institute



ÖWF (Austrian Space Forum)



Space News



SpaceRef



Women in Aerospace – Europe



Partners

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World Space Week Association



Young ESA



The Council of Young Ukrainian  
Space Industry Workers



Yuri's Night

# SGAC BACKGROUND

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# 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..



Previous logo 1999 - 2011

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/>

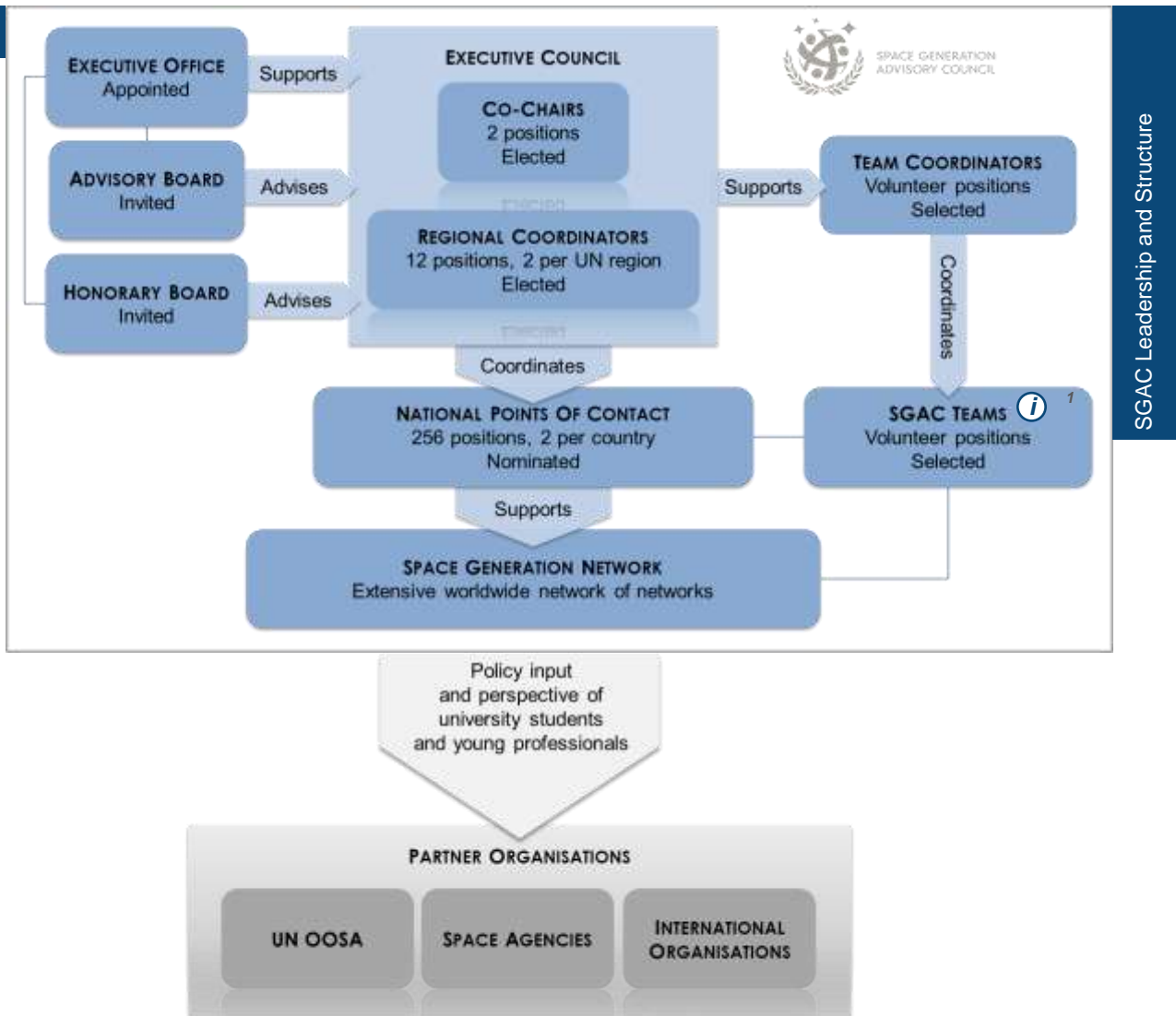
For more information about the Vienna Declaration on Space & Human Development please visit:

<http://www.unoosa.org/pdf/reports/unispace/viennadeclE.pdf>

# Leadership and Structure

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

Fig. 1.



## <sup>1</sup>SGAC Teams

The SGAC Teams are comprised of volunteers who are in charge running certain aspects of the organisation, such as Editors, Website Managers, PR & Communications Managers, Project Groups, Competition Coordinators and Strategic Partnership Coordinators.

# 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 2013, SGAC continued to hold an observer presence and provided input to the 50<sup>th</sup> Session of the Scientific and Technical Subcommittee, the 52<sup>nd</sup> Session of the Legal Subcommittee, and the 56<sup>th</sup> Session of UN COPUOS. SGAC also was represented at the UN General Assembly’s 68<sup>th</sup> Session and UN ECOSOC in New York, the 8<sup>th</sup> Meeting of ICG in Dubai, and the Action Team 14 (AT14) group meeting, the United Nations group that works on Near-Earth Objects.

## SPACE EDUCATION & OUTREACH

Space outreach was 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 National Space Symposium (NSS) 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 obtain funding for several students from developing countries to attend international conferences and workshops. Such activities included organising SGC 2013 in Beijing, China and SGFF 2013 in Colorado Springs, USA. In total SGAC was able to give 42 scholarships to SGAC members to attend several international meetings. 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 9 international space organisations in this year alone.

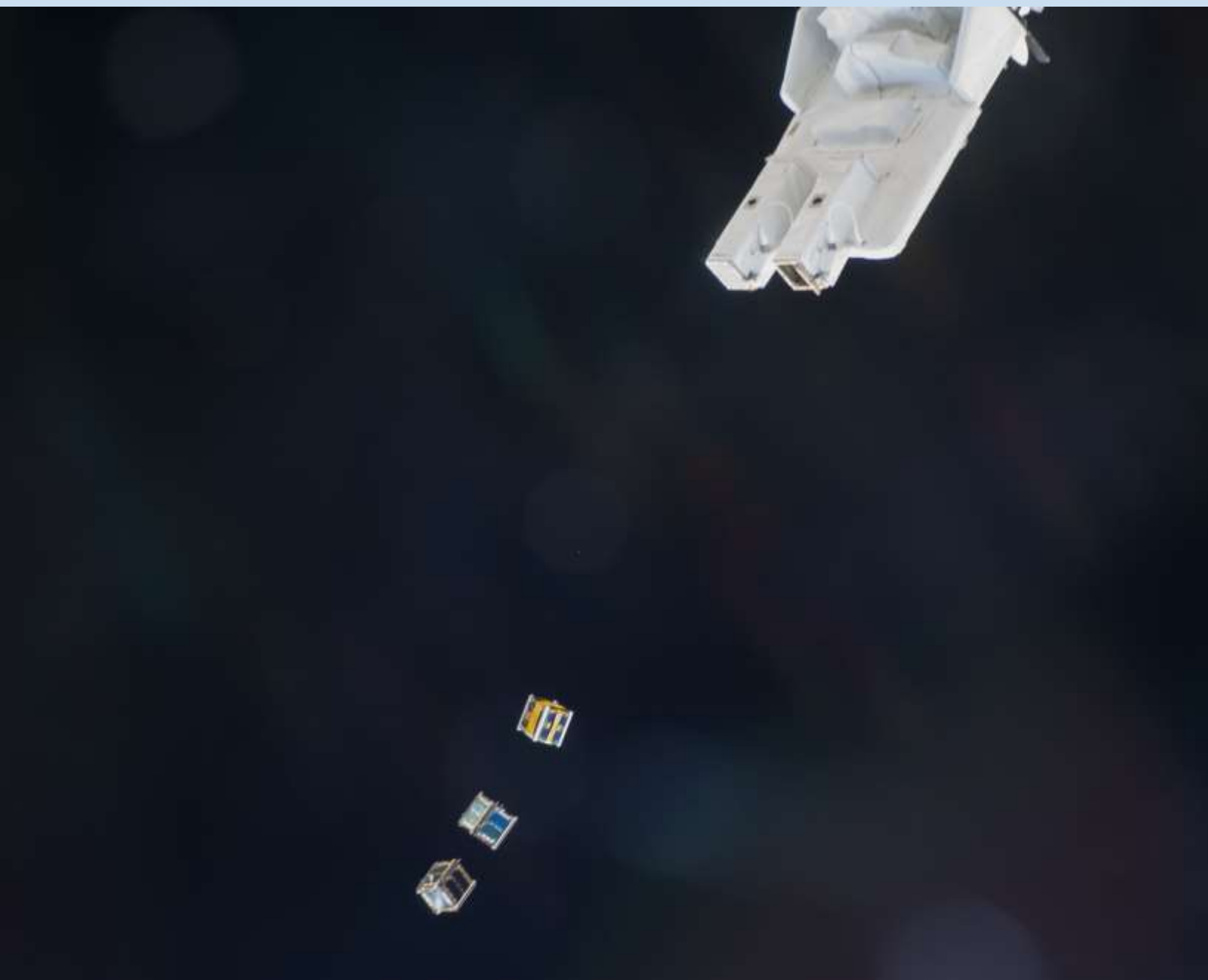
## SPACE GENERATION NETWORK

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 2013, the SGAC network had more than 4000 active members, and NPoCs represented more than 90 countries.



# THE ORGANISATION IN 2013

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# Goal Achievement Assessment

## Overview

The SGAC Strategic Plan 2013 published in January, outlined nine goals for the year ahead. This section of the Annual Report is the Executive Office's self-assessment of how SGAC fulfilled these goals. This assessment is intended to provide an additional view on the content of SGAC's activities throughout the year and inform readers about the development of the Strategic Plan for 2014.

## Strategic Goal Review

### 1. *Continuation of efforts towards financial stabilisation*

**Output:** Sustained financial stability due to strong relationships with sponsors and additional funding resources.

SGAC operated a strong financial base throughout the year to minimise the effect of the loss in 2012. The organisation stabilised financially, making up for the loss of the previous year to continue the positive trend over recent years. SGAC also welcomed new organisations and industries as new sponsors and supporters, demonstrating a growing interest of the space sector in young professionals and students.

All accounts were paid on time, and the Executive office has been confident of its ability to operate throughout the year. Changes to SGAC's financial operations throughout 2013 included introducing a new online bookkeeping system, transitioning a new treasurer to the team, and updating our transaction authorisations to allow for more flexible banking.

The major goal of securing multi-year contracts with main sponsors was not accomplished. Unfortunately, many of our sponsors are constrained in their ability to enter into such contracts and are only able to support the organisation on a year-by-year basis. Financial stability will be achieved by maintaining a close and trusted relationship with our major sponsors. However, we believe that some of the new relationships could be nurtured to develop into multi-year contracts.

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. However, there are sufficient funds to support a paid Executive Director position, interns, and an operational office space, for at least one year into the future.

### 2. *Successful execution of the Space Generation Fusion Forum 2013*

**Output:** Engage SGAC members and stakeholders in preparation for the SGFF. Seek input to increase the feasibility of this new space event for students and young professionals to be held in the US beyond 2013 and aid the general framework and purposes of SGAC's development. The SGFF 2013 edition was a resounding success. For the first time, the organisation employed the services of a Congress Manager other than the Executive Director to take full charge of the event. The organising team comprised mostly of local SGAC members who played their various roles efficiently to ensure the success of the event. We can proudly say that SGAC members and stakeholders have no doubts about the immense benefits for students and young professionals that SGFF has in store for all participants.



The SGAC signed an agreement with the Space Foundation this year to ensure the third edition of the Space Generation Fusion Forum as evidence of the successful relationship between organisations and the mutual benefits of this event.

The SGAC intends to hold this event annually, and will continue to report at the Space Symposium, bringing the voice of young professionals and students to a broader audience.

### ➤ **3. Successful execution of the 2013 Space Generation Congress**

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

The Space Generation Congress (SGC) held in Beijing, China, in September 2013 was an overwhelming success, with a great number of delegates and a strong programme of events. The organisational committee overcame a number of logistical risks and successfully hosted the first SGC in China. The SGC gathered 117 delegates coming from 38 different countries, with diverse backgrounds and professional statuses (41% YPs, 22% Bachelor Student, 21% Master Student, 16% PhD Student). SGAC was able to award 25 scholarships to participants coming from 23 different countries.

The attention generated by the event, particularly from world space leaders and former astronauts, and the support of organisations, greatly contributed to the overall success of SGC 2013. The SGC Closing Gala Dinner was a major success this year, attended by 210 people comprising young professionals, students, industry and academia leaders, and heads of space agencies. The decision to open the gala dinner to former attendees and potential partners by selling seats and tables was positively received, and will be a consideration for coming years. The SGC Final Report was completed with a high level of quality, which met our expectations and goals.

### ➤ **4. Focused development and strategic realignment of SGAC's year-round projects**

**Output:** Project groups in line with the developed SGAC project group set-up guidelines were established. A comprehensive project group structure will be designed and implemented to assign accountability for various tasks. An advisory team will also be appointed per project group that will help direct the affairs of the group. This will ensure smooth running of project groups, improve their professional outlook as well as set them on the path to be an independent entity in the long-term. Project groups will have signed agreements with their respective partners/sponsors to cement the relationship. Mechanisms will be investigated and developed to propagate the results of their work, and promote active members to participate in various space events.

In 2013, SGAC's project groups have continued to become stronger in terms of membership and output; accountability for tasks within the groups have been well allocated and members have presented many quality outputs at various global space conferences.

One new Project Group has been created in 2013: the SGAC Space Law Project Group, who will focus on policy and law matters of the space sector.

In general this year, the Projects Groups have presented more than 20 papers and presentations at conferences such as the IAC, and have continued working towards educational and outreach purposes.

Its social media presence has also increased, providing extra information and increasing the interest of the general public on the seven topics of the SGAC Project Groups.

SGAC members have continued to show increasing interest in the project groups. Two new project coordinators who are capable of ensuring smooth running of the projects were appointed. Also, a

mandatory two-year term has been implemented for project leads as this will aid the infusion of fresh ideas at the group management level. Some project groups have built lasting relationships with other organisations that have supported project group members to attend space conferences.

The impact of the outputs of the Project Groups is growing, not only when presenting papers at different conferences as mentioned, but also organising particular events on specific topics, and contributing actively to big institutions such as the International Committee on GNSS, the Action Team 14 of the UN, the UN SPIDER, and others.

## ➤ **5. Deepening of relationships with partner organisations**

**Output:** Formalise relationships with existing and new partner organisations through Memorandums of Understanding that outline the long term benefits of collaboration.

2013 was particularly fruitful in formalising SGAC's relationships with existing and new partners, including Memorandums of Understanding with the following organisations:

- Beihang University
- Future Space Leaders Foundation
- QB50 Project, Von Karman Institute
- Satellite2014
- Space Foundation
- SpaceTec
- World Space Week Association
- Young ESA
- Young Ukrainian Space Industry Workers

SGAC is also already working on a few other agreements, which, hopefully, will be signed during the first semester of 2014.

## ➤ **6. Development of a database improving alumni relations**

**Output:** Consolidation of the database of former members and reactivation of relationships with them, particularly in the context of SGAC events and on-going projects.

SGAC has held the first series of meetings to develop an alumni database. The great value and potential of this database is already recognised by the Advisory Board and the SGAC Executive Council. The first proposal to develop this database was drafted, and got the interest of many former SGAC members to keep involved with the organisation.

The SGAC 2014 Strategy document will reflect immediate and future plans to start implementing this database.

## ➤ **7. Consolidation of the SGAC membership Database**

**Output:** Consolidation of SGAC's membership database built from past events, accurate membership statistics and ease of retrieval of membership information.

The SGAC has transitioned to a new website. This new website allows the organisation to maintain a more accurate database. After initial difficulties, the original SGAC database from the old webpage has been integrated into the new database. Additional security measures have proven necessary to protect the site against hacking and spam bots.

In 2013, a first review of existing databases has been carried out, based on the activity/inactivity of some registered members. The first tentative results show that SGAC is comprised of a healthy network of 5000 members (over 2500 accounts on the site, 1000 former attendees in event's databases and over 2000 subscriptions), and growing.

The SGAC has also initiated some negotiations with a professional partner to work together towards developing and consolidating the SGAC membership database. The technical challenges of having a single, functional database integrated into our website with the required flexibility have been identified, and will lead to changes in the current system in the coming year.

# Activity Highlights

## GENERAL HIGHLIGHTS

- Chijioke CJ Nwosa (Nigeria) succeeded Catherine Doldirina (Georgia) as the new Chair of SGAC.
- SGAC welcomed a new Co-Chair, Chris Vasko (Austria/Hungary).
- SGAC welcomed two interns, Ryan Laird (UK) and Felipe Arevalo (Colombia).
- SGAC included new members to its Advisory Board, comprised of influential members of the international space community, to provide strategic guidance.  
*New members include:*
  - Catherine Doldirina, Outgoing Chair 2013
  - Steve Eisenhart, Senior Vice President, Strategic and International Affairs at the Space Foundation
  - Clayton Mowry, President of Arianespace, Inc.
  - Enrique Pacheco-Cabrera, Deputy Director for Space Science and Technology Affairs, Mexican Space Agency
  - Chris Welch, Director MSc Programmes, International Space University.
- SGAC launched its new website with more updated content and easier navigation.
- 47 delegates from 15 countries attended the 2<sup>nd</sup> Space Generation Fusion Forum (SGFF).
- SGAC supported 8 scholarships to delegates from 5 countries to attend SGFF 2013 in Colorado, USA.
- SGAC attracted more than 250 applicants from 58 different countries for the Space Generation Congress (SGC) 2013. The SGC 2013 involved 116 delegates travelling from 38 different countries around the globe.
- SGAC supported 25 full scholarships to delegates from 13 countries to attend SGC 2013 in Beijing.
- SGAC continued to record and publish presentations conducted during SGC. This offers members who were unable to attend the Congress the opportunity to review and recognise the ideas discussed during the event.
- Space News, in partnership with SGAC, started a special deal for SGAC members.
- The Project Group on Commercial Space was created and launched to explore the commercial space arena.
- The International Academy of Astronautics (IAA) selected nine SGAC members to participate in their Study Groups.
- The SGC 2013 Gala Dinner was the largest ever organised.
- SGAC achieved remarkable participation at the IAC 2013 (Beijing, China). SGAC members presented more than 40 technical papers covering vast and varying areas of interest, participated in panel discussions and organised incredibly successful outreach events, such as the NEO and Planetary Defense Event, SGAC Next Gen Reception (together with the Space Foundation), and participated in events such as Heads of Industry and Young Professionals Plenary, Space Outreach Panel, Space Debris Panel and several IAF Committees.
- SGAC expanded its social media activities with new and more active Twitter, Facebook and Flickr accounts.
- SGAC started to update its network and database of members, having so far an active membership of 5000 people from around the world.

## EXECUTIVE OFFICE HIGHLIGHTS

- SGAC Executive Director Andrea Jaime (Spain) presented SGAC's general statement, covering SGAC's developments at the UN COPUOS S&T Subcommittee in February 2013.
- SGAC Co-Chair Chris Vasko (Austria/Hungary), presented SGAC's general statement at the 56<sup>th</sup> Session of the UN COPUOS in Vienna, in June, which explained the activities that SGAC has been engaged in during the past year.
- SGAC delivered two technical presentations at the UN COPUOS.
- SGAC Executive Director, Andrea Jaime (Spain) was on a panel on space outreach organised by the Space Societies IAC Committee at the Global Networking Forum of the IAF.
- SGAC Executive Director Andrea Jaime (Spain) was the moderator, together with Stephen Ringler (USA) of the Space Generation Fusion Forum Panel at the 29<sup>th</sup> National Space Symposium.
- SGAC Executive Director, Andrea Jaime (Spain), participated in a panel for Young Professionals at the European Interparliamentary Space Conference in Brussels, Belgium, where co-Chair, Chris Vasko (Austria/Hungary) also attended.
- SGAC Executive Director, Andrea Jaime (Spain), attended the 8<sup>th</sup> meeting of the International Committee of GNSS in Dubai, UAE.
- SGAC Executive Director, Andrea Jaime (Spain), contributed as author to the ESPI Policy Year Book, preparing, coordinating and analysing a survey among young professionals in the space sector to evaluate their professional situation.
- Ali Nasser (Iran) was appointed as the new Executive Secretary.
- Jacob Hacker (Australia) was appointed as the new Treasurer.
- SGAC Executive Director, Andrea Jaime (Spain) was invited, together with Luca Nardecchia (Italy) to the MAVEN Launch, in the USA, including some featured interviews and panel.

## AFRICA REGION HIGHLIGHTS



- The Africa working group was established, which is designed to stimulate discussions among the National Points of Contact (NPoCs) and other members in the African region, thus setting up a platform to allow the opinions of students and young professionals from the African continent to be heard on matters relating to Africa and space activities. An "African Space Agency" is one topic of considerable interest.
- CJ Nwosa (Nigeria) became the Chair of SGAC.
- NPoCs to join the region in 2013 are Ifriky Tadadjeu Sokeng (Cameroon), Suki Dauda Sule (Nigeria), Funmi Erinfolami (Nigeria), Lumka Msibi (South Africa), Conrade Muyambo (Zimbabwe) and Constant Chuma (Zimbabwe).
- There was a significant increase in the outreach activities in different countries of the region such as educational and outreach workshops (Zambia, Nigeria) and linking SGAC with the Kenyatta Astronomical Society (Kenya).
- Beza Tesfaye (Ethiopia) was the winner of one of the SGAC Young Leadership Awards.
- Monthly organisational meetings with all NPoCs were established to coordinate activities.
- Africa was very active on the organisation of World Space Week and Yuri's Night events.

## ASIA PACIFIC REGION HIGHLIGHTS



- Ten National Points of Contacts were welcomed in the region: Zihua Zhu (China), Aafaque Khan and Muhammad Khan (India), Andrew Lee Chee Hau (Malaysia), Kishor Acharya and Ishan Basyal (Nepal), Jack Yeh (New Zealand), Waqas Kazi (Pakistan), Rogel Sese (Philippines), and Ilji Jang (South Korea).

- Aafaque Khan (India) and Suresh Bhattarai (Nepal) resigned from their posts as co-executive secretary at the SGAC Executive Office. Ali Nasser (Iran) took the position as the new secretary.
- Joyeeta Chatterjee (India) and Yohan Ferreira (India), outgoing regional coordinators were thanked for their great effort to lead SGAC in Asia Pacific. Suresh Bhattarai (Nepal) and Yusuke Muraki (Japan) were elected as new Regional Coordinators for the Asia Pacific Region.
- Joyeeta Chatterjee (India), former Regional Coordinator of Asia Pacific and Co-Lead of SGAC Space Law Working Group, Yusuke Muraki (Japan), Regional Coordinator Asia Pacific, and Thu Throng Vu (Vietnam), NPoC Vietnam, were the winners of SGFF Global Grants Programme 2013.
- The SGC Japanese Scholarship Programme, a unique programme created by SGAC alumni and members in Japan, was successfully introduced. It supported two Japanese Participants to SGC 2013 with full financial support. In total, SGAC Asia Pacific was awarded 9 scholarships out of 25 scholarships for SGC 2013.
- A total of 38 participants from Australia, China, Hong Kong, India, Japan, Korea, Nepal, Pakistan and Sri Lanka participated in the SGC 2013. This constituted 33% of the total number of participants and 24% of the total countries represented.
- The first SGAC workshop on "The Role of GNSS and Earth Observation in Disaster Management" provided a great opportunity for 25 students and young professionals to meet and exchange views with leaders of the space sector.
- Mr. Kishor Acharya (Nepal), NPoC to Nepal, was the winner of the Emerging Space Leader Award in the student category.
- Yusuke Muraki (Japan), Regional Coordinator of Asia Pacific, presented a proposal during the 20<sup>th</sup> Asia Pacific Regional Space Agency Forum (APRSAF-20), in Hanoi, Vietnam to host the Asia Pacific Space Generation Congress (AP-SGC) 2014 in conjunction with APRSAF-21 in Japan.
- Yusuke Muraki (Japan), Regional Coordinator, Prasanna Deshapriya (Sri Lanka), NPoC for Sri Lanka, Thu Throng Vu (Vietnam), NPoC for Vietnam and Regel Mari Sese (Philippines), NPoC for Philippines, were active participants in the 20<sup>th</sup> Asia Pacific regional Space Agency Forum (APRSAF-20) in Hanoi, Vietnam.
- The largest SpaceUp Event in Asia, SpaceUp India 2013, was successfully concluded with the participation of Aafaque Khan (India), NPoC of India, and other SGAC members.
- Pirada Techavijit (Thailand), was a winner of the Axe Apollo Space Academy Competition 2013, enabling her dream to become the first astronaut from Thailand.

## ➤ EUROPEAN REGION HIGHLIGHTS



- SGAC members in Europe participated in Yuri's Night and World Space Week celebrations.
- New NPoCs were appointed in Austria, Finland, France, Italy, Montenegro, The Netherlands, Norway, Poland, Romania, Russia and Sweden.
- European organisational teleconferences were held quarterly.
- The European Facebook page showed a large degree of activity.
- Space Day was held for the very first time in Montenegro in September 2013.
- SGAC was represented during the UN COPUOS sessions in Vienna, Austria.
- Memoranda of Understanding were signed with three European organisations: Council of Young Ukrainian Space Industry Workers, Young ESA, and the QB50 Project from the von Karman Institute.



- Leadership presentations were given at the International Space University Summer Programme.
- Seven Europeans were winners of scholarships or competitions to attend the SGC and the IAC in Beijing, China. This included Lisa Kuepers (Germany), Daniel Prokein (Germany), Benjamin Kraetzig (Germany), Massimo Vetrissano (Italy), Aidan Cowley (Ireland), Lluç Palerm (Spain) and Sandra Gonzalez (Spain).

## ➤ MIDDLE EAST REGIONAL HIGHLIGHTS



- Mahsa Taheran (Iran) ended her four-year term as Regional Coordinator for the Middle East. Behnoosh Meskoob (Iran) was elected as the new RC for this region.
- Ayman Mahmoud and Ashraf Nabil (Egypt), Mohammadreza Rezaei (Iran), Hisham Deek (Lebanon) and Aisha Saleous (Palestine) were appointed as NPoCs.
- S. Ali Nasser (Iran) received an IAF-ESL grant to participate in SGC, UN/IAF and the IAC.
- First scholarship targeted exclusively for the Middle East was given by EIAST (Emirates Institution for Advanced Science and Technology) to Nouf Al-Jaloud (Saudi Arabia) to attend the 8<sup>th</sup> ICG (International Committee on GNSS) in Dubai.
- Behnoosh Meskoob (Iran) received the SGAC 2013 Young Leadership Award to participate in SGC 2013.
- Middle Eastern countries actively participated and held programmes on International Astronomy day, Yuri's night and World Space Week.
- Hisham Deek (NpoC for Lebanon) and a team from Lebanon successfully observed comet ISON.
- The 3<sup>rd</sup> Iran Cansat Competition was held successfully in October 2013 in Tehran, Iran, with the participation of 28 universities from Iran and two teams from Cairo University, Egypt.
- The "Eyes of 51 Degrees" team from Iran discovered an asteroid (provisional level) in SGAC's Find an Asteroid Search Campaign.
- SGAC members from Cairo University of Egypt participated in the 5<sup>th</sup> Nano-Satellite symposium. Ashraf Nabil (NpoC for Egypt) won the 3<sup>rd</sup> prize in one of the symposium contests.
- The Jam-e-Jam newspaper of Iran interviewed Behnoosh Meskoob (RC for Middle East) about SGAC activities in Iran.

## ➤ NORTH, CENTRAL AMERICA AND THE CARIBBEAN REGIONAL HIGHLIGHTS



- SGAC and the Space Foundation hosted the 2<sup>nd</sup> Space Generation Fusion Forum (SGFF) at the 29<sup>th</sup> National Space Symposium (NSS) in Colorado Springs, CO (USA) on April 7-8, 2013.
- The region was proud to host over 130 Yuri's Night events across four countries.
- Regional Coordinators Alan Steinberg (USA) and Ashley Chandler (USA) continued work on a collaboration with the peer reviewed academic journal *New Space* to increase opportunities for SGAC research to reach a wider audience.
- Magaly Sandoval (Costa Rica) and the Costa Rica Institute of Technology's space observation group AstroTEC put on outreach activities for both kindergarteners and the general public in conjunction with World Space Week.
- Magaly Sandoval (Costa Rica) was one of the winners of the SSPI Scholarship to attend the SGC 2013.
- Martin Leitgab (USA) won the Space Solar Power Competition this year.
- NASA SCAI for the second consecutive year gave a scholarship to a student to participate at the SGC. It was awarded to Nicole Tchorowski (USA).
- Carmen Felix (Mexico) collaborated with the Mexican Space Agency's digital magazine, publishing articles about personal experiences in the space sector and dedicating the December article to introducing SGAC.

- Carmen Felix (Mexico) organised an SGAC Event at the Universidad Nacional Autónoma de Mexico.
- The SGAC partnered with the Future Space Leaders Foundation to allow USA professionals and students to attend SGAC events.

## ➤ SOUTH AMERICAN REGION HIGHLIGHTS



- Bolivian NPoC and members participated in the NASA Space App challenge, and won second place. Their focus was on camera applications for use in nanosatellites built with low cost in mind.
- Brazil launched the fourth remote sensing satellite of the CBERS series, developed in partnership between Brazil and China mid-December 2013.
- Alejandro Lopez (NPoC for Chile) participated in the hosting of the Google Lunar X PRIZE summit. It was the first time that the summit was held in South America.
- SGAC members participated with other Peruvian students in an analogue mission in the Utah desert at Mars Desert Research Station (MDRS), and as a result they were able to receive support and engage in the creation of the Mars Society Peru.
- Victoria Alonsoperez (NPOC for Uruguay) was awarded the Best Young Inventor Award 2013 by the World Intellectual Property Organization (WIPO). She received the award at the International Telecommunication Union Telecom World 2013, Bangkok, Thailand in November.
- Two new NPoCs were established: Josue Cardozo dos Santos was appointed NPoC of Brazil and Avid Roman-Gonzalez was appointed NPoC of Peru.
- Brazil, Colombia and Ecuador launched satellites in 2013, showing the growth of the space sector in the region, and motivating youth and SGAC members to engage in science and technology.



# Space Generation Fusion Forum Report

Fig. 2.



The second annual Space Generation Fusion Forum (SGFF) was held on 7-8 April 2013 at the Broadmoor Hotel in Colorado Springs, USA. It brought together top students and young professionals from all over the world to focus on key space topics.

The SGFF brought delegates together for one and a half days. During the first day, senior space industry professionals presented their views on space policy issues and gave relevant advice to the delegates. The first day concluded with a networking reception attended by both participants and speakers, allowing the audience to exchange their thoughts in a relaxed atmosphere and discuss the various topics raised by the speakers.

On the second day, four panel sessions were conducted:

1. Long Term Sustainability of Space
2. Operational Data Exchange and Sharing of Space Assets
3. Innovative Space Exploration Strategies
4. Regional Space Programmes: Benefits and Risks

The SGAC panellists were chosen for their relevant experience and knowledge of the topics covered. Panellists prepared materials for discussion relevant to their panel topic. During the hour-long discussions, the audience actively participated, voicing their opinions and asking questions to the panel and other delegates during a question and answer session.

The SGFF concluded with a vote for the Most Valuable Participant (MVP). The winner, Lewis Groswald (USA), presented the Fusion Forum's report and findings at the American Institute of Aeronautics and Astronautics (AIAA) Space 2013 Conference in California in September 2013. The delegates also took part in the Opening Ceremony and Opening Reception of the National Space Symposium on April 8.

The SGFF was hosted by the Space Foundation in conjunction with the National Space Symposium. Nearly half of the Fusion Forum participants attended the Symposium, along with more than 9000 international space professionals. The SGFF participants were also invited to New Generation events held throughout the week.

## fusion forum speakers and moderators

Leroy Chiao	<i>Special Advisor - Human Spaceflight, Space Foundation</i>
Carissa Christensen	<i>Managing Partner, The Tauri Group</i>
Richard Dalbello	<i>Vice President, Government Affairs, Intelsat General Corporation</i>
David Finkleman	<i>Senior Scientist, Center for Space Standards and Innovation (CSSI), Analytical Graphics, Inc. (AGI)</i>
Mark Kinnersley	<i>Director, MPCV ESM Resident Liaison at Astrium North America</i>
Lon Levin	<i>President, SkySevenVentures &amp; co-founder, XM Satellite Radio</i>
Elliot Pulham	<i>Chief Executive Officer, Space Foundation</i>
Victoria Samson	<i>Washington Office Director, Secure World Foundation (SWF)</i>
Mark Sirangelo	<i>Corporate Vice President, Sierra Nevada Corporation &amp; Head, Sierra Nevada Space Systems</i>
Roger W. Teague	<i>Director of Strategic Plans, Programmes and Analyses, Headquarters Air Force Space Command</i>
Johan Dietrich Woerner	<i>Chairman of the Executive Board, German Aerospace Center (DLR)</i>

Please see [www.youtube.com/user/spacegeneration](http://www.youtube.com/user/spacegeneration) for selected presentations.

### PANEL 1 – LONG TERM SUSTAINABILITY OF SPACE

Fig. 3.



Delegates of Panel 1, Joyeeta Chatterjee (India), Alex Karl (Germany), Dan Hendrickson (USA) and Justin Kugler (USA)

The last 50 years have seen a significant increase in the usage of space, both in terms of the number of actors (including both public and private entities) and the volume of space assets launched per actor. As the space arena becomes more crowded, changes are required to ensure its long-term sustainability. Of particular interest is the growth in the number of developing space entities, the increased risk from space debris and new international norms of responsible behaviour in space.

The panel addressed the legal aspects of space debris, the growing problem of radio frequency interference, the impact of emerging space nations on space sustainability and suggested international norms of responsible behaviour in space.

The main conclusions of the panel were:

Space debris and radio-frequency interference pose significant challenges for the space industry. The key aspect to overcoming these issues is in wide-scale cooperation across all international players. According to the panel, such cooperation and involvement in decision-making must include the input of both emerging and established space nations, and legislature must be established to support this. Furthermore, a greater sharing of asset orbital information and improved tracking systems would give better knowledge and thus improved opportunities for collision avoidance, while sustainable design practices can be used to free up the most valuable orbits.

## PANEL 2 – OPERATIONAL DATA EXCHANGE AND SHARING OF SPACE ASSETS

Fig. 4.



Delegates of Panel 2, Natassa Antoniou (Greece), Michael Brett (Australia), Thu Throng Vu (Vietnam) and Jon Vince (Canada) with Moderator Richard Dalbello (Intelsat)

The panel discussed threats to the development of the space economy and existing commercial structures (such as the Space Data Association) for mitigating those threats. In particular, the panel focused on secure mechanisms for sharing space data that allow for better management of the space environment. In discussing the mechanisms, panellists brought experiences and expertise in data sharing in many parts of the space industry, discussing the barriers to exchanging technical and competitive data.

The main conclusions of the panel were:

Operational data exchange and the sharing of space assets are important for the future of space activities, as they bring benefits to all participants in the shared operating environment of space. They will help to create an environment for collaboration among countries and build trust among participants. This is especially important for new players. However, some barriers need to be addressed, particularly in the areas of law and policy. Existing mechanisms and examples should be referenced, and SGAC can contribute by assisting with political and programmatic solutions to the stated problems.



## PANEL 3 – INNOVATIVE SPACE EXPLORATION STRATEGIES

Fig. 5.



Delegates of Panel 3, Sirisha Bandla (USA), Ross Findlay (UK), Pascal Renten (Germany), Kris Lehnhardt (Canada), Samantha Marquart (USA) with Moderator AC Charania (Virgin Galactic)

The commercialisation of the space sector is now a reality. Current and emerging players are becoming more involved in exploration programmes for profit, such as asteroid mining and the colonisation of Mars. This panel discussed the social, technological, and economic benefits and pitfalls of commercialising exploration, the development and growth of new markets, and the ethical implications of commercialising space exploration.

Among the topics that panellists addressed were: the means to overcome the technical and institutional barriers to large-scale exploration activities, opportunities for future exploration missions presented by current commercial and agency-led space activities, and new proposals and trends that promise to foster innovative exploration activities of the future.

The main conclusions of the panel were:

While humanity's exploration of space seems to have stalled since the Apollo lunar landings of over four decades ago, today there exist more diverse pathways for us to explore space than ever before. The panel noted that significant institutional, political, and technical obstacles to large-scale exploration missions persist, but they also proposed several means to overcome these challenges. Moreover, the panel drew attention to important new trends and technologies that actors, both established and emerging, encounter that hold unprecedented opportunities to discover and expand humanity's reach into space.

## PANEL 4 – REGIONAL SPACE PROGRAMMES: BENEFITS AND RISKS

Fig. 6.



Delegates of Panel 4, Alanna Krolikowski (Canada), Yusuke Muraki (Japan), Tilo Kauerhoff (Germany) and Lewis Groswald (USA) with Moderator Norimitsu Kamimori (JAXA)

The era of national competitiveness may be waning with a shift towards a focus of regional space programmes. In particular, emerging countries in regions where the space sector is rather new, such as the Asia-Pacific, are becoming more influential. This panel discussed the benefits and risks of having regional versus national space programmes, the need of new international space policies and laws, and the ways in which competitiveness versus collaboration can influence the future of global space activities. The panel focused on the advantages and disadvantages of regional space programmes, regional space programmes in Europe as a best practice, and of those in Asia and the Pacific.

The main conclusions of this panel were:

Regional space programmes are important for the future of space activities, which have been facing severe budget cuts, and for the increase in access to space by emerging countries that do not have the budget to maintain a national space programme. The European case is a good example of how a regional space programme can benefit member countries. However, there are also risks and disadvantages of such a regional space programme in regions such as Asia-Pacific. In order to identify a realistic structure for a regional space programme, not only must benefits and risks to local space activities be considered, but also the national and international politics of the region.

## fusion forum statistics

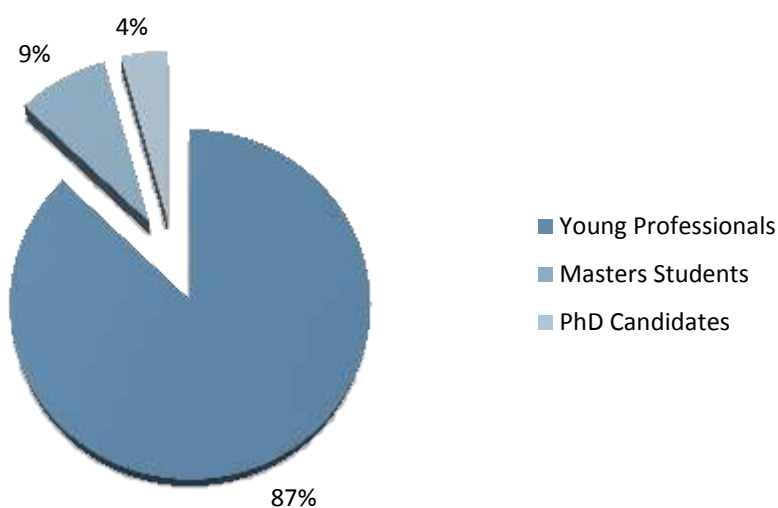
Forty seven delegates participated in the SGFF 2013.

8 participants from 7 countries were given scholarships to attend, which helped to broaden the international makeup of the forum and allowed delegates to interact with people from many different countries and backgrounds. The age range of selected delegates was from 23 to 35. Of the delegates who attended, 38% were female and 62% were male.

The majority (87%) of the attendees were young professionals, with the remaining 13% currently studying at universities across the world. Of the student participants, 67% were Master's students and 33% were Ph.D. students. The young professional attendees came from a variety of space related fields such as aerospace medicine, space law, space policy, engineering, and science. Delegates represented commercial and non-profit organisations, space agencies and universities.

Fig. 7.

Professional Status of Fusion Forum Delegates



Representatives of 15 countries participated in the SGFF. The highest percentage of delegates came from the USA; participants represented both nations with developed and developing space programmes.

Fig. 8.





Fig. 9.

## Fusion Forum Delegate Citizenship

Country of Citizenship	Number of Delegates
Australia	1
Argentina	1
Canada	4
Colombia	1
Ecuador	1
France	1
Germany	3
Greece	1
India	1
Japan	1
Netherlands	1
Spain	1
UK	1
USA	28
Vietnam	1
Total	47

# Space Generation Congress Report

Fig. 10.



Delegates at the 12<sup>th</sup> Annual Space Generation Congress in Beijing, China

The Space Generation Congress (SGC) is the major annual meeting of SGAC. Participants are top university students and young professionals with a passion for space. The three days of SGC 2013 brought together both young and experienced students, as well as professionals in the space sector. They travelled from 38 countries for an inspiring and resourceful engagement with their peers. The event was hosted at Beihang University in Beijing, China from 19 to 21 September. The congress took place just prior to the 64<sup>th</sup> International Astronautical Congress (IAC).



The SGC was attended by 116 delegates. This year's registration attracted applicants from over 58 countries, which demonstrates SGAC's ever-growing network of international members, as well as the high calibre of the organisation and its events.

Delegates were exposed to 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 (UN COPUOS).

Similarly, leaders from these space organisations had the opportunity to learn of fresh, innovative and bold perspectives from the incoming space generation on the five main themes of SGC 2013: Industry, Agency, Society, Exploration and Earth Observation. SGC 2013 was supported by several sponsors and organised by a committee of volunteers from across the globe. The 2013 Space Generation Congress would not have been possible without our supporters and dedicated volunteers, and SGAC would like to express its gratitude and appreciation.

## sgc speakers

Charles Bolden	NASA Administrator
Carissa Christensen	Managing Partner, The Tauri Group
Markus Enenkel	FFG/Bmvit Space Applications Competition Winner
Kiyoshi Higuchi	President of the International Astronautical Federation (IAF)
Yasushi Horikawa	Chairperson of UN COPUOS and Technical Counsellor at JAXA
Michael K. Simpson	Executive Director, Secure World Foundation
John Karas	Vice President and General Manager of Human Spaceflight at Lockheed Martin
Kathy Laurini	Senior Advisor at NASA
Martin Leitgab	International Space Solar Power Competition Winner
Mazlan Othman	Director of United Nations Office for Outer Space Affairs (UNOOSA)
Elliot Pulham	CEO Space Foundation
Dorin Prunariu	President of Association of Space Explorers (ASE)
Massimo Vetrivano	2013 Move and Asteroid OHB-SGAC Competition Winner
Jingnong Weng	Vice Dean, International School Beihang University
<i>Confirmed but unable to attend:</i>	
Junichiro Kawaguchi	Hayabusa Project Manager, JAXA
Sandy Magnus	Executive Director of the AIAA and former NASA Astronaut

## sgc themes and recommendations

At the core of SGC 2013 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 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 SCA and the Secure World Foundation for making these SGC working groups possible.

### Industry – Space Industry in the Era of the Globalisation

Supporter: N/A

Subject Matter Experts: Alanna Krolkowski (Canada) and Paul Guthrie (USA)

Moderator: Sandra Gonzalez Diaz (Spain)

Industry has to adapt to the current economic situation of high financial uncertainty. Investors are setting lower value on high-risk, long-term projects. This is creating a situation of capital scarcity in the space industry that, together with the lower volume of projects in the backlogs of contractors, is hindering the future competitiveness of the industry. Competition and reduced project budgets put big space equipment providers under pressure and are triggering the appearance of more small/medium sized companies, especially in developing countries.



Launch of Shenzhou 10

Industrial companies play an important role in a globalised world, acting as mediator between space-faring nations and developing countries. The potential of these relationships can be relevant for strengthening ties between countries on political or economic levels.

During the SGC industry group sessions these topics were discussed and lead to the following recommendations:

- Customer focus: At early stages of development, to commit resources to generate reliable insight into customer demand and use cases, as well as to involve users in product development.
- Entrepreneurship: Explore and integrate, where appropriate, best practices from adjacent high-tech industries to foster innovation.
- Internationalisation and industrial partnership: Invest in international public-private partnerships to efficiently determine interfaces, form standards, and solve other technical issues that individual governments and firms cannot address alone. In addition, take full advantage of new low-cost, small-scale technologies to build international partnerships.
- Knowledge management: Adapt knowledge management models to actual employment patterns by exploring new software tools for effective knowledge management; foster a closer work environment between professionals at all levels of experience; and prioritise the development and long-term training of young professionals in project management strategy.

Fig. 11.



Delegates working during the Working Group Sessions

### Agency – Space Communications in our Daily Life

Supporter: NASA SCan

Subject Matter Expert: Stephanie Wan (USA)

Moderator: Katrina Laygo (USA)

The Agency Working Group discussed the benefits of space communications in daily life and strategies for conducting outreach to increase awareness of such benefits. Space communication plays an important role in society and in our technological world. In light of this, it is remarkable how little the public is aware of space communication and its benefits. The connection between space applications and, in particular, space communications and services are unknown to a large part of the population. Therefore, efforts to raise awareness should reach people from a variety of backgrounds, as well as different nationalities and age groups.



ISS Spacewalk. Credit: NASA

The group examined the stakeholders in space communications and developed a detailed outreach strategy. This included a definition of the content to be communicated to stakeholders, as well as new media tools to be used. They concluded that an educational, dynamic, and integrated video, image, and game application campaign would be the most effective means of targeting and engaging stakeholders.

The group recommended that the most successful means of integrating this video, image and game campaign would be by utilising a neutral coordinating organisation, such as SGAC, when facilitating stakeholder outreach in the working group members' respective countries. The group recommended collaboration with existing outreach campaigns, such as NASA's International Space Apps Challenge and UK Catapult "Future Cities" as strategies for funding. They recommended that the outreach strategy be divided into several short, medium, and long term efforts, as this would provide an



interesting chance of return on investment if stakeholders, such as satellite communications providers, were to consider participating in the short term efforts discussed by the group, thus establishing a basis for medium and long-term outreach phases.

## Society – Near Earth Objects, Impact in Society

Supporters: Secure World Foundation

Subject Matter Expert: Ray A. Williamson (USA)

Moderator: Bruno Sarli (Brazil), Zhuyan Lu (China)

The Society Working Group discussed how nations and international organisations can efficiently inform the population in case of a Near Earth Object (NEO) threat. In addition, it was also discussed how current media can help or hinder this endeavour. The working group based its discussion on the report submitted by the Action Team 14 (AT-14) at the UNCOPUOS and on the Secure World Foundation's paper titled, "Crafting an effective communications plan for an international response to a threatening Near Earth Object".



To successfully and efficiently deliver information about NEO threats, the working group addressed four main issues:

- How to define an effective communication plan to prepare governments and the public to respond to the potentially hazardous NEOs
- How to implement a coordinated programme of education targeting the public, policy makers, students, and media
- How to define criteria to identify communicators to be used to deliver NEO threat information effectively and avoid misinformation
- How to access NEO Research data and real-time information

The working group recommended to work with existing organisations to deal with the communication process. The group acknowledged the effort carried out by AT-14 and endorsed their recommendations to support the development of the International Asteroid Warning Network (IAWN) and Space Mission Planning Advisory Group (SMPAG).

The group presented the following recommendations:

- An effective communication plan should foresee long, medium and short-term actions to cope with the NEO threat at different stages. Long-term action will target the general public to raise awareness and foster scientific education. At this stage, the plan should be implemented by local governments in accordance with the guidelines provided by IAWN. SGAC can greatly contribute at this stage, continuing its outreach activities and also translating the material into additional languages in order to reach a wider audience. Medium-term action will require decision-makers to develop contingency plans in the remote case of a highly probable impact. Short-term actions will directly target the general public and governments using the preparation and training learned from medium/long-term communication strategies to mitigate the consequences of threats. The group also recommended implementing new tools to directly connect the NEO threat to a procedure to be executed on ground in order to mitigate the risk.

- An effective educational plan should consist of implementing a multi-level strategy addressing different ways of providing the population with correct and factual information. The plan should implement a “media training” element with the support of universities, agencies and institutes, to produce NEO threat related TV-series, movies, advertisements and other similar media, with the guarantee of factual correctness of the material presented. Accredited organisations and international groups should aid policymakers in responding to a NEO threat and its possible consequences. In addition, schools, museums, planetariums and virtual forums should play an important role in the education of students and the general public. Where the general public could not access these kinds of activities, the group recommends getting NGOs involved in contributing to the process through community gatherings and other tools already in place for other types of emergencies.
- Taking into account the differences between nations and their available infrastructure, every nation should identify possible communicators and implement impact risk management within its own emergency service unit(s). Emergency responders should be educated on the specific threats of asteroid impacts. This highlights the importance of an Impact Disaster Planning Advisory Group (IDPAG) functioning under an SMPAG to coordinate international activities and to support national efforts. In the initial phases, national emergency service units should contact and receive information from a UN IDPAG. In the event of a short-term threat, emergency service units should start an awareness campaign to inform the public of the threat and about possible mitigation measures. As a long-term response, IAWN should act as a central body for information and international communication between countries.

Fig. 12.



Members of the Society Working Group

## Exploration – Exploitation of Space resources: Legal and Political Implications

Supporter: N/A

Subject Matter Expert: Matt Maniscalco (USA)

Moderator: Jeroen Van den Eynde (Belgium)

The Exploration Working Group examined the emerging space resources industry and the political, legal and social challenges that it faces. The group discussed the need for and application of such an industry, agreeing that there are numerous benefits to humankind. It is evident that companies such as Deep Space Industries and Planetary Resources are developing technologies to mine celestial bodies, however provisions of the current international space law treaties, such as the Outer Space Treaty, Liability Convention and Moon treaty, leave uncertainties about private ownership of what is mined, potentially preventing the progression and development of the industry.



Asteroid Eros. Credit: NASA



The group also discussed what is socially acceptable in terms of space mining, specifically with consideration to protecting the environment and unique heritage of space, while enhancing scientific research.

The group made the following recommendations based upon their conclusions:

- Due to ambiguities in the property rights of celestial bodies, a clearer interpretation of terms in the Outer Space Treaty is required.
- An impartial, international body should be formed and tasked with addressing the scientific, cultural and environmental concerns involved with space mining. Such a body would implement a regulatory framework to protect the common heritage of humankind.
- Liability for space operations currently falls to the launching state. It was deemed that this places an excessive burden on these states limiting the growth of the industry. As a result it is recommended that a United Nations General Assembly resolution be amended which highlights the importance of the creation of national space laws to regulate the allocation of risks between states and private entities. Meanwhile, states should acknowledge limitations in the Liability Convention and attempt to solve these on both the national and international level.

Space mining has the opportunity to greatly further human progress through economic stimulation and technological and scientific advancement. The group believes that through appropriate regulation, both national and international, the benefits of space mining can be experienced while avoiding the possible detriments it could entail.

Fig. 13.



Members of the Exploration Working Group during the Working Group Sessions

## Earth Observation – Earth Observation for Sustainable Development

Supporter: SGAC's Anonymous Supporter

Subject Matter Expert: Yusuke Muraki (Japan)

Moderator: Jacob Sutherlun (USA)

The Earth Observation working group discussed the challenges and possible solutions of earth observation for sustainable development in developing countries. In this context, the term “development” is not specifically focused on technology development but includes economic growth and poverty reduction. The main challenges identified by the working group were: data access and utilisation, lack



Earth from GEO. Credit: NOAA

of awareness, lack of technical capacity, and lack of coordination and political will.

The group discussed the use of Earth Observation applications for sustainable development. Major Earth Observation application areas where developing countries could benefit are: disaster relief, agriculture, medicine, urban planning, weather forecasting, and communication. Smaller areas of interest include oil theft, bunkering, piracy, illegal fishing and maritime security.

The working group developed the following recommendations and conclusions:

- **Data access and utilisation:** A data-sharing framework should be developed and include an expanded version of the current framework for disaster emergency response. The data-sharing mechanism must also be based on contribution from member countries, and include the participation of developing countries. The private sector must also be encouraged to participate in international initiatives.
- **Policy:** Best practices from developed countries on the use of Earth Observation data for sustainable development should be shared to increase effectiveness in developing countries. In addition, government-funded cost/benefit analyses should support policymakers' ability to understand the benefits of Earth Observation in developing countries.
- **Awareness:** User awareness must be increased, but also the awareness of the established space community in terms of new user needs.
- **Technical capacity:** Templates for STEM education can be used, and the sharing of job creation techniques and technical exchanges to establish skilled domestic workforces in the countries where these skills are required most.
- **Avoiding duplicative efforts:** Domestically, the roles and responsibilities amongst agencies must be clarified in individual countries; internationally, efforts must be better co-ordinated through, for example, formal agreements, workshops, and online information sources.

Fig. 14.



Members of the Industry Working Group

SGAC closed registration for the SGC on 1<sup>st</sup> September, with more than 250 applications from 58 different countries.

After a diligent selection process, a total of 116 delegates participated in SGC 2013. Of those, 25 participants from 13 countries received scholarships from SGAC and its partners. There was a gender distribution of 31% women and 69% men, an achievement that is uncommon for events in the space sector. Delegates came from varying backgrounds, with 22% undergraduate students, 21% masters students, 16% PhD students, and 41% 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 delegates from an array of countries and regions. SGC 2013 attendees came from more than 38 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.

Fig. 15.



Mazlan Othman, UNOOSA Director and networking opportunities at SGC

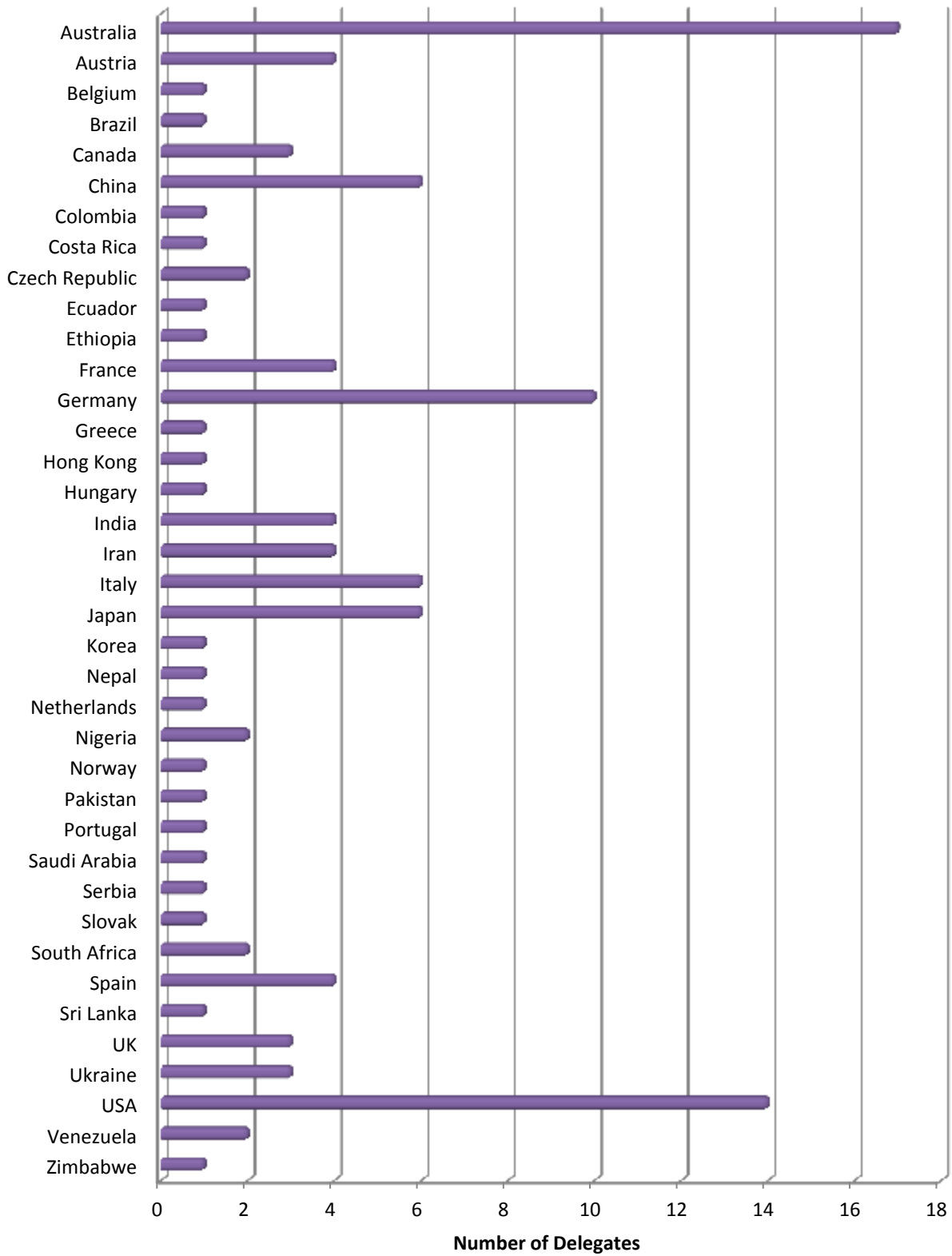
Fig. 16.



SGC Closing Gala Dinner with Charles Bolden, NASA Administrator

Fig. 17.

## SGC Delegate Citizenship

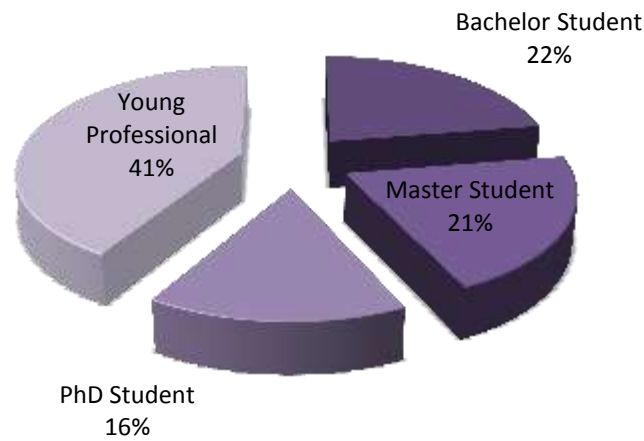




Whilst the majority of SGC delegates were students, 41% were young professionals working within industry, in postdoctoral positions or working in space agencies.

Fig. 18.

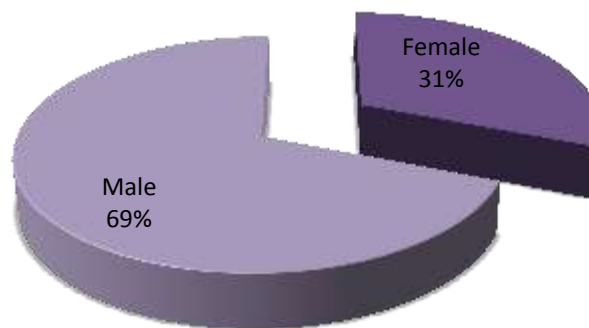
Professional Status of SGC 2013 Delegates



SGAC is proud to have relatively even gender distribution amongst the SGAC Team. However, the pool of delegates at SGC 2013, represented a bit less balanced distribution than in the past with only a 31% female representation. SGAC hopes to increase the participation of female in future events.

Fig. 19.

Gender of SGC 2013 Delegates



# 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.

The 56<sup>th</sup> Session of the UNCOPUOS was held on June 12<sup>th</sup> – 21<sup>st</sup> 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 2013. Additionally, SGAC held an Advisory Board meeting on the 14<sup>th</sup> of June and participated in the International Committee on GNSS (ICG) meeting on June 11<sup>th</sup>.

SGAC Co-Chair, Chris Vasko, gave the official statement for SGAC on the 14<sup>th</sup> of June, 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.

Also on the 14<sup>th</sup> of June, SGAC held an Advisory Board meeting at the United Nations. In this meeting, board members were given a summary of SGAC's status and strategy. The lively discussion that followed was full of valuable suggestions and inputs.

On the second week, Executive Director Andrea Jaime, addressed COPUOS once again with a technical presentation on the results of the 2<sup>nd</sup> Space Generation Fusion Forum.

SGAC also signed the Heads of Agreement with Space Foundation. They agreed on the preparation of the 3<sup>rd</sup> Space Generation Fusion Forum, to continue the partnership started two years ago, and to setup several meetings with potential partners.

We would also like to highlight the large delegation that SGAC had this year, and thank all of them for their attendance. Andrea Jaime (Executive Director), Azam Shaghaghi (Iran, Commercial Space member team), Catherine Doldirina (Former Chair and Advisory Board member), Chris Vasko (Co-Chair and Treasurer), Juan Robalino (Ecuador), Vojna Ngjeqari (NPoC Albania) and Zhuoyan Lu (China, Commercial Space Lead) formed the SGAC delegation, bringing diversity and young spirit to the United Nations.

Fig. 20.



Left: Chris Vasko (Austria/Hungary) giving the SGAC Statement at the UN COPUOS. Right: Andrea Jaime (Spain) presenting the Space Generation Fusion Forum to the Committee.

## 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 50<sup>th</sup> session held from the 11<sup>th</sup> – 22<sup>nd</sup> of February at the United Nations in Vienna, Austria.

On Tuesday, February 12<sup>th</sup>, 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 2012.

The statement highlighted SGAC's achievements in 2012, 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

Andrea Jaime also participated in the 23<sup>rd</sup> UN/IAF workshop planning meeting, and both she and Winter Intern, Ryan Laird, have contributed to the Action Team 14 on Near Earth Objects meetings held around S&T. During the second week Ryan Laird presented the results and recommendations of the 2012 SGC held September 27 to 29 in Naples, Italy. In his presentation to the S&T Subcommittee, Ryan 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 had the first Advisory Board meeting of the year, where the strategy for 2013 was actively discussed.

SGAC organised an informal gathering on Tuesday evening, including the SGAC delegation and its friends and supporters in attendance at the UN COPUOS S&T meeting.

SGAC is proud of its delegation consisting of Executive Director Andrea Jaime (Spain); Intern & NPoC Ryan Laird (United Kingdom), Zhuoyan Lu (China), Andjie Boyd.



Fig. 21.



## LEGAL SUBCOMMITTEE

The Legal Subcommittee of UN COPUOS held its 52<sup>nd</sup> session in Vienna from the April 8<sup>th</sup> to 19<sup>th</sup>. For the first time, Eirini Maria Sfantzikaki (Greece), who is a representative of the SGAC Space Law Project Group, made a statement at this session. Andrea Jaime and Ryan Laird were also part of the delegation attending the meetings.

## 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. In particular, they took part in meetings on the 1<sup>st</sup> and 4<sup>th</sup> Committees of the UNGA, since both had agenda items dealing with space matters and were therefore relevant to SGAC.

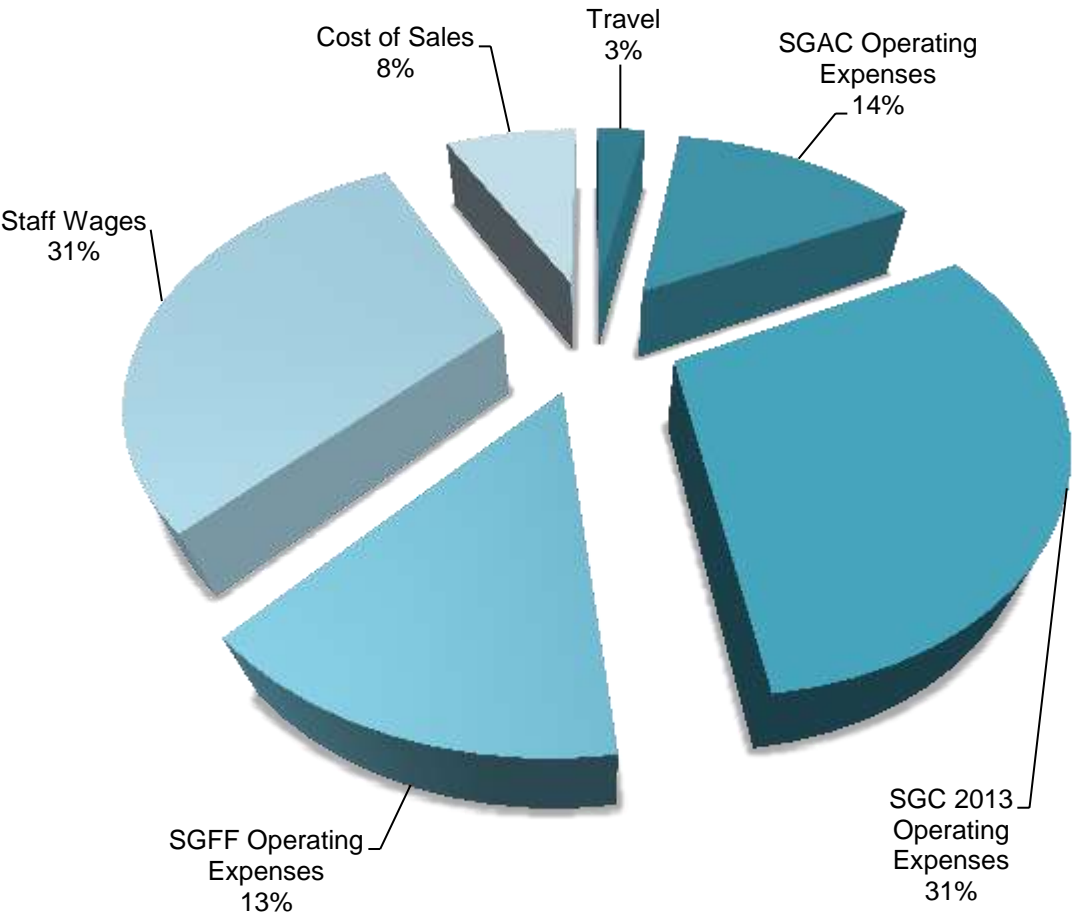
# Financial Report

## profit and loss statement

	2013	2012
<b>Income</b>		
General Sponsorship	€5,807.06	43,977.07
Interest Income	€10.77	38.33
Refunds on payments	€2,152.51	248.42
SGC Delegate Fees	€10,034.29	9,415.00
SGC Sponsorship	€79,242.97	47,543.10
SGFF Delegate Fees	€2,008.42	1,311.42
SGFF General Sponsorship	€28,192.11	47,012.71
<b>Total Income</b>	<b>€127,448.13</b>	<b>€149,546.05</b>
<b>Less Cost of Sales</b>		
Operating Expenses	€8,118.76	11,053.19
<b>Total Cost of Sales</b>	<b>€8,118.76</b>	<b>€11,053.19</b>
<b>Gross Profit €</b>	<b>€119,329.37</b>	<b>138,492.86</b>
<b>Less Operating Expenses</b>		
Accounting and Bookkeeping	€5,498.90	-38.99
Association membership fees	€735.00	746.32
Bank Fees	€1,998.99	2,468.38
Creative Design	€0.00	1,707.61
Foreign Currency Gains and Losses	€2,995.53	1,874.02
IAC participation - registration, booth, etc	€4,781.72	6,385.35
SGAC Projects	€190.95	0.00
Previous SGC Congress hosting expenses	€0.00	542.88
Previous SGC Scholarships	€0.00	15,474.44
SGC Scholarships	€13,450.82	22,082.17
SGC Congress hosting expenses	€18,576.23	40,688.01
SGFF Congress hosting expenses	€6,552.36	5,248.52
SGFF Scholarship	€7,648.25	12,343.60
Travel and Accommodation Expenses	€2,972.87	2,928.84
Wages - Deputy Executive Director	€0.00	12,331.56
Wages - Executive Director	€30,000.00	34,463.81
Wages - Interns	€2,000.00	1,500.00
Website	€1,198.42	€33.94
<b>Total Operating Expenses</b>	<b>€98,600.04</b>	<b>€160,780.46</b>
<b>Net Profit €</b>	<b>€20,729.33</b>	<b>-€22,287.60</b>

Fig.22.

SGAC 2012 Expenses: Total Expenses: 171,883.65 € <sup>2</sup>



## balance sheet

	2013	2012	2011
<b>Assets</b>			
<b>Bank</b>			
Bank Austria	€9,489.83	€15,696.34	€13,198.47
Bank of America	€48,200.05	€22,783.42	€61,526.73
Paypal	5,989.39€	1,423.31€	€3,792.82
Accounts Receivable	€26,201.72	€21,174.10	€2,397.47
<b>Total Bank</b>	<b>€89,880.99</b>	<b>€61,077.17</b>	<b>€80,915.49</b>
<b>Current Assets</b>			
Accounts Receivable	€26,201.72	€21,174.10	€2,397.47
<b>Total Current Assets</b>	<b>€26,201.72</b>	<b>€21,174.10</b>	<b>€2,397.47</b>
<b>Fixed Assets</b>			
Computer Equipment	€333.34	€333.34	€0.00
<b>Total Fixed Assets</b>	<b>€333.34</b>	<b>€333.34</b>	<b>€0.00</b>
<b>Liabilities</b>			
<b>Current Liabilities</b>			
Accounts Payable	€17,787.56	€7,518.38	€4,100.85
Income Tax Payable	-€0.37	€0.00	€0.00
Rounding	-€4.80	-€4.81	-€0.01
Unpaid Expense Claims	€0.00	€2,194.35	€0.00
<b>Total Current Liabilities</b>	<b>€17,782.39</b>	<b>€9,707.92</b>	<b>€4,100.84</b>
<b>Total Liabilities</b>	<b>€17,782.39</b>	<b>€9,707.92</b>	<b>€4,100.84</b>
<b>Net Assets</b>			
<b>Net Assets €</b>	<b>32,510.94</b>	<b>62,243.69</b>	<b>85,675.45</b>
<b>Equity</b>			
Current Year Earnings	€20,729.33	-€25,112.04	€36,013.94
Members' Capital	€40,022.85	€40,022.85	€40,022.85
Retained Earnings	€11,679.76	€36,791.80	€777.86
<b>Total Equity</b>	<b>€72,431.94</b>	<b>€51,702.61</b>	<b>€76,814.65</b>

## 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)

In 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 organization

## 3. Management Committee and Staff Members

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

Co-Chairpersons	Cj Nwosa
	Christopher Vasko sa
Co-Secretaries	Aafaque Kahn
	Ali Nasser
Treasurer	Jacob Hacker

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

Contracted support staff engaged throughout 2013 were:

Executive Director	Andrea Jaime Albalat
Interns	Felipe Arevalo – Botero
	Ryan Laird

## 4. Definition of terms used

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

<b>SGAC:</b>	Space Generation Advisory Council
<b>SGAC USA:</b>	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.
<b>SGC:</b>	Space Generation Congress – SGAC's annual member's conference held alongside the International Astronautical Congress
<b>SGFF:</b>	Space Generation Fusion Forum – SGAC's new annual member's conference held alongside the National Space Symposium

## committee's declaration

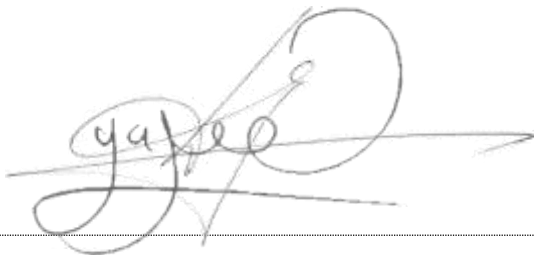
### Statement by the Executive Committee

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, 2013
- 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, 2013
- 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:

On behalf of the Management Committee:

#### Original signed



Cj Nwosa – Co-Chairperson

Johannesburg, South Africa, January, 2014

#### Original signed



Christopher Vasko – Co-Chairperson

Delft, Netherlands, January 2014

# Communications and Public Relations Report



## SGAC NEWSLETTER

SGAC uses newsletters as an avenue to inform members of the organisation's achievements throughout the month. Members are welcome to contribute news, events and articles regarding the space sector in this newsletter. Many member contributions reflect their participation in various activities such as STEM outreach, conferences and local space events. The newsletter also incorporates general news and fun facts about the space sector. Competition announcements and scholarship opportunities are also incorporated, with winners being announced as awards are granted.

## WEB NEWS

Web news items placed on the SGAC website provide one of the primary means of updating SGAC members on the activities of the organisation. Throughout the year, web news articles are published to announce SGAC achievements and developments, the release of the SGAC newsletter, new positions and scholarship opportunities for SGAC events.

## NEW PR APPROACH UTILISING THE SGAC NPOC NETWORK

In 2013 a new method for the promotion of SGAC activities was created and implemented. The PR and Communication team were approached early in the year by the leads of the SGC technical paper competition working groups who wanted to increase the number of applicants for each competition. It was found that existing methods of advertising SGC competitions and scholarships, such as web news items and social media advertising, were not utilising the full potential of the extensive SGAC member network.

An approach was formulated, where an information pack on the three main SGC competitions was prepared and sent via the RCs to the SGAC NPOCs. The NPOCs were instructed to send these materials in a prepared email directly to local national organisations that could pass these on to students and young professionals. Such organisations included universities, space agencies and organisations promoting space. The NPOCs were also instructed to enter the names of the organisations they had contacted into a Google spreadsheet so that the extent of the campaign could be monitored, and regions that had not forwarded the information could be reminded. This approach allowed over 100 organisations worldwide to be contacted, which helped increase the number of entrants in all three SGC competitions.

A few rollout problems were encountered. For instance, it took a large number of email reminders to encourage the NPOCs to forward the information. Also, there were delays in the preparation of materials, and as a result, the information pack was sent a month before the closing date of the competitions and many of the organisations were only contacted around the closing dates. This may have led to many possible participants not having enough time to complete an entry. In 2014, this will be improved such that the NPOCs should be given materials and instructions no later than two months before the competition closing date, as well as frequent reminders to the NPOCs who have not yet passed on the information.

This method was reused for the 2013 Find an Asteroid campaign, and has so far assisted in gathering a large number of entrants.



## SOCIAL MEDIA

Social media continues to be a key utility for the Public Relations and Communications team. The regional Facebook pages continue to be used to provide region specific SGAC information, while the main SGAC Facebook page and Twitter feed have been used to provide regular updates on SGAC activities and opportunities.

## SGAC EVENT PROMOTION AND DEDICATED TEAMS

The PR and Communications team promoted the SGC 2013 and the SGFF 2013 through the use of web news, newsletter articles and social media. Dedicated PR teams covered the public relations requirements at each of these events.

## EXTERNAL ORGANISATIONS

In 2013, SGAC activities were highlighted through external organisations. An example of this is the inclusion of short articles on SGAC activities in International Astronautical Federation newsletters.

## FUTURE RECOMMENDATIONS

It is recommended that the PR approach utilising the NPoC network is used again in the future, as this approach takes better advantage of the wide reach of the SGAC network. Further emphasis is needed on utilising social media through Facebook and Twitter in order to provide more regular updates. A possible solution could be the creation of a dedicated social media reporter position within the PR and Communications team.

Note: Check Appendix A for further information and specific links.

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# Project Outcomes and Highlights

SGAC's mission and mandate are reflected in the activities of the Project Groups. These seven groups implement a range of projects throughout the year, each focused on a topic of interest to SGAC members. They are: the Space Safety and Sustainability (SSS) Project Group; the Near Earth Object (NEO) Project Group; the Space Technology for Disaster Management (STDM) Project Group; the Youth for Global Navigation Satellite Systems (YGNSS) Project Group; the Small Satellite Project Group; the Space Law and Policy Project Group (formerly the Space Law Group); and the Commercial Space Project Group. The groups vary in size and in the scope of their activities, but are all led by highly committed Project Leads and coordinated by SGAC's Project Coordinators.

This year saw the Project Groups reach new heights in the involvement of their members, research output, scale and significance of their events, and their international exposure. The Project Groups also continued to grow in size. They conducted activities of global reach, involving student and young professionals from every continent. But most importantly, the groups undertook many important "firsts," such as new outreach campaigns, workshops, and other special events.

In late 2012, all Project Groups committed to increasing their total number of active members and to doubling their number of total paper submissions in 2013. They also aimed to create partnerships with industry actors, space agencies, and NGOs. Goals were also set of raising financial support to enable students and young professionals to present at conferences, thus increasing the visibility of SGAC in the space community.

Over the course of 2013, the groups met and exceeded these goals. They more than doubled their number of paper submissions to major conferences, increasing it from 5 in 2012 to 13 in 2013. Several of the groups have established partnerships with external actors. For example, the NEO Project Group collaborated with the Planetary Society and the NEO Committee of the IAF on a new project. The Small Satellite Group signed a Memorandum of Understanding with QB50 and AMSAT. The groups successfully sought the support of partners who could make their events possible and accessible to students and young professionals. For example, the YGNSS and STDM groups partnered with Beihang University in Beijing, an institution that supported their efforts by hosting a workshop they organised. In addition, the Space Law and Policy Project Group, the Commercial Space Project Group, the STDM Group, and the Small Satellite Project Group are very active on social media services such as Twitter, with respectively 230, 190, 106 and 61 followers.

In the fall of 2013, the Executive Director, the Chairs, and the Project Coordinators chose two new Project Coordinators to succeed Emmanuelle David and Alanna Krolikowski for a term of two years. Their focus is on preparing for this transition and ensuring its success. To ensure that this process is smooth, Emmanuelle and Alanna will create a handover guidebook for their successors. The outgoing and incoming Project Coordinators' terms will overlap for three months, giving the new Coordinators time to prepare for their roles. After the formal end of their term, Emmanuelle and Alanna will continue to advise and guide the new Coordinators for another three months. This six-month transition process will ensure a smooth transfer of knowledge, practices, and responsibilities. It will also enable all the participants to reflect upon lessons learned over the past two years and chart a new course through to 2016.

With the new Project Coordinators in place, the groups will take on new projects and challenges in 2014. The project groups will each pursue their own long-term strategies and work to meet their milestones. In addition, they will continue to work towards their common goals. By the end of 2014, they aim to increase their total number of active members and total number of paper submissions. They will continue to develop and build the partnerships they have established with firms in industry, NGOs, and space agencies, and hope to establish new ones. Finally, they will continue to raise financial support to enable students and young professionals to present at conferences.

The Project Groups are an important pillar of SGAC. They provide a channel through which SGAC members can create and maintain relationships during the months between our annual SGC and SGFF meetings. The groups also provide an opportunity for members to develop expertise and to acquire experience that supports their professional development. Finally, the groups provide a podium from which students and young professionals can make their voices heard throughout the international space community. The Project Coordinators and Project Leads will continue to work toward these overarching goals. In the process, they will continue to foster and channel enthusiasm for projects among SGAC members, while ensuring that new activities are feasible, sustainable, and supportive of the organisation's mission.



# Commercial Space

## Project Group

Commercial space activities have, since the first years of spaceflight, supported achievements and played a major role in shaping the way space has been used and is used today. Driven by the potentially game-changing developments in recent years, new emerging challenges, and a revitalised interest in these topics, SGAC's Commercial Space Project Group strives to get the young generation of space enthusiasts introduced to and involved in the world of commercial space activities. The group was established in January 2013.



### Goals

1. To conduct academic research on the “theory of industrial practice” in the commercial space sector.
2. To gather a next generation “think-tank” for commercial space.
3. To make the project influential upon decision-makers and getting the generation’s thoughts on commercial space to be heard publicly.
4. To equip the young generation with knowledge, tools and networks to be active in the realm of commercial space and entrepreneurship.

### Accomplishments of the Commercial Space Project Group in 2013

#### *NEW MEMBERS*

Beginning with the formation in January 2013, the group has already built a pool of talented young members interested in commercial space activities. New active members include: Zhuoyan Lu, Philipp Maier, Noemie Bernede, Jie Hou, Lluc Palerm Serra, Azam Shaghaghi, and Jan Svoboda.

#### *NEW ADVISORY TEAM MEMBERS*

The project group is grateful to have found a number of experienced professionals in the space field willing to advise and support the group in its activities. Thanks go to the current members of the advisory team: Julio Aprea (ESA), Ken Davidian (FAA), Daniel Faber (Heliocentric LLC), Stefano M. Fiorilli (ESA), Robert P. Mueller (NASA), and Rex Ridenoure (IZUP LLC). In addition, the group is glad to cooperate with the Federal Aviation Administration’s Centre of Excellence for Commercial Space Transportation and the International Astronautical Federation’s Entrepreneurship and Investment Committee.

#### *SUPPORT OF AN IAA STUDY GROUP*

Since early 2013, the commercial space group has contributed to the International Academy of Astronautics Study Group on Public/Private Human Access to Space. Research has been conducted on the structure of the European space industry, on national cultural and historical backgrounds to serve for future industry analyses. Several project group members have been appointed as members of the Study Group. Work for the Study Group will be continued in 2014.

## *\$PACE IS BUSINESS! PAPER COMPETITION*

The second IAF-EIC/SGAC “\$pace is Business!” paper competition was organised by members of the project group. The competition, jointly organised by the International Astronautical Federation’s Entrepreneurship and Investment Committee (IAF-EIC) and the SGAC, aims at drawing the attention of students and young professionals to the challenging topics associated with entrepreneurship and investment in the space sector. The 2013 edition encouraged students and young professionals to submit research papers touching on “Global Public/Private Innovative Initiatives in Spaceflight” or other current issues concerning entrepreneurship and investment. This year’s winning paper was entitled “Microsatellites and Microlaunchers: The Tandem that will disrupt the Satellite Industry”, by Lluç Palerm Serra, Jordi Barerra Ars, and Jorge Salas Solanilla. The authors received an award of 2500 USD and presented the paper at the SGC 2013 and the IAC 2013.

## *OUTREACH AND COMMUNICATION*

In order to inform interested members and the public about the group’s work, and to conduct outreach on current topics of interest to the group, several communication channels were established, including a Twitter account, a Facebook page, and a page on the SGAC website.

## **Conference Papers and Presentations**

- Lu Z, Maier P, Svoboda J, Hou J, Shaghaghi A.: Identification and Analysis of National and Regional Industry Clusters of the European Space Industry. International Astronautical Congress, Beijing, China, 2013.
- Bernede N: Entrepreneurship and Innovation in the European Space Sector: Overview and Impacts of European Space Agency and European Union's Initiatives. International Astronautical Congress, Beijing, China, 2013.
- Maier P: Historical and Cultural Assessment of Entrepreneurship and Investment in Germany. International Astronautical Congress, Beijing, China, 2013.

## **Looking Ahead – Activities for 2014**

Based upon the work that the group has already achieved in the past year, the project group intends to further broaden its scope and improve in the following aspects:

## *CONTINUING WORK ON RESEARCH PAPERS*

- IAA Study Paper  
The project group will continue its collaboration with the IAA Study Group and follow up with work done in 2013. The focus in 2014 will lie on the following two areas: Industry Chain Analysis on Human Spaceflight in Europe and A Historical Overview of Chinese Entrepreneurship and its Impact on the Space Industry.
- Country by Country Study Paper  
In addition, work that began in 2013 on national and regional industry clusters of the European space industry will be continued. Building on the past work, in-depth analyses will be carried out for selected countries. For the next year, these include France, Germany, and Benelux (Belgium, Netherlands, and Luxembourg).
- Further Broaden Scope of Research on European Space Industry  
The group also leaves the opportunity open for further research work, especially on the European space industry, which gives the group more flexibility and capacity for hosting more interested members to be actively involved with group work.



## POTENTIAL OPPORTUNITIES FOR THE DEVELOPMENT OF MEMBERS

- **Collaboration with Consultancies**  
In order to broaden the scope of research undertaken by the group, and further bring our generation's opinion and views to current debates, opportunities are being explored to collaborate with consultancies active in the space sector. This collaboration would furthermore benefit the group members by helping to build relationships.
- **Exploration of Entrepreneurship Opportunities**  
Connections between senior professionals, industry leaders, and advisory board members of CSPG and members of the group will be made next year by exploring coaching, training, and mentor programme within the group.

## IMPROVEMENTS IN OUTREACH CHANNELS

- **Networking inside and outside the group**  
In addition to endeavours from the past, next year new channels for outreach work of the group will be developed. Examples include: developing a blog for CSPG and updating it weekly or monthly, establishing an up-to-date reference website, generating a series of Google hangouts/webinars that will also be published on YouTube, and working on a contact list of members from CSPG.
- **Group Seminar Connected to IAF Spring Meeting in Paris**  
The group also intends to make use of the IAF spring meeting in Paris to create an opportunity for members to meet-up and exchange views amongst each other and with advisory team members.

Fig. 23.



CSPG group and advisory team members at the SGC 2013 closing dinner in Beijing, including 2013 Space is Business winner Lluc Palerm Serra.

# Near Earth Object

## Project Group

The 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 on planetary defence through annual reports, competitions, conference attendance, and public outreach projects related to Near Earth Objects (NEOs).



### Goals

1. To ensure that the opinion on matters related to NEOs of students and young professionals is heard by the global community.
2. To promote the work of students and young professionals to the planetary defence community and to encourage others to get involved.
3. To present honest and balanced facts on the dangers posed by NEOs to the general public in a non-technical format.

### Activities in 2013

#### *UNCOPUOS AT14*

SGAC is a member of the United Nations Committee for the Peaceful Uses of Outer Space (UNCOPUOS) Action Team (AT) 14 on Near Earth Objects. The NEO PG actively takes part in the meetings of AT14 and supports the recommendations put forward for an international response to NEO impact threats. The NEO PG further reports its annual activities to the Chairman of AT14 to be included in the AT14 report to the Science and Technology Subcommittee Meeting of the UNCOPUOS, which takes place every year in February.

#### *PARTICIPATION IN PLANETARY DEFENSE CONFERENCE 2013*

The 3<sup>rd</sup> IAA Planetary Defense Conference took place in April in Flagstaff, Arizona, USA. SGAC's NEO Project Group was represented by Alex Karl who presented a poster about the group's activities. Furthermore, the NEO Project Group was involved in hosting a public outreach event that featured Bill Nye.

Fig. 24.



### MOVE AN ASTEROID 2013 TECHNICAL PAPER COMPETITION

The NEO project group continued its successful Move an Asteroid technical paper competition series, which has been held annually since 2008. Students and young professionals were tasked to come up with original ideas that address the challenges involved with either the safe deflection of an earth-bound NEO, the detection of NEOs, or exploring a NEO for commercial utilisation. The winner was Massimo Vetrignano, a third year PhD student at Advance Concepts Laboratory, University of Strathclyde, Glasgow, with his paper entitled “Effective Approach Navigation Prior To Small Body Deflection”. In his paper, Massimo proposed an approach strategy for the precise orbit determination and approach navigation for small asteroids on the example of a contactless deflection technology. His prize was a scholarship to present his work at the SGC 2013 and IAC 2013.

Fig. 25.



Massimo vetrignano presenting his winning paper at sgc 2013

### FIND AN ASTEROID 2013 SEARCH CAMPAIGN



SGAC's Find An Asteroid Search Campaign was concluded on September 18 after a 5-week campaign in collaboration with IASC. SGAC selected 15 teams from all over the world to participate. The teams made the following observations and discoveries:

Main Belt Asteroid Discoveries (provisional): 1

Main Belt Asteroid Discoveries (preliminary): 12

NEO Confirmations: 15

NEO Observations: 45



Note that a preliminary discovery is the original observation of a Main Belt Asteroid located between the orbits of Mars and Jupiter; if a second observation within 7-10 days confirms its existence and refines its orbital characteristics, the asteroid is promoted to provisional and entered into the Minor Planet Centre database. Provisional discoveries are monitored for three to six years through further NEO observations, which allow further refinements to their orbit calculations. After the orbit is fully determined the provisional is numbered and placed into the world's official minor bodies catalogue by the IAU. At the point it's numbered, the discoverers can propose an official name to the IAU.

The SGAC discovery is:

2013QV47, Eyes of 51 Degrees, Iran

### *SGAC NEO PG ORGANISES SUCCESSFUL NEO EVENT AT IAC*

During the IAC 2013, the NEO Project Group organised a dedicated two-hour event entitled “NEOs and Planetary Defence - Where do we stand?” NEO group leader Alex Karl moderated the event, which aimed to inform the audience about the threat of NEOs and the current status of planetary defence.

The event included presentations from experts and gave the audience an overview on asteroids, how to detect them, the work of AT14 and the current status of a legal framework within the UN, and recommendations on how to communicate the risk to the public. It was concluded with a panel discussion involving Dr. Scott Hubbard (B612 Foundation), Dr. Dorin Prunariu (ASE), Dr. Sergio Camacho (CREALTEC), and Dr. Ray Williamson (Secure World Foundation).

The event also featured two contributions by SGAC members. Massimo Vatriscano presented his winning paper of the 6<sup>th</sup> edition of the Move An Asteroid Technical Paper and Lauren Lyons and Niels van der Pas from the SGC 2013 Society Working Group presented their group's recommendations on how to communicate the NEO threat to the general public. SGAC also unveiled its latest outreach activity: Name An Asteroid, a competition open to all ages to propose a name for a newly discovered asteroid.

Fig. 26.



Delegates at IAC NEO event.

## NAME AN ASTEROID



In collaboration with the Minor Planet Centre and the donation of an unnamed asteroid to be named, SGAC's NEO Project Group was able to unveil the Name An Asteroid Campaign. This competition encourages the general public to submit their suggestions on what to name the asteroid. The campaign should raise awareness about NEOs and provide an easy way for the public to get involved in the search. With more than 1000 entries, this campaign was highly successful. The winner will be announced in 2014.

# Small Satellite

## Project Group

Small satellite programmes are becoming a disruptive technology in space mission design and operation due to their affordability. Developing countries, academic groups and independent teams of space enthusiasts are increasingly able to develop their own small satellite space missions. The Small Satellite Project Group was officially announced at SGC 2012 and consists of more than 20 members.

### Goals

1. To provide career and project assistance to young professionals and students active in the small satellite community.
2. To offer the small satellite community up-to-date information on relevant topics, as well as recommendations regarding the direction to be taken for future research and development and/or policy and legal issues.
3. To attract young professionals and students to the applications of small satellites and generally to the world of space exploration.



### Activities in 2013

#### *SOCIAL MEDIA*

SSPG is active on the following social media services and has expanded their use in 2013:

- Facebook
- Twitter
- LinkedIn

#### *MOU WITH QB50*

SSPG signed a MoU with the QB50 project and is prepared to sign agreements with other companies and organisations within the aerospace sector.

#### *PAPERS AND CONFERENCES*

##### *Papers:*

“Earth Observation small satellites programmes at universities: Benefits of strengthening international collaboration between space-fairing nations and developing countries” at the 9<sup>th</sup> IAA Symposium on Small Satellites for Earth Observation., Berlin – Germany. Authors: Bernede, N., González Díaz, S.



SSPG was also present at the following conferences.

SGC 2012, Naples – Italy

- European Interparliamentary Space Conference 2013 Workshop, Redu, Belgium
- 9<sup>th</sup> IAA Symposium on Small Satellites for Earth Observation, Berlin – Germany
- Space Up Paris, France
- Small Satellite Developer Workshop, India - July 2013
- Space Generation Congress, Beijing – China
- AMSAT DL Satellite Symposium, Bochum – Germany

## Looking Ahead - Small Satellites Project Group in 2014

### PAPERS AND REPORTS

The process for the selection of subjects and paper review philosophy has been decided, including an internal group peer review. Papers and abstracts have been submitted to various conferences, and the group hopes that the SSPG will have several publications before SGC 2014.

### CONFERENCE ATTENDANCE SPONSORSHIP

Avenues are being pursued to support group members to present at conferences.

### MISSION IDEA CONTEST

A mission idea contest will be unveiled in the first half of 2014.

QB50

Based on the MoU signed in 2013, further promotional activities will take place with the QB50 team.

Fig. 27.



SSPG Presenting their work at the AMSAT Symposium and in Berlin

# Space Law

## Project Group

The Space Law Project Group was created in the spring of 2012, and has just fewer than twenty members. It is comprised mostly of students and young professionals from law and policy fields, but also includes individuals with other specialities. The group intends to serve as a forum for young professionals and students who are interested in space law. They hope to have their voices heard in the global conversation. There exists an intersection between space activities and their legal regulations. Tomorrow's space professionals, both legal practitioners and academics, will have much to discuss as space activities continue to evolve. Our current research project is on the preparatory works of the 1967 Outer Space Treaty. In 2014 the group intends to recruit new members, develop new projects, partner with other organisations, continue conducting research and applying their findings to on-going issues in space law.



### Goals

1. To develop working papers, white papers, reports and statements expressing the views of the next generation of legal professionals on various space law issues.
2. To bring the views of tomorrow's space leaders to important international forums, including academic and industrial conferences and meetings.
3. To develop relationships with other professional/civil society organisations and academia, including the International Institute of Space Law.
4. To encourage SGAC and Project Group attendance at regular high-level meetings, such as the annual UN-COPUOS, its Legal Subcommittee, and 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

### Activities in 2013

Since its creation, the SLPG has held monthly teleconferences related to the organisation of its on-going research project to investigate the treatment of international organisations under the Outer Space Treaty of 1967. This emerging issue needs investigation and clarification, and the group's research can address this complex and nuanced topic. The project group presented to the 2013 SGC delegates in Beijing, and new members have been recruited as a result of that presentation.

### Looking Ahead: Activities for 2014

The group will continue to develop conference papers and other deliverables. It will also investigate other possible projects and activities aligned with the group interests, depending upon available human resources.

# Space Safety and Sustainability

## Project Group

2013 has once again been a very successful year for the Space Safety and Sustainability (SSS) project group. The group welcomed Tiffany Chow (USA) as the new co-lead for the group to replace CJ Nwosa (Nigeria), as well as a further increase in its membership numbers. Over the year, the SSS project group explored three yearlong technical and policy projects on space safety or sustainability related topics. The results were presented by SSS members at numerous international conferences, including the 6<sup>th</sup> IAASS Conference "Safety is not an Option" (Montreal, Canada) and IAC 2013.



### Goals

1. To encourage active participation among students and young professionals in space safety and sustainability related debates and activities.
2. 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.
3. To afford current industry stakeholders access to a pool of young space enthusiasts interested in space safety and sustainability related issues.

### Activities in 2013

- The SSS project group welcomed Tiffany Chow (USA) and Dr. David Finkleman as the new SSS co-lead and SSS advisory team member, respectively.
- The SSS project group saw a further increase in the number of active SSS members.
- SSS further expanded its projects in 2013, and initiated three year-long projects in 2013 with both a technical and policy focus:

#### *ACTIVE DEBRIS REMOVAL (ADR) POLICY PROJECT*

This project aims to explore some of the challenges of Active Debris Removal (ADR) and will propose an economically, politically, and legally viable ADR option through the construction of a scorecard-oriented evaluative method.

#### *ORBITAL DEBRIS MANAGEMENT PROJECT*

The project investigates an alternative solution for decreasing orbital debris in LEO by altering the atmosphere at LEO altitudes, and thereby increasing local air density and inducing drag on orbital debris. Initial computational studies at the University of Michigan suggest this concept is plausible. This cost-effective proposal may require the use of a vortex ring generator to reduce drag upon propelled fluid during ascent. This study explored how air vortex rings propagate and their use as a drag inducing mechanism for orbital debris management.

## ACTIVE DEBRIS REMOVAL TECHNICAL PROJECT

This project investigated an ADR system that could be capable of approaching a selected debris object through a close-range rendezvous, establishing physical contact, stabilising its attitude and finally de-orbiting the debris object using a type of propulsion system in a controlled manoeuvre. The project investigated different methods of approach and de-orbiting (chemical, chemical-EDT) using Analytical Graphics Inc Systems Tool Kit (STK) and ESA's DRAMA software. Methods for initiating physical contact with the identified object and an assessment of the suitability of such a mission required the group to look at, among other variables, the mission cost estimations.

- Early 2013 saw the launch of the SSS project group Facebook page, allowing SSS to reach a wider international audience outside of its membership base. The social media site has enabled an open forum for members to post news articles, discussion questions, relevant websites, and conference information related to SSS.
- In October 2013, the SSS project group contributed input and recommendations based on the research in the areas of space debris and debris mitigation guidelines to the fifty-first session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space to be held in February 2014.
- SSS member, Matthew Noyes (USA), was voted SGAC July 2013 Member of the Month for his work and leadership on the Orbital Debris Management team project.
- SSS member, Ali Nasserli (Iran) won the 2013 SGAC-IAASS Space Safety Paper Competition for the work done by the SSS Active Debris Removal technical project team. The scholarship allowed Ali to present the paper titled, "Active Debris Removal Mission Using Modified Launch Vehicle Upper Stages" at the 6<sup>th</sup> International IAASS Space Safety Conference "Safety is not an option" in Montreal, Canada (21-23 May, 2013).

## CONFERENCE PAPERS AND POSTER PUBLICATIONS

Emanuelli, M., Chow, T., Prasad, D., Federico, G., Loughman, J., "Conceptualizing an economically, legally and politically viable active debris removal option"

Nasserli, A., Emanuelli, M., Raval, S., Turconi, A., Becker, C., "Active space debris removal using european modified launch vehicle upper stages equipped with electrodynamic tethers"

Emanuelli, M., Becker, C., Ghasemzadeh, L., "Priority targets for an autonomous debris removal mission"

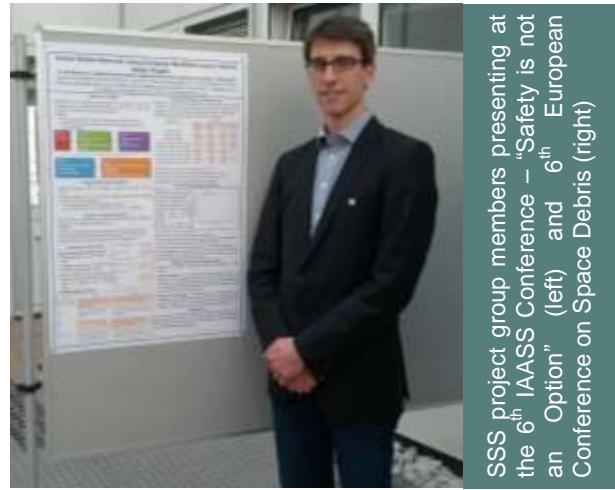
Noyes, M., Rugaber, G., Mitra, P., Dicholkar, A., "Propagation of surface-to-leo vortex rings for orbital debris management"

Nasserli, A., Emanuelli, M., Raval, S., Fisher, S., Lousada, J., David, E., Braun, V., Turconi, A., "Active debris removal mission using modified launch vehicle upper stages"

- Other Participation at Conferences:
  - 6<sup>th</sup> European Conference on Space Debris - Darmstadt, Germany 22-25 April 2013
  - 6<sup>th</sup> IAASS Conference "Safety is not an Option" - Montreal, Canada 21-23 May 2013
  - AIAA Fluid Dynamics Conference and Exhibit - San Diego, USA 24-27 June 2013
  - 64<sup>th</sup> International Astronautical Congress (IAC) - Beijing, China 23-27 September 2013
  - Tsinghua University IAF-SUAC International Student Workshop - Beijing, China 28 September 2013
  - Toronto Students for the Advancement of Aerospace (TSAA) conference - Toronto , Canada October 25-27<sup>th</sup> 2013



Fig. 28.



SSS project group members presenting at the 6<sup>th</sup> IAASS Conference – "Safety is not an Option" (left) and 6<sup>th</sup> European Conference on Space Debris (right)

## Looking Ahead – Plans for 2014

### *CONTINUATION OF THE TECHNICAL ADR PROJECT*

Previously, a method was developed for active debris removal. This method can still be further analysed from both technical and implementation points of view, based on input and feedback from conference presentations.

### *ACTIVE DEBRIS REMOVAL AND ON-ORBIT SERVICING MAPPING*

Numerous methods have been developed for active debris removal and on-orbit satellite servicing. This project aims to map these onto a performance chart and also perform a cost benefit analysis. In addition, the project will incorporate the ADR policy project outcomes.

### *RELEASE OF FURTHER EDUCATIONAL SERIES DOCUMENTS*

Investigating the SSS project group's other thematic areas including Space Debris and Space Safety.

### *DISSEMINATION OF RESULTS*

Current technical and policy research outcomes will be further publicised in the form of peer-reviewed publications, brochures and short educational videos.

### *TECHNICAL PAPER COMPETITION*

There will be a continuation of the Space Safety Paper Competition with a focus on a key area that is related to space safety and/or sustainability. This will help members of the project group so that they may attend and present their research at conferences.

# Space Technologies for Disaster Management

Project Group

The STDM Project Group aims to promote the contribution of space technologies to the disaster management cycle. Despite the importance of space technologies in disaster management and the involvement of several national and international organisations, the application field is still underexploited. Members of academia, industry, governments, and the general public can benefit from an increased awareness of how space assets can contribute the preparation for and response to disaster events.

The STDM Project Group contributes to research efforts and aims to raise awareness by publishing papers on space policy, law, medicine, engineering, and other related topics. The STDM Project Group aims to promote the contribution of space technologies to the disaster management cycle. Despite the importance of space technologies in disaster management and the involvement of several national and international organisations, the application field is still underexploited. Members of academia, industry, governments, and the general public can benefit from an increased awareness of how space assets can contribute the preparation for and response to disaster events.



The STDM Project Group contributes to research efforts and aims to raise awareness by publishing papers on space policy, law, medicine, engineering, and other related topics.

## Goals

1. To establish a forum of discussion for students and young professionals within the international space community. This forum should focus on interdisciplinary topics involving space disaster management and its impact on society
2. To develop literature about space technologies for disaster management based on members' collaborative work. These papers are to be made available on the STDM website.
3. To support education and outreach activities in space disaster management.

## Accomplishments in 2013

*SPACEUP PARIS IN MAY 2013*

*WORKSHOP AT SGC 2013 IN BEIJING, CHINA*

In cooperation with the YGNSS Working Project, the STDM organised a Workshop on "The Role of Global Navigation Satellite Systems and Earth Observation in Disaster Management" Workshop after the SGC. This workshop was the first of its kind and was very well received by the participants and speakers, who encouraged STDM to continue this effort in the future.



### *PARTICIPATION FOR IAC IN BEIJING, CHINA*

The following papers were presented at the 64<sup>th</sup> IAC:

"Social Media in Disaster Cycle - Useful Tools or Mass Distraction?" (Natassa Antoniou and Mario Ciaramicoli)

"The Progressive Use of Satellite Technology for Disaster Management Relief: Challenges to a Legal and Policy Framework" (Sandra Cabrera-Alvarado, Sara Langston, Natassa Antoniou and Enrique Urquijo)

"Building up national space capabilities for disaster management: Analysis of a trend in emerging space nations" (Noemie Bernede)

### *SOCIAL MEDIA*

New members Tamara Cottam and Tanay Sharma will coordinate Facebook and the recently launched LinkedIn group. The LinkedIn group requires further promotion. The group's activities are also promoted on Twitter by the Social Media Coordinator, Noemie Bernede.

### *MULTIMEDIA ELEMENTS*

An educational video was launched to present the STDM group and as an introduction to how space technologies can be applied to disaster management.

### **Looking ahead: plans for 2014**

### *WORKSHOP AND OTHER OUTREACH PROJECTS*

A second workshop is planned for the SGC 2014 in Toronto, Canada. More sponsors and participants have been identified and other topics could be addressed.

### *CONTRIBUTION TO THE SGAC NEWSLETTER*

Members aim to contribute more actively with a column on the SGAC newsletter to raise awareness of the group's mission.

### *STDM LIBRARY PROGRESS*

The group will launch several research topics in order for new members to develop research based on the needs of international organisations focused on disaster management.

Fig. 29.



Select pictures from STDM Project Group talks in 2013

# Youth for GNSS

## Project Group

The year 2013 was a successful year for the Youth for Global Navigation Satellite Systems (YGNSS) team. It recruited new team members and developed ambitious new projects. The team updated and translated the YGNSS brochure, entitled “Global Navigation Satellite Systems (GNSS) and the Youth”, organised its first workshop in collaboration with the Space Technologies for Disaster Management (STDM) project group, and unveiled a new logo.

### Goals

The goal is to educate and promote cooperation on the uses and applications of Global Navigation Satellite Systems.

### Activities in 2013

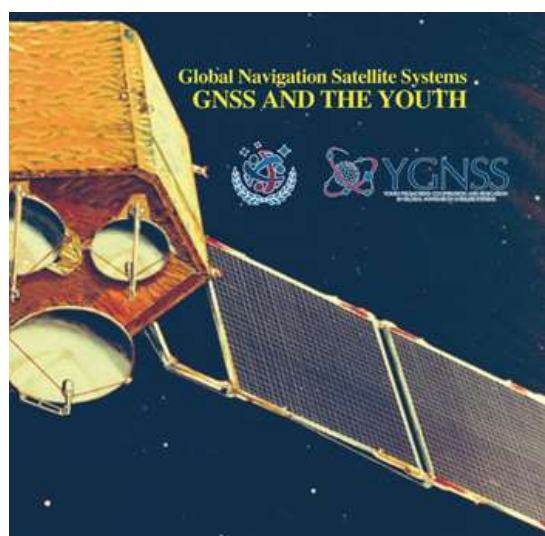
#### NEW LOGO

YGNSS got a new look with a revised logo from Zuleynt Quevedo.

The logotype is a sphere formed by small circles that give the sphere a three dimensional shape. Orbiting around the sphere, there are six circles that simulate movement as they move along their trajectory in two orbits. The six small spheres specifically represent the six main GNSS systems: GPS, GLONASS, GALILEO, IRNSS, Beidou, and QZSS systems.

The small circles that form the sphere give it a flexible appearance and symbolise union. Its 3-dimensionality lets us imagine movement, which in turn represents constant change and innovation. The circles of the sphere work to represent the efforts being made by youth at a global scale to communicate and increase the advantages of using GNSS.

#### GNSS AND THE YOUTH BROCHURE UPDATED



The YGNSS updated its GNSS and the Youth brochure to reflect the increasing amount of GNSS applications and number of GNSS satellites launched since 2010. The updated version was also translated into Chinese and Arabic, and copies were distributed at the IAC 2013 and the 8<sup>th</sup> International Committee on GNSS in Dubai, UAE.

Future plans include translating the brochure into other languages for a greater international outreach.



### *“THE ROLE OF GLOBAL NAVIGATION SATELLITE SYSTEMS (YGNSS) AND EARTH OBSERVATION IN DISASTER MANAGEMENT” WORKSHOP*

The YGNSS and the Space Technologies for Disaster Management (STDM) Project Group organised “The Role of GNSS and Earth Observation in Disaster Management” Workshop - a one day event that offered about 25 students and young professionals the opportunity to meet and exchange views with leaders of the space sector from government, industry, and academia on how GNSS and Remote Sensing technologies are used in disaster management.

The workshop was held after the SGC 2013 and prior to the IAC 2013. The event aimed to gather a select group of delegates from various space interests to discuss disaster management and allow participants to get some hands-on experience with key tools in addition to networking with other professionals and GNSS experts.

The opportunity included background presentations, panel discussions, and hands-on training provided by high-level experts including Dr. Scott Pace, Mr. Olojo Olabamiji, Dr. Shirish Ravan, Mr. Enrique Pacheco, Dr. Falin Wu, and Ms. Katrina Laygo. Special thanks goes to Lockheed Martin, who kindly provided support to the workshop that allowed six students and young professionals to attend the event and the SGC 2013.

Fig. 30.



### *PARTICIPATION AT THE INTERNATIONAL COMMITTEE ON GNSS IN DUBAI, UAE*

The Emirates Institution of Advanced Science and Technology (EIAST) kindly provided a scholarship to one Middle East SGAC member and sponsorship to the SGAC Executive Director to attend and support the youth perspective at the International Committee on GNSS in Dubai, UAE. Nouf Al Jalaud, the SGAC Middle East Regional Coordinator, won the scholarship.

YGNSS co-lead Stephanie Wan presented in Working Group C: Information Dissemination and Capacity Building. She provided an update of SGAC and YGNSS activities in 2013. The presentation was taken positively by the working group members, and established new relations with other GNSS educational programmes around the world.

The SGAC Executive Director provided a closing statement thanking the ICG Secretariat and the generous UAE hosts, as well as allowing for SGAC to continue participating in ICG in an Expert capacity to Working Group C. She reinforced the importance of SGAC’s continuous support of ICG activities.



Fig. 31.



YGNSS Co-Lead and SGAC Executive Director with delegates at the Eight Meeting of The International Committee on Global Navigation Satellite Systems

### Looking Ahead – Plans for 2014

The main objectives of the YGNSS group for 2014 include:

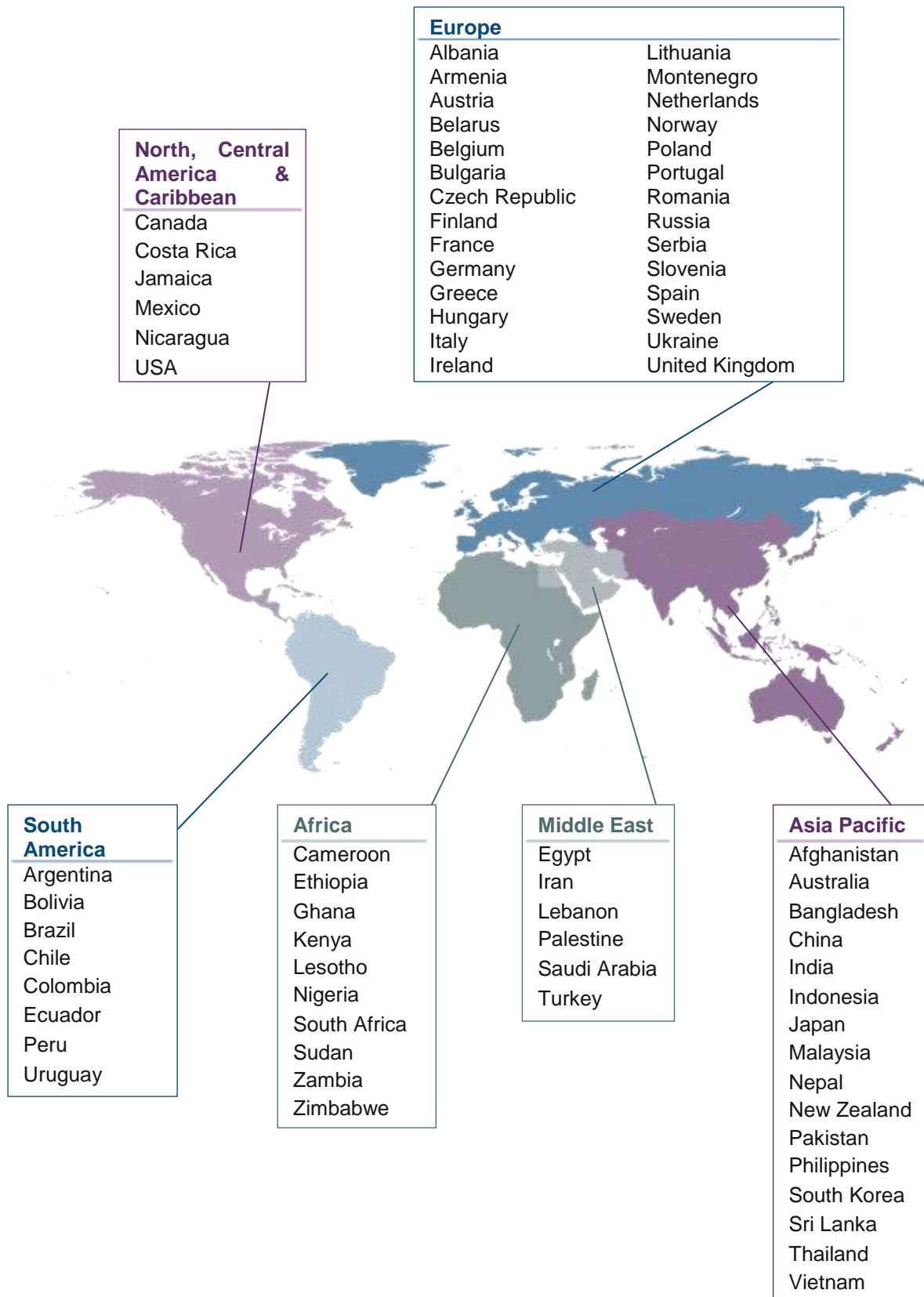
- To organise a follow-up workshop on GNSS-related topics
- To increase partnerships and cooperation with various youth and international organisations, as well as to recruit more members within SGAC to the YGNSS.
- To continue to share youth perspectives on GNSS at conferences.
- To develop an international contest that will consist of developing an interactive model that visualises the compatibility and interoperability of GNSS systems.
- To continue participation in ICG activities and to branch out and establish support activities in other working groups.

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# SGAC 2013 Regions and Represented Countries





# Regional and National Reports

## africa

### REGIONAL REPORT

#### Significant Growth in Africa

While 2013 was associated with some challenges, it was not without amazing success stories. SGAC's visibility, as well as the number of space-related events, has grown in Africa. Efforts to expand the SGAC African network have been successful, with a large number of appointments of new NPoCs. This expansion not only aids current NPoCs, but also allows countries, not previously represented at SGAC, an opportunity to develop their space sector through participation with SGAC.

#### Changes to SGAC Africa

##### *SGAC Co-Chair*

CJ Nwosa (Nigeria) was appointed as SGAC chair, marking the first time an SGAC chair position has been held by an African representative.

##### *SGAC National Points of Contact (NPoCs)*

2013 has seen many additions to SGAC African nations, with new members being appointed the positions of National Points of Contact (NPoCs). These included; Ifriky Tadadjeu Sokeng (Cameroon), Suki Dauda Sule (Nigeria), Funmi Erinfolami (Nigeria), Lumka Msibi (South Africa), Conrade Muyambo (Zimbabwe) and Constant Chuma (Zimbabwe).

#### 2013 Regional Highlights

##### *SGAC Africa Project Group*

The SGAC African team has recently initiated a new project group, which will feature discussion on space developments within the African region. NPoCs in the region have shown lots of support to this nascent group.

##### *Scholarships*

##### Space Generation Congress 2013

Beza Tesfaye (Ethiopia, NPoC Ethiopia)

##### *African Representation at Conferences 2013*

##### Space Generation Congress 2013

SGAC African members from Nigeria and Ethiopia attended the SGC in Beijing, China. Though this represented only a small African delegation, it was fantastic to have the African continent represented at this year's SGC.

## Looking Ahead – Plans for SGAC Africa in 2014

- Expand SGAC Africa network of contacts and increase awareness of SGAC in the region.
- Addition of 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 to contribute to SGAC from African perspectives by participating at conferences.

## NATIONAL REPORTS

### CAMEROON NATIONAL REPORT

#### Current State of Space Affairs in Cameroon

Space affairs in Cameroon have mostly been in the form of Cameroonians involved in space programs and agencies in other countries (including NASA and SANSA) than within Cameroon itself. There is, however, a noticeable effort to raise awareness in Cameroon not only on the state of space affairs at the global level, but also into how Cameroon can fit in the picture. There is an effort to help youth adults understand how space can be used to solve problems that Cameroon and Africa are facing. There is yet no government body dedicated to space related activities in the country, nor is there any stated intention from the government to get involved in space affairs. Within universities, there are also no directly space relevant departments (astrophysics, satellite systems engineering, etc). Nonetheless, universities seem to offer the best entry point towards the development of such a framework.

#### Accomplishments in Cameroon in 2013

The main space-related activity has focused on school outreach. The objective was to raise awareness within high schools. A platform for a partnership between the University of Buea (UB) (Cameroon) and the Cape Peninsula University of Technology (CPUT) (South Africa) was initiated. The partnership centers around the building of 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. This will hopefully accelerate the growth of space knowledge in Cameroon, and add an important ground support station in the equatorial plane for the rest of the continent. No agreement has yet been signed but intentions have been expressed from both parties.

#### Looking Forward to 2014

The main goal for 2014 is to move forward in the partnership between UB and CPUT. More aggressive outreach and presentations are planned but the main challenge will be securing funding for the efforts because of the absence of a dedicated space infrastructure within the Cameroon government. In addition, it is also very difficult to find sponsorship from the private sector as Cameroon is mainly a consumer-based economy and research related fields are not yet very attractive to the private sector in Cameroon.

### ETHIOPIA NATIONAL REPORT

#### Ethiopia Building Observatory Center

The Ethiopian Space Science Society (ESSS) finished building the country's first observatory at the Entoto Mountains, Addis Ababa some 3,200 m above sea level. The observatory has two robotic telescopes of 1 meter diameter, which were manufactured by Astelco. The building of such an observatory aims to start the development of formal space programs in Ethiopia and give opportunities for PhD and MSc students to carry out their studies using it.

Fig. 32.



Left: Entoto observatory center.  
Right: The telescope's installation.

### Basic Astronomy Training

The ESSS organized and conducted basic astronomy training for high school students and space enthusiasts from 6<sup>th</sup> – 8<sup>th</sup> of September 2013 at Addis Ababa University Institute of Technology. The training included lectures on basic astronomy, ancient Ethiopian astronomy, observational astronomy and a demonstration of astronomical tools and telescopes.

Fig. 33.



Left: Training attendee in front of AAIT.  
Right: At workshop, Beza (NPoC of Ethiopia) assisting.

### NPoC of Ethiopia Beza Tesfaye received SGAC Young Leadership Award 2013

Ethiopian NPoC Beza Tesfaye received the SGAC Young Leadership award to attend SGC 2013 in Beijing, China where she worked as Logistics Coordinator with the organizing team of SGC 2013. She also attended the IAC 2013 in Beijing, China .

### World Space Week 2013, Ethiopia

Ethiopia celebrated World Space Week (WSW) 2013 for the fifth time. ESSS is the main organizer of the event in Ethiopia through its branch offices. This year Addis Ababa, Jimma and Debre Berehan Universities took part in the WSW 2013 celebration. The event included a presentation of scientific papers on the exploration of Mars and earth observation, and was followed by a panel discussion.

Also the NPoC of Ethiopia, Beza Tesfaye, organized events in two high schools in Addis Ababa where students participated in lectures and activities.

Fig. 34.



Left: WSW at Jimma University.  
Right: WSW at School of tomorrow.

## Solar Eclipse 2013 in Ethiopia

NPoC of Ethiopia Beza Tesfaye and SGAC members in Ethiopia organized an event at Meskel Square to watch the partial solar eclipse that took place in Addis Ababa, Ethiopia on November 3, 2013. Students and teachers from Addis Ababa schools also participated in the event. The BBC news correspondent Emmanuel Issa Igunza was present at the event.

Fig. 35.



Left: By Emmanuel Issa Igunza. Right: Students participating to watch the solar eclipse.

## Upcoming highlights for 2014

- The Ethiopian government is set to announce its first space policy.
- The Entoto observatory will commence operations.
- ESSS aims to carry out a series of trainings and outreach activities in Ethiopia.

## ➤ GHANA NATIONAL REPORT

### The Current State of SGAC-Ghana

Space Generation Advisory Council Ghana (SGACG) Ghana has broadened its networks of partnerships and made several accomplishments in 2013.

### Accomplishments of SGACG in 2013

SGACG entered into new partnerships with the Ghana Robotics Foundation, African Center for Science and International Security (AFRICISIS) and Ghana Planetarium Centre.

SGACG was also represented in three educational and outreach events during 2013. In May, the National Point of Contact Mr. Abdul-Mumin Yussif participated in the launch of the African Center for Science and International Security (AFRICISIS) workshop, an African not-for-profit non-governmental organization that has space and satellite as one core program. AFRICISIS was established by SGAC former regional coordinator for Africa, Mr. Hubert Kum Foy.

SGACG in association with Ghana Robotics Foundation organized a hands-on robotic training competition to promote science education in secondary and high schools in Ghana. This offered an opportunity to inspire the next generation of science students who are needed to develop further a sustainable space industry in Ghana. The workshop was held at the Northern Regional Library ICT centre on the 13<sup>th</sup> of July 2013. Two teams participated in the competition, St. Charles Minor Seminary and Team Alpha.

In October, SGACG and AFRICISIS jointly organized a two-day event in Accra to commemorate the 1999 UN-declared World Space Week. Hosted in the Nuclear Security Support Center of Ghana Atomic Energy Commission's (GAEC) Graduate School of Nuclear and Allied Science, over 80 participants attended the event. The participants included local residents and junior high school forms 1-3, university students, and staff of the GAEC Basic School from one of Accra's small towns, Kwabenya, where the GAEC commission is located. The event activities were aimed to raise awareness of space issues among Ghana's decision makers, legislators and the public. The World



Space Week 2013 theme, "Exploring Mars, Discovering Earth," establishes the connection between humanity's quest to inquire into the life-supporting features of Mars as an off-the-Earth base for scientists to better learn and understand human presence, and the evolution of our solar system bodies including our planet Earth.

Fig. 36.



In November, SGACG participated in a three-hour event to observe a hybrid solar eclipse over Ghana. Organized by and hosted in the Ghana Planetarium Center, the event brought together over 100 children and their parents. The children experimented with solar observation techniques and discussed basic physics surrounding the formation of the eclipse.

### Opportunities for Growth

There remains a lack of key resources which would aid the further development of SGACG:

- Laptops to manage activities of SGACG
- Cameras to cover promotional events
- Funding to cover transport and venues for outreach events
- SGAC leaflets to promote the organization itself, and space education and outreach in general

### Future Plans

SGACG hopes to benefit from the increased operational activities of Ghana Space Science and Technology Institute and AFRICSIS. Despite difficulties, membership is gradually increasing and is expected to grow as more youths and enthusiasts become aware of the advantages of space activities.



Fig. 37.



Students from Ghana celebrating the World Space Week.

## ➤ KENYA NATIONAL REPORT

### Current State of Space Affairs in Kenya

- Space Science is an area that has been dormant for many decades despite the inherent motivation found in space science. However growth has been tremendous in recent years. The growth has been motivated by
- The ideal topology of Kenyan land (dry and high altitude areas) The country is ideal for both radio and optical astronomy. This has made Kenya a partner of the Square Kilometre Array (SKA). Kenya was awarded the opportunity to host one of the SKA nodes (site searching is ongoing) and possible telecommunication dishes.
- Ongoing plans to build optical telescopes.
- University training: Two main universities are offering astronomy as a complete course (Bsc. Astronomy and Astrophysics) or as an elective course as part of physics.
- Awareness outreach campaigns. The SGAC has emerged as the second-most active group in the country and among the young generation. The most active group, East Africa Astronomical Society (EAAS), has been very active and has sufficient funds to hold mega regional conferences every year. Other awareness groups include Astronomy without Borders, Hands on Universe and Galileo Teacher Training programme.
- Clubs and Organizations. The most productive and long-lasting space science activities have always been student initiated programmes and/ or organizations. The main agenda of SGAC Kenya has been to merge space science with existing science clubs in visited institutions to produce a long-term effect. The most promising club in Kenya is the Kenyatta University Amateur Astronomy Club (KUAAC) whose members (majority are SGAC members) will form the engine for outreach activities.

### Accomplishments in 2013

During 2013, various accomplishments were realised:

#### *Linking SGAC Kenya with the Regional Center for Mapping Resources for Development*

SGAC Kenya, managed to link with the Regional Center for Mapping Resources for Development (RCMRD), a non-governmental organization <http://www.rcmr.org/>.

RCMRD has brought together young scientists from across the world through its diverse courses/programmes. We trust that SGAC will work together with the SGAC to enhance space science in Kenya and the East Africa Region.

### *Outreach Activities to Institutions of Higher Learning*

Selected members of SGAC managed to reach various primary, secondary schools and universities in the country, giving presentations on space science.

Fig. 38.



Top: NPoC Antony Kinyili (left) an SGAC presentation to Kenyatta University Environmental Club students at the Kenyatta University Hall on 4<sup>th</sup> February 2013. Bottom: SGAC members' photo with pupils of K.U Primary School on 15<sup>th</sup> March 2013 after a presentation.

During the sessions, learners participated actively through asking questions and giving comments.

Other schools that were visited include the Riabai Secondary and Chief Wandie Primary schools both in Central province, Kenya.

## Looking Ahead: Tentative Plans for the Future of SGAC in Kenya

We intend to do the following in the year 2014

- Link SGAC with more organizations in the country, with the aim of enhancing SGAAC activities in the Kenya and East Africa region.
- Reach out to more primary, secondary and tertiary institutions as well. The aim of this is to motivate young students to pursue Space Science.
- Register at least 300 students and young professionals with SGAC. An increased number of SGAC members would also enable members to hold conferences due to many member-participation.
- Motivating more SGAC members to join the SGAC Africa working Group. Working together it would be a boost to space science in Africa and the rest of the world.

## ➤ LESOTHO NATIONAL REPORT

### Events in 2013

For the first time university students became involved in SGAC activities in Lesotho. The group managed to provide public presentations and now holds monthly meetings.

Although it was intended to celebrate World Space Week (WSW), the government organized a science week during that time with an alternative theme, which prevented the necessary participation. However, the group was involved in the science week and allowed, for the first time in Lesotho, conversations among young professionals to share ideas about space science.

A working team is also now in place to initiate projects that will be rolled out to universities and potentially to high schools.

### Plans for 2014

- Recruit a second NPoC for Lesotho.
- Increase participation in the working groups and to share ideas for initiating new projects.
- Work on the CanSat project. This was intended to start in 2013, but will start in 2014.
- Work with the education department to start projects and to give presentations at high schools.
- Make World Space Week 2014 a success in Lesotho.

## ➤ NIGERIA NATIONAL REPORT

### Current State of Space Affairs

Presently, Nigeria has three satellites in orbit. These include two Earth observation satellites (NigeriaSat2, NigeriaSatX) and one communications satellite (NigcomSat1R). All three satellites were launched in 2011 and after a full hand over of the assets by the manufacturers the country has spent most of 2013 on the utilization of these satellites. The government-owned company, NIGCOMSAT Plc. has focused on marketing the available services of the communications satellite particularly in the internet broadband and direct to home broadcast. The country's space agency, the National Space Research and Development Agency (NASRDA), has been responsible for remote sensing applications with the NigeriaSat2 and NigeriaSatX. NASRDA's commercial arm, GEOAPPS Plus Ltd. is responsible for marketing satellite data over Africa while its partners, United Kingdom based company DMCii, market data over the rest of the world.

NASRDA is empowered by law as the primary driver of space activities in the country. In the month of June, the highest policy and decision-making body for space, the National Space Council was inaugurated. The council is chaired by the President while the Vice-President serves as vice-chair. The



next key target under the national space roadmap is the launch of a synthetic aperture radar (SAR) satellite and commencement of plans for training the first Nigerian astronaut.

### Accomplishments in Nigeria in 2013

SGAC in Nigeria was without National Points of Contact (NPoCs) until July and August when two young professionals, Suki Dauda Sule and Funmi Erinfolami were elected by the executive council. A number of seminars and awareness presentations have been made to students and young professionals since this period with more expected in the coming year. Two SGAC members, Suki Dauda Sule and Olabamiji Olojo attended the SGC 2013 in Beijing, China and were both part of the Earth Observation for Sustainable Development in Developing Countries working group where they participated actively and made useful contributions. Funmi Erinfolami attended the UN/IAF workshop which was also attended by other SGAC members from around the globe. They shared their experiences with other colleagues and SGAC members.

The partial solar eclipse that took place on the 3<sup>rd</sup> of November was witnessed at the headquarters of the Nigerian Space Agency. SGAC played a very critical role as one of its members, Yinka Fagbemi, provided the solar eclipse viewing glasses for the event. Yinka is also the Nigerian Coordinator of Astronomers Without Borders and all the glasses used were provided through her. Hundreds of students and young professionals from the primary school level attended the event and viewed the solar eclipse.

Fig. 39.



Students Viewing the Solar Eclipse and Students at the Astronomy School

In addition, several space activities and events were held in 2013 across Nigeria organized by NASRDA and its centers such as the Centre for Basic Space Studies (CBSS) and African Regional Centre for Space Science and Technology Education (ARCSSTE) and were attended by students and young professionals. These include:

- *Symposium on Space Weather & Space Based Technologies*. NASRDA Hqtrs., Abuja. Keynote speaker was Prof. Christine Amory from France January.
- *Space Weather Seminar and Training* held at Bells University, Ota, Ogun State. February.
- *Women in Physics Conference* held at Covenant University, Ota, Ogun State.
- *CSTD Week: Centre for Satellite Technology Development*. 2 day workshop with the theme: Achieving Space Benefits via Corporate Partnerships. NASRDA Hqtrs., Abuja.
- *NASRDA Press Briefing, Abuja*. Commemoration of maiden communications satellite Syncom 2 phone conversation between US President Kennedy & Nigerian Prime Minister Tafawa Balewa on 23/8/1963.
- *World Space Week*. 4-10 October. Abuja and other cities. A one-day sensitization lecture was delivered by Miss Caria Sharpe, Business Development Manager, SKA, South Africa with the title: "The Business of Aerospace: Potentials of the Nigerian Market and Development Strategies".
- *Astronomy Summer School/Workshop for West Africa*. 21-25 October. NASRDA Hqtrs. Abuja. A five-day Astronomy Summer School/Workshop for students and teachers from West Africa.

Trainers were involved from countries such as Canada and South Africa, and the event was attended mainly by students and young professionals.

### Looking Ahead – Plans in Nigeria for 2014

SGAC Nigeria has a number of plans and ideas that it hopes to be able to achieve in the coming year. They are outlined accordingly:

- Formally expand and consolidate the membership of SGAC in Nigeria from all the zones within the country.
- Start a blog on space activities, issues and awareness.
- Create an open, controlled Facebook page for SGAC Nigeria.
- Continue space awareness presentations and seminars for students and young professionals in schools, educational institutions and space related organizations.
- Hold a successful Yuri's Night event.
- Make attempts to get sponsors who will provide scholarships for SGAC members by reaching out to private companies and selected organizations.

## ➤ SOUTH AFRICA NATIONAL REPORT

### Current State of Space Affairs in South Africa

The most notable event in the South African space sector over the last year is the creation of Denel SpaceTeq, a new business unit in Denel Dynamics, a division of Denel SOC Ltd., which came about after the sale of Sunspace to Denel Dynamics. Denel Spaceteq has been operating since July 1<sup>st</sup> and was inducted into the International Astronautical Federation (IAF) during World Space Week.

South Africa was well-represented at this year's International Astronautical Conference (IAC) and Space Generation Council (SGC) – 20 delegates attended the IAC and two delegates attended the SGC. The Department of Trade and Industry (DTI) provided a National Pavillion with stakeholders in the South African space sector (the usual IAC exhibitors as well as the Integrated DTI Aerospace Programme, National Aerospace Centre and Space Commercial Services).

### Accomplishments in South Africa in 2013

The South African Agency for Science and Technology Advancement (SAASTA) and the Department of Trade and Industry continued their campaigns to promote space awareness in South Africa. The DTI organised several activities during World Space Week, including workshops, demonstrations, mentoring and exhibitions. 5831 learners and 300 educators were reached through the various activities.

During World Space Week, the South African National Space Agency (SANSA) unveiled a new high frequency digital radar (the superDARN Radar) which was constructed and built by SANSA Space Science. The radar will be used to monitor space weather conditions and was shipped to Antarctica on 28 November to be installed at the South African Antarctic Research Base - SANAE IV.

### Looking ahead - plans in South Africa in 2014

The SGAC NPoCs in collaboration with the Youth Chapter of the South African Space Association are hard at work organising a conference for students and young professionals in the South African space arena. The conference will have a format similar to that of the SGC. They will be calling on SGAC members in South Africa and NPoCs that are based in South Africa to either participate or help organise the conference.



They are also investigating opportunities to organise and host public events throughout 2014 in collaboration with agencies and organisations in South Africa, including SANSA, SAASTA, the DTI and SKA Africa.

Fig. 40.



## ➤ ZAMBIA NATIONAL REPORT

### Zambia in 2013

SGAC-Zambia's team has continued to work hard to promote its activities country-wide. The membership has grown tremendously through outreach awareness programs that the team is carrying out in schools, colleges and universities.

#### Detailed Report

##### *February/March 2013 – Outreach Programs*

The months of February, March and April were concentrated on outreach by holding Junior Engineers Technical Science (JETS) academic quizzes. Different schools held their own JETS competitions in their respective districts and provinces.

##### *April/May 2013*

During the Global Astronomy Month and Yuri's Night some students from Kantanshi Secondary School and Mufulira Secondary School visited Zambia Telecommunication Company (ZAMTEL) Mufulira branch. Here they familiarized themselves with the operations of the company and how radio and TV signals are received and sent throughout the country from Mwembeshi Satellite Station.

Fig. 41.



Students visiting ZAMTEL during Global Astronomy Month in Mufulira.

June/July 2013

#### 24<sup>th</sup> June to 12<sup>th</sup> July 2013 (Galileo Teachers Training Program – GTTP)

A computer workshop/training/seminar for teachers was held at Mujoku School in Luanshya and 24 teachers were trained on how to use computers to teach science to students. The training included the use of astronomical software such as Kalzium, Kstars and Stellarium. With Kalzium, teachers learned the basics of how to use and process Class tables, Periodic Table, Transition Elements, Isotope table, Molecular editor, Equation solver, Convert chemical files and how to plot the data. Kstars is a graphical desktop planetarium for K Desktop Environment (KDE). It depicts an accurate simulation of the night sky, including stars, constellations, star clusters, nebulae, galaxies, the sun, the moon, comets, asteroids and other planets. You can see the sky as it appears from any location on Earth, on any date.

Fig. 42.



A Picture showing teachers who participated during the computer training workshop in Luanshya.

18<sup>th</sup> July /August 2013

The Former Africa Representative for SGAC and founder for SGAC – Zambia Mr Prospery Simpemba (Physics lecturer at the Copperbelt University) received an education kit under a program called Dark Skies Outreach to Sub-Saharan Africa. The program is sponsored by the International Astronomical Union (IAU) and coordinated by Dr Constance Walker of the National Optical and Astronomical Observatory (NOAO), USA. The project demonstrates light pollution, outdoor lighting audits, how light pollution affects the stars and spectra of light.

#### *August/September 2013 – JETS National Fair and Fundraising Ventures*

Schools from different provinces in Zambia met from 8<sup>th</sup> to 12<sup>th</sup> August 2013 in North Western Province at Solwezi Teachers Training College for the JETS National Quiz fair where schools battled in different categories such as Physics, Chemistry, Mathematics and Biology Olympics They also showcased different projects. After the fair the province with the most points, and thus winner, was Lusaka Province. On 7<sup>th</sup> September 2013, Mr Prospery Simpemba and The Copperbelt University (CBU)

Team organised a fruitful fundraising venture at Zemics. Lecturers, students and the community participated in the fundraising venture and the money that was raised was used to support the activities for World Space Week.

#### *10<sup>th</sup> October 2013 – World Space Week*

The Astronomy and Space Week was organised by the Copperbelt University Committee. The educational World Space Week Seminar took place on Thursday 10<sup>th</sup> October, 2013. Schools such as MCM- Nkana school, Lechwe School, Chibote Girls Secondary School, Chamboli Secondary School, Copperbelt University Students, Copperbelt Teachers College (COTSECO), Mufulira College of Education (MUCE) and Mukuba Secondary School attended the seminar.

Fig. 43.



Participants of World Space Week at Copperbelt University

#### Official Opening and welcoming remarks of World Space Week

The chairman of the Copperbelt Astronomy and Space Week Committee Mr. Simfukwe welcomed all the participants who attended the World Space Week event. The guest of honour was the Acting Deputy Vice Chancellor Professor Phiri who gave a speech on the importance of World Space Week. During the celebration, the first talk was given by Mr K. Mwelwa entitled “Why continue with Mars Exploration?” In his presentation, Mr Mwelwa emphasized the importance of exploring Mars in the quest for discovering life on other bodies. The second presentation entitled “Atmospheric Ions Formation” was given by Dr Kaonga. A further presentation was given by Mr H. Fungamwango entitled “Earth’s Discoveries towards the Exploration of Mars”. Mr M. Mutuzana, NPoC for SGAC Zambia, gave a presentation on the mission, goals, activities and benefits of joining the SGAC community and encouraged students to take part in all Space Science Activities. Dr Chinyama also presented a paper entitled “Research Programmes, Career Opportunities and Job Prospects”.

Fig. 44.



World Space Week in Zambia.



### Debate

Immediately after the lunch break, there was a debate amongst the students of Copperbelt University on the motion “Is it Futile to explore Planet Mars?” The best speaker was judged Jethro Mwanza with Mbanji Mwinga coming in second place.

Fig. 45.



### Closing Ceremony of World Space Week

The Copperbelt University Head Of Department for Physics gave the closing remarks. All the participants received certificates of participation. About 235 people attended this celebration.

Fig. 46.



### **Looking Ahead: The Plan for the Future of SGAC-Zambia**

- Course in astronomy for science teachers (Physics) at Copperbelt University (CBU)
- SGAC-Zambia outreach programs in schools and the community
- Cassini Scientist for a Day Essay Competition for students
- Organising Galileo Teacher Training Program / workshop
- Debate about planet Mars for pupils/students in schools
- Junior Engineering Technical Scientists (JETS) – School, National Quiz

### **Proposed programme for 2014**

- Global Astronomy Month- April 2014
- Yuri's Night- 12<sup>th</sup> April 2014
- World Space Week 4-10 October 2014
- Space Science quizzes and debates
- Seminars and Workshops on Space Science

## ➤ ZIMBABWE NATIONAL REPORT

### Zimbabwe in 2013

Over the past years, Zimbabwe was not majorly involved in space activities, but great improvements have been made in recent years in the telecommunication sector. A lot still needs to be done however, and it is important for the country to formulate a space policy and embrace space technologies, for instance in disaster management, agriculture and climate analysis for sustainable development of the country. In 2013, two new NPoCs were appointed for Zimbabwe: Conrade Muyambo and Constant Chuma. Their goals are:

- To promote space interest.
- To expand SGAC's impact and presence in the country.
- To empower young people with space ideas and to create an informative and active space network / forum to share these ideas.
- To advocate for the establishment of a space agency and space museum in Zimbabwe.

### Activities and Accomplishments in 2013

In general, activities in 2013 were limited due to lack of funding.

#### Space Generation Congress 2013

The NPoC for Zimbabwe, Conrade Muyambo was selected to attend the Space Generation Congress 2013 in Beijing, China.

#### International Astronautical Congress 2013

The NPoC for Zimbabwe, Constant Chuma, participated at IAC 2013 and later at SGC, in Beijing, China.

#### African Leadership Congress 2013

The NPoC for Zimbabwe, Conrade Muyambo was invited to participate at the African Leadership Congress in Accra, Ghana.

#### Building Connections & Networking

SGAC Zimbabwe managed to come up with a database of young space enthusiasts in Zimbabwe, and industry information was shared through emails and blogging.

### Looking Ahead – the Plan for the Future of SGAC Zimbabwe

The goals for the upcoming year for SGAC in Zimbabwe are the following:

- Continue to increase SGAC activity in Zimbabwe.
- Increase awareness of SGAC and its goals across the country.
- Increase participation and attendance of SGAC members at national and international space conferences.
- To open space-related clubs and incorporate space knowledge in science clubs which already exist in schools from primary to university level. Currently, no Zimbabwean university or institute offers space related courses at any level.
- To partner and engage with the Ministry of Science and Technology and other organisations, so as to get support and resources.
- Encourage space outreach and foster space education.



## REGIONAL REPORT

The Asia Pacific Region was very vibrant during 2013 with the continuation of programs from past years and the development of new programs through the active participation of the members in the region. This year we welcomed eight team members to represent India, Nepal, New Zealand, Pakistan and South Korea. We appreciated Aafaque Khan and Suresh Bhattarai as co-executive secretary.

The success of Space Generation Congress 2013 in Beijing, China showed the increasing interest of the youths towards space science and application in the region. This year we were successful in creating the Space Generation Congress Japanese Scholarship Program, a unique program, created by SGAC alumni and members in Japan. Our representation in Space Generation Fusion Forum 2013 (SGFF2013) and Space Generation Congress 2013 (SGC2013) remained instrumental. The concept to host the 1<sup>st</sup> Asia Pacific Space Generation Congress (AP-SGC) during 2014 was successfully introduced and discussed during SGC2013 in Beijing, China and during the 20<sup>th</sup> Asia Pacific Regional Space Agency Forum (APRSAF-20) in Hanoi, Vietnam. The proposed AP-SGC 2014 will be hosted in conjunction with the 21<sup>st</sup> Asia Pacific Regional Space Agency Forum (APRSAF-21) 2014 in Japan.

We are proud to have Pirada Techavijit, SGAC member from Thailand, as a winner of Axe Apollo Space Academy Competition 2013 enabling her dream to become a first astronaut from Thailand. Congratulations to SGAC Thailand for her great success!

### Regional Highlights

#### *Space Generation Fusion Forum 2013*

This year Asia Pacific was represented by our members from Australia, India, Japan and Vietnam. We consider it a great success that 50% of the Global Grant Winners were from Asia Pacific region. Joyeeta Chatterjee, former RC Asia Pacific and Co-Lead of SGAC Space Law Working Group, Yusuke Muraki, Regional Coordinator Asia Pacific and Thu Throng Vu, NPoC Vietnam were the winners of Global Grants.

#### *SGAC Japanese Scholarships 2013*

SGAC Japan successfully introduced the SGAC Japanese Scholarship Program to support Japanese participants to SGC and IAC. This year, they were able to generate funds from the SGAC members and Alumni from Japan to send two Japanese students/young professionals to SGC2013.

#### *Space Generation Congress, China 2013*

It was our great privilege to organize the Space Generation Congress 2013 in China. It was the fourth series of SGC in Asia Pacific region after successful events in Japan during 2005, India during 2007 and South Korea in 2009. This year 38 participants from 9 different countries from Asia Pacific attended the Congress which is ~33% of the total participants of the event and ~24 % of the total countries represented in the congress. The countries represented in the congress were Australia, China, Hong Kong, India, Japan, Korea, Nepal, Pakistan and Sri Lanka. This year SGAC awarded 25 scholarships among which 9 scholarships were awarded to participants from Asia Pacific.

#### *The Global Navigation Space Systems and Earth Observation for Disaster Management Workshop 2013*

SGAC Asia Pacific was proud to host the first Workshop on "The Role of GNSS and Earth Observation in Disaster Management" which provided a great opportunity to 25 students and young professionals to meet and exchange views with leaders of the space sector from around the globe.

*International Astronautical Congress, China 2013*

Mr. Kishor Acharya, NPoC to Nepal, was one of the winners of the Emerging Space Leader Award under the student category. The award made his dream to attend UN/IAF Workshop, SGC and IAC in Beijing, China with full financial support.

*20<sup>th</sup> Asia Pacific Regional Space Agency Forum (APRSAF-20), Vietnam 2013*

Yusuke Muraki, Regional Coordinator of Asia Pacific, presented a proposal on hosting an Asia Pacific Space Generation Workshop (AP-SGW) in 2014 in conjunction with APRSAF-21 in Japan. The 20<sup>th</sup> APRSAF-20 was attended by Prasanna Deshapriya, NPoC for Sri Lanka, Thu Throng Vu, NPoC for Vietnam, Regel Mari Sese, NPoC for Philippines and other SGAC members from the Asia Pacific

**Looking Ahead: Plans for the Future of SGAC Asia Pacific**

With over 60% of the world's population living in the Asia Pacific region, SGAC Asia Pacific looks forward to 2014 with the following goals:

- To strengthen the network of SGAC engaging more young professionals and university students to its projects and activities.
- To host the first Asia Pacific Space Generation Congress 2014 (AP-SGC2014) in conjunction with the 21<sup>st</sup> Asia Pacific Regional Space Agency Forum (APRSAF-21) in Japan.
- To motivate SGAC Asia Pacific members to participate at Space Generation Fusion Forum (SGFF) and National Space Symposium (NSS), Space Generation Congress (SGC) and International Astronautical Congress (IAC), Asia Pacific Space Generation Congress (AP-SGC) and Asia Pacific Regional Space Agency Forum (APRSAF) respectively.
- To explore different scholarship programs for the members of SGAC Asia Pacific Region.
- To continue the SGAC Japanese Scholarship Program.

**NATIONAL REPORTS****AFGHANISTAN NATIONAL REPORT****Overview**

SGAC in Afghanistan is working to pave the way for future space involvement in Afghanistan by promoting space and astronomy among young people as well as pooling Afghan talents and building international collaborations. The goal of our efforts is to encourage people to join the space sector, know the importance of astronomy and space education, and understand that astronomy and space applications are key factors for current and future technological advancements.

SGAC in Afghanistan seeks to encourage students, young professionals, and the government to help initialize astronomical societies throughout the country and to include astronomy in school curriculums. One day we aim see another Afghan astronaut in space to follow the footsteps of Abdul Ahad Momand, the first Afghan astronaut in space who spent nine days aboard the MIR Space Station in 1988.

Although space is not a priority in war-torn countries like Afghanistan, the SGAC NPoC, has been working to initialize space-related activities and projects throughout the country. So far, as stated in earlier reports, the space-related activities in Afghanistan are carried out by individuals as no professional space societies currently exist in the country.

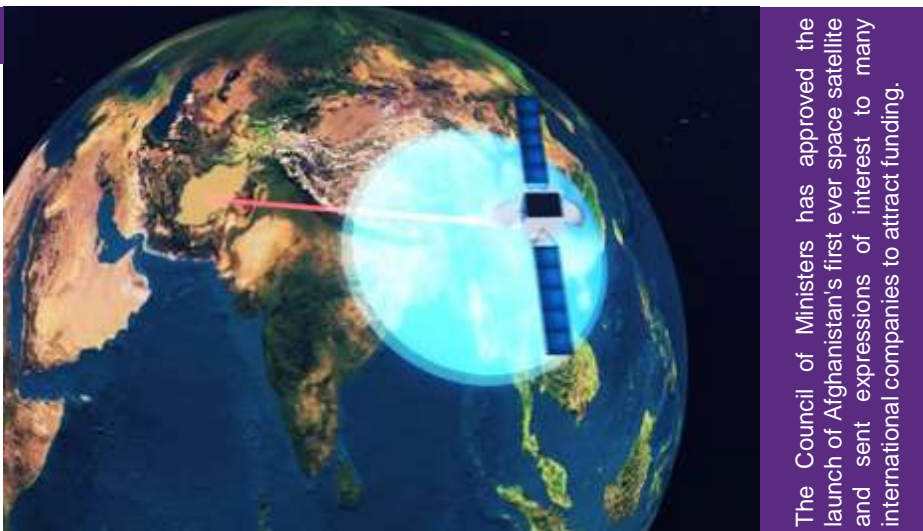
## Space Activities in Afghanistan for 2014

Kabul (BNA) reports are quoting officials from the Ministry of Communication and Information Technology as saying that Afghanistan intends to launch its first ever satellite into space to further develop mobile and Internet coverage in the country. The Minister of Communication and Information Technology Amierzai Sangeen commented that the satellite is expected to be launched into space by a foreign company and added that launching of satellite will cost nearly \$ 250 million, planning for which has been approved by the cabinet..

The Minister of Communication announced the polarization of the satellite to be about 50 degrees on the east and the Government of Afghanistan maintains the rights to decide on frequency and position of the satellite. He added that launching of the satellite will boost communication coverage in the country alongside radio and television frequencies and it will also support fibre optics services in remote regions and districts.

Meanwhile, economic analysts in the country have described the move as a vital decision to further boost radio TV, Internet and communication services. Additionally, nationals of the country have warmly welcomed launching of the satellite and believe that the project will seek solutions to the Internet problems.

Fig. 47.



The Council of Ministers has approved the launch of Afghanistan's first ever space satellite and sent expressions of interest to many international companies to attract funding.

## ➤ AUSTRALIA NATIONAL REPORT

### Current State of Space Affairs in Australia

2013 has been a particularly busy year for the space sector in Australia. In April 2013, the Australian Government released the nation's first space policy – known as the Satellite Utilisation Policy. The biennial Australian International Air Show, along with the Australian International Aerospace Congress and a number of other associated conferences were also held in 2013. The Space Generation Advisory Council had a strong presence at this event, running an information booth during both the trade and public days of the air show. During this time we were able to share the role and activities of SGAC with many members of the aerospace industry, as well as the general public. Education of the young and seasoned professionals alike has continued in space matters with another successful Southern Hemisphere Summer Space Program (SHSSP), run by the International Space University and the University of South Australia.

The year ended with strong Australian attendance at the SGC and IAC continuing into 2013, and Australian delegates once more constituted the most represented nation at the SGC. A record six scholarships were awarded to Australian students through the Young Australian Space Leaders Scholarship and in addition to this a further Australian student received an SGAC Young Leadership Scholarship. Four Australian students were involved in the organising committee for SGC 2013. A

successful science teacher development program was also run for Chinese teachers, organised by the Victorian Space Science Education Centre and the International Astronautical Federation.

### Accomplishments in Australia in 2013

Numerous achievements in the Australian space sector have been made during 2013. Some of these highlights include:

- The Australian International Air Show and Aerospace and Defence Exposition (including the Australian International Aerospace Congress), held at Avalon Airport in March of 2013. This year SGAC hosted a booth in the main exhibition hall, and shared the activities of SGAC with numerous members of the local and international aerospace industry, as well as the general public. We received the email addresses of many interested visitors, later sharing with them an electronic summary of SGAC's programs and signing them up to the SGAC Talk mailing list.
- Strong Australian representation at the Space Generation Congress (SGC) and the International Astronautical Congress (IAC) held in Beijing, China. Australians constituted the most represented nation at SGC. A number of Australian delegates were also recipients of scholarship funding to the SGC, including a record six scholarships to Australian students as part of the Young Australian Space Leaders Scholarship. The Victorian Space Science Education Centre organised a professional development program for Chinese teachers in Beijing during the conferences in partnership with the International Astronautical Federation. This program demonstrated space-related science experiments used to reinforce a primary school student's basic scientific understanding.
- The release of the Australian Government's Satellite Utilisation Policy, Australia's first space policy. This resulted in the disbanding of the Space Policy Unit and the subsequent creation of the Space Coordination Office, Australia's new centralised body for space activities.
- The successful completion of another Southern Hemisphere Summer Space Program (SHSSP), run by the International Space University and the University of South Australia. This 5-week program was held in Adelaide in January and February of 2013.
- The Murchison Widefield Array formally commenced operations early 2013, a low frequency radio array built as part of Australia's contribution to the international Square Kilometre Array project.
- Australian teams had a strong presence in the International Space Apps Challenge held during April 2013, with teams from most major cities.
- The Australian Space Development Conference was held in Adelaide in 2013 after a brief hiatus. It is one of the main space conferences held in Australia, during the same week as the Australian Youth Aerospace Association's Aerospace Futures conference for university students, also hosted in Adelaide. These events along with other space related activities during the same week in July created an informal 'Space Week' in Australia.

Fig. 48.



Australian NPOCs at the Australian International Air Show SGAC Booth



## Looking Ahead – Plans for Australia in 2014

The momentum behind space projects will continue in Australia into 2014, with the first full year of the Australian Government's Space Coordination Office. Following the creation of Australia's first space policy, it is hoped that there will be increased interest in space related efforts in Australia. 2014 also marks the continuation of the Southern Hemisphere Summer Space Program (SHSSP) run by the International Space University and the University of South Australia. This is likely to be the last consecutive SHSSP program hosted in Australia, after which the event will alternate between Australia and another Southern Hemisphere host nation. This upcoming year should also be the first full year of operation of a new Masters qualification in Satellite Systems Engineering from the University of New South Wales, one of the few international degrees in satellite systems. All in all, an exciting year ahead!

## ➤ JAPAN NATIONAL REPORT

### Overview

SGAC Japan has been focusing on maintaining its member networks including, the participants of the past SGC, and the space enthusiasts of the present and next generation in Japan. As a result, a scholarship program for Japanese participants of SGC was launched this year. Two Japanese students participated in the SGC 2013 in Beijing by this program and they contributed to SGC working groups as rapporteurs. What was truly remarkable about the Japanese scholarship program was that it was supported by SGAC former members individuals and private companies. SGAC Japan will continue to keep handing down the great experiences in SGAC to the next generation and hopes to build on these successes with further similar ventures.

### Accomplishments in 2013

*Kick-Off Meeting of Japanese Scholarship Program, April 1-3, 2013*

At Manila, Philippines

Daichi Nakamura, NPoC of Japan visited Yusuke Muraki, Regional Coordinator of Asia-Pacific. This face-to-face meeting became a great step to put the Japanese scholarship program into practice.

Fig. 49.



Daichi Nakamura, NPoC of Japan and  
Yusuke Muraki, Regional Coordinator of  
Asia-Pacific.



*SGC Round-Table Talk Events, April 14, May 5, May 26, June 8, 2013*

At Shibuya, Tokyo, Japan

SGAC Japan organized SGC round-table talk events for students and young professionals who have an interest in SGAC/SGC. This could be a great opportunity to share the experience at SGC to the current and future generation of Japan.

Fig. 50.

SGC Round-Table  
Talk Events*Welcome Party of SGAC Overseas Members in Japan, May 19, 2013*

At Shibuya, Tokyo, Japan

A welcome party for SGAC overseas members who were currently studying/working in Japan was held. Some members from Nepal, Sweden and Brazil participated in the party and SGAC Japan members enjoyed meeting old and new international friends.

Fig. 51.

Welcome Party of SGAC  
Overseas Members in Japan*Pre-SGC Meeting, September 14, 2013*

At Akihabara, Tokyo, Japan

Pre-SGC Meeting for the winners of Japanese scholarship program was held. They shared the information about topics of the SGC working groups beforehand and decided to introduce a Japanese traditional dance at International Night in SGC2013.

Fig. 52.



Pre-SGC Meeting.

*SGC 2013, September 19-21, 2013*

At Beijing, China

Four space enthusiasts from SGAC Japan including the winners of Japanese scholarship program participated in the SGC2013. The scholarship program was successfully accomplished and this year was the most successful SGC ever for Japanese members in terms of Japan's attendance.

Fig. 53.



### Looking Ahead – the Plan for the Future of SGAC Japan

We, SGAC Japan team, are planning for the following in the near future:

- Hold meetings and events of SGAC Japan regularly (monthly) to make it easier for members to participate in events.
- Utilize mailing-list of SGAC Japan more efficiently
- We are planning to distribute some domestic information related to space activities like a newsletter, because we have a national Japanese mailing-list which is not used actively.
- Activate international public relations

In addition to a domestic newsletter, we are planning to utilise the monthly SGAC international newsletter. It may be helpful to prepare a draft of the newsletter cooperating with members of SGAC Japan.

## ► NEPAL NATIONAL REPORT

### Introduction

This year SGAC welcomed two new national points of contacts for Nepal, Mr Kishor Acharya (who commenced in May) and Mr Ishan Basyal (who commenced in August). SGAC Nepal saw a number of events run in the second half of the year to coincide with these new positions. The report below is divided on a basis of participation, outreach programs, conferences, and special news.

### Participation

- NPoC for Nepal, Kishor Acharya received the Emerging Space Leaders Grant Programme Award and attended the 64<sup>th</sup> International Astronautical Congress (IAC) and Young Professional Workshop. Mr Suman Gautam, president of Pokhara Astronomical Society (PAS) also participated in the United Nations – International Astronautical Federation (UN-IAF) Workshop and the 64<sup>th</sup> IAC.
- Ms Manisha Dwa, Project Coordinator of Nepal Astronomical Society (NASO), presented her paper to the International Conference on "e-infrastructure for an Engaging Science

Classroom", August 2-5, 2013, Volos, Greece, a conference jointly organised by Global Hands on Universe and Discover the Cosmos.

- A team of seven enthusiastic people from Nepal participated in the Astronomy Olympiad Exposure Camp held from the 28<sup>th</sup> to 31<sup>st</sup> of October, 2013 at Homi Bhabha Centre for Science Education in Mumbai, India.

### Events and Outreach Programs

Marking International Day of Cosmonautics and the 50<sup>th</sup> Anniversary of the First Woman to Space, Valentina Tereshkova, was held on 11<sup>th</sup> of April 2013. A programme titled "Meet the Cosmonaut" was organised by the Russian Centre of Science and Culture and the Nepal Astronomical Society (NASO) and also supported by Space Generation Advisory Council (SGAC). It was a lecture by the renowned Russian Cosmonaut Vladimir Dzhanibekov followed by an interactive discussion with curious Nepali students. The programme was a huge success with participation numbers exceeding 250 people.

To mark Yuri's Night, a special radio programme "Our Vibes@10: U and I" was broadcast on the 11<sup>th</sup> of April, from 10-11 P.M. on Times FM 90.6 MHz with RJ Bijay. There was also another special edition on Pralaya Sessions 094 with Prakrity at [www.pralayasessions.com](http://www.pralayasessions.com) on April 12, 2013. In addition, Pokhara Astronomical Society organised a party in celebration of Yuri's Night.

- An interactive space science programme was organised in the beautiful valley of Pokhara to celebrate World Space Week. There was a large participation of people of different age groups. Our regional coordinator Mr Suresh Bhattarai briefed participants about the importance of celebrating World Space Week and answered questions from the audience. Participants had the opportunity to observe sun spots by solar filter.

Fig. 54.



World Space Week Celebrations.

- "Human Orrery Making" a project executed by Nepal Astronomical Society (NASO) in collaboration with Eureka School in Kathmandu Nepal was also held. The Human Orrery is drawing various orbits of the solar system on the ground including constellations and comets to provide a unique perspective of planetary motion. It is also an enjoyable and engaging activity and can elucidate fundamental ideas in astronomy, mathematics and space science to a wide audience. The Nepal Astronomical Society is planning to execute the Human Orrery project in different schools of Nepal.



Fig. 55.



Human Orrery Making Team

## Conference

A conference on "Black holes, jets and outflows" was organised in Kathmandu, Nepal, from October 14 - 18, 2013. Main topics included Unification of Black-Hole Jets in AGNs, jet-lobe structure and evolution in AGNs, gamma ray bursts, binaries, and new experimental opportunities. The conference was jointly organised by the Istituto Nazionale di Astrofisica (INAF), the Osservatorio Astronomico of Roma (INAF/OAR), the Istituto di Astrofisica Spaziale e Fisica Cosmica (INAF/IASF Bologna), the Nicolaus Copernicus Astronomical Center (Warsaw), and the Central Department of Physics of the Tribhuvan University (Kathmandu).

## Special News

To assist in space science outreach in the Midwestern part of Nepal, Dang Astronomical Society (DAS) was established in Ghorahi, Dang of Midwestern Development region on 8<sup>th</sup> of November, 2013 under the president-ship of Mr Ajay Neupane. This club is supervised and guided by RC Mr Suresh Bhattarai and NPoC Mr Kishor Acharya.

## ➤ NEW ZEALAND NATIONAL REPORT

### Current State of Space Affairs

The New Zealand space scene took another major step in 2013. Despite the lack of a governing space body, our country's passionate group of space pioneers took it upon themselves to nurture the seeds of tomorrow with a variety of inspirational educational events. The annual highlights of the NZ space calendar include some spectacular rocketry challenges and events. As always the enthusiasm of our space youth and young professionals was a welcoming sight. 2013 was the year of firsts for New Zealand on the international stage, with the debut of 4 New Zealand teams in the International Space App Challenge, and also the first time New Zealand students competed in the International Astronomy Olympiad. New Zealand has a bright space future ahead in 2014, where we hope to continue to propel New Zealand onto the international space stage with our first ever SpaceUp NZ event and Space Ed NZ. Both events highlight the role of international collaboration and feature esteemed guests from both JAXA and ISU. We aspire to inspire, to empower, and to give a voice to the young space enthusiasts of New Zealand and around the world.

### Highlights 2013

*New Zealand Rocketry Challenge: Auckland (15 December 2013)*

Challenged 18 teams of year 7 and 8 students from around the country to design, build and test model rockets to carry an egg to an altitude of 150 metres without damaging the payload.

<http://www.rocketcontest.org.nz/>

### *International Space Apps Challenge*

New Zealand participated in the International Space Apps Challenge in 2013 for the first time. There were 4 teams, addressing the challenge areas of education, 3D printing, deployable greenhouse design and Spot the Station App extension. In less than 48 hours, each team was able to put together a compelling app, with Spot the Station Team taking out the top spot. Their winning application was an Android based app with innovative features including real-time ISS tracking, and extensive social media integrated functionality. Overall it was a successful debut for the New Zealand teams who are ready to take on the challenge in 2014!

<http://2013.spaceappschallenge.org/location/auckland/>

### *TasMars 2013 (27 January - 10 February 2013)*

As a follow-up to KiwiMars in 2012, TasMars took place this year and followed a similar pattern as the prior year. Six crew members from New Zealand were sent on a 2 week mission in the Utah desert to conduct research and emulate working and living conditions of a manned Mars base at the Mars Desert Research Station. The primary objective was to deliver an engaging science learning experience for both educators and students as part of the outreach campaign.

<http://www.kiwispace.org.nz/display/MDRS/Mission+Dashboard>

### *National Rocket Day, Taupiri (3 February 2013)*

A spectacular event with a great public turnout. The have-a-go rockets were once again extremely popular with children lining up all day to launch them. Some went off as a drag race between two of the same models. Darryl Kay's V2 was a booming success and of course so was Craig Packard's Big Red. Then there was Joy Radovan's pink spotted creature complete with landing shoes that was a big crowd pleaser. <http://www.nzrocketry.org.nz/index.php?page=rocket-day>

### *International Astronomy Olympiad (27 July - 5 August 2013)*

For the first time from New Zealand, high school students competed in the International Astronomy Olympiad. New Zealand Science Teachers Association was invited this year to send students to the 7<sup>th</sup> International Olympiad on Astronomy and Astrophysics, which was held in Volos, Greece from 27<sup>th</sup> July to 5<sup>th</sup> August 2013. Navodhi Depalchitra, Daniel Yska from Onslow College, Darina Kuhn from Wellington East Girls College and Connor Hale from Tawa College were accompanied by Gordon Hudson, president of the Royal Astronomical Society of New Zealand.

### *Stratospheric Observatory for Infrared Astronomy [SOFIA] (5 August 2013)*

SOFIA landed in New Zealand on the 5<sup>th</sup> August. SOFIA is a world-class airborne observatory that detects the visible, infrared and sub-millimeter spectrum. It is the legacy of the famous planetary scientist Dr. Gerard Kuiper. SOFIA is now the largest airborne astronomical observatory and a test bench for a wide variety of astronomical instrumentation and detector technology. Kiwis are looking forward to learn more about this amazing aircraft, and the contribution that it brings to the development of science.

### *Aoraki Mackenzie Starlight Festival (11 October 2013 - 13 October 2013)*

The Festival celebrated the creation of the southern hemisphere's first International Dark Sky Reserve, in the Mackenzie Basin and at Aoraki/Mt Cook National Park in the centre of New Zealand's South Island. The Festival comprised a mix of scientific, educational and cultural events over three days, designed to attract students, family groups and members of the public who are interested in learning more about the stars, the night sky, the problems of light pollution and the appreciation of the environment and outer space. The events included stargazing, lectures, a concert, an essay and poetry competition, and documentaries on the night sky, a photographic exhibition.



<http://www.phys.canterbury.ac.nz/starlightfestival/>

## Looking Ahead – 2014

In 2014, we hope to continue to build on the growth and progress of the New Zealand space community to promote the activities of the SGAC. In addition to firsts like the International Space Apps challenge in 2013, New Zealand will be holding the following events as firsts in New Zealand that a popular events in other space faring nations.

### *SpaceUp NZ - a space unconference (15 February 2014)*

New Zealand's first multi-disciplinary space unconference. It will be an opportunity to collaborate, learn, share new developments and mingle with other people working with space technologies and data in New Zealand.

### *Space Ed NZ (16 February 2014)*

A 2-day workshop co-hosted by the Japan Aerospace Exploration Agency (JAXA) educators. This will be a space workshop to help engage students with a range of hands-on, multidisciplinary activities.

New Zealand is also in talks with NASA Ames to hold Spaceward Bound Expeditions in New Zealand to train the next generation of space explorers by having students and teachers participate in the exploration of scientifically interesting but remote and extreme environments on Earth as analogs for human exploration of the Moon and Mars.

<http://quest.nasa.gov/projects/spacewardbound/>

## ► PAKISTAN NATIONAL REPORT

### Overview

Pakistan has a budding space program, and the interest in space science and technology is increasing everyday. Many volunteer groups and societies active in promoting outreach activities related to space organized talks and astronomy nights. Since the launch of 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.

### Activities:

World Space Week (WSW) was celebrated with great fervor, with the theme "Exploring Mars, Discovering Earth." Activities for the youth included essay writing, planetarium visits, aero modelling & water rocket competitions, and space model designs. Many young students up to high school level, participated in these activities organized by different organizations. Space technology workshops were also held for high school science teachers and also university faculty and students.

A major development this year was the launch of Pakistan's first cubesat, icube, which was developed at Institute of Space Technology (IST), Islamabad. The cubesat was integrated with UniSat-5 in Italy, and was launched aboard the Dnepr launch vehicle from Russia. The cubesat reached its orbit successfully and both the ground station at IST and amateur ham radio operators successfully received its beacon signal internationally.

The Khwarzimid Science Society (KSS), a non-profit association aimed at furthering a science culture in Pakistan's educational institutions and in the general public, undertook many space science and technology related activities in 2013. An open-to-all talk on "dusty cool plasmas" was organized in Lahore in September. KSS also participated in the WSW activities under SUPARCO's Lahore office. An astronomy night was arranged at a high school in Lahore in October. The International Observe the

Moon night (InOMN) was celebrated at a university in Lahore. Finally, as part of its project of distributing galileoscopes to deserving high schools in the country, KSS organized a workshop for teachers in October.

The Lahore Astronomical Society (LAST) organized astronomy nights in March and September, and also celebrated the InOMN in October.

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

Two major national conferences related to space technology and applications were held this year. The 3<sup>rd</sup> International Conference on Aerospace Science & Engineering (ICASE) was held at IST, Islamabad in August. The Institute of Space and Planetary Astrophysics, University of Karachi organized the 2<sup>nd</sup> National Conference on Space Science (NCSS) in October as part of the WSW activities; the theme for the conference was “Exploring the Universe.”

GIS (Geographic Information Systems) day was celebrated at various educational and professional organizations on 20<sup>th</sup> Nov.

Waqas A. Qazi joined SGAC as Pakistan NPoC. Numerous organizations were informed regarding the “Name an Asteroid” competition in November.

Fig. 56.



Models of the Solar System (left) and a satellite (right) made by middle-school students, for WSW activities at IST.

## Looking Forward

- In 2014, the following steps and activities are being planned for SGAC engagement in Pakistan:
- Develop a liason with amateur astronomy societies nation-wide for SGAC participation in astronomy night activities for outreach purposes
- Organization of a few talks from SGAC platform
- Connect with Buraq Space Camp, and inquire how SGAC can play a constructive role in the camp for next year
- Spreading more information about SGAC in various educational institutions

## ➤ PHILIPPINES NATIONAL REPORT

### Current State of Space Affairs in Philippines

The Philippines became active in the Space Generation Advisory Council upon the appointment of the National Points of Contact last February 2013. As such, we are beginning to increase the amount of space related activities in the country. 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. Currently, the country has no single space agency that would handle all space related issues. The supposed function of a space agency is currently scattered through various government agencies as follows:

- Philippine Atmospheric, Geophysical and Astronomical Services Administration (astronomy)
- National Disaster and Risk Reduction Management Council (space issues)
- Science Education Institute (education)
- National Mapping and Resource Information Authority (remote sensing)
- Manila Planetarium (public outreach)

In terms of education, the Philippines has a few research activities in space science. Most are limited to the 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 less than a handful of private companies that are involved such as Asia Broadcast Satellite, PASCO Corporation and Regulus SpaceTech. Among the three, Regulus SpaceTech is the only company wholly owned by Filipino citizens.

### **Accomplishments in Philippines 2013**

#### *2013 National Astronomy Week*

The National Astronomy Week is an annual event held every 3<sup>rd</sup> week of February. It began in 1993 through President Fidel Ramos' Proclamation no. 130. This year's activity was limited to the Metro Manila Area spearheaded primarily by the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAG-ASA), Philippine Astronomical Society and the Astronomical League of the Philippines. Activities include public lectures and telescope viewing events.

#### *Yuri's Night*

Since 2001, Yuri's Night commemorates the achievement of Yuri Gagarin, the very first astronaut. For 2013, the Philippines celebrated Yuri's Night for the very first time. The event was held at the Planetarium of the Science Discovery Center at the SM Mall of Asia and was attended by 150 participants from academia, government agencies and the private sector. The events included public lectures on the value and importance of space science, followed by a telescope viewing session.

#### *World Space Week*

Since 2004, the Philippines has celebrated the World Space Week, an annual event from October 4 to 10. This year, the Opening Program was held on October 4, 2013 at the Manila Ocean Park in conjunction with the Hyundai New Thinker's Summit. The rest of the activities were held at the Gawad Kalinga Enchanted Farm in Angat, Bulacan. Gawad Kalinga is an NGO that aims to uplift the poor through education and livelihood activities. The WSW was an opportunity to show underprivileged children about the beauty and wonders of space. Activities include the National Water Rocket Competition, lectures for teachers and students as well as a star party for participants and the Gawad Kalinga community. In addition, one of the main highlights of this year's WSW was the demo launch of a CanSat in preparation for next year's National CanSat Competition for High School Students.

#### *SSTA Study and Scoping Workshop*

Currently, a 10-Year Baseline Study on Space Science and Technology Applications is being conducted by the Manila Observatory and funded by the Department of Science and Technology. The aim of the study is to determine where the Philippines currently stands on space science and what are the resources (tangible and intangible) that are currently available. It discusses the situation in several

areas such as space law and policy, education, research and development, innovation and international collaborations. Upon completion of the study in December 2013, a final report will be created which would eventually serve as the basis for the future developments in Philippines space science and technology.

#### *Participation in International Meetings*

Several professors and students participated in various space-related meetings namely, the International School for Young Astronomers, Universe Awareness Workshop, Communicating Astronomy to the Public Conference, CanSat Leadership Training Program, 5<sup>th</sup> Nano-Satellite Symposium and the Asia-Pacific Regional Space Agency Forum.

#### *Space Science Program Pilot Testing*

To encourage more students to pursue careers in space science, a pilot program was initiated last June 2013 at the Diliman Preparatory School. Students from kindergarten to high school take a weekly 80-minute class on space science as an additional subject. Various space topics are discussed from astronomy to spaceflight to satellite technology in an exciting manner to keep the students interested.

#### **Looking Ahead - plans in the Philippines in 2014**

The Philippines SGAC has several activities planned for 2014. As mentioned, the 1<sup>st</sup> CanSat Competition for High School Students will be held during the 2014 World Space Week. The University Space Engineering Consortium (UNISEC) of Japan has expressed their interest in funding and supporting the activity. This marks the first time that such a space-related event will be held in the country. In addition, the space science education program will be implemented to several more schools in the country to encourage more students to pursue space careers.

Another issue that needs to be addressed is the action plan resulting from the 10-Year Baseline Study. This includes the formulation of a National Space Policy and the creation of a Philippine Space Agency, both of which has to be enacted by the Philippine Congress. A similar bill was filed in December 2012, but it needs to be revised and resubmitted. The creation of a National Space Policy is imperative to clearly define the goals and objectives of the Philippines prior to the creation of a space agency.

Finally, more students and professors will be attending upcoming conferences and meetings in 2014 including the International Astronautical Congress and the Space Generation Congress.

## **SOUTH KOREA NATIONAL REPORT**

### **Current State of Space Affairs in South Korea**

The Korean Helicopter Program's (KHP) objective is to secure the core technologies in the Korean aircraft industry and is aimed at developing the indigenous military utility helicopters by 2012. As one of three Development Leading Agencies (DLA) for the KHP, Korea Aerospace Research Institute (KARI) is playing a very important role in developing the dual use core components of the helicopter as a part of the Korea Helicopter Technology Enhancement Program. KARI has developed a canard-type general aviation aircraft that is a 4-seat single engine aircraft. As a special project, the so-called Smart Unmanned Aerial Vehicle (SUAV) for remote investigation and surveillance has been developed recently. In addition, the Communication Navigation Surveillance / Air Traffic Management (CNS/ATM) technology is also being intensively developed for future air navigation to enhance flight safety. The aviation test center is being built in Goheung as an important part of Korea's aeronautical infrastructure. By 2015, this facility will be expanded to a state-of-the-art Flight Research Center with the addition of flight test equipment, facilities and staff.

Korea has successfully launched the following satellites: KOMPSAT-1(Korea Multi-Purpose Satellite-1) in 1999, KOPMSAT-2 in 2006, COMS(Communication, Oceanography and Meteorology Satellite) in

July, 2010, and KOMPSAT-3 in May, 2012. The KOMPSAT-5 project is ongoing, and remote sensing research and space environment tests are being carried out.

In the launch vehicle area, single-stage and two-stage scientific sounding rockets were developed in 1993 and 1998 respectively. The KSR-III with liquid propellant engine system was launched successfully in 2002. Currently, Korean-satellite launch vehicles and the Naro space center are being developed.

### Accomplishments in South Korea in 2013

#### *Naro Launch*

On January 30, 2013, the KSLV-I space launch vehicle, carrying the Naro scientific satellite (STSAT-2C), finally flew into space with a brilliant flame, after three consecutive attempts. All launch events proceeded nominally beginning with the successful separation of the fairing, which was the main cause for the failure of the 1<sup>st</sup> launch attempt, at 215 seconds, the 1<sup>st</sup> and 2<sup>nd</sup> stage separated as planned at 231 seconds, the 2<sup>nd</sup> stage kick motor ignited at 395 seconds with shut off occurring at 455 seconds after reaching the target orbit, and successful separation of the satellite was accomplished at 540 seconds. The Naro scientific satellite (STSAT-2C) was successfully inserted into its target orbit (300km perigee, 1,500km apogee) after being separated from the KSLV-I space launch vehicle. The ground station in Norway successfully received the beacon signal from the Naro scientific satellite for a duration of 10 minutes at 5:26 p.m. on the day of the launch. First contact was made with the ground station of the Satellite Technology Research Center at KAIST in Daejeon during a 14-minute satellite pass over the Korean peninsula at 3:28 a.m. confirming the satellite was operating normally.

Fig. 57.



The space rocket, also known as Naro, launched from the country's Naro Space Center

#### *KC-100*

KC-100 is Korean four-seat, low-wing, single engine light aircraft under development by Korea Aerospace Industries that first flew on 20 July 2011. KC-100 was certified in March, 2013 after the process for qualifying during 3 years and 6 months. In the meantime, Korean Systems technology for light aircrafts certification was evaluated by FAA, and it is almost ready for manufacturing.



Fig. 58.



'KC-100' as Light aircraft on flight-test.

*KSLV-II Rocket*

Since 2010, KARI has been developing its own KSLV-II rocket to carry a 1.5 ton-class application satellite into a 600~800km Sun-Synchronous Orbit on the basis of the technical achievements and experiences of KSLV-I. A test facility for propulsion system is being built at the Naro space center.

Fig. 59.



On construction of turbopump building.

*KOMPSAT-3A*

A functional test and thermal vacuum test of Korea Multi-Purpose Satellite-3A (KOMPSAT-3A) was successfully completed on May 2013 and will be launched in 2014.

Fig. 60.



Thermal vacuum test of KOMPSAT-3A.

## KOMPSAT-5

The launch of KOMPSAT-5 satellite was successfully performed by RS-20 rocket (Dnepr Launch Vehicle) from Yasny Launch Base, Orenburg region, Russia, on August 22, 2013. The satellite utilizes a modular design consisting of Payload Module, Avionics Module and Propulsion module (designed to operate with monopropellant hydrazine and gaseous nitrogen). The main payload of the satellite is COSI (COrea SAR Instrument) operating in X-band, and the secondary payload is AOPOD (Atmosphere Occultation and Precision Orbit Determination), which is composed of a dual frequency GPS receiver and a Laser Retro-Reflector Array (LRRRA).

KOMPSAT-5 will conduct the following necessary in-orbit tests: all-weather day-and-night repetitive observations of Earth's surface, in particular, of the Korean Peninsula, for 5 years.

KOMPSAT-5's primary mission is to provide High Resolution mode SAR images of 1 m resolution, Standard mode SAR images of 3 m resolution, and Wide Swath mode SAR images of 20 m resolution.

KOMPSAT-5 will provide the collected data to the KOMPSAT-5 Ground Segment located at KARI's site in Daejeon, South Korea, which supports SAR image processing.

Fig. 61.



## Looking Ahead - plans in South Korea in 2014

The major goal of the KOMPSAT-3A program is to develop an earth observation satellite to obtain IR (Infrared) and high-resolution EO (Electro-Optical) images for GIS (Geographical Information Systems) applications in environmental, agricultural and oceanographic sciences as well as natural disasters. In addition, the KOMPSAT-3A program is devoted to the industrialization of the bus system development by domestic companies. KOMPSAT-3A is expected to launch in 2014. The mission orbit is a sun-synchronous orbit at an altitude of 530 km during 4 years.

Korea, which plans to begin full-fledged lunar exploration in 2020, exchanged a commitment letter to proceed with the Lunar Impactor Project with NASA. KARI will provide a Lunar Orbiter for a test by 2014.

## ► SRI LANKA NATIONAL REPORT

### Overview

Sri Lanka has witnessed remarkable progress in the space and astronomy related outreach in 2013. Many individual groups have emerged to conduct events focused on awareness and development of space science in a holistic way. This report summarizes important events taken place from January through November 2013 in Sri Lanka.

### Russian Centre Commemorates 50<sup>th</sup> anniversary of Valentina Tereshkova's First Space Flight

The Russian Centre in Colombo together with the Sri Lanka Russia Friendship Society hosted an event on the 19<sup>th</sup> of June 2013 to commemorate the First Woman in Space – Valentina Tereshkova and the 50<sup>th</sup> anniversary of her spaceflight Vostok-6 on the 16<sup>th</sup> of June, 1963. This event comprised of a photographic exhibition plus a documentary movie about Valentina Tereshkova and was followed by a cocktail party. It is noteworthy that Russian cosmonaut Vladimir Lyakhov, a two- time 'Hero of the Soviet Union', and the President of the Sri Lanka Russia Friendship Society also graced the occasion.

### Weekly Activities & Outreach Activities of Astronomy & Space Study Center (ASSC)

Astronomy & Space Study Center (ASSC) has been conducting its usual weekly Saturday sessions where a lecture and an activity would take place at the Subodhi Institute in Piliyandala. The lecture generally commences at 1:30 pm every Saturday followed by an activity session. The sessions last until 5.00 pm and the location of the institute also offers an interesting close-to-nature ambiance ideal for sharing & practicing knowledge. ASSC also facilitates with resources for educational workshops and astronomy observation camps depending on the demand. These events are conducted free of charge by voluntary members of the Astronomy & Space Study Center. On 12<sup>th</sup> of July 2013, ASSC members contributed to the observation camp organized by the Astronomical Club of Sri Dharmaloka College, Kelaniya, under the name "Exploration-4".

### A Water Rocket Camp by Maliyadeva College, Kurunegala

Astronomical Society of Maliyadeva College, Kurunegala organized a water rocket camp on 25<sup>th</sup> of July 2013. This was the first water rocket camp held by them and it brought many enthusiasts interested in rocketry to one place, to share each other's passions and enjoy a vivid experience designing and launching hydro rockets.

Fig. 62.



Water Rocket ready for launch.



## Outreach Activities & Star Quest 2013 of MAS

The students of the Mathematical & Astronomical Society (MAS) of the University of Colombo organized an event featuring an astronomy observation camp plus a book donation in the month of May for the students in Horuwila Vidyalyaya, Wilpaththu. The donated books were sourced from the students of the MAS and sponsorships of well-wishers. There was an attendance of over 100 students for this event and a gift pack containing books, pens, mathematical instruments, past paper books were given away to each of them. This was followed by the night sky observation sessions and the attendees benefited from clear skies, common in the Wilpaththu area in Sri Lanka.

It was a rare chance for the facilitators of the event, to indulge themselves in the wonderful and unspoiled sights of Milky Way, leaving behind the usual polluted skies in Colombo. Thus the camp was a great success allowing everyone to enjoy the heavens navigating among planets, deep- sky objects and constellations.

## Star Quest 2013

Continuing for the 6<sup>th</sup> consecutive time, 'Star Quest; interschool astronomy quiz competition was held on 13<sup>th</sup> of October at the premises of University of Colombo. There was a participation of over 200 students from 30 different schools and Nalanda College, Colombo became champions with Ananda College, Colombo as runners-up.

## World Space Week 2013 (WSW) Activities

Sri Lanka hosted several events to celebrate the World Space Week from 4<sup>th</sup>-10<sup>th</sup> of October with the global theme "Exploring Mars, Discovering Earth". Thishan Pavithra was the national coordinator for Sri Lanka while Milan Nuwantha was the assistant coordinator along with many other voluntary youth, making up the Sri Lanka WSW crew. The variety of events guaranteed the smooth flow of an eventful space-week in Sri Lanka with vivid content and wide participation. Here is a list of events that were conducted in celebration of WSW 2013.

Fig. 63.



- Public Solar Observation Camp organized by Foundation of Astronomy Studies and Exploration (FASE)
- Mobile Planetarium conducted by Sri Lanka Planetarium
- Moon Night organized by Isipathana College Astronomical Society (ICAS)
- Solar Observation and Water Rocket competition organized by St. Bridgets College Astronomical Society

- Night Sky Observation Camp organized for the students of Physics Society of University of Sri Jayawardenapura by Astronomy & Space Study Center (ASSC)
- Open Art Competition organized by Sri Lanka WSW crew.
- Night Sky Observation Camp organized by Astronomy and Space Study Center (ASSC) It is also important to mention that there was an opening ceremony for the WSW 2013 held at the auditorium of Russian Cultural Centre in Colombo on the 4<sup>th</sup> of October, 2013. The chief guest for the opening ceremony was Dr. Kavan Ratnatunga and ceremony was linked to the WSW Mission Control in Innsbruck, Austria, demonstrating the international scale of this celebration. Further, the closing ceremony of Sri Lanka WSW was held at the Subodhi Institute in Piliyandala, with the addition of an observation camp on the 10<sup>th</sup> of October, 2013. It is evident from these events that the interest in space science and astronomy is growing in Sri Lanka, and more youth is becoming interested in higher studies and associated careers in space science. Prasanna Deshapriya & Eranga Thilina National Points of Contact (NPoC) Space Generation Advisory Council Sri Lanka

## ► THAILAND NATIONAL REPORT

### Activities in 2013

Several activities were planned out during the year 2013. Most were carried out successfully, and new opportunities for events surfaced. Here is what happened in 2013:

- The international Youth Astronomical and Space Academy (IYASA) – a forum of members with interest in Space and Astronomy is now an informal partner of SGAC in Thailand. IYASA hosts and participates in international space camp around the world. This year's camp was held in Malaysia. The camp participants had a chance to interact with Dr. Shiekh Muszaphar Shukor, the first Malaysian astronaut.
- GISTDA Youth Space Camps: The camp made its rounds around Thailand. This year, the camp made its round to Ubon Ratchathani and Kanchanaburi. The Youth Space Camp is an educational project initiated by GISTDA. During the Youth Space Camp, scientists and engineers from GISTDA visited the school for 3 to 5 days and educated the students about all space related subjects in a fun and informational way. Field work including using a GPS receiver, studying maps, astronomy and learning about Satellite Remote Sensing Technologies were part of the day's work.
- This year, GISTDA with NARIT hosted the 1<sup>st</sup> COSPAR Symposium between 11<sup>th</sup> to 15<sup>th</sup> November. This symposium is the first of a new series of events initiated by COSPAR. It will be held every two years in a different area of the world. This first Symposium aims at promoting space and astronomical research with the theme of "Planetary Systems of our Sun and other Stars, and the Future of Space Astronomy" at regional level, which include multidisciplinary sessions and training sessions. Professional, young professional and students in the ASEAN region and worldwide have participated. A capacity building workshop was also organized during the week before the Symposium. The Symposium featured both plenary lectures and oral session in parallel with poster sessions.
- Partnership in space technology development and usage was struck between Thailand and China. Thailand and China have signed an agreement on space technology development, aimed at trade and investment cooperation on remote sensing and survey. The deal was signed between the Thai Geo-Informatics and Space Technology Development Agency (GISTDA) and the Chinese Wuhan Information Technology Outsourcing Service and Research Centre (WITOSRC). China will install a remote sensing system for natural disaster management and install a ground station and administration office, with an initial investment of around 50 million USD. The cooperation on space technology involves key state laboratories of information engineering in surveying, mapping and remote sensing.
- This year, AXE paid a special tribute to space with the introduction of the Axe Apollo perfume. As part of the campaign, 3 people from Thailand will be selected to go to a space camp in Orlando, Florida and one will receive a ticket to fly to Space with XCOR. The selection has



been completed with a quiz competition, a video making competition and a lucky draw. One of the selected person is SGAC Thailand's own Pirada Techavijit. She will be joining 65 other candidates from around the world in Florida.

- Space Technology Training by National Space Organization (Taiwan) – NSPO, Taiwan conducted a Space technology training course open to everyone on the request of GISTDA. This training was attended by professionals and students alike.
- Thailand is partnering with a European company to develop software for satellite control. This project involves Thai universities along with SMEs and GISTDA.
- Participation of SGAC's Thailand chapters at conferences and workshop –Thailand also set up a booth at the International Astronautical Congress (IAC) in Beijing with participants from 6 Thai companies and the government Agency – GISTDA. It was an eye opening experience for many of the Thai companies.
- Thailand was also the host of the ASEAN SCOSA meeting on satellite technology agreement between the ASEAN countries. The proposal was to develop a joint satellite for ASEAN especially for disaster planning, mitigation and management and the outcome of the meeting provided the roadmap for the joint ASEAN satellite program.

### Looking ahead to 2014

There are several reasons to look ahead to 2014 for Thailand. With the development of the Space Krenovation Park in Thailand, there are several activities planned for 2014.

- 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. The regional center is currently being developed in Sriracha and the building should complete by next year.
- Thai universities led by Thai's space agency, GISTDA, are cooperating to build the first cubesat in Thailand. GISTDA is also setting an adequate lab to test and develop other space related testing and integration facilities. There have been several rounds of discussion and finalization is definitely on the horizon for 2014.
- IYASA will be promoting their astro camp for 2014 and GISTDA will also be doing the same for its space camp. Currently, the venue has not been decided yet. The latest updates can be found on the facebook pages of IYASA and GISTDA.

Several other programs will develop in the next year as time draws nearer. Thailand is taking its first strides in space development and the next few years will be the most adventurous for all the young space enthusiasts in Thailand.

## REGIONAL REPORT

## Accomplishments in 2013

- The Regional Coordinators, Guzel Kamaletdinova and Damian M. Bielicki, appointed new NPOCs from 11 European countries, including some countries new to the SGAC.
- Although SGC and IAC took place in China in 2013, students and professionals from Europe gave a significant number of presentations during both events.
- During SGC/IAC the Ukrainian NPoC, Dmytro Faizullin, signed a Memorandum of Understanding (MOU) between the Council of Young Ukrainian Space Industry Workers and SGAC. From now on the Ukrainian citizens will be able to attend SGC and IAC thanks to the financial support provided. Similar MOUs were signed by SGAC with the World Space Week Association, Young ESA, the Future Space Leaders Foundation and QB50. Guzel and Damian are currently negotiating other MOUs which shall be finalized by early 2014.
- On 26<sup>th</sup> September 2013 a Space Day took place in Podgorica, Montenegro. It was an alternative for Europeans unable to attend SGC/IAC in China. The event was organized by the new NPOCs, Sanja Šćepanović and Aleksandar Jacimovic, in cooperation with the Department of Education of Montenegro. It was the first event of its kind in the country and the Balkans Region.
- To strengthen internal and external communication, European teleconferences were held once every four months. The European Facebook page remained very active.
- SGAC strengthened relations with organisers of the major events: Yuri's Night and World Space Week. Both were well attended and represented in Europe.

## Plans for 2014

- SGAC Europe aims to have each European country represented with an NPoC, especially in countries that have never had an NPoC before.
- The coordinating team will encourage more involvement in SGAC projects to strengthen the internal structure and communication. The regional strategy is also to strengthen relationships with other space outreach organisations across Europe.
- The regional coordinators will also focus on fundraising to allow people from the region to attend the 2014 SGC and IAC in Toronto, Canada.

## European Region Highlights

- SGAC in Europe widely celebrated the Yuri's Night and World Space Week to inspire the public.
- New NPoCs were appointed in Austria, Finland, France, Italy, Montenegro, The Netherlands, Norway, Poland, Romania, Russia and Sweden.
- To strengthen internal and external communication, European teleconferences were held once every four months. The European Facebook page remained very active.
- Space Day was held for the very first time in Montenegro in September 2013.
- SGAC was represented during the UN COPUOS sessions.
- Memoranda of Understanding were signed with 5 different organisations: Council of Young Ukrainian Space Industry Workers, World Space Week Association, Young ESA, the Future Space Leaders Foundation and QB50.
- SGAC leadership presentations at the International Space University Summer Program

## NATIONAL REPORTS

### ALBANIA NATIONAL REPORT

#### Overview

In November 2012 SGAC appointed Vojna Ngjekarri as the NPoC of Albania. Awareness of SGAC Albania increased this year thanks to cooperation with a local space forum named Scientific Club Universalb. The relationship between SGAC and Universalb was consolidated through an agreement, where the SGAC Albania could release all the vacancies and activities of SGAC in Universalb homepage in the Albanian language. The agreement is significant for bringing all space-related activities and organizations in Albania closer to the public. Our major aim is to increase the participation of the Albanian students in international space-related activities.

#### SGAC Developments during 2013

- The NPoC of Albania, Vojna Ngjekarri took part in the fifty-second session of the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space (COPUOS) held from 8-19 April 2013 at the United Nations Office at Vienna, Vienna International Center, Vienna, Austria.
- The delegation of Albania celebrated Yuri's Night. It was represented by NPoC Vojna Ngjekarri and Silvana Hysa, members of SGAC Albania.
- The fifty-sixth session of the COPUOS held from 12-21 June 2013 at the United Nations Office at Vienna was attended by NPoC Vojna Ngjekarri representing SGAC.

Fig. 64.



SGAC Executive Director Andrea Jaime and NPoC of Albania Vojna Ngjekarri at the 56<sup>th</sup> Session of the Committee on the Peaceful Uses of Outer Space 12-21 June 2013

Fig. 65.



NPoC of Austria Klaus Konfeld, UK Ryan Laird and Albania Vojna Ngjeqari with the UNOOSA Director Mazlan Othman during Yuri's Night 2013

Fig. 66.



NPoC of UK Ryan Laird with NPoC Vojna Ngjeqari at COPUOS April, 2013

### Goals for 2014

- Focus on forging collaborations with universities and governmental institutions
- Provide assistance to host and share information about a space course offered by the Scientific Preparatory Academy for Cosmic Explorers
- Continue to promote space and the SGAC to students via websites, presentations, and other opportunities
- Increase the number of active Albanian members within the SGAC to enhance the
- awareness of space
- Highlight upcoming events, competitions and vacancies

## ➤ AUSTRIA NATIONAL REPORT

### Overview

Thanks to several high profile events (World Space Week, Yuri's Night) and increasing cooperation with national space related organisations, especially the Austrian Space Forum (OeWF) and the Research Promotion Agency (FFG) awareness of SGAC in Austria increased significantly. Special



thanks to outgoing NPoCs Christopher Vasco (currently Co-Chair) and Klaus Kornfeld for their tireless efforts of spreading the word about SGAC in Austria. The newly appointed NPoCs are Julia Heuritsch and Reinhard Tlustos (also Communication & PR Team). SGAC was again well accepted by event organisers to act as co-organisers and consultants for public outreach.

## Highlights for SGAC Austria

### *MARS2013*

In February the Austrian Space Forum (OeWF) conducted an interdisciplinary, month-long Mars analogue mission in the Northern Sahara of Morocco. Several SGAC members volunteered for the mission and worked in multiple areas, including Flight Control, Science Support and Media Outreach.

<http://mars2013.owf.org>

Fig. 67.



### *Yuri's Night*

This year's Yuri's Night continued the success of last year's event. The Planetarium Wien generously provided the location for the event, which drew a large crowd, exceeding the capacity of the venue. This year's theme was "The World of Women" and speakers included the planetarium's director Werner Gruber, Mazlan Othman (UNOOSA), Lisa Kaltenegger (Max Planck Institute for Astronomy and Harvard University) and Claudia-Elisabeth Wulz (CERN). The OeWF (Austrian Space Forum) ended the official part by announcing the winner of this year's Polar Star Prize, which was awarded to Mazlan Othman.

([http://www.der-orion.com/index.php?option=com\\_content&view=article&id=940:yuris-night-kosmos-der-frauen&catid=82:termine-rueckschau&Itemid=157](http://www.der-orion.com/index.php?option=com_content&view=article&id=940:yuris-night-kosmos-der-frauen&catid=82:termine-rueckschau&Itemid=157))

### *Participation in SGC 2013*

This year saw another increase in Austrian participation at the SGC. Four Austrians attended the Congress in Beijing including Markus Enenkel, the winner of the first joint FFG/BMVIT/SGAC Space Apps Competition. Markus submitted the winning paper and won a scholarship paying for his travelling expenses. It is notable that the Austrians continue to be actively involved with the organisational team of SGC (Christopher Vasco as SGAC Co-Chair, Reinhard Tlustos and Klaus Kornfeld as official photographers).



### Space Exhibition

From 25<sup>th</sup> Oct 2013 until 29<sup>th</sup> June 2014, the Technisches Museum Wien (Vienna Museum of Technology) is hosting "SPACE – The Exhibition" in cooperation with ESA. It not only displays the history of space travel, how astronauts live in space and what we are looking for in space, but also explains how space technology is used in our daily lives. In addition, this exhibition includes many interactive stations intended to attract and inspire a mainstream audience. SGAC was represented by Reinhard Tlustos during the opening ceremony on October 24<sup>th</sup>.

([http://www.esa.int/ger/ESA\\_in\\_your\\_country/Austria/Das Technische Museum Wien laedt zu einer Reise durch Zeit und Raum](http://www.esa.int/ger/ESA_in_your_country/Austria/Das_Technische_Museum_Wien_laedt_zu_einer_Reise_durch_Zeit_und_Raum)), (<http://www.technischesmuseum.at/exhibition/space>)

### TUGSAT-1 & UniBRITE Launch

This year proves to be an historic year for the Austrian Space Sector. On February 25<sup>th</sup> the first Austrian satellites were launched into space in cooperation with the university of toronto TUGSAT-1 and UniBRITE. They are part of the BRITE nanosatellite constellation which is a purely scientific project investigating the brightness oscillations of massive luminous stars by differential photometry. The satellites are operational and will have finished with the final commissioning tasks by the end of the year.

<http://www.tugsat.tugraz.at/>

### Looking Ahead

SGAC Austria plans to continue and deepen the partnerships it has developed with the OeWF and the FFG and to reach out to other space-based organisations and the industry. In addition to the already established space events - SGAC members Christopher Vasko, Klaus Kornfeld and Reinhard Tlustos together with "der Orion" are organizing a SpaceUp Vienna unconference on 12 April 2014.

<http://spaceup.org/near-you/vienna/>

The new NPOCs are honoured and enthusiastic to accept the position and hope to serve SGAC well in the coming years.

## ➤ BELGIUM NATIONAL REPORT

### Overview

Belgium is a very blessed country when it comes to Space related activities. Belgium has two astronauts: Dirk Frimout, who 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 ISS followed by a 6-month stay on board the ISS in 2009. He became the very first European commander of the station. Consequently, there is a great amount 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. Because there are many high quality public and private initiatives as well as events organized by both professional and non-professional organisations, it is somewhat challenging for the NPOC's to host even more events. Instead SGAC Belgium understands its main task is to aid existing organisations, to reach more people and to aid in promoting events.

### Brief state of the space programme and non-SGAC activities in Belgium

- *beSPACE vzw/asbl*: A community of young space professionals and students who work, study or live in Belgium, founded in 2013. They meet 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 and aims to bring space closer to the youth. A specific event is the ODISSEA-Prize, which is awarded annually to one or more senior University students for their outstanding space related theses. (<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 a department in Belgium in Leuven/Brussel. It organizes lectures and offers visits at aerospace companies in and outside of Belgium. Each year they have a very active program.

<http://leuven.euroavia.eu/>

- *Planetaria and observatories*: Belgium is very blessed with an enormous amount of star-observatories. They offer activities almost every week, and especially on the *National Stargazing-days* each year in February/March, and during the annual Perseid meteor shower in august. Most stargazing opportunities, as for example lunar-eclipses, as there was this year, are announced in media several days in advance, which creates a lot of awareness in all layers of society.

### SGAC Belgium Developments and Activities 2013

The year 2013 was an exciting year concerning space activities for Belgium.

First of all, there was the founding of a new association, beSPACE vzw/asbl, for young space enthusiasts in Belgium. There is close cooperation between SGAC and beSPACE vzw/asbl. A space walking dinner was held at the kickoff event for beSPACE in March 2013 in the Planetarium in Belgium, with help from SGAC. Over 100 participants attended the event to hear Mr. Beka (High Representative of Belgium for Space Policy), Serge Van Herck (CEO, Newtec) and Jean-Pascal van Ypersele (UCL, Vice-chair of the Intergovernmental Panel on Climate Change) talk about the achievements they were the most proud of in their career in the space industry.

Since January 1<sup>st</sup> 2013, the Belgian Senate has taken over the Presidency of the 15<sup>th</sup> European Inter-parliamentary Space Conference. In March 2013, there was a dinner and visit to the European Space Center and Redu, organized by the Belgian Senate. NPOC Sarah Moens attended the visit, together with Andrea Jaime and Jeroen Van den Eynde.

The Plenary Session took place in Brussels in October 2013 and was dedicated to education for space. Sarah Moens, Chris Vasko, and Andrea Jaime attended the Session.

The Belgian National Trainee Programme (NTP) has been launched in 2013. Thanks to the NTP, a cooperation between BELSPO (Belgian government) and ESA, three young Belgian scientists or engineers can do an internship at ESA.

In October 2013, BELSPO (Belgian government) organized a press conference with Frank De Winne (astronaut) and Philippe Courard (state secretary for science policy). beSPACE participated and NPOC Maarten held a presentation about how students and young graduates can maximise their chances when applying for space internships, such as ESA YGT and Belgium's NTP programme. NPOC's Maarten and Sarah attended the conference.

In November 2013, SGAC in cooperation with beSPACE will organize a visit to the NASA Space Exposition - A Human Adventure in Utrecht (Netherlands).

## Tentative Plans for SGAC Activities in 2014

SGAC expects to organize more events, in cooperation with beSPACE and WIA. The NPoC's will continue aiding all space-related activities and organisations in Belgium, who continue to bring space in all its aspects closer to the public, and we will continue creating an exhaustive list of links to all of them. The NPoC's will also continue to elaborate on their specific tasks as representatives of the premier linking organization about space, for youth, as of ambassadors of Belgium in the SGAC community.

## ➤ BULGARIA NATIONAL REPORT

### Current State of Space Affairs in Bulgaria

#### *ESA and Bulgaria*

Bulgaria is not a member state of the European Space Agency (ESA), it has an observer status since 2011.

#### *National Space Activities*

Despite the fact that Bulgaria was the sixth country to send humans into space and had two cosmonauts (Georgi Ivanov in 1978 and Alexander Alexandrov in 1988), for the last two decades, the Bulgarian space programme has serious financial issues and faces a lack of strong domestic interest. As a result, many young people are currently working in leading space organizations abroad. However, the Institute for Space Research and Technology at the Bulgarian Academy of Sciences has performed a number of successful projects in cooperation with other countries. One of them is the "Obstanovka" experiment that takes place on the International Space Station.

#### *Legal Regulation*

Bulgaria is a signatory to all five UN International Space Law treaties but currently does not have a national law on space activities. The allocation of radio frequencies and GEO slots is regulated under the Telecommunications Law. A draft law providing for all space activities is currently under discussion in the Bulgarian Council of Ministers and in the Parliament.

#### *SGAC and Bulgaria*

Currently, Bulgaria is represented in SGAC by NPoCs Raycho Raychev and Rada Popova.

### Accomplishments in Bulgaria in 2013

#### *4<sup>th</sup> Edition of the Space Challenges Program*

The Space Challenges Program / <http://spaceedu.net> / became the largest space and advanced technology education initiative in the Balkans. In 2013 the program had its 4<sup>th</sup> successful edition. The students in the programme are currently developing four high-tech projects /read all the details on their blogs/:

- Exoskeleton system: <http://exoskeletonsc.wordpress.com>
- Stratospheric system: <http://stratoshuttle.wordpress.com>
- CubeSat Project: <http://cubesatsc.wordpress.com>
- Science Data Visualization for ACE Space Mission: <http://sciencedatasc.wordpress.com>

Following the tradition from the first editions of the programme, live lectures, workshops, and video-conferences were organized successfully. Representatives from the global communities attended, including those from NASA, ESA, Caltech, MIT, Stuttgart University, French National Space Program, Stanford University, and Oxford University. The curriculum of Space Challenges 2013 included core-

lectures separated in thematic modules: biotechnology, artificial intelligence, robotics, space medicine, neuroscience, aerospace engineering, space systems technologies and applications, nanotechnology, planetary sciences, astrophysics, policy and space law, business development and entrepreneurship studies. The participants were given final assignments that required a demonstration of multidisciplinary understanding of the high-tech sector and its applications.

### *Bulgarian Equipment Onboard the ISS*

Equipment developed and designed at the Institute for Space Research and Technology of the Bulgarian Academy of Sciences was successfully installed onboard the International Space Station. The “Obstanovka project”, an international initiative in cooperation with England, Poland, Russia, Ukraine and Czech Republic, is part of the global programme “Space Weather” and is designed to explore the environment around ISS - magnetic and electric fields, space plasma and the electric potential on the surface of the station <http://www.space.bas.bg>. The Bulgarian Institute for Space Research and Technology built four out of eleven devices for the experiment.

Furthermore, the scientific spacecraft “Bion-M”, launched on 19 April 2013, carried three Bulgarian radiation sensors onboard to monitor radiation levels in space.

### *Scholar Activities*

In 2013, a member of the Space Challenges team, Sergey Petrov was nominated for the Global Impact Competition and won a full scholarship for the Graduate Studies Program at Singularity University in NASA Ames Research Center <http://singularityu.org>. Overall, two of the ten Global Impact Competition Finalists were Bulgarians and both were from Space Challenges program.

Sofia University is successfully developing a M.Sc. Program of Aerospace engineering and communications <http://goo.gl/56B0ns>.

### *Space-related Competitions*

The Space Challenges Program partnered with Heineken to announce a space-related competition#80kmtospace, with the final goal of sending 3 Bulgarians for a simulated astronaut training in Houston.

Sofia University was one of the hosts to the biggest international space application competition of NASA on April 20-21 2013. One of the two Bulgarian finalist teams won the People’s choice award at the global final of the competition for their ChicksBook project.

### *Aerospace Business in Bulgaria*

A new aerospace company was created in Bulgaria – Special Concepts <http://www.specialconcepts.net>. The organization is currently working on two different advanced engineering projects: A Stratospheric Shuttle System and CubeSat Modular System.

## **Looking Ahead – Plans for Bulgaria in 2014**

The position of Bulgaria as the last EU state that has not yet signed the Cooperation Agreement with ESA will probably remain disputable as state administration is still indecisive on the matter. Educational and business initiatives that have proven to be extremely successful such as Space Challenges will continue to provide opportunities for young people and entrepreneurs to develop and apply their capabilities in the field of high technologies. Initiatives fostered by the academic and non-governmental sector that require an adequate state policy on space so universities and small and medium-sized companies develop space-related products will likely increase and continue to look for sponsoring from European funds such as Horizon 2020.

## ➤ CZECH REPUBLIC NATIONAL REPORT

### Current State

The Czech Republic built an underwater habitat to be used for training and research. It is scheduled to start its service on 26<sup>th</sup> November. The habitat will serve as a venue for training of divers as well as astronauts – extra-vehicular activities, training for flight to asteroids and planets (Mars, Moon). Research areas are psychology, physiology and botanic. The details about the project can be read on project's web: [www.hydronaut.eu](http://www.hydronaut.eu).

A team of scientists from the Czech Technical University (CTU) in Prague, Faculty of Electrical Engineering, Department of Measurement were part of a mission to locate the Chelyabinsk meteorite (recently pulled out from Chebarkul Lake). The team from Czech Republic believes it located the meteorite's position and measured its magnetic field. Samples were also collected.

Fig. 68.



Underwater habitat. Courtesy of hydronaut.eu.

Fig. 69.



Equipment for locating the Chelyabinsk meteorite.



Fig. 70.



### Accomplishments

The Czech NPoC published a paper 'Complete performance tests of an analogue sun sensor with improved linearity, variable slit and shutter distance' with a support of Surrey Satellite Technology. CTU's cubesat, CzechTechSat, and SGAC were represented on an outreach event – festival 'Kontejnery'. Interested people were introduced to activities of SGAC and CTU and CzechTechSat. In addition, other equipment was demonstrated. Some students were also invited to a full motion simulator in the CTU laboratories.

Fig. 71.

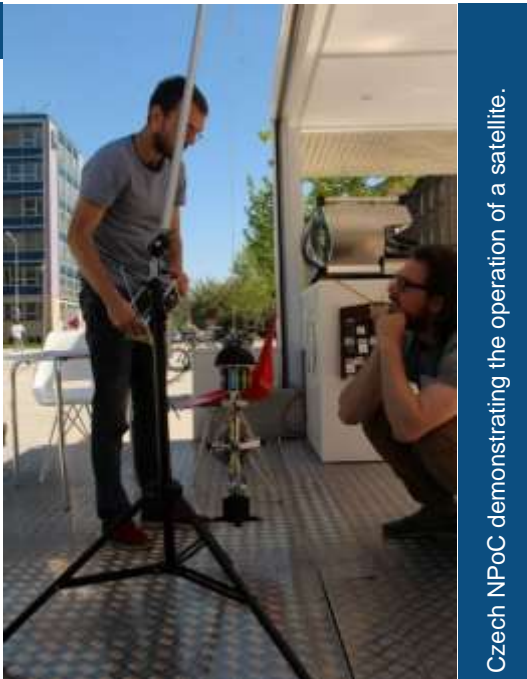


Fig. 72.



### Goals for Next Year

Goals include establishing collaboration with any interested subjects to provide sponsorship for SGAC. The sponsorship should allow interested people to join SGC 2014. Establish closer cooperation with a group Kosmoklub, which is currently one of the most active initiatives in the Czech Republic. Organize an outreach event for students from middle schools and universities about activities of SGAC and motivate them to get involved with SGAC.

## FINLAND NATIONAL REPORT

### Overview

After a long pause in SGAC activities, Finnish operations started again after the nomination of a new NPoC (Lauri Neuvonen) in early fall of 2013. Most of the Finnish activities have been aimed at restarting operations, for example, updating web pages and contacting relevant people.

### Accomplishments and Activities

One of the main developments in Finland was the birth of a new space community in the aftermath of the 2013 NASA Space Apps Challenge and the inaugural Spaceship event. During the fall, this community organised itself into an association called Spaceship and will, as its first main effort, organise next year's local Space Apps Challenge event. It is intended to be an upgraded version from last year. The Finnish NPoC was one of the founding members and is now a board member of the association. The long-term goal of the association is to create a national space community and an incubator to help create new companies and space related activity.

During the year, Finnish researchers and companies have participated in international space activities and research. Projects include: satellite mapping related to forestry, ESA's CryoSat and the Galactic Cold Cores Project that explores new stars being born. The Estonian EST-1 satellite also delivered a tether of a Finnish-developed electric sail into space for testing.

The core of Finnish space activities is formed around ESA's programmes, which involve approximately 30 Finnish companies and 20 research institutes. In addition to the Spaceship association, the Astronomical Association Ursa continues to provide Finns with opportunities and information on astronomy and space sciences.

### Politics

In politics, Finland received a new strategy for space activities in the beginning of the year. The four focus points of the strategy are:

- Support activities in the arctic areas through space technologies
- Open positioning data to reinforce competitiveness of services
- Upgrade of the level of scientific research based on ESA and EU programmes
- Respond to international competition by specialising and creating applications

These will advance the four sectors of the Finnish space activities: scientific research of space and the Earth, satellite mapping, satellite positioning and space industry.

### Looking Ahead – The Finnish Plans for the Future

The main issue for SGAC Finland activities in the coming year is to establish a network of companies, institutions, organisations and people. Since there exists a limited SGAC network at present, significant effort is required. The current plan is to build the network by using existing partners as a backbone to integrate the SGAC network into such organisations. One of the first tangible goals is to find a second NPoC to share the workload.

## ► FRANCE NATIONAL REPORT

### Overview

Despite the world economic crisis, many space events and projects in connection with the aim of the SGAC were accomplished in France during 2013. Other interesting space perspectives are expected to be reached in 2014.

### Accomplishments During 2013

*Focus on the 50<sup>th</sup> Paris Le Bourget International Aerospace Show, Paris Le Bourget, France, 17<sup>th</sup> - 23<sup>rd</sup> June 2013*

### Challenges faced by France in the Space Sector

France, the European leader in the strategic sector of space, faces several challenges, including the resurgence of the United States (telecommunications launches associated with Boeing and SpaceX) and the rise of emerging countries. Given this situation, COSPACE – a consultative state/industry committee – was established with the aim of developing technological roadmaps for the convergence of efforts of all national actors.

According to Geneviève Fioraso, the French Minister of Higher Education and Research, "Last November, in Naples at the Ministerial Council of ESA, we collectively began to meet this challenge through the decisions we have taken and for which I fought." This included:

- Ariane 6 was acted, a decision that should allow Europe to remain a market leader in satellite launches. The first priorities for 2013 to 2014 have been decided, with maximum synergy between Ariane 6 and Ariane 5 ME (Midlife Evolution) to be the focus
- European industry satellites should federate around the Neosat project, which is a new programme platform for innovative telecommunications satellites and electric propulsion
- France is a co-leader with Germany on Metop-SG, the European programme for operational meteorology; with a contribution of 27%<sup>1</sup>

<sup>1</sup> <http://www.enseignementsup-recherche.gouv.fr/cid72541/50e-salon-du-bourget-le-spatial-francais-un-secteur-d-excellence.html>

### The International Rocketry Challenge Competition

On June 21, the International Rocketry Challenge took place. Amateur rocket competitions aimed at American, English, and French college students took place during Paris Le Bourget International Aerospace Show. The United States ended up winning ahead of France and England.

Each team had to design, build and launch their own model rocket that carried a raw egg in to an altitude of 229 metres, remain in the air for 50 seconds and land the egg intact.

The French team was supported by engineers from Herakles (Safran), a company that specialised in solid propellant engines for space missiles and launchers. The Rocketry Challenge aims to give young people a taste for science and technology. It also aims to promote the aerospace industry and space while encouraging scientific vocations among young participants<sup>2</sup>.

### The 7<sup>th</sup> Student Aerospace Challenge

Since it was launched in 2006 at the initiative of Dassault Aviation, the Student Aerospace Challenge has been giving higher education students the opportunity to compete against each other as they work on a manned suborbital vehicle project.

Every year several work packages are proposed, covering all the aspects in the aerospace sector. A record 17 teams competed in 2013 in a variety of fields including propulsion, spaceport design and legal matters.

On June 21 at the 50<sup>th</sup> Paris Airshow, the 7<sup>th</sup> edition of the Challenge concluded with a ceremony held at the European Space Agency's (ESA) pavilion. With astronaut Jean-Pierre Haigneré and Head of ESA's Education and Knowledge Management Office Hugo Marée in attendance, the Challenge's partners awarded the six prize-winning teams with official diplomas<sup>3</sup>.

### The 18<sup>th</sup> Air and Space Forum

This forum took place during the three public days of the Le Bourget International Aerospace Show, held on June 21 through the 23<sup>rd</sup>. As one of the aerospace sector's leading employment, careers and training fair, the Air & Space Forum is a place for the general public to meet companies, educational and training establishments, trade associations, and to find out about careers and courses available in the aerospace industry, air transport and the defense sectors.

It helps to promote professional recruiting, as well as initial scientific, technological and vocational training courses, to a wide audience. 70 companies, training institutions and associations welcomed people looking for courses, apprenticeships and jobs<sup>4</sup>.

### *The ATV-4 "Albert Einstein"*

The 4<sup>th</sup> European resupply ship reached the ISS and docked to the Russian Zvezda module of the station on June 15<sup>th</sup>, 2013. Astronauts were able to transfer the equipment, food and oxygen it carried.

The 215<sup>th</sup> Ariane rocket (71<sup>st</sup> Ariane 5) orbited two communications satellites on August 29<sup>th</sup>, 2013. It was launched from the European Spaceport in Kourou, French Guiana.

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<sup>2</sup> <http://lebourget.safran-group.com/en-images/videos-16/rocketry-challenge-medaille-d-argent-pour-l-equipe-francaise.html>

<sup>3</sup> <http://www.dassault-aviation.com/en/dassault-aviation/news/2013-student-aerospace-challenge/>

<sup>4</sup> [http://www.paris-air-show.com/GB/GENERAL-PUBLIC/Espace-Emplois-et-Formations.htm#section\\_2798\\_12](http://www.paris-air-show.com/GB/GENERAL-PUBLIC/Espace-Emplois-et-Formations.htm#section_2798_12)



### *Appointments*

On April 3<sup>rd</sup>, the Council of Ministers appointed Jean-Yves Le Gall, Chairman of the French Space Agency (CNES).

Also in April, the Board of Directors of Arianespace appointed Stéphane Israël to become CEO of the company on April 22<sup>nd</sup>, 2013.

### *Conferences, Symposia and Exhibitions*

- Space Perspectives 2013" ("Perspectives Spatiales 2013"), January 15<sup>th</sup>, Pavillon Dauphine, Paris, France
- ECSL Practitioners' Forum 2013, "The Registration of Satellites – Legal Aspects and Practice", March 15<sup>th</sup>, Room A, ESA HQ, Paris, France
- 17<sup>th</sup> ISU Annual International Symposium, "Space technology and tele-reach: benefiting humanity on Earth and beyond", 5<sup>th</sup> - 7<sup>th</sup> March, ISU Central Campus, Strasbourg, France
- 11<sup>th</sup> ISU Executive Space Course, 22<sup>nd</sup> - 26<sup>th</sup> April, Strasbourg, France
- 1<sup>st</sup> Parisian SpaceUp, 24<sup>th</sup> – 26<sup>th</sup> of May, Directorate of Launchers, CNES, Paris: event organised by a community of space enthusiasts and bloggers. The CNES supported this innovative with Ariane 6 as a main thread
- ISU Space Studies Programme, was held June 24<sup>th</sup> through August 25<sup>th</sup> in Strasbourg
- "Explore Mars" ("Explorez Mars") held at the Cité de l'espace, 1 Avenue Jean Gonord, Toulouse, France, on September the 1<sup>st</sup>
- "Futurapolis, the meeting of technological and scientific innovation", 11<sup>th</sup> - 13<sup>th</sup> April, at the Centre de congrès Pierre Baudis, in Toulouse, France
- "International Space Apps Challenge: Meet the 50 Technological Challenges of NASA", was held in La Cantine, Paris and Toulouse, on April 20<sup>th</sup> and 21<sup>st</sup>. It consisted of innovative ideas and solutions to complex challenges and showed how space can help solve concrete problems on Earth.
- Conferences, Symposia and Workshops organised by ESA in France during 2013:
- [SMOS & Aquarius Science Workshop](#)  
15 - 17 April 2013, Ifremer, Brest, France
- [IVEC 2013 - Fourteenth International Vacuum Electronics Conference](#)  
21 - 23 May 2013, UIC-P Espaces Congrès, Paris, France
- 50<sup>th</sup> Paris Le Bourget International Aerospace Show, Paris Le Bourget, 17<sup>th</sup> – 23<sup>rd</sup> of June
- 23<sup>rd</sup> edition of "The Nights of Stars" ("Les nuits des étoiles") was held August 9<sup>th</sup> – 11<sup>th</sup> in Paris. CNES joined the event, which celebrated the Gaia satellite mission this year
- Euroconsult's World Satellite Business Week was held on September 9<sup>th</sup> – 13<sup>th</sup> at the Westin in Paris, France
- Science Festival (Fête de la Science) held October 17<sup>th</sup> – 19<sup>th</sup> at Place Carrée, Forum des Halles, Paris brought together 14 scientific organisations, including the CNES. It was an innovative free public event
- My city by satellite" ("Ma ville par satellite") took place inside the Luxembourg Station. CNES and the RATP offered the RER B travelers the exhibition "My city by satellite" in order to draw out urban diversity and the numerous problems of the city
- Les Mardis de l'espace took place in the heart of Paris. These evenings are open to the public from 19.30 to 21.30 at Café du Pont Neuf 14, Quai du Louvre in Paris

### **Looking Ahead: Plans for the Future of SGAC France**

Among the main perspectives we see:

- "Space Perspectives" ("Perspectives Spatiales 2014"), to take place in January 2014. Place to be announced



- ECSL Practitioners' Forum 2014, "The Registration of Satellites – Legal Aspects and Practice", Friday March 15<sup>th</sup> at Room A, ESA HQ, in Paris, France
- Euroconsult's World Satellite Business Week, 8<sup>th</sup> – 12<sup>th</sup> of September

These perspectives will offer new opportunities to share ideas on space issues and to set new goals. We are convinced that they will attract many space enthusiasts from all over France.

## ➤ HUNGARY NATIONAL REPORT

### Overview

Hungary used to be an active member of the SGAC in early the 2000's. Unfortunately, over the years many industry contacts have been lost. In 2012, Hungary returned to the SGAC with a newly appointed NPoC. Since then, the focus has been on rebuilding connections with the organisation and presenting SGAC to as many Hungarian students and young professionals as possible.

### Achievements in 2013

SGAC Hungary activities were carried out with collaboration and active help from the Hungarian Astronautical Society (HAS) (MANT in Hungarian abbreviations). Founded in 1956, this is the oldest Hungarian non-profit space association. This society gathers Hungarian space researchers, users of space technology and everyone who is interested in the interdisciplinary and state-of-the-art uses of outer space. HAS has been a voting member of the International Astronautical Federation since 1959. Members of this society participated in the UNISPACE III conference when SGAC was established.

#### *One step closer to the ESA*

In June, Hungary officially announced its request to join the European Space Agency (ESA). A few months later, the start of the negotiation phase was approved by the ESA council. Meanwhile, the PECS (Plan for European Cooperating States) has been extended until the date of entry into use of the Agreement of Hungary's accession to the ESA Convention. The latest this can take place is the 5<sup>th</sup> of November, 2015.

#### *Cubesat, European Space Expo, Yuri's Night*

In February, Hungary celebrated the first birthday of the first Hungarian cubesat. At the time of submitting this report, Masat-1 is still operating.

In March, SGAC actively helped Budapest with the European Space Expo.

In April, we organised two Yuri's night events in two different Hungarian cities (Budapest, Sopron) with the Hungarian Astronautical Society.

#### *Hungarian Space Camp for Students*

Since 1994, a one-week-long space camp has been organised every year for Hungarian students interested in space technology. In 2013, the camp was held between July 7<sup>th</sup> and 13<sup>th</sup> in the Hungarian city of Alsomocsolad. During the programme, the activities of SGAC were presented to the participants.

#### *Day for Space Research*

This event was organised by the Hungarian Astronautical Society on the 18<sup>th</sup> of October in Szekesfehervar, Hungary. It was a one-day event for the general public and included a workshop

about the possibilities of Hungary being an ESA member state. The Hungarian NPoC had the opportunity to present the activities of SGAC during this event.

#### *Promoting SGAC inside and outside of the Hungarian Astronautical Society*

The communication tools of the Hungarian Astronautical Society (e.g. newsletter and forums) were used to promote SGAC among Hungarian students and young professionals. SGAC Hungary is looking to contact the Hungarian Space Office at the Ministry of National Development as well.

#### *Connection with a Hungarian News Portal*

Space World ('Urvilág' in Hungarian) is a non-profit Hungarian space news portal that was established in 2002 with the goal of bringing space news, events and developments closer to the Hungarian general public. The portal took an inside look into Hungarian SGAC activities and related news that appeared during the year.

#### *Representing Hungary in SGAC*

The Hungarian NPoC participated in the spring Eurotelecon and was the only Hungarian at the Space Generation Congress in Beijing.

#### **Looking Ahead – the Plan for the Future of SGAC Hungary**

Hungarian students and young professionals participated successfully in the ESA's REXUS/BEXUS programme. Hopefully, these active young Hungarians will be involved in SGAC Hungary in the future.

We intend to increase the number of Hungarian SGAC members in 2014.

The list of planned events are as followed: an event for Yuri's night in April, organising a Hungarian Space Academy for university students and young professionals, possible virtual collaboration between students from different countries during the Hungarian space camp in June, an event for World Space Week, and presenting SGAC in Hungarian public space forums.

## **IRELAND NATIONAL REPORT**

### **Overview**

Ireland NPoCs worked together throughout the year to promote space and SGAC throughout the country. The Gathering Ireland 2013 provided the perfect excuse to reach out to friends and family who have moved away, and invite them back to Ireland to celebrate at the numerous events organised throughout the year. This has been a great success. Some highlights included the Lynx & Nanoracks competitions, Space Generation Congress in Beijing, ISU's space studies programmes and much more. As usual Irish universities were heavily involved in various space related research projects and competitions. A company from Dublin secured an ESA coastal monitoring contract. It's the first time an ESA Earth Observation project has been led by an Irish group and was secured with support from Enterprise Ireland.

### **Activities**

#### *ISU's Space Studies Programme (24<sup>th</sup> June – 23<sup>rd</sup> August)*

Several Irish participants attended the International Space University's [Space Studies Programme](#) which was held at ISU's campus in Strasbourg, France. In its Masters & Summer programme, ISU offers its students a unique core curriculum covering all disciplines related to space programmes and enterprises. Irish NPoC Dr. Norah Patten was yet again a chair on the summer programme which has been pivotal for promoting SGAC.

*Alpbach Summer School 2013 (July 16<sup>th</sup> – July 25<sup>th</sup>)*

This year Alpbach hosted a ten-day intensive course of lectures, workshops and projects which provided indepth teaching on space science and space technology subjects. This year's theme was, "Space Weather: Science, Missions & Systems". Enterprise Ireland currently funds Irish students to attend this annual event.

*'Future Power Day' (August 2013)*

Ireland's NPoCs continued to promote space and SGAC in Ireland with presentations at Engineers Ireland headquarters in Dublin. SGAC, space education, and upcoming space events were all discussed in an entertaining presentation which included a video of the Curiosity landing on Mars.

*Nanoracks Competition*

Transition year students were invited to look to the stars as part of a once-in-a-lifetime opportunity to design an experiment and test it in space. The Irish Centre for Composites Research (IComp), based out of the University of Limerick, through its partnership with NanoRacks LLC, is offering one lucky team of transition year students the opportunity to send their research to the International Space Station. Ireland's NPoC Norah Patten is the project leader and also the communications and outreach manager at IComp.

*The Lynx Competition*

The Lynx competition is being run by Space Expedition Corporation (SXC) and is giving 22 people from across the globe a chance to see the Earth from space. Ireland's NPoC Dr. Norah Patten got through to the London finals after successfully ranking high on the national voting pole in Ireland. Norah had a busy couple of months of consistent promotion via interviews including appearances on national television, radio, magazines, newspapers, social networks and online media. This was invaluable promotion for space in Ireland. Norah really inspired people of all ages throughout the country during this relatively tough economic environment.

The 7<sup>th</sup> Irish Earth Observation Symposium took place in Teagasc, Dublin in October. There were a good variety of researchers and companies presenting on how they utilise Earth observation satellite data in Ireland and across Europe.

The European Space Expo held in Trinity College Dublin on June 4<sup>th</sup> through the 9<sup>th</sup> was attended by Irish NPoC Patrick Crowley.

**Goals for 2014**

- Increase the number of active Irish members within the SGAC to enhance the awareness of space and the organisation.
- Highlight upcoming events, courses and competitions.
- Continue to collaborate with space associated parties in Ireland to build the SGAC Ireland homepage as a focal point for space information and networking in Ireland.
- Continue to promote space and the SGAC to students via websites, presentations and other opportunities.

Fig. 73.



Dr. Norah Patten: Lynx Competition

Fig. 74.

European Space Expo held in Trinity College Dublin on June 4<sup>th</sup> through the 9<sup>th</sup>.

## ➤ ITALY NATIONAL REPORT

### Overview

2013 was dedicated especially to growing the Italian young space generation community, which is quite spread over the peninsula. Matteo Emanuelli, who renewed his second term as NPoC, welcomed Giulia Federico as Co-NPoC in October. Giulia is a space policy expert, ISU alumni and very much involved in the International Association for the Advancement of Space Safety.

## Accomplishment in 2013

Although it was not possible to obtain any kind of scholarship from Italian entities to support Italian space generation members to take part at SGC and IAC 2013 this year, six delegates – master students, PhDs and young professionals – represented the Italian delegation that went to Beijing. Among them was Massimo Vetrivano who won the “Move an Asteroid 2013” paper competition.

Fig. 75.



SGAC members Luca Nardocchia and NPoC Matteo Emanuelli presenting their papers at IAC 2013 in Beijing

In order to facilitate communication between Italian SGAC members, the NPoCs have created a mailing list to help spread information that is relevant to Italian SGAC opportunities and competitions. The mailing list will also be used to brainstorm and coordinate new initiatives.

Space TV, the Italian channel on science, space, and aeronautics invited Matteo Emanuelli for a special programme dedicated to the launch of ATV-4.

<http://www.youtube.com/watch?v=imXQIPVBTNA>

<http://www.youtube.com/watch?v=1taBoCELyxE>

<http://www.youtube.com/watch?v=4c7uLFiaGek>

SGAC and the space branch of Sapienza Aerospace Student Association (SASA) from University La Sapienza in Rome are on the verge of signing a Memorandum of Understanding (MoU). According to the preliminary draft of the MoU, SASA will commit to organise a conference every year in Rome to present SGAC and its activities to the students.

SGAC member Valentina Boccia is organising a Women in Aerospace branch in Naples.

## Looking Ahead

In 2014, the NPoCs will work to arrange MoUs similar to the one signed with SASA with other associations on the peninsula.

The NPoCs have approached the Italia Space Agency (ASI) in order to arrange a competition that will permit Italian students to take part at SGC and IAC 2014 in Toronto, Canada.

## LITHUANIA NATIONAL REPORT

### Accomplishments

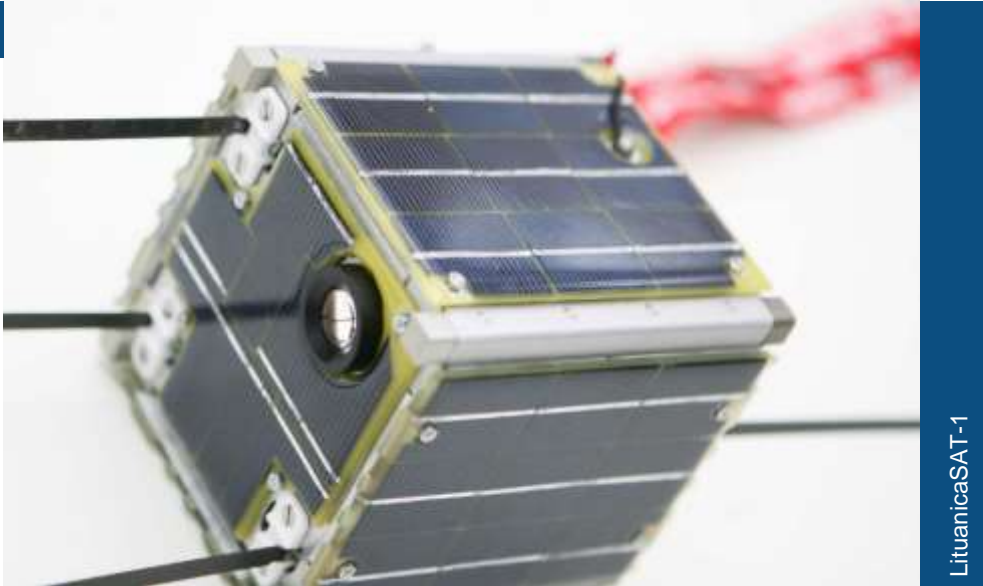
At the end of 2012 the following 3 major goals have been raised by SGAC Lithuania:

- Raise sufficient funds to build and launch the first Lithuanian satellite
- Create a dedicated website for the satellite project
- Organise presentations at Lithuanian universities and conferences, including “SEMWO 2013”



The first goal was the most challenging and demanding. Work on the satellite conceptual design began in June 2012 during the internship of then master students Vytenis Buzas and Laurynas Mačiulis (NPoC Lithuania) at the NASA AMES Research Centre. The project was named LituanicaSAT-1 to honor the 80<sup>th</sup> Anniversary of the flight across the Atlantic by Lithuanian-American pilots Steponas Darius and Stasys Girėnas.

Fig. 76.



LituanicaSAT-1

One of the keys to the project's success was having a talented and passionate team of young engineers, professionals, radio amateurs and researchers from Vilnius University that joined forces together to fulfill a dream of launching the country's first satellite. Work was carried out on a voluntary basis while industry partners and patronages sponsored the manufacturing and procurement of the hardware components. This would not have happened if not for the active public outreach campaign that was organised by the team. The official project homepage – [www.kosmonautai.lt](http://www.kosmonautai.lt) – was launched on April 12<sup>th</sup> with the Facebook page [facebook.com/Lituanicasat1](https://facebook.com/Lituanicasat1) launched well beforehand. Presentations about the project were made during major space related events such as “SEMWO 2013” and the European Space Expo held in Vilnius.

Fig. 77.



Project team during the presentation of the satellite at Vilnius University.

LituanicaSAT-1 is an educational project. Its primary mission objective is to provide university students and young engineers with knowledge and real hands-on experience in satellite engineering, thereby helping to develop infrastructure and know-how in space technology by interdisciplinary interaction between academia and industry in Lithuania. The satellite is scheduled to launch to the ISS on December 15<sup>th</sup>, where it will be deployed into orbit using the JEM remote manipulator system. You can read more about the project at [www.kosmonautai.lt](http://www.kosmonautai.lt)

### National Space Based Events

- On 17-22 September, the [European Space Expo](#) was held in the capital city of Vilnius in Cathedral Square, attracting a very high number of visitors. Registered classes were able to attend special tours led by LituanicaSAT-1 developers Vytenis Buzas and NPoC for SGAC Laurynas Mačiulis.
- 4<sup>th</sup> International Conference on "Space Economy in the Multipolar World" ([SEMWO 2013](#))
- On 6<sup>th</sup> of June, the [Lithuanian Educational CanSat \(CS\) and Unmanned Aircraft \(UAV\) Competition](#) was conducted at the Ignalina aerodrome in the north of Lithuania.

### Goals for 2014

- Maintain full mission support during the operations of LituanicaSAT-1 satellite.
- Work together with Vilnius University to integrate space into the official university programme.
- Organise educational presentations in various schools around Lithuania to promote space science and technology amongst the younger generation.
- Raise funds for the next Lithuanian satellite mission.
- Increase space awareness in the society by organising public events related to space activity.

## ➤ MONTENEGRO NATIONAL REPORT

### Overview

This year for the first time Montenegro appointed its first NPoCs. A recently formed and relatively small country, Montenegro carries out few space activities at the present. The existing activities include astronomic observations by local astronomical societies and scientific outreach by the Ministry of Science and the Montenegrin Science Promotion Foundation, PRONA.

### Space Day (26<sup>th</sup> of September)

The first NPoCs and members of the Organization of Montenegrins Studying Abroad (OMSA) brought novel space ideas to their fellow youth by organising the first Space Day in Montenegro. Space Day took place on the 26<sup>th</sup> of September during Open Science Days in the capital city, Podgorica. The event was organised by OMSA in cooperation with the Montenegrin Ministry of Science and received considerable media attention throughout the entire country.



ORGANIZATION OF  
MONTENEGRINS  
STUDYING ABROAD

Space Day took the form of a TEDx event, where five young space-professionals from five different European countries presented their work and research to the respectively large audience. The conference was organised at the new and modern Atlas Capital Center.

Fig. 78.



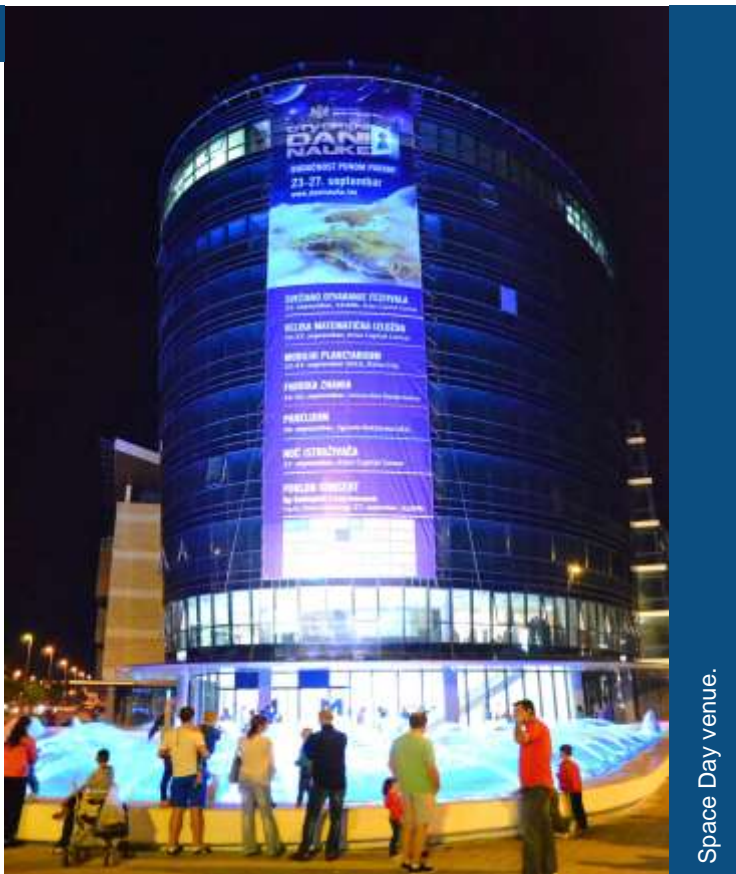
The speakers at the first Space Day in Montenegro: Dr. Jessica Flahaut from France, Ashley Dale from the UK, Dr. Michale Johnson from Ireland, Dr. Guzel Kamaletdinova from Russia and Dragos Bratasanu from Romania presented their high-quality and interesting speeches to the Montenegrin audience.

Fig. 79.



Space Day speech.

Fig. 80.



Space Day venue.

Fig. 81.



Ashley Dale presenting during the Space Day

See the following websites for more information:

<http://omsa.me/me/projekti/otvoreni-dani-nauke-2013>

<http://daninauke.me/>

### Night of Explorers

Night of Explorers is a youth-related science event that occurs every year as part of Open Science Days. It aims to promote scientific activities, particularly space activities. This year the event brought some space speakers and allowed students to take part in different types of scientific experiments.

<http://festivalnauke.me/2013/>



## Goals for 2014

- Increase the number of Montenegrin members within the SGAC network.
- Continue to promote space through conferences and through channels such as OMSA
- Work on organising space-related courses at the University of Montenegro

## ► NETHERLANDS NATIONAL REPORT

### Accomplishments in 2013

From 2010 to the end of 2012, NPoC Lex Meijer represented the Netherlands. He managed to find two successors from within the Netherlands Space Society (NVR). Peter Batenburg and Susanne Pieterse have been officially assigned as the new NPoCs of the Netherlands as of June 2013.

Peter works at EADS Astrium in Bremen for the International Space Station. As Operations Support Engineer he provides support to the European Flight Control Team (located in Munich) for the European Columbus module. During his free time, he keeps himself up to date on the latest news in space and tries to promote spaceflight by, amongst other things, writing for the magazine “Ruimtevaart” (Spaceflight), which is published by the Netherlands Space Society (NVR).

Susanne works as a legal consultant and project manager in spatial planning. During her spare time she is the social media manager of Astronomy Society Astra Alteria and the Netherlands Space Society. As an amateur-astronomer she loves to tell the public about space and to show them the stars and planets through a telescope on ‘open days’ with Astra Alteria. Spaceflight fascinates her even more. This started at the age of six, when she saw pictures of astronauts standing on the Moon during a television show about the 20-year anniversary of the first lunar landing. It is her goal to work in the space industry.

### Key Events of 2013

#### *52<sup>nd</sup> Legal Subcommittee of the UN COPUOS*

NPoC Susanne Pieterse attended the first three days of the 52<sup>nd</sup> session of the Legal Subcommittee of UN COPUOS as a representative of SGAC. Together with fellow NPoCs Vojna Ngjeqari (Albany) and Ryan Laird (United Kingdom), Susanne got to experience how diplomacy works at the UN. She wants to thank SGAC for this great opportunity.

#### *Yuri's Night 2013, Leiden*

On April 13<sup>th</sup> the fifty-second celebration of the first human space flight blasted off. This year many space students and professionals attended, including several SGAC members.

#### *Exposition: NASA - A Human Adventure*

The traveling exposition “NASA - A Human Adventure” landed in Utrecht in the Netherlands on June 20<sup>th</sup> in presence of Apollo 16 astronaut General Charlie Duke. This exposition was previously held in Stockholm, Madrid and Istanbul, and after the Netherlands, will go to Tokyo. NPoC Peter Batenburg is, together with other space enthusiasts and professionals, part of a team of tour guides who want to inspire visiting groups with their own stories, experiences, backgrounds and passions.

The organisation provides the possibility for national space interests to present as well. The exposition in Utrecht contains ‘Dutch Dimensions’ that show plans and achievements involving Dutch astronomy, planetary sciences and space technology spin-offs. In addition, ESA’s ESTEC has an exhibition on past and current missions in Earth observation, human spaceflight and deep space exploration.



### General Assembly of the Netherlands Space Society

On Thursday, June 20<sup>th</sup> the Netherlands Space Society had their General Assembly. During this event the new NPoCs for the Netherlands, Peter Batenburg and Susanne Pieterse, were introduced by Tanja Masson-Zwaan (NVR board member and SGAC advisory board member). The GA was held at 'NASA - A Human Adventure' and included an exclusive visit and tour on the official first day. At the GA a large group of SGAC members were present. This illustrates that the NVR serves as a good place for SGAC members to meet and expand their network in the space industry.

Fig. 82.



On the photo several SGAC members (from left to right): Remco Timmermans, Chris Vasko, Carmen Victoria Felix, Tanja Masson-Zwaan (NVR boardmember and SGAC advisory board member) and Susanne Pieterse (NPoC for the Netherlands).

Fig. 83.



Dutch astronaut André Kuipers interviews Apollo 16 Lunar Module Pilot general Charlie Duke during the NASA - A Human Adventure exposition opening.

### Movie Nights, Delft

Together with TUDelft and ISIS (Delft), the Netherlands Space Society organised two movie nights where the movie 'Moon' and the episode 'Spider' from the series 'From the Earth to the Moon' were shown.

### SpaceBorrel, Leiden

In March and July the Netherlands Space Society (NVR) organised the SpaceBorrel (space social). While enjoying a drink, professionals in the Dutch space industry, SGAC members, NVR members and others interested in space had the opportunity to catch up with each other and network.

### *Visit to the Dutch Youth Association for Astronomy*

Chris Vasko presented the SGAC to the Dutch Youth Association for Astronomy during their volunteer weekend on October 12<sup>th</sup>. He showed the new SGAC video, gave an overview of what we do and presented SGAC using slides.

### *3-Hour Exhibition Tour*

On October 19<sup>th</sup> NPoC Susanne Pieterse organised a visit to the exhibition NASA - A Human Adventure with members of Astronomy Society Astra Alteria and the observatory of Amersfoort. NPoC Peter Batenburg was their guide during the 3-hour tour. The group of 17 learned a lot about spaceflight. Peter and Susanne had a great time working together.

### *SGAC at the Nacht van de Nacht (Night of the Night, night about light pollution)*

On October 26<sup>th</sup>, the nationwide event Nacht van de Nacht was organised. During the night, many events take place to draw attention to light pollution. NPoC Susanne Pieterse was in Kootwijk for a large event that involved many organisations that protection the environment as well as the Astronomy Society Astra Alteria. The booth of the Astronomy Society was used to advertise SGAC.

### *Symposium: Private Commercial Spaceflight in the 21<sup>st</sup> Century: Vehicles and Payload*

A symposium was organised by Alphasparks to elaborate on the status of commercial spaceflight and the possibilities for flying microgravity experiments. The event was attended by a large group of NVR members, both NPoCs, and representatives of the Dutch and international space industry (e.g. Virgin Galactic).

## **Outlook 2014**

The new NPoCs would like to continue with the directive of the previous NPoC: Intensifying contact with other NPoCs and foreign students and employers that reside in the Netherlands and to create more involvement and outreach via social media.

The NPoCs would like to implement this directive via the following plans:

- Improve SGAC brand awareness
  - (Further) introduce SGAC to potentially interested parties
    - Youth Association for Astronomy
    - Students of the International Institute for Air & Space Law
    - Students studying space engineering 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
    - Dutch space events
  - Set up of direct SGAC information distribution among SGAC members (members to be polled for interest in this communication)
  - Promotion of contacting NPoCs for question and ideas
- Organise events
  - SpaceUp
  - Visits to the NASA: A Human Adventure exposition
- Further develop cooperation with Dutch space societies

- Develop closer communication with Delft aerospace engineering study society 'VSV Leonardo da Vinci' and 'Vis Viva'
- Develop further synergies with the Netherlands Space Society 'NVR'.

### Special Thanks to Our Predecessor

Peter and Susanne would like to thank the former NPoC Lex Meijer for his encouragement and support. Thanks to him The Netherlands is on the SGAC map. Peter and Susanne will continue his work.

## ➤ NORWAY NATIONAL REPORT

### Accomplishments in Norway

In March 2013, a new white paper on Norwegian space activities (Meld. St. 32) was presented to top-level politicians for the first time in 27 years. The document reflects the Norwegian National Space Policy core values, which seek to optimise the value of Norwegian space activities. The document also provides an evaluation that takes into account the significant developments that have taken place in the Norwegian space industry over the past 27 years. The Norwegian government places a particular significance on the potential of developing new services, systematisation, and turnover of satellite data into useful information. The political strategy seeks to leverage the Norwegian space industry with respect to these areas.

The Norwegian company Norsk Titanium was awarded a 4.5-year contract from ESA's AMAZE (Additive Manufacturing Aiming Towards Zero Waste and Efficient Production of High-Tech Metal Products) project. On the 15<sup>th</sup> of October, the Norwegian company presented their new techniques for 3D printing. The event, which took place in London, included press coverage from CNN and BBC. Norsk Titanium is also about to qualify their 3D-printing methods to produce parts for the aerospace- and space industry giant Astrium.

In September 2013, the Search and Rescue (SAR) station in Svalbard, the northernmost part of Norway, was completed. The station makes up a part of the ground segment of Galileo and acts as a part of the European contribution to the global COSPAR SARSAT system. The Norwegian satellite company Kongsberg Satellite Services AS operates the station in Svalbard on behalf of the European Union.

Former student Marianne Bakken was awarded the 2013 Norwegian Industry Forum for Space Activities (NIFRO) prize for her outstanding work on the NTNU Test Satellite programme, where she contributed as part of her Master's thesis. Her work included the evaluation of image processing algorithms with regards to movement-induced blurriness.

In the context of the Axe Apollo Space Academy that was announced by astronaut Buzz Aldrin earlier this year, Norwegian NPoC Tale Sundlisæter was selected by Norway's national committee to represent Norway at the Global Space Camp in Florida. The contest promises to send winners to space academy, where global winners will be selected to fly aboard a rocketplane into a sub-orbital flight.

The global event Yuri's Night was held for the first time in Norway on April 12<sup>th</sup>. Space Generation Advisory Council in Norway arranged the event in collaboration with the student organisation Realistforeningen at the University of Oslo. The event consisted of presentations by Marianne Moen, head of Communications at the Norwegian Space Centre; Hans Amundsen, founder of Earth and Planetary Exploration Services AS and AMASE; and Christopher Hoftun, CEO of the Norwegian Mars Institute.

## Current and Future Space Activities in Norway

In January 2013, the Norwegian Space Centre announced the planning of a Norwegian satellite that will be built to investigate solar radiation, space weather, and maritime traffic. The new satellite, to be launched in 2015, will also carry a more advanced AIS receiver than what is currently onboard Norway's first satellite – AISat-1, which was launched in June 2010.

Since early 2013, the Norwegian Mapping Authority Kartverket has been delivering weather data from the ionosphere to the ESA SSA (Space Situational Awareness) Programme. The data is being collected from a network of ground sensors in the Arctic, which are contributing to more accurate and earlier predictions of space weather at a global level. Norway has a long tradition of northern lights and space weather research, given the country's geographical location, makes it well suited for geomagnetic storms and northern lights observations.

In summer 2013, AMASE (Arctic Mars Analog Svalbard Mission) carried out comprehensive testing of the ExoMars instruments including the PanCam, the CLUPI microscope, and a Raman-spectrometer that analyses minerals. The instruments were tested on several lava streams in Svalbard, of which the highest altitude of testing was at 1000 metres above sea level. AMASE is an annual expedition that was founded by Norwegian planetary researcher Hans Amundsen in 2003. It is one of few projects where ESA and NASA scientists and engineers get together to carry out interdisciplinary work on various space projects.

In June 2013, the Serpentine Robots for Planetary Exploration (SERPEX) conceptual study began with financial support coming from ESA. Collaboration between the Norwegian Sintef/Robotnor, the Norwegian Centre for Interdisciplinary Research in Space (CIRiS), and the Norwegian Space Centre produced a study that investigated what types of snake robots are best suited for operations in space. There are areas where rovers may fall short and this study takes into account what tasks could be best handled by rover missions and which tasks might go more smoothly with robotic snakes.

## ➤ POLAND NATIONAL REPORT

### Overview

2013 was an intense year for the Polish space industry. Most of this year's actions were related to its recent membership into the European Space Agency.

### Student Activities

Tests of the Amelia 2 rocket, which is built by the Warsaw University of Technology, took place, as did experiments of the Świtezianka balloon that is able to reach the stratosphere. Additionally, students are preparing the second Polish student's cubesat – PWSat 2.

### Activities of Local NGOs

#### *Astronomia Nova*

Yuri's Night in Kraków entailed several science lectures and a party for space enthusiasts.

#### *Kujawsko-Pomorska Turist Organisation*

The Astro Festival that took place in Zławieś Wielka on June 15<sup>th</sup> 2013 featured many events for space enthusiasts. Special guests included Polish astronaut Mirosław Hermaszewski and ambient music composer and astronomer Przemysław Rudź.

*Stowarzyszenie Moja Białoleka:*

Dni Odkrywców Kosmosu (The Days of Space Explorers) took place in the Białoleka, Warsaw district. Lectures for grade school students were given and at the end of the event there was a picnic.

*Stowarzyszenie ARDiS*

The First Astronautical Meetings took place in Opole. Older students presented popular science talks to the younger members in the audience.

**Conferences and Workshops**

The 13<sup>th</sup> European Workshop on Astrobiology Conference was organised by the European Astrobiology Network Association (EANA) in Szczecin. It was attended by 118 recognised scholars and young researchers from 24 countries including the United States, countries from the EU, Brazil, Iran, Chile, and Japan. Although astrobiology is currently not very popular in Poland, every event connected to this field is important.

**Contests***University Rover Challenge (URC) 2013*

Polish teams from the Białystok University of Technology and Wrocław University of Technology won first and second place, respectively. Another Polish Team from Rzeszów University of Technology also participated in the URC.

*AstroBot*

AstroBot is a two-stage contest for students. In the first stage, participants must write essays that include a proposition of a space exploration mission. In the second stage, there are robotic workshops and competitions to see which team has the best idea. Winners were sent to the NASA Kennedy Space Center. The Mars Society – Poland and the Polish National Fund for Children, prepared the contest.

*Space Generation Advisory Council*

Szymon Moliński was selected to become the new NPoC for Poland.

**Goals for 2014**

- Organise the “Second Astronautical Meeting in Opole”, which should entail astronautical workshops that emphasise electromechanic spacecraft systems such as those found in the Copernicus and Galileo programmes. This conference should be designed for students, scientists and industry workers from the south-west part of Poland
- Organise special scholarships for young scientists to provide space-oriented presentations
- Organise the first Polish Space Tweetup that was originally postponed in February 2012
- Increase the awareness of the importance of space throughout the general public by improving opinions and giving context as to why space is important to Poland

## **PORTUGAL NATIONAL REPORT**

**Current State of Space Affairs in Portugal**

After more than a decade as a member of the European Space Agency, Portugal has achieved a stable situation and managed to establish industries and research institutes to execute space activities



under ESA's supervision while ensuring a return of its investment. Portuguese NPOCs believe there is room for improvement regarding communication links and collaboration between the main national space players, as it seems the sector is segmented into different sub-sets, such as: industry, academia, space policy, scientific education outreach, and general public. We believe that the younger generation can help bridge this gap.

### 2013 Accomplishments

A variety of events took place in Portugal throughout 2013. They ranged from winning international student competitions, to the more conventional organisation of conferences. They include the following:

#### *Café da Ciência ("Science's Coffee Break")*

On April 19<sup>th</sup> 2013, industry leaders, academic representatives and decision makers informally discussed the relationship between Portugal and the space industry. "Science in Space, Opportunities on Earth", was the theme of the event that took place at the Portuguese Parliament Library, and was organised by the Ciência Viva and the Conselho dos Laboratórios Associados, an association that unites scientific laboratories across the country.

Under a relaxed atmosphere, it was the perfect opportunity for a group of parliament members from all political spectrums, distinguished representatives from the national space industry and scientists coming from research institutes and universities with activities in space, to converse and debate the current state of space activities in the country.

#### *7<sup>th</sup> International Workshop on Satellite Constellation and Formation Flying (IWSCFF)*

The 7<sup>th</sup> IWSCFF took place in Lisbon on March 13<sup>th</sup>-15<sup>th</sup>. In addition to the keynote lecture and the round table discussion, there were 62 presentations by participants from more than 10 countries. The final programme can be found at: <http://iwsccf.astrodynamics.org.pt>

#### *European Space Expo in Lisbon*

The European Commission launched the European Space Expo, a free interactive exhibition that illustrates the services and applications derived from the major European space programmes in the domains of satellite navigation (Galileo and Egnos) and Earth observation (Copernicus). The exhibition was held in Lisbon December 4-9, 2013.

#### *Semana da Ciência e Tecnologia 2013 (Science and Technology Week 2013)*

During Science and Technology week, held 18-24 November, scientific institutions, universities, schools, and museums opened their doors to the public, giving them an opportunity to meet their local space experts.

#### *Participation in International Space Events*

Portuguese NPOC Luís Ferreira participated in the SGC and IAC 2013 in Beijing, China. He took part in the Industry Working Group and had an active role in helping this year's organisation team during SGC, and spreading the word about SGAC throughout the IAC. He established several important contacts with Portuguese representatives during IAC. Luis also attended the ISU SSP Alumni Weekend. This year the event took place in Strasbourg, France.

### Looking Ahead - 2014

Next year we intend to find a second Portugal NPOC. The current NPOC, Luís Ferreira, is engaged in finding a suitable person for the role. This is an important step for establishing a strong presence in the country so that SGAC can contribute to and profit from Portugal. Moreover, we will improve SGAC visibility not only by official national channels, but also through independent scientific and educational

blogs. We have identified that this type of outreach is the most effective. We also intend to collaborate with the Ciência Viva programme, which is a channel of the Ministry of Science and Technology and whose goal is to promote scientific and technological culture among the Portuguese population.

So far there are no activities planned for 2014 directly under the SGAC Portugal umbrella. Nevertheless, there is a list of activities and events that we intend to follow up on and whenever possible create an impact. These events include the following:

- 2-6 June: 9<sup>th</sup> International ESA Conference on Guidance, Navigation & Control Systems in Porto
- Yuri's Night
- Science and Technology Week 2014

## ▶ ROMANIA NATIONAL REPORT

### Accomplishments in 2013

#### *Experiment Collects Data from 2500m Depth in the Mediterranean*

In Magurele, Poland, the Institute of Space Sciences (ISS) successfully coordinated the preparatory phase of an international experiment called KM3NeT, which is an undersea telescope with a volume of 6 cubic km in the Mediterranean. KM3NeT will study neutrinos of astrophysical origin and simultaneously will be an important tool in the search for dark matter in the universe.

The device, which is referred to as "Mini-DOM", was installed on one of the vertical underwater structures of KM3NeT in the spring of 2013 at a depth of 2500m in the Mediterranean Sea and has an optical module prototype for the KM3NeT experiment. Currently the device meets all the initial requirements called for so the data provided can be analysed within the KM3NeT collaboration.

This effort involves collaboration between teams of researchers, engineers and technicians from France, Italy and the Netherlands. KM3NeT has over 200 members from 40 European institutes and has been a part of the ISS consortium since April 2007. KM3NeT draws benefits from the expertise and experience of the ANTARES project.

The objective of KM3NeT is to build an observatory to study "light" neutrinos in the universe. They can originate from distant sources such as gamma-ray bursts, supernovae, collisions between stars, or unknown sources that the experiment could find.

### Activities in 2013

#### Researchers Night

Researchers Night was held in 12 cities, but most notably at the University Alexandru Ioan Cuza and University of Iasi. Along with a consortium of institutions with strong research programmes, the evening had similar events organised in Iasi, Cluj, Timisoara and Craiova. Institutions involved included:



the University of Craiova, the West University of Timisoara, Bucharest University, the National Institute for Laser, the Plasma and Radiation Physics Institute, Babes-Bolyai University, the Institute of Space Science and the Antipas Museum.

In Iasi, participants froze flowers, vegetables, and rubber with liquid nitrogen and watched how they crumbled. We used the power of vacuum to break plywood with Ping-Pong balls and we produced lightning while invited participants to pedal a bike to find out how much energy they produce. In Bucharest, we prepared experiments in Tineretului Park. Experiments included transmitting electrical signal through people, defying gravity with the cylinder that rolled up a hill, and music from a harp without strings. In addition, research labs of some institutions and the Antipa Museum were open to the public. They offered several special activities such as auditioning of insect sounds, which allowed participants to understand researchers' work.

Students and children, who were the target audience, had the opportunity to participate in an art and science photo contest, a paper airplane competition, and give science presentations. This spectacular event, which was supervised by teachers and researchers, allowed for hand-made experiments to be created.

### World Space Week

On the WSW 2013 website there were 123 events registered in Romania (~11% of the total 1130 events registered worldwide), spread all across the country. Of which, 66 were mapped (~12% of the total of 553 mapped events).

The events consisted of various activities and involved kindergarten, primary, middle and high school students as well as their teachers, researchers and charity foundations. Just to see a small part of what was going on in Romania during World Space Week, we've highlighted two events:

#### *World Space Week at the "Carturesti" Bookstore – Timisoara*

In October, the "Carturesti" bookstore in the Iulius Mall hosted several presentations dedicated to astronomy, robotics, and astronaut training. The presentations were moderated by Virgiliu Pop, a researcher at the Romanian Space Agency.

#### *World Vision Romania Foundation – Constanta: Children of the Cosmos*

Some activities held by World Vision Romania Foundation during the World Space Week included: visits to Constanta's Planetarium, an astronomy contest, an essay contest, a "Cosmic Landscapes on Earth" photo contest, educational games for children about our solar system's planets, planet modeling activities for kindergarten children, and an Extraterrestrial Cross Party for kids.

### **Plans for 2014**

We look forward to continuing the KM3NeT collaboration. We are also enthusiastic about participating in the upcoming annual space events that take place in Romania. We hope for Romania to have a stronger impact on international space-related matters and we will do our best to maintain and improve the relationship of SGAC with the Romanian space industry.



## ➤ RUSSIA NATIONAL REPORT

### Overview

This year, several state organisations hosted space events for young people, which is a good sign the government is increasing its awareness of the new space generation in the country. A very inspirational event took place this year and was celebrated all over the world – the 50 year anniversary of Valentina Tereshkova's space flight, who in 1963 became the first woman in space.

Fig. 84.



Photograph of Valentina Tereshkova after the historic space flight [1].

### Space Events During 2013

#### *Korolev Readings*

The main goal of the reading was to teach young people about space education. Dozens of teachers and students from different regions participated in the lectures and presentations. The event included interesting visits to space museums and videoconferences with astronauts on the ISS [2].

#### *Rocket Fest*

Rocket Fest is an annual event that takes place at multiple locations around the country. Young people and children can gather to demonstrate and test their model rockets.



Fig. 85.



Photograph of one of the Rocket Fests in 2013 [1]

### MDRS

From April 20<sup>th</sup> through May 4<sup>th</sup>, a Russian youth team made a two-week stay at the Mars Desert Research Station (MDRS) in Utah. The station, organised by the Mars Society (non-profit U.S. organisation), is designed to simulate a stay on the surface of Mars. It was the first time every member of the team was Russian ("Team Russia").



### CanSat Russia

CanSat Russia took place for the second time this year. It is an innovative educational project used to launch school satellites. The project was organised by NNIIYAF MGU and the Memorial Cosmonautics Museum. The CanSat concept is a real satellite model weighing only 350 grammes and is composed of a power supply, satellite computer and scientific payload. Applications for this programme are open for 2014 [4].



Fig. 86.



CanSat Russia official logo and a photograph of a can satellite [3].

### Star Relay and Manned Spaceflight

A Star Relay competition was held at the Gagarin Research & Test Cosmonaut Training Centre (GTC) to find the most creative space-oriented contributions from students this year [6].



In November, GCTC held a conference on Manned Spaceflight [7].

#### *Other Space Conferences and Events*

- All-Russian Conference with International Participation, “Space Technologies Application for Arctic region development” [8]
- “Aviation and Space 2013” at the Moscow Aviation Institute [9]
- “Fundamental and Application Space Research” conference for young scientists [11]
- “Space Patrol” scientific work competition for students [12]

#### *SGAC Activities*

This year we welcomed new NPoC for Russia Aleksandre Khokhlov, who has become an active and enthusiastic SGAC member. He and his team participated in MDRS as the first Russian team and who later published an article in the SGAC newsletter.

NPoCs are constantly updating the SGAC page on Russia’s largest social network. They announce main SGAC events and scholarship opportunities.

#### **Future Plans of SGAC Russia**

Some of the NPoCs may attend the Horizon 2020 conference, which will be held in Moscow next year. This will be a good opportunity to talk with heads of companies and state organisations about SGAC, our mission, and the chance for these entities to become partners or sponsors.

We continue to advocate for SGAC at every space event possible and spread information about SGAC amongst students and young professionals.

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## **SERBIA NATIONAL REPORT**

### **Introduction**

Serbia is a country in transition and therefore, interest in space and space-related sciences is unfortunately very low. Serbia does not have any agencies or institutions that relate to space-oriented science with the exception of a few random courses partially relate to space.

Nevertheless, the NPoC has been trying to promote space, especially space law. They have written several papers on space law and starting this year, will be in working towards a PhD in Law at University Union. The NPoC’s thesis will be related to space law.

## Activities During 2013

- A Serbian team participated in the Manfred Lachs Space Law Moot Court Competition that took place in Rome.
- The Center for the Promotion of Science organised several space-related activities during 2013.

## Conclusion and Plans for 2014

Summary of the plans for the following year:

- Promote space sciences through social networks like Facebook and LinkedIn
- Develop space law in Serbia
- Connect with relevant international and EU institutions and legal experts

## ► SLOVENIA NATIONAL REPORT

### Current State of Space Affairs

#### *Slovenia Building its First Satellite*

The Slovenian Centre of Excellence for Space Sciences and Technologies (SPACE-SI) is developing a high precision interactive remote sensing mission for acquiring multi-spectral images and real-time HD video.

The mission is based on an Earth-monitoring and observation microsatellite and is being developed in collaboration with the Space Flight Laboratory (SFL) at the University of Toronto Institute for Aerospace Studies.

The satellite will be capable of capturing a ground sampling distance (GSD) of 2.8 metres on its panchromatic channel and 5.8 metres on multispectral channels from a design altitude of 600km and will carry two optical instruments – a narrow-field instrument as well as a wide-field instrument.

The spacecraft will be capable of performing real-time imaging, attitude control and video streaming over Slovenia and other regions where it will be in view of a ground station with the appropriate setup.

The ground station consists of two antennas. The smaller of the two is being setup on the roof of the electrical engineering faculty and the larger is near Pomjan. The smaller antenna will be primarily used for transmitting data to the satellite, while the large antenna will be reserved exclusively as a receiving antenna.

With a well positioned and adaptable ground control station – covering areas of the Alps, the Pannonian Plain and the Mediterranean – the Centre of Excellence SPACE-SI will become attractive for many research and development groups around the world and will offer support for communications with their satellites during flights over areas the ground station will cover.

This will open up possibilities for accessing different kinds of data, information, technologies and services with a high added value not only for Slovene space activities, but also for ESA members and the wider international community.

### Looking Ahead

SGAC Slovenia will, despite the harsh austerity measures that affect activities and interest for space itself, further support raising space awareness in Slovenia and support Slovenian students interested in space-related areas by motivating them to become new SGAC members.

## ► SPAIN NATIONAL REPORT

### Overview

During 2013, Space Generation in Spain was focuses mainly on two areas: working with schools to increase awareness about space and related sciences among the students, and offering support and guidance to SGAC members in order to find space-related jobs within the country.

### Outreach

In March, SGAC spent a morning with students between 8 and 9 years of age, at an elementary school in the North of Spain. We had excellent feedback from the students as can be read in their blog (<http://blog.educastur.es/mjesusd/2013/03/26/taller-de-astronomia/>). Teachers were also very happy with the results. For that workshop, some outreach material was developed in Spanish in the form of a PowerPoint that can be used in future workshops.

We were also invited to perform another workshop using similar material in a rural school in the North of Spain. This workshop was held during the last week before Christmas.

Fig. 87.



NPoC Abigail Calzada-Díaz and students from C.P. Villalegre, Avilés.

Fig. 88.



A moment during the workshop at the C.P. Villalegre, Avilés.

### Networking

Due to the complicated financial situation in Spain, many of our members expressed their worries about finding jobs in the space industry in Spain. SGAC would like to be a reference for guidance and support to these students and young professionals. In fact, most of our time is used in spreading news and vacancy information that we receive from third-party organisations, companies, and the Spanish

government. Public vacancies are often announced in the B.O.E. which is a diary used by the Spanish government to announce public jobs and laws.

### Global Exploration Roadmap

Together with UK NPoCs, we developed a short survey to gather the views and perspectives of students and young professionals regarding space exploration. We were invited to present our conclusions in a meeting hosted by the Royal Astronomical Society in London. We presented a poster that was well received according to the good reviews and comments gathered. In addition, we were invited to write a paper on young perspectives for the Global Exploration Roadmap by Space Policy Journal editor Jill Stuart.

Due to the good feedback received, we will continue working on this in collaboration with SGAC members in the UK and UKSEDS. Hopefully we will have many other organisations, including some that are Spanish.

## ➤ SWEDEN NATIONAL REPORT

### Overview

In 1961 the launch of the small rocket Plutnik marked the beginning of the Swedish space age. Since then, Sweden has been an important part of the space industry with satellites such as Viking, Freja, Astrid 1&2, Odin and the recently launched Prisma.

The Swedish space programme is carried out by means of extensive international cooperation, in particular through Sweden's membership of the European Space Agency (ESA). The main goals of the Swedish space programme are to promote the use of space for public applications (e.g. environment, climate, communication and transport), and to increase the competitiveness of the Swedish space industry and its scientific institutions. Most of the activities funded by the Swedish National Space Board are carried out in cooperation with other countries.

The Swedish National Space Board also supports research within the areas of astronomy, space physics, earth observation, atmospheric research, astrobiology, human spaceflight, and material sciences in microgravity. Institutes conducting research in space related fields include universities such as Chalmers University of Technology, the Royal Institute of Technology, Stockholm University, Lund University, and the Karolinska Institute. Moreover, the Swedish Institute of Space Physics (IRF) is a governmental research institute that conducts research and postgraduate education in atmospheric physics, space physics, and space technology. It has provided instruments on the Swedish satellites Viking, Freja, Astrid 1, Astrid 2, Munin and Prisma, as well as on many international satellite missions.

Another good example of Swedish space activities can be found at the Esrange Space Center, which was founded in 1966. It offers an exclusive opportunity for atmospheric sciences and micro gravitational research. It is also one of the busiest civilian satellite ground stations with over 500 rockets having been launched since the founding. Esrange Space Center is a part of the Swedish Space Corporation (SSC).

Sweden has been a member state of ESA since it was founded in 1972. So far, Sweden has one astronaut, Christer Fuglesang, who has spent 26 days in space. He has flown two missions to the International Space Station and with 32 hours of spacewalk, he is the most experienced astronaut within ESA.

## Current State of Space Affairs

### *REXUS/BEXUS Programme*

Each year, two REXUS rockets and two BEXUS balloons are launched from the Esrange Space Centre in Kiruna, Sweden. Payloads are typically student experiments from ESA membership countries. During 2013, team MUSCAT from the Royal Institute of Technology (KTH) and SOLAR from Luleå University of Technology launched their experiments on REXUS 13. In 2014 ISAAC we be part of the REXUS 15/16 campaign. For more information about the REXUS/BEXUS programme, please visit: <http://www.rexusbexus.net/>.

### *International Science Festival in Gothenburg*

With hundreds of activities and over 60,000 visitors, the International Science Festival in Gothenburg is one of Europe's leading popular science events and the only one of its kind in Sweden. It took place on April 23<sup>rd</sup> – 28<sup>th</sup>. For more information, please visit: <http://vetenskapsfestivalen.se/english/>.

### *Rymdforum*

Rymdforum 2013 was held in Trollhättan, Sweden on the 18<sup>th</sup> and 19<sup>th</sup> of March. This event is a gathering of important representatives from the space industry, the Swedish government, universities and research organisations throughout Sweden. More information (in Swedish) can be found at: <http://rymdforum.wordpress.com/>.

### *CEAS 2013*

CEAS 2013 is a joint event merging the fourth biennial CEAS European Air & Space Conference and the eighth triennial Flygteknik Congress on Aeronautics and Astronautics. Flygtekniska Föreningen, the Swedish Society of Aeronautics and Astronautics will arrange it every third year from this point forward. The event was held in Linköping, Sweden on the 16<sup>th</sup> – 19<sup>th</sup> of September. For more information follow the link: <http://www.ceas2013.org/>.

### *Geek Girl Meetup 2013: Enter Space*

Geek Girl Meetup is an un-conference for geeky girls interested in web, code and business development. The goal is to create new networks and elevate female role models in the industry. This year Geek Girl Meetup was held on May 25<sup>th</sup> and 26<sup>th</sup> in Stockholm with the theme "Enter Space". Speakers included women from the Institute of Space Physics, the start-up company Umbilical Design, teachers and artists. They shared their knowledge and experiences to inspire the younger girls in attendance. More information can be found at: <http://geekgirlmeetup.com/>.

### *Accomplishments in 2013*

The NPoC roles in Sweden have been vacant since December 2012. Effectively starting October 2013, 2 new NPoCs for Sweden began their work. New NPoCs for Sweden are Louise Lindblad and Fredrik Persson.

## Looking Ahead – Plan for the Future of SGAC Sweden

- Inform the public about SGAC at universities and in industry
- Inspire the younger generation towards careers in space business
- Start a dialog with space companies, research organisations and space media outlets in Sweden
- Update the Swedish SGAC webpage with an events calendar for 2014



## ► UKRAINE NATIONAL REPORT

### Accomplishments in 2013

For 2013, in Ukraine, there were several productive events and effective actions that took place: scientific youth conferences, seminars, exhibitions, forums, sports competitions and other space related events were held throughout the country.

The Fourth International Conference “Space Technologies: Present and Future” has become one of the most significant events in Ukraine’s space sector. The conference took place on 17 – 19 of April, in Dnepropetrovsk under the aegis of the International Academy of Astronautics. Around 400 representatives from 22 countries took part in the conference. The Yuzhnoye State Design Office, Yuzhny Machine Building Plant PA, Dnepropetrovsk National University and the National Space Agency of Ukraine traditionally sponsor the conference. Participants discussed new trends in space, advanced developments in rocket technologies and provided new insight into global space problems.

Fig. 89.



The Fourth International Conference “Space Technologies: Present and Future”.

A great contribution to the promotion of space science and space technology among pupils, students and young scientists was made by the National Center of Aerospace. Throughout 2013, this organisation has conducted the following events:

- The XV International Youth Scientific and Practical Conference "Human and Space" was held under the aegis of the International Astronautical Federation on April 10 – 12. The conference reaffirmed the high intellectual, technological and industrial potential of Ukraine and the unquenchable interest of youth in space science, space investigation, launch vehicle design and work areas related to space.
- The XI All-Ukrainian Research-Educational Conference of Pupils "Star Way" was held on April 22<sup>nd</sup> and 23<sup>rd</sup>. During the conference, young scientists represented and defended their original research in various areas including astronomy, physics, natural phenomena, space ecology, technical creativity, rocket modeling, and computer technology. This knowledge was shared with peers from many different regions of Ukraine.
- A scientific reading entitled "Dneprovskaya Orbits" took place on September 19<sup>th</sup> through the 21<sup>st</sup>. The conference was devoted to the 100<sup>th</sup> Anniversary of V.S. Budnik’s birth. He was a pioneer of rocket and space technology, an academic at the National Academy of Sciences in Ukraine, and a well-known professor of the sciences. There were presentations about various issues related to the humanitarian aspects of missile and space technology including the history, education, and environmental impact of space activities on society. Worldview developments in these areas were presented during the event.
- Every summer top aerospace students and winners of the conferences and contests enjoy the opportunity to take part in the “Suzirya-Artek” and “Suzirya-Laspi” aerospace festivals.

The Council of Young Ukrainian Space Industry Workers (CYUSIW) is especially active in organising events for younger people interested in space. Over the past year, the organisation has done a fantastic job supporting and stimulating young Ukrainian professional in the space sector.

Fig. 90.



The Council of Young Ukrainian Space Industry Workers

Main CYUSIW activities:

- The "Best Young Worker of the Ukrainian Space Industry" competition was held to promote professional growth of those working in the space industry. Candidates were encouraged to submit abstracts of their special contributions to a production of science and space development.
- The VIII Annual Youth Sports Contest of the Ukrainian Space Industry was held on the base of the National Space Facilities Control and Test Center on June 3<sup>rd</sup> through June 8<sup>th</sup>.
- The 6<sup>th</sup> meeting of the Council of Young Space Workers of Ukraine (CYSWU) was held September 9<sup>th</sup> – 14<sup>th</sup>. The meeting, which is organised every two years, is held for the purpose of electing a new head and determining the direction of the council and its members. Space companies send youthful representatives to take part in this event.

Other events:

- The development of a Ukrainian youth satellite by Yuzhnoye SDO and NCAEY, two prominent aerospace universities in Ukraine, became more intense this year.
- Yuri's Nights were held in the Ukrainian cities of Kiev, Kharkiv and Zaporizhie.

### SGAC Activity

Over the last year SGAC Ukraine conducted the following activities:

- Reports about SGAC projects and possibilities for Ukrainian youth were presented at the Council of Young Ukrainian Space Industry Workers and "Yuzhnoye" State Design Office's Youth Council.
- Information regarding SGAC events was promoted through social networking.
- Coordination with student councils of leading space education institutions in Ukraine was established.
- A memorandum of understanding between SGAC and CYSWU was signed during SGC in Beijing.

Fig. 91.



The signing the memorandum of understanding between SGAC and CYSWU.

### Looking Ahead – Plans for the Future of SGAC Ukraine

- Establish contacts with additional student councils of Ukrainian space universities.
- Look for financial support to the participation of Ukrainian youth at SGC 2014.
- Conduct scientific seminars, forums, sports contest, and culture events in coordination with CYUSIW.
- Participate in NAECY events to promote SGAC.
- Present reports about SGAC and its events at youth conferences held in Ukraine.

## UNITED KINGDOM NATIONAL REPORT

### Current State of Space Affairs in UK

As part of the [UK Civil Space Strategy](#), two major elements were unveiled in Oxfordshire at the Harwell Space Cluster: Satellite Applications Catapult and the European Centre for Satellite Applications and Telecommunications (ECSAT), the UK's new ESA Centre.

A number of key announcements were made at the UK Space Conference. The UK secured a Metop weather satellite contract and the UK Government is providing an extra £60m of funding to Reaction Engines to develop their innovative concept of a single stage rocket propulsion system called Skylon.

Following the ESA Ministerial last year, where the UK Government increased contributions to a microgravity experiment, ELIPS, it was announced this year that British ESA astronaut Tim Peake is assigned to a six-month mission to the International Space Station (ISS) in 2015-16.

The British space sector was more recently commended in a report by the House of Commons Scientific and Technology Committee as a multi-billion success story “with an average growth rate of almost 7.5 per cent. The sector has the potential to be a great success story for the UK economy, with ambitions to increase its annual turnover ... to £40 billion by 2030”.

We helped the UK to be in the top five countries that had the most events for World Space Week 2013. UKSEDS celebrated their 25<sup>th</sup> anniversary with a sold-out conference, while the British Interplanetary Society (BIS) celebrated their 80<sup>th</sup> anniversary during World Space Week. The Royal Astronomical Society (RAS) and Royal Aeronautical Society along with the British Astronomical Association and many other organisations also run frequent events to ensure that space continues to thrive in the UK.

## Accomplishments in UK in 2013

### *Building Connections*

We attended the European Space Solutions conference & European Space Expo, a major three-day conference that included Minister of State for Universities and Science, Rt. Hon. David Willetts and Richard Branson.

Ryan attended the 8<sup>th</sup> Appleton Space Conference in December 2012, which included Prof. Dame Jocelyn Bell Burnell and Doug McCuiston, the NASA Mars Programme Director speaking about the Curiosity Mission, alongside again, Rt. Hon. David Willetts.

As Secretary of UKSEDS (UK Students for Exploration & Development of Space), Ryan is well positioned to be in touch with the 18 to 25 year old age group. Jane has helped the UKSEDS committee with various aspects such as their conference, outreach events and accounts. Both have been involved in helping the BIS Events, Media, and Education & Outreach sub-committees.

Jane had a summer internship at the University of Leicester. Internationally, she attended the post-Alpbach workshop, and worked for 10 days in the multinational Remote Science Support Team of the Austrian Space Forum Mars analogue mission in Morocco during February 2013. This led to a conference poster at EGU in Vienna and a visit to the European Space Policy Institute (ESPI) and the SGAC head office. She attended the “Impact cratering and its role in the evolution of life” astrobiology school in Estonia, and the NASA/CLRN Field School at the Sudbury Basin.

Ryan worked as intern for SGAC between January and April and attended the UN COPUOS Scientific & Technical and Legal Subcommittees (STSC & LSC), presenting conclusions from SGC 2012. In the summer, Ryan also attended the International Space University (ISU) Space Studies Programme (SSP) following a successful application for a scholarship from the UK Space Agency and ESA. Along with Emmanuelle David (SGAC Projects Co-Lead), Ryan gave an introduction to SGAC to other ISU participants.

### *Space Policy in the UK*

Jane attended a reception at Parliament for the announcement of Tim Peake’s mission to the ISS in 2015 and enjoyed a cross-party Science and Engineering debate attended by the main UK political parties, who appeared in good agreement about the need to ring-fence and improve science funding.

In June, Ryan attended an “Introduction to Science Policy” workshop by Newton’s Apple at the House of Commons, Westminster. The workshop gave a great insight into the workings of the UK parliamentary system and was a good platform to introduce SGAC to those interested in space policy. Ryan recently became a prospective member of the International Institute of Space Law (IISL).

SGAC held a useful meeting with the London Institute of Space Policy and Law (ISPL), which has agreed to share relevant information on their mailing lists. Jane attended the Westminster session of the European Planetary Science Congress (EPSC) intended for scientists to present and debate science issues with members of the Parliamentary Space Committee.

SGAC UK surveyed “Young perspectives on the Global Exploration Roadmap” in order to compile results for the RAS Discussion meeting on 8<sup>th</sup> November, which were displayed on a poster, and will later be published by the journal Space Policy.

### *Outreach and Education*

Both UK NPoCs are members of the BIS Education and Outreach committee. Jane took up the mantle for World Space Week in the UK and managed to co-ordinate and publicise 71 independent events taking place around the country. This is remarkable when compared with the 17 events that took place



in 2012. UKSEDS has expanded its outreach portfolio with events such as the Big Bang Fair and Cheltenham Science Festival.

Ryan and Jane are both STEM ambassadors and support outreach activities in the UK. Jane volunteered for the Ice Worlds stand at the Royal Society Summer Science Exhibition, and for the UKSEDS and Kennedy Space Centre stands at the Big Bang Fair. Additionally she gave presentations at Space School UK and Hockerill Anglo-European College. Jane attended a weekend in the Lake District with the International Space School Educational Trust and the UK Planetary Forum January “Early Career Scientists’ Meeting”. Ryan regularly helps manage UKSEDS outreach activities and is currently supporting activities at the UNAWE (Universe Awareness) office in Leiden, Netherlands.

The British Interplanetary Society has been funded by the Department for Education (DfE) to produce a top-level proposal demonstrating the need and feasibility to develop a modular space MOOC (Massive Open Online Course) targeted at 16-18 year olds. They are keen to eventually accredit the course as an International Baccalaureate or A-level. Jane is involved in helping to develop the top-level syllabus content for the initial proposal and is consulting with appropriate experts.

#### *Media and Communications*

As enthusiastic writers, Jane and Ryan have blogs and are active on social media, one of the best ways to connect with young people in the UK. Jane was invited to be on the Space Boffins podcast in February and ran the Twitter account for the European Planetary Science Congress (EPSC). Ryan manages the UKSEDS Twitter and Facebook accounts and helps post SGAC-related material that may be of interest to UKSEDS members. Jane has also accepted an invitation to join NASA Social activities surrounding the MAVEN launch to Mars.

#### *Other Notable Events*

The UK boasts a rich space heritage, which has led to a large number of high profile space visitors during the year. Jane went to the nearly sold out talk by Alan Bean (Apollo 12) in Pontefract, with over 450 attendees, and will be meeting Nobel Prize winner Peter Higgs and Stephen Hawking next month when they open a new exhibition at the Science Museum in London. Jim Lovell (Apollo 13) accepted the Guild Award of Honour for Aviation Heroism and Professionalism at the London Science Museum.

The Sir Arthur Clarke awards were held at the UK Space Conference in July, recognising achievements across a range of UK space activities. It was another successful year for NASA’s Mission X initiative, to get 9-12 year olds to ‘Train Like An astronaut’, which is popular in the UK.

#### **Looking Ahead – Plans in UK for 2014**

In the next year, we look forward to the UK Space Environments Conference and RAL Space Conference completing 2013, followed by the 26<sup>th</sup> UKSEDS National Conference in February and the Farnborough International Airshow in July 2014. The UK Centre for Astrobiology in Edinburgh is hosting the European Astrobiology Conference in October, and the UK Space Agency is looking to increase outreach activities in the run up to Tim Peake’s assignment to the ISS in 2015. A team for looking into the logistics of running a SpaceUp UK unconference has been formed.

We plan to reach out more to the full SGAC age range by writing for Space:UK, a publication by the UK Space Agency. SGAC NPoCs hope to appear on at least one space-related podcast. Ryan is currently drafting a space policy event that will take place later next year and be aimed at young people in the UK. Hopes to bring together his connections from UN COPUOS, ISPL, IISL and ESPI.



Fig. 92.



UKSEDS volunteers at the Big Bang Fair, 2013

## REGIONAL REPORT

The space sector in the Middle East saw continual growth over the previous year. The hard work has resulted in several major accomplishments throughout the region.

Following the launch of Turkish satellite Göktürk-2 in late 2012, on 28<sup>th</sup> January 2013, Iran successfully launched the Pishgam probe (Pioneer), which carried a monkey to an altitude of 120 kilometres and safely returned it back to Earth. Additionally, Turkey sought allies to work with in an attempt to grow its space operations. They successfully signed a treaty with China which, starting in 2014, will benefit both countries' space capabilities.

These positive initiatives also affected the SGAC as our network continues to grow rapidly. With Mahsa Taheran's term ending as the Regional Coordinator, Behnoosh Meskoob was elected as the new Regional Coordinator. In 2013, SGAC had its first NPoCs nominated from Egypt and Palestine. They join Ayman Mahmoud (Egypt), Ashraf Nabil (Egypt), Aisha Saleous (Palestine), Mohammadreza Rezaei (Iran) and Hisham Deek (Lebanon) as new NPoCs to the region.

## NATIONAL REPORTS

### EGYPT NATIONAL REPORT

Space development in Egypt has started thanks to interest from the youth population. Many space-related activities and projects have been initiated. Here are some of the major highlights:

- For the first time, some undergraduate aerospace students had the opportunity to conduct summer training at the National Authority for Remote Sensing and Space Science (NARSS)

Fig. 93.



Aerospace Students.

- "Cu-cube Satellite", the first cube satellite designed and implemented by Egyptian undergraduate students, won the best project in the Computer category at the Egyptian Engineering Day (EED)
- The Astronomical Society of Mahmoud Mosque (AASM) held many outings for observing astronomical phenomena and sky gazing

Fig. 94.



AASM Outing.

- For the second time in row, the aerospace department at Cairo University was ranked first among all other engineering departments and faculties, which demonstrates that the younger generation is starting to become aware of the space industry
- Several students attended the 5<sup>th</sup> Nano-satellite Symposium in Japan as well the pre-MIC 3 (19-25 Nov). Some students presented their ideas for solving problems with the use of nano-satellites.

## IRAN NATIONAL REPORT

- On the first of January, the Second Iranian Space Club Meeting was held in Isfahan at the Adib Astronomy Center. It was hosted by Aseman-e-Shab (Night Sky Magazine) and supported by the Iranian Space Agency. Mr Sirous Borzo, the editor of Marzhaye Bikarane Faza Magazine, and Mr Shahram Yazdanpanah, an author and journalist of space science, were privileged guests at the meeting. They discussed future Iranian space activities and sparked enthusiasm amongst members of the club.

Fig. 95.



From left and top: Iran Space Club Poster; Mr. shahram Yazdanpanah (left), Mr. Sirous Borzo(right); Audiences of Iran Space Club



- On the 28<sup>th</sup> of January, Iran launched the Pishgam probe (Pioneer) using a rocket that carried a monkey named Aftab into space. It remained at a height of 120 kilometres above sea level for more than twenty minutes before coming safely back to the Earth.

Fig. 96.



Left: Pioneer launcher; The Iranian Monkey Astronaut

- Astronomy councils in Tehran, Isfahan, Mashhad, Ahvaz, Tabriz, Shiraz and 26 other cities around Iran celebrated Yuri's Night and Astronomy Day. Groups educated the general public about Yuri's first flight and featured programmes such as showing and analysing space movies, observing the night sky, astronomy exhibitions, and children's booths.

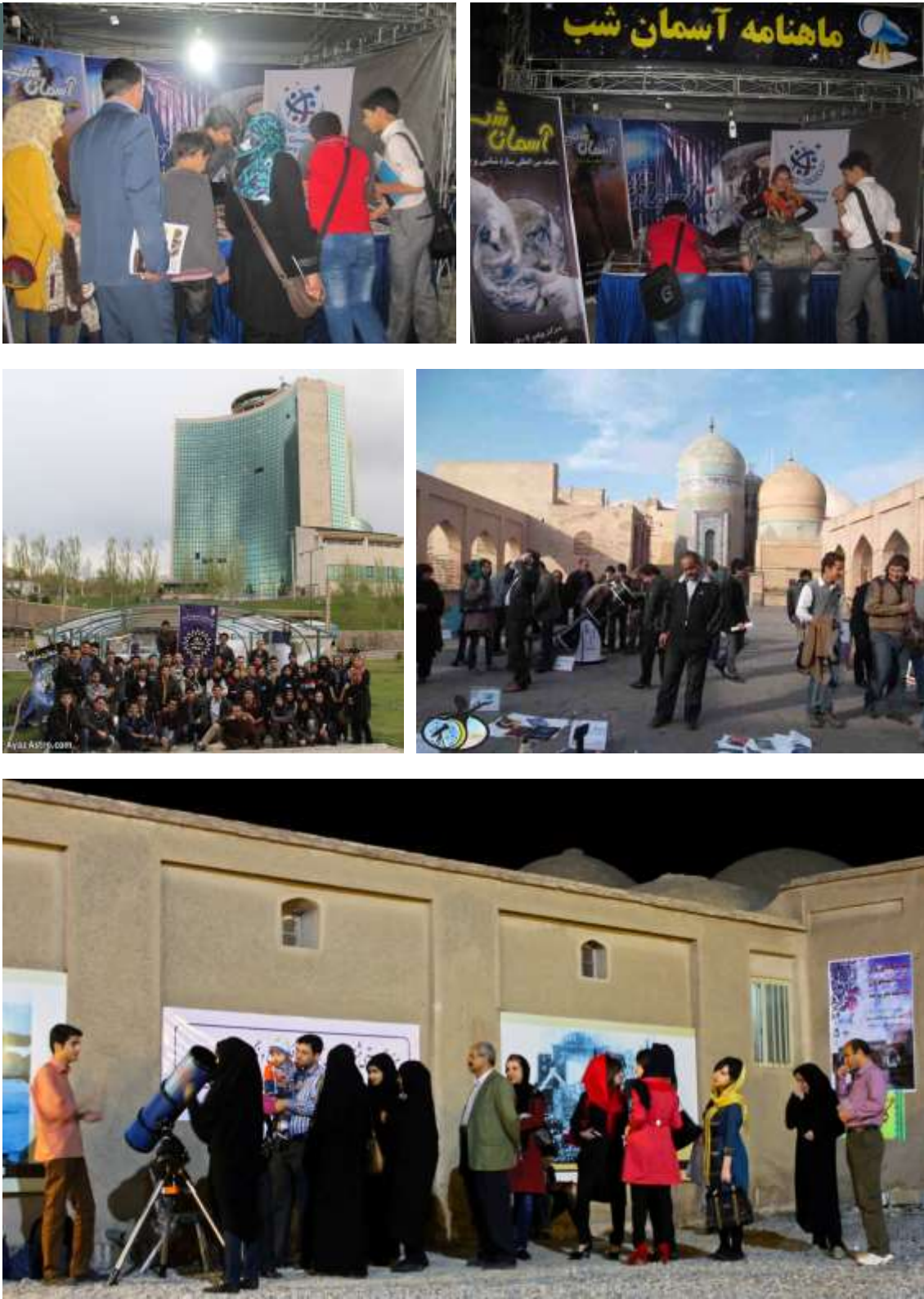
Fig. 97.



From left and top: The Poster of Yuri's Night in Iran; Astronomy Day in Sheikh Lofollah Mosque, Isfahan; Astronomy Day in Naghshe Jahan Square, Isfahan.

- Iranian SGAC members set up a booth in conjunction with Aseman-e-Shab (Night Sky Magazine) to introduce the Space Generation Advisory Council to visitors and enthusiasts during Astronomy Day. SGAC members in Iran (Leila Ghasemzadeh, Ali Alizadeh, Mohammadreza Rezaie, Behnoosh Meskoob and Safoura Tanbakouei) explained SGAC's activities and goals. The report of these activities and participation at the booths were announced on the News Channel of Iran.

Fig. 98.



From top left: SGAC & Aseman-e-Shab booth in astronomy Day, Azarbayerjan; Astronomy Day, Tabriz; Astronomy Day (x2); Astronomy Day, Birjand



Fig. 99.



- On the 24<sup>th</sup> of April, Jame-jam Newspaper – a daily newspaper that is published in Iran – had an interview with Ms Behnoosh Meskoob, Regional Coordinator of SGAC for Iran. She introduced SGAC and spoke about her background, university degree, job and experiences with SGAC. She also explained to the audience how enthusiasts are able to become members of SGAC.

Fig. 100.



- On the 17<sup>th</sup> of June, Iranian NPoC Safoora Tanbakouiei gave a presentation to the Astronomy Club in Isfahan about the first women astronauts. Additionally, she invited students and young professionals to become members of SGAC.

Fig. 101.



- The Third Iranian Space Club was hosted by Aseman-e-Shab and Eshragh Farhangsara in Tehran on the 20<sup>th</sup> of June. It was about women in space exploration over the last fifty years. Mr Sirous Borzo, the editor of Marzhaye Bikarane Faza Magazine talked about the first woman astronaut, Valentina Tereshkova. Then Mr Mohammadreza Rezaie, a Aseman-e-Shab journalist, had a chat with Ms. Behnoosh Meskoob, the Regional Coordinator of SGAC in Iran. They discussed her job at the Aerospace Research Institute in Iran (ARI) and her experiences as a woman in the space industry. Also she talked about SGAC and what students and young professionals do on the council. Many enthusiasts of the space sector took part in this club event.

Fig. 102.



- On the 12<sup>th</sup> of August, the first Astronomy Summer School was held in Shahin Shar, Isfahan over the course of four days. It was hosted by IOTA/ME and supported by the Iranian Space Agency and the International Astronomical Union (IAU).

Fig. 103.



- On the 5<sup>th</sup> of August, the International Olympiad of Astronomy and Astrophysics was held in Greece. In this Olympiad, students attended from 41 different countries. Iran took second place overall, winning 3 gold, 3 silver and 4 bronze medals.
- World Space Week programmes in 2013 with the theme “Exploring Mars, Discovering Earth” was held in Iran. Tehran, Tabriz, Kashan, Sari, Kermanshah, Isfahan, Yazd, Mashhad and Shiraz organised observations and space exhibitions for WSW2013. In addition, scientific projects involving university students and space research institutes were held. Moreover, Aseman-e-Shab and Astronomy Magazine published special papers about WSW2013. Dr.Mezlan Osman, director of the Office of the United Nation – Outer Space, was the special guest.

Fig. 104.



WSW2013 in Iran.

- The first Iranian water rocket tournament was held at the Isfahan University of Technology (IUT). Sixty students from eighteen different universities and schools from around Iran participated in the event, which was hosted by the Association of Technology and Physics Department at IUT on the 6<sup>th</sup> of October 2013.

Fig. 105.



Tournament in IUT.



- An aerospace systems design and manufacturing competition was held on the 1<sup>st</sup> of November at Sharif University. High school and university students competed with each other in designing and making water rockets, gliders, balloons and airships.
- The Promoting Science Award was split into two divisions: astronomy and space science. One Promoting Science Award was awarded to astronomy journalist Ahmad Dalaki and the other to Mr Sirous Borzoo, a space science advocate. This award is typically given to individuals who have actively promoted science throughout the year.

Fig. 106.



Left: Mr. Ahmad Dalaki. Right: Mr. Sirous Borzoo

## LEBANON NATIONAL REPORT

### Documentary and Discussion

The screening of the documentary “Does God Exist?” by Stephen Hawking was organised by the Lebanese American University. People were very curious about the movie and a nice discussion took place afterwards. Dr Nelly Mouawad facilitated this dialog. Every student was given the opportunity to present his or her opinion of the film. The positive feedback gathered proved that this was a very successful event. Some students wanted to discuss the science behind astronomy in general and some the relation between religion and science. Further side discussions went on until late in the evening.

### Stargazing – Mission: Sky Exploration at the Lebanese American University

On April 13<sup>th</sup>, Ali Jawhar and Khalil Azar aided students in using an eight-inch telescope to take pictures of M13 and Saturn. During the stargazing, LAU architectural student Habib Trad, took some fantastic pictures of the night sky. One of his pictures was posted on LAU’s website. The event, which took place at Ayoun El Simen, was considered a success by the approximately 30 attendees.

### Documentary and Discussion on “Black Holes”

The Lebanese American University Astronomy Club screened a documentary about black holes on May 17<sup>th</sup>. Although the original intention was to go stargazing, but the weather did not cooperate so the club had a discussion about the documentary with Dr. Nelly Mouawad instead.

### Lebanese American University and Notre Dame University’s Astronomy Clubs

On the 6<sup>th</sup> of July, Ziad Khoury and Nathalie Tabet brought their 4.5-inch telescope to Ayoun El Simen. 33 students, many of who were first-time stargazers, participated in the event. They were amazed by the sky and how clearly they saw the Milky Way. Students also had the chance to see many objects in the sky including planets, nebulae, galaxies and star clusters. It was a successful event full of learning and excitement.

Fig. 107.



### Perseid Meteor Shower

This event was a collaboration of the NDU and AUB Astronomy Clubs. They typically organise an event for the annual Perseid Meteor Shower. The show started very late in the night because the radiant from which the meteor appears, does not come up until around midnight. A bus was organized but it quickly filled up so some members followed with their own cars. Participants had the chance to see about 100 shooting stars per hour. A 14-inch telescope was also available to the fifty attendees that took part. Rabih Younes, instructor from the faculty of engineering joined in too.

### TEDxLAU

On September 7<sup>th</sup> the LAU Astronomy Club and Lebanese Astrophotography Group hosted TEDxLAU in Beirut. The event included observation of sunspots with an 8-inch telescope using a solar filter and an exhibition of the Astrophotography Group. This had never been done before in Lebanon. Two young amateur astronomers, Ali Jawhar and Ziad El Zaatari, are deep space photographers in Lebanon and their work was on display. They have been capturing deep sky objects like galaxies and nebulae for a long time and this exposition (TEDxLAU) gave them the perfect opportunity to gain public exposure.



The crowd was excited to see sunspots through the telescope. Both activities were successful and enthusiasm to plan another exhibition event was evident. Participants included a diplomat visitor, Tom Fletcher, the British Ambassador in addition to Dr. Elise Salem, LAU's Vice President of Student Enrollment.



Fig. 108.



Team of Lebanese Astrophotographers.

Fig. 109.



Night collective – by Gaby Nehme

The NDU Astronomy Club organised an observation night to observe what has been called “The Comet of the Century”, comet ISON. The event was held at dawn on the 3<sup>rd</sup> of December at the NDU dome, Zouk Mosbeh. It lasted from 1:00am till 5:00am, when the comet was most visible. Other targets were observed as well, and the event was met with much excitement. ISON could be seen with a 10-inch (25cm) telescope so for the NDU’s 60cm telescope, it was easier than ever to see.

## REGIONAL REPORT

### Overview

The North, Central America and the Caribbean (NCAC) region has always been a leader in the space sector. The past year saw many big successes across the region. Commercial space has been making large strides. Orbital Sciences Corp. successfully launched its Cygnus cargo spacecraft aboard its Antares rocket, a successful step in continuing the US commercial capability to resupply the International Space Station. Meanwhile, SpaceX's Grasshopper, a 10-story Vertical Takeoff Vertical Landing (VTVL) vehicle, successfully completed its highest leap to date of 744 metres. NASA selected eight new astronaut candidates, showing its continued dedication to human space exploration. Additionally, NASA launched its Mars Atmosphere and Volatile Evolution probe (MAVEN) onboard an Atlas V rocket in late November. In addition, the Canadian Space Agency launched a dual-use communication and scientific experiment satellite called CASSIOPE, which stands for "CAscade, SmallSat and IOnospheric Polar Explorer". It was launched on top of a Falcon 9 v1.1, the first launch of SpaceX's upgraded Falcon 9 rocket.

### Accomplishments in 2013

#### *Fusion Forum 2013*

SGAC and the Space Foundation hosted the second Space Generation Fusion Forum (SGFF) at the 29<sup>th</sup> National Space Symposium (NSS) in Colorado Springs, CO (USA) on April 7-8, 2013. SGFF gathered together a select group of 47 young adults from 15 different nations and from various space sectors to participate in an intense, interactive forum for discussion in conjunction with the largest annual space event, the NSS. The Fusion Forum provided this group of students and young professionals the opportunity to connect with space sector leaders and present their ideas on salient topics.

#### *Yuri's Night 2013*

Yuri's night activities took place in Canada, the United States, Mexico and Jamaica. A dozen events were held across five provinces in Canada. In the United States, there were a total of 88 events held across 32 states. Four events took place in Mexico across three of its federal districts. Jamaica celebrated Yuri's Night with a single event in Kingston. All together Yuri's Night was celebrated in multiple ways ranging from a group of friends gathering in Port Alberni, British Columbia, to structured educational events such as the Star Party at the Campion High School in Jamaica, to large scale dance parties with hundreds of people in Los Angeles, California.

#### *Regional Facebook Page*

The regional Facebook page introduced last year (2012) has been instrumental in increasing the NCAC region's communication. Events that take place or affect the region are posted on the page to involve as many people as possible. The page has seen remarkable growth in the number of likes throughout 2013.

#### *2013 in Digital Print*

Regional Coordinators Alan Steinberg and Ashley Chandler published an article highlighting SGAC's synergies with New Space. An issue dedicated to students and young professionals will be released next year. Mexican NPoC Carmen Felix was invited to collaborate in the Mexican Space Agency's (AEM) digital magazine. She has published several articles about her personal experiences in the space sector and dedicated her December article to discussing SGAC.

#### *World Space Week*

NPoC for Costa Rica Magaly Sandoval and the Costa Rica's Institute of Technology's space observation group AstroTEC hosted outreach activities for a kindergarten and the general public. World Space Week was also celebrated in multiple venues across the United States and Canada.

## Looking Ahead

The next International Astronautical Congress (IAC) and Space Generation Congress (SGC) will be held in the NCAC region (Toronto, Canada). The IAC and SCG will remain in the NCAC region again in 2016 with Guadalajara City, Mexico being selected as the venue.

Goals for the upcoming year in the North, Central America and Caribbean region are as follows:

- Continue to increase SGAC regional activity in the NCAC region
- Continue to strengthen relationships with other space outreach organisations within the region
- 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

## NATIONAL REPORTS

### CANADA NATIONAL REPORT

#### Overview

Canada continues to be an important player in the international space industry. Since 1962 with Alouette I, Canada's first satellite, and the development of the Canadian Space Agency (CSA) in 1989, Canadians have initiated great innovations. Young professionals and students continue to share their passions for space exploration and increase their knowledge through national and international conferences and by studying space-related topics at renowned universities. Canadians can benefit from various activities and forums whereby influencing the future of Canada in space. This century, marked by globalisation, exploration and environmental concerns, will see a new generation of explorers emerging with a new vision for space and a continuous enthusiasm for inspiring the future of the Canadian space industry.

#### Canadian Space Agency in the News

Canadian astronaut Dr. Chris Hadfield was launched aboard a Soyuz spacecraft on Expedition 34 and reached the ISS where he was, for six months, the first Canadian commander. This is a milestone for Canadian space exploration. Dr. Chris Hadfield participated in many outreach events with students and has recently published his book "An Astronaut's Guide to Life". He is currently on an international book tour.

Recently recruited CSA astronaut Jeremy Hansen was in Vancouver, British Columbia speaking to young Canadians. He encouraged over 300 students to participate in CSA's Canadian Science Challenge to send experiments to space, and he was also part of the largest practical science session, which set a Guinness world record.

Dr. David St-Jacques was recently on Prince Edward Island in November 2013 where he met with students, public servants and engineers. He spoke about his career path, his job as an astronaut and the unique training it entails.

Finally, Canada is on Mars with the Curiosity rover. Canada's contribution involves a geology instrument that determines chemical compositions of rocks and soil and will enable the rover to

establish if Mars ever had an environment that once supported life. It is evident, that Canada is making bold steps to the future of the international space industry as endeavours related to space exploration continue.

### **Accomplishments in 2013**

Canada is currently represented by one National Point of Contact (NPoC), Laura Drudi. She is actively pursuing a career in aerospace medicine as a Vascular Surgery trainee at McGill University in Montreal, Canada. She is the founder and president of the Aerospace Medical Club at McGill University, the editor in chief of the Aerospace Medical Student, editor of the Resident Organisation Orbiter Newsletter and a mentor to many students wishing to pursue a career in the aerospace medicine industry.

#### *Canada's representation at the International Space University 2013 Space Studies Programme in Strasbourg*

There were nineteen Canadians represented at the International Space University's Space Studies Programme (SSP) held in the summer of 2013. It was hosted at the International Space University headquarters in France.

#### *Canada's representation at the 2013 International Astronautical Congress (IAC)*

Due to budget cuts from the Canadian Space Agency (CSA), there was no funding provided for delegate participation in the IAC. However, Canadian sponsorship was provided through the European Space Agency. One Canadian, Annie Martin, was selected as a recipient of an ESA scholarship through the International Student Educational Board (ISEB) to attend the 2013 International Astronautical Congress (IAC) held in Beijing, China.

#### *2013 Space Generation Fusion Forum and National Space Symposium*

The Space Generation Advisory Council (SGAC) held, for the second year in a row, the Space Generation Fusion Forum (SGFF) in Colorado Springs, Colorado. Four Canadians delegates were present at the SGFF with one Canadian, Alanna Krolikowsky, chosen as a Global Grant winner. Global grant winners had the opportunity to participate in panels on international collaboration, developing regions and space applications, and commercial spaceflight. Following the SGFF, all global grant winners further participated in the 2013 National Space Symposium (NSS) in Colorado Springs.

#### *2013 SpaceUp*

SpaceUp is a space conference where participants decide on topics, the schedule, and the structure of the event. The second Canadian SpaceUp conference was held in Water in April 2013. Over 35 people attended from multi-disciplinary backgrounds, including engineers, scientists, artists and web developers.

### **Looking Ahead – Canada's Plan**

- The annual Canadian Space Summit conference was held on November 14 and 15 in Ottawa, Ontario. The theme of the 2013 Canadian Space Summit was "Canada's Space Economy". This summit provided a unique forum to address relevant issues in Canada's current and future space programme and the major roles that could be played by various participants and advocates, private sector companies, provincial and federal government organisations and academia.
- The IAC will be held in September 2014 in Toronto, Canada preceded by the 2014 Space Generation Congress. Updates can be followed at the following website: <http://iafastro.org/>
- Many universities across Canada have participated with "Let's Talk Science" to adopt an extensive outreach community initiative for elementary schools, high schools, and post-



secondary institutions. The programme involves speaking about various aspects of science with the goal of inspiring students to enter into STEM disciplines. A new component is geared towards space education with a focus on Commander Chris Hadfield's upcoming mission.

## Interesting Web Links for the Young Generation in Canada

### *Groups, People, Institutions*

Canadian Lunar Research Network: <http://clrn.uwo.ca/about.htm>  
 Canadian Space Agency: [www.asc-csa.gc.ca](http://www.asc-csa.gc.ca)  
 CSA Capacity Building Programme: [http://www.asc-csa.gc.ca/eng/ao/2011\\_cluster.asp](http://www.asc-csa.gc.ca/eng/ao/2011_cluster.asp)  
 Canadian Aeronautics and Space Institute: [www.casi.ca](http://www.casi.ca)  
 Canadian Space Commerce Association: <http://spacecommerce.ca/>  
 Canadian Space Society: [www.css.ca](http://www.css.ca)  
 Canadian Alumni of the International Space University: [www.caisu.org](http://www.caisu.org)  
 Geological Association of Canada - Planetary Division: <http://uwo.ca/earth/GACPSD/membership.html>  
 NSERC CREATE Canadian Astrobiology Training Programme (CATP): <http://create-astrobiology.mcgill.ca/>  
 NSERC CREATE Technologies and Techniques for Earth and Space Exploration: <http://cpsx.uwo.ca/research/nserc-create-2>  
 Royal Astronomical Association of Canada: <http://rasc.ca/centres>  
 Southern Ontario Science Fiction festival and Southern Ontario Space technology and research festival in Waterloo Ontario: <http://www.so-scifi.com/>  
 Student for the Exploration and development of Space Canada: <http://canada.seds.org>  
 University of Toronto Astronomy and Space Exploration Society: <http://asx.sa.utoronto.ca/>

### *Studies*

2013 Impact Cratering Short Course: <http://cpsx.uwo.ca/study/study-1/graduate-courses/2013-impact-cratering-short-course>  
 Aerospace engineering University of Carleton: [www.mae.carleton.ca](http://www.mae.carleton.ca)  
 Aerospace Engineering École Polytechnique Montréal (French): [www.polymtl.ca](http://www.polymtl.ca)  
 Aerospace Engineering University of Alberta: [www.engineering.ualberta.ca](http://www.engineering.ualberta.ca)  
 Aerospace Medicine University of Toronto: [www.utoronto.ca](http://www.utoronto.ca)  
 Centre for Planetary Science, University of Western Ontario: <http://cpsx.uwo.ca/>  
 Institute of Space Science, Exploration and Technology, University of Alberta: <http://www.isset.ualberta.ca/> McMaster University: [mscehealth.mcmaster.ca](http://mscehealth.mcmaster.ca)  
 Origins, McMaster University: <http://origins.mcmaster.ca/>  
 Planetary and Space Science Centre, University of New Brunswick: <http://www.unb.ca/fredericton/science/research/passc/>  
 Planetary Science Short Course: <http://cpsx.uwo.ca/study/2012-short-course>  
 Scholarship for the International Space University: [www.cfisu.ca](http://www.cfisu.ca)

## ➤ COSTA RICA NATIONAL REPORT

### Overview

Costa Rica has seen great improvement in the aerospace sector during 2013. There have been different activities involving outreach, STEM projects, robotics, scientific investigations, and the growth of NGOs related to the space sector.

### Activities

#### *Robifest- ARLISS*

A Rocket Launch for Student's Satellite (ARLISS) is an international competition held in Black Rock, Nevada in the United States since 1999. Until now, only teams representing Japan, Korea, the US, and Europe have participated. This year Costa Rica became the first Latin-American country to participate in ARLISS. A team of three university students won the chance to represent the country and Latin America during the ARLISS 2013 competition, September 9-15.

NPoC Andres Mora organised the ARLISS category in the Costa Rican National Robotics Competition known as RobotiFest. There was strong participation from the Central American Association of Aeronautics and Space (ACAE) and the University of Costa Rica (UCR).

#### *Science Camps: Space Rover*

Parallel to Andres's efforts during Robotifest, NPoC Magaly Sandoval helped lead the Young Talent Club of the Ministry of Science and Technology. In early July, bright and talented high school kids developed sixty rovers at the National Science and Technology Camp. The goal was to inspire them to study science related careers such as mechanics, electronics and computer science. They demonstrated that aerospace sciences can be understood through these specialties. Currently Phase 2 of this outreach project is being developed and discussed with potential sponsors.

#### *World Space Week*

Thanks to collaboration between NPoC Magaly Sandoval and Costa Rica's Institute of Technology's Space Observation Group, AstroTEC, it was possible to commemorate the World Space Week with two major activities. The first involved a kindergarten and several outreach activities. The second consisted of an open activity to the general public involving around fifty people of different ages.

#### *Participation in SGC and IAC*

Costa Rica was represented at both the IAC 2013 and SGC 2013. In addition, NPoC Magaly Sandoval was awarded the Third Annual Satellites scholarship by SGAC and SSPI.

#### *SGAC Promotion*

There have been several activities involving the promotion of SGAC to prospective new members in Costa Rica. Additionally, there is great interest in involving more countries of the Central American region in SGAC.

### Future Plans

- Participating in Yuri's night
- Preparing for World Space Week 2014
- Organising the Costa Rican ARLISS qualification round and the participation of the winning team at the final ARLISS competition in 2014
- Coordinating Space Camps with the Ministry of Science and Technology
- Regional cooperation with other Central American countries

## ► JAMAICA NATIONAL REPORT

### Overview

This year 2013 was one of continued and successful efforts in the areas of space and astronomy outreach in Jamaica. It was predominately spearheaded by the Astronomical Association of Jamaica (AAJ). The AAJ, Jamaica's premier astronomy group, is the local SGAC liaison for space and science education and outreach.

### Media Presence

#### *Columna TV Noi si Cerul (Us and the Sky) TV show*

The year 2013 got off to a great start with the AAJ featuring Columna TV's Noi si Cerul (Us and the Sky) on a Romanian television station. This was a special New Year's broadcast which featured astronomy-focused groups from all over the globe. The AAJ was featured with locally taken photographs of the planet Jupiter and the Moon's Sinus Iridum, a Mare filled impact crater superimposed on the Imbrium basin. An archive of the broadcast was available on the Columna TV's Noi si Cerul website (<http://www.columnatv.ro/tv/category/emisiuni/noi-si-cerul/page/2>) from December 29<sup>th</sup> until January 5<sup>th</sup>.

#### *TVJ Smile Jamaica TV show*

The AAJ was also featured on Jamaican TV's Smile Jamaica morning show to discuss the work they do, particularly in light of the meteor that broke up over Chelyabinsk in Russia. The interview was just two days after the event, which allowed for significant media impact.

#### *Facebook*

The AAJ launched its Facebook page in 2013 and has so far enjoyed an enthusiastic following.

### Collaboration

#### *International Meeting of Astronomy and Aeronautics*

The AAJ widened its network of partners and was invited to the 6<sup>th</sup> International Meeting of Astronomy and Aeronautics held on April 18 – 20, in Rio de Janeiro, Brazil.

#### *Stony Hill Telescope*

The AAJ continued to work with several partners, including the University of the West Indies in a comprehensive plan to restore and develop the Stony Hill Telescope facilities. The facilities house a telescope built early in the 20<sup>th</sup> century, which is reputedly the largest optical telescope in the English-speaking Caribbean.

#### *US Embassy Invitation*

The AAJ was invited to two events hosted by the US Embassy in Jamaica. The first included guest speaker Dr. Neil deGrasse Tyson, an eminent astrophysicist and science communicator who is currently the Director of the Hayden Planetarium at the Rose Centre for Earth and Space and a research associate in the Department of Astrophysics at the American Museum of Natural History.

The second was held during February – Black History Month – and featured American physician and NASA astronaut Dr. Mae Carol Jemison. Dr. Jemison travelled into space aboard the Space Shuttle Endeavour on September 12, 1992 and is the first African American woman to do so.

Both speakers championed space exploration endeavours and the need to tailor education towards this. Their words inspired a renewed effort by the AAJ to standardise the educational material it provides in its Galileoscope distribution programme. The AAJ is working towards a standard space and astronomy educational reference tool for Jamaican schools.

## Outreach

### *Astro Gate*

The AAJ has established the Astro Gate library, as a niche section within the library of the University of the West Indies. AAJ members have the opportunity to read on a variety of space related subjects from astronomy and planetary science to astrobiology and human spaceflight.

### *SGAC Presentation*

The SGAC NPoC gave a talk on SGAC and the concept of the Space Generation at a special AAJ meeting on November 19. This was a unique opportunity for a face to face meeting between the NPoC and AAJ individuals with whom collaboration has been performed solely over the internet.

Fig. 110.



From top left: Jamaica NPoC Marc Cornwall presenting SGAC to AAJ group; AAJ group; Marc Cornwall at the AAJ Astro Gate library; Marc Cornwall with AAJ Secretary Jennifer Rowe (left), AAJ President Errol Rickmann (center) and AAJ Vice President Stanley Smellie (right) at the AAJ Astro Gate library.

## Events

### *Annual General Meeting*

A particular highlight from the February 2013 Annual General Meeting was the presentation of a book on the universe to the Campion Astro Club, which was donated by former AAJ Treasurer Cleveland Gustard.



Fig. 111.



AAJ Annual General Meeting – Members of the Campion High School Astro Club receiving a book on the universe from the Assistant Public Relation Officer

### *Yuri's Night*

The AAJ celebrated Yuri's Night with a Star Party at Campion High School. Celestial objects on the viewing agenda included the Moon, Jupiter, Saturn, the Lyrid Meteor Shower, the Orion Nebula and Comet Ison. Videos of life on the International Space Station with NASA astronaut Sunita Williams were also viewed.

Fig. 112.



Yuri's Night Star Party – Jupiter and its Moons

### *Global Astronomy Month: 30 Nights of Star Peace*

The AAJ participated in the 30 Nights of Star Peace collaborative viewing event, which saw groups from different geographical setting up Star Parties to observe the sky. Close to 70 students and teachers attended. The evening encountered slight weather problems however eventually cleared to allow viewings of the Moon and Jupiter. There were also further viewings of International Space Station videos that featured astronaut Sunita Williams.

Fig. 113.



30 Nights of Star Peace – Attendants  
Prepare to Watch International Space  
Station Video

### Acknowledgements and Outlook

The NPoC for Jamaica would like to acknowledge the valued partnership forged with the AAJ through which the goals of space outreach and education are being achieved in Jamaica. The year 2013 was one of steady progress in those goals. As the AAJ continues to expand its local and international network by raising its media profile, it will build on its past successes throughout 2014.

## ► MEXICO NATIONAL REPORT

### Current State of Space Affairs in Mexico

2013 was an excellent year for the space industry in Mexico. The young Mexican Space Agency (AEM) worked hard to consolidate the agency, to make it grow significantly, and to establish new connections with international partners. SGAC Mexico also had an international presence and conducted significant outreach programmes inside and outside of the country.

#### *Mexican Space News*

- AEM signed agreements of collaboration with several universities in the country
- At least three new “Technology Development Centers” will be built in different Mexican states, to collaborate as branches for the AEM
- AEM launched a programme entitled Space Boot Camp in several different cities around Mexico

### Accomplishments in Mexico

- Increased collaboration between universities and institutions allowed the organization of new conferences and events related to space, as well as the opportunity to attend conferences hosted by international partners like DLR.
- Mexican Astronaut Jose Hernandez gave presentations at several universities and participated actively during the celebration of World Space Week in Mexico.
- The first International Congress of Science and Aerospace Technology (CICYTA) was held in Jalisco, Mexico.
- In Vienna NPoC Carmen Felix represented the International Association of Advancement of Space Safety (IAASS) at the annual session of the United Nations Committee of Peaceful Uses of Outer Space in support SGAC.
- Three scholarships were offered to SGAC members to attend the 6<sup>th</sup> IAASS Conference in Montreal. Mexican NPoC Carmen Felix, who is also an IAASS member, helped coordinate this competition.

Fig. 114.



- Collaboration with Space Safety Magazine continues to be strong. Several Mexican writers and contributors are highly involved with the magazine.
- A stronger relation between SGAC and AEM was created. Good communication between the two institutions, regarding the promotion of events and support, was important during this year. AEM's Deputy Director for Space Science and Technology Affairs, Enrique Pacheco, became a member of SGAC's advisory board.
- The influence and communication of SGAC events and news has been well managed through the Facebook group: "Jovenes por el Espacio Grupo Mexico". More members have joined and a link with the Mexican Space Agency has been added.
- Early in 2013 NPoC Carmen Felix was invited to collaborate with the AEM's digital magazine. She published several articles about her personal experiences in the space sector and dedicated the December article to SGAC.
- A talk about SGAC and space was given to the University of Tec de Monterrey, in Sinaloa by NPoC Carmen Felix. She is also mentoring a group of students through the FIRST robotic competition and is a NASA Camp guidance councilor.
- During the World Space Week 2013 Mexico offered many events in cities across the country. SGAC together with OeWF, WSW, Mars Society and Kiwi Space, organised the Mars Simulation event, which was held in Utah and Innsbruck. Mexican NPoC Carmen Felix participated in the event as CapCom of the Mission Control Center and recorded videos of the daily activities for the Mexican Space Agency. These videos explain what a Mars simulation entails and elaborates on the importance of analog studies. The videos were shared by WSW Mexico, SGAC and AEM.
- NPoC Carmen Felix is in the process of opening a new local chapter of the Aerospace Sector in the Netherlands, under the government programme "Network of Mexican Talents". She is also looking into the collaboration of space projects within Mexico, the Netherlands, WSW and SGAC.
- An SGAC conference took place in Mexico City at the end of the year. The goal was to reach out to more young students and professionals and get them to join SGAC.
- In September 2013, the International Astronautical Congress was held in Beijing. There was a large group of Mexican delegates that were able to participate. Papers from AEM and young professionals were presented. Additionally a proposal to host the IAC 2016 was submitted by the Mexican government. Ultimately Guadalajara City was selected to host the IAC in 2016.

## Looking Ahead - plans in Mexico in 2014

- A plan to establish Mexican scholarships for young professionals and students to allow them to participate in international events like IAC is in process.
- There is a plan to grow SGAC Mexico by having a stronger presence at national space events.

## Interesting Links

Facebook: [Agencia Espacial Mexicana](#)  
[Agencia Espacial Mexicana \(Foros\)](#)  
[Jóvenes por el Espacio Grupo México](#)  
[Quiero Estudiar Ing. Aeroespacial \(MEX\)](#)

Schools: [Centro de Desarrollo Aeroespacial - Instituto Politécnico Nacional](#)  
[Universidad Autónoma de Nuevo León - Ing. Aeronáutica](#)

## ► UNITED STATES NATIONAL REPORT

### Current Space Affairs

Since the dawn of the Space Age, the United States has played a major leadership role in the international space arena. In 2013 the United States experienced fiscal challenges that have required changes to NASA and governmental space affairs. These changes have also led to innovative and maturing private and commercial space sectors that continue to prosper with significant accomplishments and technical feats in the quest for future deep-space missions.

After successfully landing on the Martian surface in August 2012, in February NASA's Curiosity rover drilled into rock in the Martian Gale Crater revealing the presence of key chemical ingredients for life. The car-sized rover continues to successfully utilise its laboratory of tools to analyse collected samples.

In June, Planetary Resources launched a successful Kickstarter campaign for the People's Space Telescope, raising more than \$1.5 million in 33 days. The small space telescope is set to launch into low Earth orbit in 2015, allowing thousands of people to photograph celestial objects and their own self-portraits from orbit.

On July 7, NASA Mars rover Opportunity celebrated the 10<sup>th</sup> anniversary of its launch and more than 9 years spent on the Martian surface. Initially designed for a 3-month mission, on May 15, the rover's odometer reached 35,760 kilometres giving Opportunity the US space programme's all-time record for distance traveled on another planet. It continues on its search for water and other soil resources on the hostile planet.

In August, NASA selected eight candidates to become its newest astronaut trainees. This group was selected from more than 6,100 applicants, the second largest number of applications received in NASA history. This group will prepare to continue research on the International Space Station and to be part of the first human missions to asteroids and Mars.

In September, after analysing observations and data based on measured plasma density, NASA confirmed that the Voyager 1 spacecraft has reached interstellar space and has been traveling through this region for about one year.

In September, Orbital Sciences Corp. successfully launched its Cygnus cargo spacecraft aboard its Antares rocket, a successful step in continuing the US commercial capability to resupply the International Space Station.

On October 7<sup>th</sup>, SpaceX's Grasshopper, a 10-story Vertical Takeoff Vertical Landing (VTVL) vehicle, successfully completed its highest leap to date with an altitude of 744 metres. Instead of a rocket



designed to burn up on atmosphere reentry, Grasshopper is designed to return itself back to Earth intact.

In October, the Lunar Atmosphere and Dust Environment Explorer (LADEE) arrived in lunar orbit. The main payload is testing laser data links and communications for potential use in future deep space missions. LADEE will also spend one-hundred days measuring the composition of the Moon's atmosphere and exploring the dust environment above the lunar surface.

### **SGAC Accomplishments in the United States in 2013**

Two NPoCs currently represent the United States: Tiffany Chow and Stephanie Finnvik.

Space Generation Fusion Forum at the 29<sup>th</sup> National Space Symposium, Colorado Springs, Co

SGAC hosted, together with the Space Foundation, the second annual Space Generation Fusion Forum (SGFF) at the 29<sup>th</sup> National Space Symposium (NSS) in Colorado Springs, CO on April 7-8, 2013. SGFF gathered together a select group of 47 young adults from 15 different nations and from various space sectors to participate in an intense, interactive forum for discussion in conjunction with the largest annual space event, the NSS. The Fusion Forum provided this group of students and young professionals, 28 of whom were from the United States, the opportunity to connect with space sector leaders and present their ideas on salient topics.

The two-day programme featured eighteen outstanding SGAC members on its panels and was filled with speeches from influential leaders in the space sector, dynamic discussions moderated by space executives and networking opportunities for participants. SGFF delegates nominated Lewis Groswald as the winner of the AIAA MVP Award. As MVP, Groswald received a full scholarship to attend the AIAA's 2013 SPACE conference in San Diego, California. He presented a report of the viewpoints expressed during the panel discussions at the Fusion Forum.

SGFF was organised and coordinated by then Chair and Co-Chair (Catherine Doldirina and CJ Nwosa respectively), Executive Director Andrea Jaime and Fusion Forum Manager Stephen Ringler, as well as a small team of eight U.S. SGAC members including Julio Aprea, Kyle Buse, Tiffany Chow, Emmanuelle David, Kristine Ferrone, Paul Guthrie, Emma Hinds, and Stephanie Wan. In addition to being co-hosted by Space Foundation, the Fusion Forum was generously supported by several other partners including Lockheed Martin, AGI, the American Institute of Aeronautics and Astronautics (AIAA), the Federal Aviation Administration (FAA), the Center of Excellence for Commercial Space Transportation (COE CST), the Secure World Foundation, and the Washington Space Business Roundtable.

After the Fusion Forum's official programme concluded, delegates were invited to attend the 29<sup>th</sup> National Space Symposium and participate in its New Generation activities. Over half of the Fusion Forum participants remained in Colorado Springs to actively engage in the NSS. The symposium highlighted SGAC and its Fusion Forum. The Space Generation Fusion Forum was then spotlighted with an expert video designed and prepared by Thu Vu, one of the Fusion Forum Global Grant winners. Following the highlight video Andrea Jaime welcomed onstage the winners of the SGFF Global Grants. The Space Generation Fusion Forum was a great success and will take place again in 2014 alongside the recently renamed 30<sup>th</sup> Annual Space Symposium.

### **Other Youth-Oriented Space Activities in 2013**

*Space Generation Congress 2013, Beijing, China*

The 12<sup>th</sup> annual SGC was another successful event with over 120 students and young professionals from over 40 nations. The U.S. had strong representation with over 25 delegates. Many of these delegates assumed various leadership roles during the SGC. Kate Laygo acted as Agency Working Group Moderator, Stephanie Wan acted as Agency Working Group Subject Matter Expert and Matthew Maniscalco acted as Exploration Working Group Subject Matter Expert. U.S. Scholarship

recipients included Nicole Tchorowski and Martin Letigab, enabling them to attend and participate in the SGC and IAC.

#### *International Astronautical Congress 2013, Beijing, China*

During the 2013 IAC in Beijing, many U.S. SGAC members participated in SGAC Working Group projects and presented papers in a variety of technical sessions.

#### **Looking Ahead – The Plan for the Future of SGAC in the United States**

In 2013, SGAC has continued to expand its impact in the United States. In continuation with previous goals, the United States SGAC group has worked to form collaborations and partnerships with existing space sector networks and activities, both local and national. Some specific goals for the coming year include:

- Increase SGAC membership in the United States
- Expand SGAC presence in the United States and continuing to encourage more members from the United States to assume staff and leadership roles in SGC 2014
- Develop activities locally available for SGAC members of the United States

One new partnership in 2014 that will target all three of these goals is collaboration with SATELLITE 2014, a premier conference for satellite communications that will take place in Washington, DC on March 10 –13. SGAC will team up with the SATELLITE 2014 organisers to host a speed-mentoring event for young professionals and SGAC members during the conference. All participants will be invited to network with conference attendees and leaders in the space sector directly after the speed-mentoring event at SATELLITE 2014's Awards Celebration and Reception. In addition, SATELLITE 2014 and SGAC will team up to offer SGAC members the opportunity to win one of 20 complimentary conference passes to SATELLITE 2014.

## REGIONAL REPORT

## Introduction

2013 was a good year in South America for space-related activities. Brazil and Argentina continued advancing in their space related projects. Argentina especially will now be a major player in the personal commercial space sector since it announced the creation of a new spaceport. 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.

## Regional Space Activities and Highlights

- The region gained 2 new NPOCs:
  - Brazil: Josue Cardozo dos Santos
  - Peru: Avid Roman-Gonzalez
- A list of scholarships and competitions that South America students and young professionals can apply to has been assembled and is currently available at the SGAC website.

## Activities in Argentina

- SAC-D/Aquarius Satellite continues with successful operations.
- Argentine government awarded a 500-million budget for the construction of SAOCOM and ARSAT satellites.
- Argentine President inaugurated test facility for satellites – Announced the development of a new spaceport.
- ESA's Deep Space Antenna 3 (DSA 3) was inaugurated on Argentine soil.
- Tronador II rocket development: CONAE to launch pathfinder rocket as part of development – Program budget was doubled.

## Activities in Bolivia

- A Bolivian team of students participated in SGAC's Find an Asteroid Campaign.
- A team formed by the NPoC of Bolivia and an SGAC Bolivia member won 2<sup>nd</sup> place at NASA's Space Apps challenge.

## Activities in Brazil

- Seminars about SGAC and its activities were given at the main Brazilian Universities.
- Advancements in the China-Brazil Earth Resources Satellite.
- Brazilian Space Agency promoted training workshop for journalists.
- New tests for Project SARA (Atmospheric Re-entry Satellite).
- Improvements were made on the Alcantara Launch Centre.

## Activities in Chile

- Chile NPOC, Alejandro Lopez, participated in the hosting of the Google Lunar X PRIZE summit.
- The European Space Agency (ESA) conducted Mars rover tests in the Atacama desert (North of Chile)
- The Atacama Large Milimeter/Submillimeter Array (ALMA) was inaugurated by the Chilean President.
- FASAT-Charlie (SSOT) the 3<sup>rd</sup> Chilean satellite, launch late 2011 has been fully operational and providing images for government services.

### Activities in Colombia

- The Colombian Network of Astronomy or Red de Astronomía de Colombia (RAC) hosted its annual meeting in the city of Ibagué.
- Colombia was proposed to host the Communicating Astronomy for the Public (CAP) meeting in 2016.
- A seminar on space policy and law was held in Bogotá.
- Yuri's Night celebrations were hosted in several cities in the country in April, with more than 1000 participants altogether.
- Colombia is currently defining the necessary requirements to develop an international space policy in order to create the Colombian Space Agency.

### Activities in Ecuador

- The Ecuadorian Space Agency launched the Cubesat Pegasus in April 2013.
- The CubeSat Kryasor was launched.

### Activities in Peru

- The Alas Peruanas University launched its first pico-satellite called UAPSAT.
- Yuri's Night was celebrated across the country.

### Activities in Uruguay

- Significant progress was made on the establishment of the Uruguayan Space Agency.
- Uruguay's NPoC, Victoria Alonsoperez, won the Best Young Inventor Award 2013 by the World Intellectual Property Organization (WIPO)
- SGAC Uruguay had several appearances in the media: National Newspaper, TV Shows, radio.
- Uruguay celebrated the Girls in ICT Day for the first time.
- Progress was made on the construction of the first Uruguayan satellite that is scheduled for launch in early 2014.
- An interdisciplinary team of students from different Universities was a finalist at the forum organized by NASA, RASC-AL.
- High School students from all over the country participated in the Astronomy Olympiads.

### Looking Ahead for 2014

(Tentative plans for 2014)

- This year the terms of Nicole Jordan and Victoria Alonsoperez ended and there are elections taking place to determine the two new NPoCs.
- Create more content on the Facebook regional page to comply with the SGAC requirements as well as satisfy the current members in the region.
- Recruit new members as well as qualified NPOCs
- Promote Yuri's Night Events and World Space Week celebrations.
- Connect South American space universities and associations with SGAC in order to receive more funding to bring Latin American members to the SGC 2014.



## NATIONAL REPORTS

### ARGENTINA NATIONAL REPORT

#### Space-Related Activities

##### *SAC-D/Aquarius Satellite Continues with Successful Operations*

The joint Argentine/U.S. SAC-D/Aquarius mission continues mapping the salinity—the concentration of dissolved salt—at the ocean surface, information critical to improving our understanding of two major components of Earth's climate system: the water cycle and ocean circulation. By measuring ocean salinity from space, Aquarius is providing new insights into how the massive natural exchange of freshwater between the ocean, atmosphere and sea ice influences ocean circulation, weather and climate.

Related Article: <http://arstechnica.com/science/2013/03/how-salty-is-that-seawater-ask-the-aquarius-satellite/>

##### *Argentine Government Awards a 500-Million Budget for the Construction of SAOCOM and ARSAT Satellites*

The Comisión Nacional de Actividades Espaciales CONAE and government-owned ARSAT Company awarded INVAP, an Argentine aerospace company, the 2014 budget for building the SAOCOM and ARSAT satellites in 2014. The 2-billion Argentine pesos award includes over 500 million Argentine Pesos (over 80 million USD) destined exclusively for the SAOCOM and ARSAT development, as well as the building an engine test facility.

Source: <http://adnrionegro.com.ar/2013/10/invap-con-presupuesto-por-mas-de-2-000-millones-y-ambiciosos-planes/>

##### *Argentine President Inaugurates Test Facility for Satellites – Announces New Spaceport*

Argentine President Cristina Fernandez de Kirchner inaugurated the “Centro de Ensayos de Alta Tecnología” (High-Technology Test Center) in the city of Bariloche built by INVAP for the government-owned ARSAT Company. The facility will allow satellites to be tested in simulated mission vibration, gravity and vacuum conditions. Furthermore, CONAE signed a collaboration contract with INVAP to build two launch platforms to support the upcoming Argentine Tronador II rocket; the platforms will be constructed in the Naval Base of the city of Bahía Blanca, 640km south of Buenos Aires.

Source: <http://www.invap.com.ar/es/home/sala-de-prensa/784-la-presidenta-inauguro-el-centro-de-ensayos-de-alta-tecnologia-y-dio-inicio-a-las-pruebas-finales-del-satelite-arsat-1.html>

##### *ESA's Deep Space Antenna 3 (DSA 3) is Inaugurated on Argentine Soil*

The Malargüe station, Deep Space Antenna 3, is ESA's newest tracking station and is located 30 km south of the city of Malargüe, about 1200 km west of Buenos Aires, Argentina. DSA 3 hosts a 35 m-diameter antenna with transmission and reception in X-band and reception in Ka-band.

DSA 3 entered full service in early 2013, providing daily support to missions such as Venus Express, Mars Express, Herschel and Planck.

Photos of the inauguration ceremony:

[http://www.flickr.com/photos/esa\\_events/sets/72157632284813356/detail/](http://www.flickr.com/photos/esa_events/sets/72157632284813356/detail/)

### *Tronador II Rocket Development: CONAE to Launch Pathfinder Rocket as Part of Development – Program Gets Budget Doubled*

The Argentine space agency CONAE is preparing a November launch of its Vex 1A rocket, one of the pathfinder rockets designed as prototypes to test navigation, guidance and control systems to be used in the Tronador II rocket, scheduled for completion on 2015. Three to six further pathfinder flights are scheduled. Launch will take place from the city of Punta Piedras, 160 km south of Buenos Aires. Accordingly, CONAE received a budget increase close to 100% in the last year as part of the Argentine government plan to boost space development in the country.

Source: <http://www.pagina12.com.ar/diario/economia/2-233210-2013-11-09.html>

## **Argentina Chapter**

Sergio Taleisnik and Julio Aprea represent SGAC in Argentina. Sergio is Argentina's SGAC as well as part of the PR team. Julio is SGAC Argentina's NPoC as well as Competitions Coordinator for the organization.

## **Future Plans**

We are planning to increase outreach by contacting high schools and universities to promote SGAC and to create awareness regarding the future of the space sector in Argentina and the rest of the world. We are also planning to renew the Argentine NPoC staff in order to boost SGAC activities in the country.

## **BOLIVIA NATIONAL REPORT**

### **Things We Continued**

There were many successful activities in 2012 including the Find an Asteroid Campaign in which Bolivia participated. In 2013 Bolivia SGAC participated in the campaign a second time with even more interested participants, and some schools are interested in teaching astronomy using some of the tools used in the campaign.

There are plans to continue this activity in 2014 and beyond, because it had a great impact on people using their computers. Participants could find asteroids and give them a name, being designated as the person that found a new asteroid.



### **Things We Innovated On**

During 2013 we made some new adventures as SGAC Bolivia, one of them was the participation on the NASA's Space Apps challenge, where a team composed of the NPoC and SGAC Bolivia members won 2<sup>nd</sup> place, with a new experiment related to the creation of camera applications for use in nano satellites to be launch with low cost engineering.

More information in the following link:

<http://photos.state.gov/libraries/bolivia/22433/notasdeprensa13/NASA%20a nuncia%20Space%20Apps%20challenge.pdf>



## Perspective on New Projects For 2014

While there were many accomplishments in 2013, we missed some important events, like Yuri's night, because of local conflicts that altered trip itineraries of organizing team and participants.

SGAC Bolivia is recruiting an additional NPoC as organizing activities and obtaining funding requires extra support.

The nano satellite project in Bolivia is just kicking off, we expect to have a formal team working on it by the beginning of 2014, when we expect to have even more economic support from the government and related institutions.

## ► BRAZIL NATIONAL REPORT

### Overview

Space activities in Brazil are mainly organized by the Brazilian Space Agency (AEB) and executed by the National Institute for Space Research (INPE) and the Institute of Aeronautics and Space (IEA) with the 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. The Brazilian SGAC has two delegates Bruno Victorino Sarli and, newly appointed, Josue Cardoso dos Santos. The Brazilian SGAC was created in 2012 and great effort has been dedicated to promote and grow the organization in the country by holding seminars in the main Brazilian universities and contacting the main aerospace institutions in the country.

### Highlights of the Brazilian Space Programme in 2012

#### *Advancements on the CBERS Programme*

The CBERS (acronym for China-Brazil Earth Resources Satellite) program runs since 1988 in partnership with China. In Brazil, the CBERS program is managed by the Brazilian Space Agency (AEB), and it includes the National Institute for Space Research (INPE) and the Chinese Academy of Space Technology (Cast, acronym in English) at a cost of \$ 125 million for each nation. In 1988, the two countries created the CBERS Program to join efforts for capacity building in the field of Earth observation. Three satellites have been already launched - CBERS - 1 in 1999 , CBERS - 2 in 2003 and CBERS - 2B in 2007.

The fourth remote sensing satellite of the CBERS series (CBERS-3 replaces the version 2B), developed in partnership between Brazil and China, is ready for Taiyuan launch (TSLC) . The launch is planned for the first half of December. The satellite has been moved from Beijing to Taiyuan by train and the journey lasted about 15 hours. AT the TSLC, the centre's technical experts from INPE and Cast are integrating service modules and satellite payload. Some electrical tests will be done to verify that no damage occurred during transportation and installation of the solar panels. Upon completion of this activity the satellite's readiness will be reviewed (SRR), which authorizes the filling of fuel tanks. After the SRR, the satellite is transferred to the launch tower and attached to the rocket Long March - 4 for the pre-launch tests.

Today, Brazil hires foreign satellite services, such as the U.S. Landsat, to receive remote sensing images. In an effort to reduce reliance on other countries, Brazil plans a smaller launch interval for the next version of the CBERS's satellite series, CBERS - 4. CBERS - 4 should be the last satellite of the Chinese-Brazilian cooperation to be launched from a Chinese centre. The next launches are expected to take place at the Launch Centre (CLA) in Maranhao, Brazil . The CBERS - 4 is scheduled to go into space in 2015.

See more on the CBERS Program on page [www.cbbers.inpe.br](http://www.cbbers.inpe.br) #

*AEB promotes Training Workshop for Journalists*

In order to clarify key points of the Brazilian space policy and inform about the various applications and services of the National Programme of Space Activities (Pnae) the Brazilian Space Agency (AEB), an institution under the Ministry of Science, Technology and Innovation (MCTI), promotes in its headquarters in Brasilia on the 12<sup>th</sup> of November a Training Workshop on Space Program. The activity is composed of six expert lectures and a panel discussion.

*New Tests for Project SARA*

The SARA (Atmospheric Re-entry Satellite) Project aims to develop an orbiting platform for performing experiments in microgravity, 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.

The buoyancy test of the Suborbital Mechanical Qualification Model of the SARA was successfully held on 29 and 30 July. The test was conducted in the facilities of the Oceanographic Institute of USP (Ubatuba - SP), where teams from the Space Systems Division and Salvage and Rescue Group dropped the qualification model into the ocean and observed sealing characteristics for twenty hours. After this period the model was hoisted, preliminarily checked and prepared for return to São José dos Campos. This test checked the stability and resilience characteristics as well as the logistical and operational procedures to recover the system in the future launch operations.

*Improvements to Alcantara Launch Centre*

The Brazilian Space Agency (AEB) has received authorization and license by the Brazilian Institute of Environment and Renewable Natural Resources (IBMA) to undertake complementary building projects at the Alcantara Launch Centre, located in Alcantara (MA), after eight years and seven months from the beginning of the first negotiations with the Institute. Both the license and authorization are valid for three years. This license has a special meaning for the Brazilian Space Program (PEB). It is now possible to complete the Master Plan of the Launch Centre, which will provide better services to potential customers who want to use Brazilian satellite launch vehicles and experiments. As a consequence, the construction of the medical centre, primary and secondary schools and the completion of the airfield infrastructure, among others, may be initiated.

**SGAC Activities in 2013**

In this year there were efforts to introduce the council members to students, researchers and important institutions like São Paulo State University at Guaratinguetá (FEG/UNESP), Federal University of São Paulo (UNIFESP), Federal University of ABC (UFABC) and INPE. This strategy will be continued in the next months; seminars are being planned at other institutions that have space research. Examples include the INPE, the Federal University of the ABC (UFABC), the Institute of Science and Technology (ICT) of the Federal University of the São Paulo (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). Apart from the seminars, a great effort was put into the planning of the first Latin American SGAC conference, a project being organised by SGAC South America, with the objective of organising a conference in the model of the SGC next year.

**Looking Ahead – the Plan for SGAC in 2014**

As mentioned above, a proposal for a Latin American space conference similar to the SGC, focusing on the Latin American region, was presented during the SGC South American September Telecon by the regional coordinator of SGAC South America, Victoria Alonsoperez. The initial idea for this conference aroused significant interest from the IAF Latin American members and the AEB. Regarding



the SGAC promotion in the country, contacts have been made to introduce the SGAC and make a presentation about the council in 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. Also, there are plans to work create strong links with GAMAT (Group of Astronomy and Mathematics) of UNESP at São José do Rio Preto, which is a project of continuing education that works promoting the space sciences among society.

## ► CHILE NATIONAL REPORT

### Current State of Space Affairs in Chile

La Subsecretaría de Telecomunicaciones convoca a:

## Consulta Pública Ciudadana Política Nacional Espacial (2013-2020)



- Since 2011, there has been no Space Agency in the Country. During September and October, a public consultation regarding the 2013-2020 *National Space Policy* was conducted. Hopefully the results of this will be the resurrection of a space agency, together with the publication of a National Space Law/Policy.
- The European Space Agency (ESA) conducted Mars rover tests in the Atacama desert (North of Chile)
- The Google Lunar X-Prize summit was hosted in Santiago, Chile during April this year. The local team Angelicvm hosted the event. Angelicvm procured a launch together with Earth Rise last year, and has been participating in conferences worldwide.

Fig. 115.



Thank you poster signed by all the participants of the GLXP 2013 summit hosted by the Chilean Team Angelicvm (. Credit: @TeamAngelicvm.

- European Space Observatory (ESO) celebrated 50 years of cooperation with Chile. Also the Atacama Large Milimeter/Submillimeter Array (ALMA) was inaugurated by the Chilean President this year.

Fig. 116.



Picture of the newly inaugurated ALMA.  
Credit: Actualidad Espacial

### Accomplishments in Chile in 2013

- FASAT-Charlie (SSOT) the 3<sup>rd</sup> Chilean satellite was launched in late 2011 and has been fully operational and providing images for government services
- In the Netherlands, the NPoC gave a presentation on SGAC to the members of the Professional Society Vis Viva
- There were no SGAC organized activities during the year. Conversations with different organisations in the country were held.
- Rocketry group continues to develop their rockets, and also held several events.
- SGAC information about scholarships and events was disseminated to the country, through e-mails and website posting.

### Looking Ahead - Plans for Chile in 2014

- Next year is the new edition of the bi-annual FIDAE (one of the biggest air, defense, and space fairs in South America). The idea is to have presence at the fair, and spread the word about SGAC.
- Current NPoC term comes to an end. Therefore, a new one is required.
- Work towards the realization of a South American SGAC Event (which has been under discussion in the regional teleconferences for some time now).

## ► COLOMBIA NATIONAL REPORT

### Current State of Space Affairs in Colombia

- Colombia is currently leading a proposal for the establishment of an Andean Regional Node in Astronomy with the International Astronomical Union (IAU). This regional office for the development of Astronomy will include countries from the Andes region: Peru, Chile, Ecuador, Bolivia, Venezuela and Colombia. During 2013, work was distributed into three task forces (TF) to develop projects in Astronomy:

TF1 – Universities and Research

TF2 – Children and Schools

TF3 – Public Outreach

The working groups for each task force include members from all participating countries. The idea is to share experiences and look for potential opportunities for joint efforts.

More information about the Office for Astronomy Development can be found at:

<http://www.astro4dev.org/>

- Colombia continues the process of purchasing its first satellite for Earth observations and succeeded in allocating a budget for the satellite. This effort has been lead by the Colombian vice-president together with the Colombian Space Commission (CCE) that is now being conducted by the Colombian Air Force (FAC). There have been several meetings with aerospace companies from around the world to complete this process and the CCE is presently finishing the technical studies.
- More importantly, Colombia is currently defining the necessary requirements to develop an internal space policy to create a Colombian Space Agency.

### Accomplishments in Colombia in 2013

- The Colombian Network of Astronomy, or Red de Astronomía de Colombia (RAC) hosted its annual meeting in the city of Ibagué. This meeting has been held over the last decade in different cities across the country, gathering amateur astronomy groups from all regions. Some of the topics discussed included:
  - Results obtained during the National Colombian Olympiads, and remarks on the participation of Colombian representatives in the International Astronomy Olympiads held in Greece, where a 2<sup>nd</sup> place medal was received with a bronze medal.
  - There is a proposal to build a one-metre astronomical observatory in the Tatacoa Desert (in the central eastern part of the country). It was concluded that there needed to be more feasibility studies conducted to determine its suitability.
- Colombia submitted a proposal to host the Communicating Astronomy for the Public (CAP) meeting in 2016 during the biannual meeting in Warsaw, Poland. Other countries interested in hosting the event are Japan, the United States and Canada. The final decision will be determined in early 2014.
- A seminar on space policy and law was held in Bogotá at the beginning of November, and was hosted by the CCE. The Colombian vice-president announced the creation of the Presidential Program for Space Affairs, which will allocate more funding for space-related projects in the country. This office will support the efforts that the CCE has been working on over the past years.
- Yuri's Night celebrations were hosted in several cities across the country in April, with more than 1000 participants. This was the first time that the event was held in parallel with other cities in addition to the capital.

### Looking Ahead - Plans for Colombia in 2014

- FAC will continue developing their first 3-unit cubesat satellite called FACSAT 1, whose main goal is to conduct dual remote sensing tasks.
- A final decision on the company that will build the first Colombian satellite for Earth observations is expected in 2014.
- Colombia is expected to continue advancing the Colombian Space Policy, as a stepping-stone to form the Colombian Space Agency. At the same time, Colombia will start playing a more active role in the Latin-American Aerospace Agencies Project (ALAS).
- Both the University of Sergio Arboleda, in Bogotá, and the Metropolitan Institute of Technology, in Medellín, will continue paving the way to have their cubesat projects launched in 2015.
- The first Workshop on Small Satellites will be held during the first semester of the year in Medellín. There will be participants from several American and European countries where Cubesat missions are being held.

## ► ECUADOR NATIONAL REPORT

### Review of 2013

This was the first year Ecuador had a designated NPoC. The year concluded with the successful implementation of Ecuador's SGAC website. Other goals set for 2013 were to complete and implement a scholarship/competition list for the South American youth and to find another SGAC NPoC who could work to make SGAC more visible in Ecuador.

Unfortunately, the goals for 2013 have not been fully achieved. While the list of scholarships and competitions was implemented with the help of the SGAC South American team, the current NPoC was not successful in finding collaborators who reside in Ecuador.

Contact with three Ecuadorian citizens who reside in Ecuador (a university student, a high-school teacher, and an engineer at the Ecuadorian Space Agency (EXA)) was made and SGAC was discussed over email. Unfortunately, none of these individuals showed interest in pursuing either a membership or a shared NPoC position. The current NPoC does not reside in Ecuador and promoting SGAC and organising events is nearly impossible. The Technical Salesian high-school (ITSS) in Cuenca was contacted through email to inform them about SGAC. Skype calls to mathematics and physics teachers were also made. These teachers informed students about SGAC but again, because of geographical constraints, no events were organised.

The Ecuadorian Space Agency made the news last year with the launch of the cubesat Pegasus in April 2013. The Ecuadorian Ministry of Defense, with a budget of approximately 70,000 USD, funded the launch. The air force shared the procurement of the satellite with EXA. The cubesat aimed to demonstrate domestic engineering capabilities by fully developing the satellite in Ecuador and motivating Ecuadorian youth to engage in science and technology. The agency confirmed a successful orbit insertion and telecommunications with the satellite. However, just a month later (May 27), the satellite collided with a Russian rocket upper-stage and is considered still in orbit but out of reach. EXA launched its second cube-sat, Kryasor, aboard a Dnep rocket in late November.

### Plans for 2014

At this point, the current NPoC has decided to step down due to geographical constraints and the inability to perform tasks properly because of a shortage in time. They wish the South American NPoC group all the best with future SGAC endeavors and are still committed to communicating information about SGAC to fellow Ecuadorian space professionals who might be interested in the NPoC role.

## ► PERU NATIONAL REPORT

### Overview

Peru's National Space Agency (CONIDA) is responsible for all space related activities in Peru. CONIDA was founded in 1974 and focuses its research on the field of space science and technology. Research areas of CONIDA include astronomy, propulsion, geometrics, scientific instrumentation and rocketry. CONIDA is currently in the process of selecting a supplier for the purchase of a remote sensing satellite that Peru is committed to acquiring.

### Accomplishments in 2013

On December 15<sup>th</sup> of this year, the Alas Peruanas University will launch its first pico-satellite, UAPSAT. It will be placed in the Cygnus-1 spacecraft and travel to the International Space Station onboard the first resupply mission of the Orbital Sciences Antares rocket.

In March, Peruvian students participated in an analog mission in the Utah desert at the Mars Desert Research Station (MDRS). At the conclusion of participation with the Mars Society, the Mars Society Peru was created.



## 2013 Youth Space Activities Overview

- There are a number of groups in Peru where young professionals and students can meet to share ideas and projects related to space. Some of them include:
- The Yuri's Night celebration that took place across the country
- International Space Week
- International Scientific Meeting ECI 2013v and ECI 2013i  
<http://www.encuentrocientificointernacional.org/>
- International Congress of Electric and Electronics Engineering - INTERCON

## Interesting Web Links

Peruvian Space Agency: <http://www.conida.gob.pe>

Peruvian Air Force: <http://www.fap.mil.pe>

Geophysical Institute of Peru: <http://www.igp.gob.pe>

Peruvian Association of Astronomy: <http://www.apa.com.pe>

Direction of Aerospace Interests: <http://www.dinaeperu.gob.pe>

Mars Society Peru: <http://peru.marssociety.org/>

Astronomy Group of the National University of Engineering: <http://astronomia.uni.edu.pe>

Nano-Satellite Chasqui I of the National University of Engineering: <http://www.chasqui.uni.edu.pe>

Pico-Satellite UAP-SAT of the Alas Peruanas University: <http://www.uapsat.info>

## Studies

The CONIDA Centre for Space Studies is providing advanced training courses for public and private sector professionals in different aspects of remote sensing technology, digital processing of satellite images, geographic information systems (GIS) and global positioning systems (GPS). The Technological University of Peru (UTP) also has an engineering Bachelor's degree programme in Aeronautical Engineering.

## ► URUGUAY NATIONAL REPORT

### Overview

Among the highlights of 2013 is the progress made on the establishment of the Uruguayan Space Agency. Also, the construction of the first Uruguayan satellite under development at the Universidad de la Republica is almost complete and ready for launch. Furthermore, several students took part in international competitions last year achieving good results.

This past year has been very good for SGAC Uruguay in terms of media exposure. Thanks to the appearances in national TV, radio, and written press, awareness of SGAC was spread and young people started asking about the work done at SGAC.

### SGAC Activities in 2013

#### *Awards received by SGAC members*

Victoria Alonsopérez, National Point of Contact, was awarded the Best Young Inventor Award 2013 by the World Intellectual Property Organization (WIPO). She was invited to receive the award at the International Telecommunication Union Telecom World 2013, held in November in Bangkok, Thailand.

#### *Uruguayan Space Agency*

Since the end of 2011 there have been several meetings to establish the Uruguayan Space Agency. Victoria Alonsoperez, was invited to take part in those meetings and provide suggestions. There has

been significant progress and all the paperwork to establish the space agency has started and has been through several offices. This could be a big step for the aerospace field in Uruguay.

#### *Girls in ICT Day*

60 girls ~13 years of age from both public and private institutions were invited by ORT, Greentizen, IEEE, Ceibal and Espacio Ciencia to participate in Uruguay's First Girls in ICT Day event. The girls participated in three different workshops. The first one was an engaging talk by four women in ICT: Engineers Victoria Alonsopérez, Patricia Corbo from ORT, Marcela Corbo from Genexus and Sylvia Chebi from Greentizen. Victoria Alonsoperez talked about her career and about the benefits of space exploration.

#### *Media*

SGAC Uruguay had several appearances in the media. After Victoria Alonsoperez won the ITU Young Innovators Competition 2012 she was interviewed by the National Newspaper, "El Pais", and by several radio shows and she had two Television appearances on National TV, where she talked about SGAC.

The interviews are available at the following links:

Interview National Morning Show, "Dia Perfecto": <http://www.youtube.com/watch?v=2GH3Q3S1L6I>

Interview National Newspaper, "El Pais": <http://historico.elpais.com.uy/121120/pciuda-676809/ciudades/desde-la-conquista-del-espacio-a-la-lucha-contr-la-fiebre-aftosa/>

Interview on "Punto Tecno": <http://www.youtube.com/watch?v=IB2rF9-sywY>

### **Other Youth-oriented Activities in Uruguay in 2013**

#### *First Uruguayan Satellite – LAI Project*

The objective of Project LAI is to put the first Uruguayan Cubesat into orbit. This project is led by Professor Juan Pechiar who considers aerospace activities as a way to involve students in engineering. The project is being conducted at the Institute of Electrical Engineering at the Universidad de la República (UdelaR). At the end of 2011 the project became funded by the National Telecommunications Company, Antel.

Many students worked on this project including Victoria Alonsopérez; together with two friends the attitude control system. The aim is to launch the satellite in February 2014.

#### *Uruguayan Astronomy Olympiads (Olimpíadas de Astronomía Uruguayas, OAU)*

This year students from all over the country participated in the OAU. Five finalist students participated in the Latin American Astronomy Olympiads that took place in Cochabamba, Bolivia. Three of them earned a silver medal.

#### *Event of the Aeronautic-Space Center of Investigation and Outreach (CIDA-E)*

In October 2013, the annual event of the CIDA-E. The aim of this event is to inform the Uruguayan aeronautical community about the activities that were done by CIDA-E on the current year. Furthermore, there were presentations by distinguished international speakers, mainly in aeronautic law. This event is a great opportunity for people that are involved in the aeronautical field in Uruguay to get together and discuss current issues that affect the country's aeronautics.

*Uruguayan students at NASA*

This year, as well as last year, a team of Uruguayan students were finalists at the forum organized by NASA and the National Institute of Aerospace, RASC-AL (Revolutionary Aerospace Systems Concepts - Academic Linkage). It took place in June in Cocoa Beach, Florida, USA.

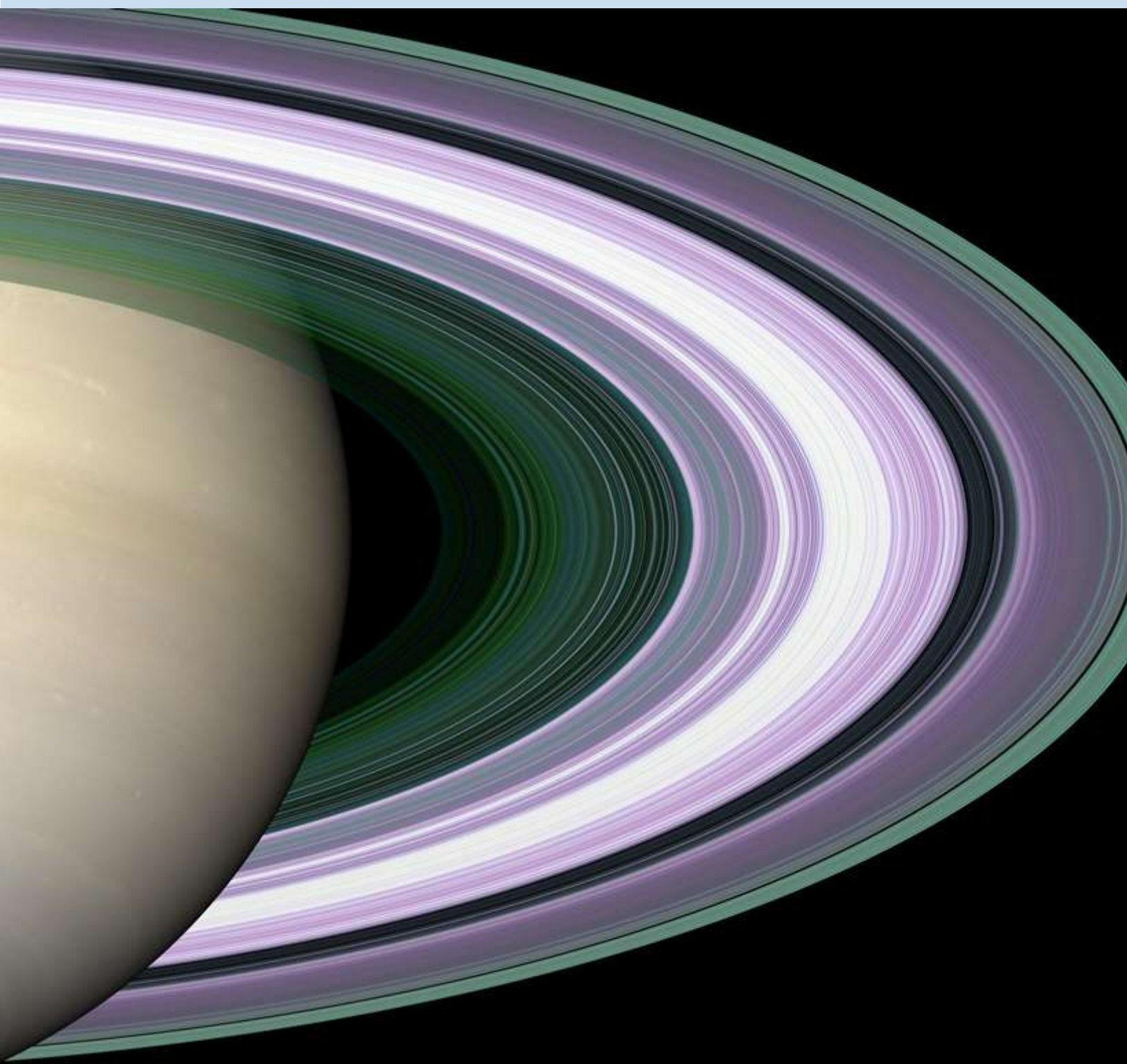
The Uruguayan team developed a project in collaboration with the University of Clarkson from New York. It was a great experience for the Uruguayan students who could interact with people from NASA and from other very important aerospace US companies.

**Plans for 2014**

SGAC Uruguay is already looking for a new NPoC since Victoria's second term expires at the end of 2013.

# APPENDICES

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# Appendix A: Websites

## SGAC Websites

SGAC Official Website	<a href="http://spacegeneration.org/">http://spacegeneration.org/</a>
Facebook	<a href="http://www.facebook.com/spacegeneration">http://www.facebook.com/spacegeneration</a>
Flickr	<a href="http://www.flickr.com/photos/spacegeneration/">http://www.flickr.com/photos/spacegeneration/</a>
Linkedin	<a href="http://www.linkedin.com/company/space-generation-advisory-council">http://www.linkedin.com/company/space-generation-advisory-council</a>
Twitter	<a href="http://twitter.com/#!/SGAC">http://twitter.com/#!/SGAC</a>
Wikipedia	<a href="http://en.wikipedia.org/wiki/Space_Generation_Advisory_Council">http://en.wikipedia.org/wiki/Space_Generation_Advisory_Council</a>
Youtube	<a href="http://www.youtube.com/spacegeneration">http://www.youtube.com/spacegeneration</a>

## Conference Websites

SGC	<a href="http://www.spacegenerationcongress.org">http://www.spacegenerationcongress.org</a>
SGFF	<a href="http://www.spacegenerationfusionforum.org">http://www.spacegenerationfusionforum.org</a>

## Regional Facebook Pages

Africa	<a href="https://www.facebook.com/pages/Space-Generation-Advisory-Council-African-Region">https://www.facebook.com/pages/Space-Generation-Advisory-Council-African-Region</a>
Asia Pacific	<a href="https://www.facebook.com/SpaceGenAsiaPacific">https://www.facebook.com/SpaceGenAsiaPacific</a>
Europe	<a href="https://www.facebook.com/SpaceGenEurope">https://www.facebook.com/SpaceGenEurope</a>
Middle East	<a href="https://www.facebook.com/pages/Space-Generation-Advisory-Council-Middle-East-Region">https://www.facebook.com/pages/Space-Generation-Advisory-Council-Middle-East-Region</a>
NCAC	<a href="https://www.facebook.com/pages/Space-Generation-Advisory-Council-NCAC-Region">https://www.facebook.com/pages/Space-Generation-Advisory-Council-NCAC-Region</a>
South America	<a href="https://www.facebook.com/pages/Space-Generation-Advisory-Council-South-American-Region/">https://www.facebook.com/pages/Space-Generation-Advisory-Council-South-American-Region/</a>

<b>Project Pages</b>	
<i>Commercial Space Project Group</i>	
Official Website	<a href="http://www.spacegeneration.org/index.php/en/projects?id=717">http://www.spacegeneration.org/index.php/en/projects?id=717</a>
Blog	<a href="http://commercialspacesgac.wordpress.com/">http://commercialspacesgac.wordpress.com/</a>
<i>NEO Project Group</i>	
Official Website	<a href="http://spacegeneration.org/asteroid">http://spacegeneration.org/asteroid</a>
Facebook	<a href="https://www.facebook.com/pages/SGAC-NEO-Project-Group">https://www.facebook.com/pages/SGAC-NEO-Project-Group</a>
Twitter	@NEOProjectsSGAC
<i>Small Satellites Project Group</i>	
Official Website	<a href="http://spacegeneration.org/index.php/projects/small-sats">http://spacegeneration.org/index.php/projects/small-sats</a>
Facebook	<a href="http://www.facebook.com/sswg.sgac">http://www.facebook.com/sswg.sgac</a>
Linkedin	<a href="http://tinyurl.com/lisgacsspg">http://tinyurl.com/lisgacsspg</a>
Twitter	@SGACSSPG
<i>Space Law Project Group</i>	
Official Website	<a href="http://spacegeneration.org/index.php/projects/space-law">http://spacegeneration.org/index.php/projects/space-law</a>
Facebook	<a href="https://www.facebook.com/SGACSpaceLawProjectGroup">https://www.facebook.com/SGACSpaceLawProjectGroup</a>
Twitter	@SGACSpaceLaw
<i>Space Safety and Sustainability Project Group</i>	
Official Website	<a href="http://spacegeneration.org/index.php/projects/space-safety-a-sustainability">http://spacegeneration.org/index.php/projects/space-safety-a-sustainability</a>
Facebook	<a href="https://www.facebook.com/ssspgroup">https://www.facebook.com/ssspgroup</a>
<i>Space Technologies for Disaster Management Project Group</i>	
Official Website	<a href="http://spacegeneration.org/index.php/projects/space-technologies-for-disaster-mgmt">http://spacegeneration.org/index.php/projects/space-technologies-for-disaster-mgmt</a>
Facebook	<a href="https://www.facebook.com/pages/Space-Technologies-for-Disaster-Management-SGAC-Project-Group/383767891697248">https://www.facebook.com/pages/Space-Technologies-for-Disaster-Management-SGAC-Project-Group/383767891697248</a>
Linkein	<a href="http://www.linkedin.com/groups/Space-Technologies-Disaster-Management-SGAC-4947901">http://www.linkedin.com/groups/Space-Technologies-Disaster-Management-SGAC-4947901</a>
Twitter	@STDM_SGAC
<i>Youth for GNSS Project Group</i>	
Official Website	<a href="http://spacegeneration.org/index.php/projects/ygnss">http://spacegeneration.org/index.php/projects/ygnss</a>

# Appendix B: Executive Team

## Co-Chairs (Executive Council)



Co-Chairperson

(Apr 2012-Apr 2014)

[Chijioke Cj Nwosa](#)

Nigeria



Co-Chairperson

(Apr 2013-Apr 2015)

[Christopher Vasko](#)

Austria/Hungary

## Executive Office



Executive Director

(Sep 2011 ►)

[Andrea Jaime](#)

Spain



Treasurer

(Oct 2012-Oct 2014)

[Jacob Hacker](#)

Australia



Executive Co-Secretary

(Dec 2011-Dec 2013)

[Aafaque R. Khan](#)

India



Executive Co-Secretary

(Apr 2013-Apr 2015)

[Ali Nasser](#)

Iran

## Executive Office



Communications & Public  
Relations Co-Lead

[Cynthia Chen](#)

Australia

(Nov 2011-Nov 2013)



Communications & Public  
Relations Co-Lead

[Michael Kretzenbacher](#)

Australia

(Nov 2011-Nov 2013)



Membership Manager

[Claudia Raposo Correia](#)

Portugal

(Jul 2011-Jul 2013)



Project Co-Coordinator

[Emmanuelle David](#)

France

(Jul 2011-Jul 2013)



Project Co-Coordinator

[Ana Margarida Raposo](#)

Portugal

(Dec 2013-Dec 2015)



Project Co-Coordinator

[Alanna Krolkowski](#)

Canada

(Jul 2011-May 2014)



Project Co-Coordinator

[Lewis Groswald](#)

USA

(Jan 2014 ►)



## Executive Office



Competition Co-coordinator

(Dec 2013-Dec 2015)

[Noemie Bernede](#)

France



Competition Co-coordinator

(Dec 2013-Dec 2015)

[Philipp Maier](#)

Germany

## Regional Coordinators (Executive Council)

Regional Coordinator –  
Africa

(Jun 2012-Jun 2014)

[James Chibueze](#)

Zambia

Regional Coordinator –  
Africa

(Mar 2012-Mar 2014)

[Minoo Rahnasabapathy](#)

South Africa

Regional Coordinator – Asia  
Pacific

(Apr 2013-Apr 2015)

[Suresh Bhattarai](#)

Nepal

Regional Coordinator – Asia  
Pacific

(Apr 2013-Apr 2015)

[Yusuke Muraki](#)

Japan

Regional Coordinator –  
Europe

(Feb 2011-Feb 2015)

[Guzel Kamaletdinova](#)

Russia

## Regional Coordinators (Executive Council)



Regional Coordinator –  
Europe

[Damian Maria Bielicki](#)

Poland

(Apr 2010-Jun 2014)



Regional Coordinator –  
Middle East

[Behnoosh Meskoob](#)

Iran

(Apr 2013-Apr 2015)



Regional Coordinator –  
Middle East

[Hasan Aziz Kayihan](#)

Turkey

(Feb 2010-Feb 2014)



Regional Coordinator –  
North, Central America  
and the Caribbean

[Ashley Chandler](#)

USA

(Apr 2012-Apr 2014)



Regional Coordinator –  
North, Central America  
and the Caribbean

[Alan Steinberg](#)

USA

(Dec 2011-Dec 2013)



Regional Coordinator –  
South America

[Nicole Jordan](#)

Colombia

(Aug 2009-Nov 2013)












Regional Coordinator –  
South America









[Victoria Alonsoperez](#)

Uruguay









(Dec 2011-Dec 2013)

# Appendix C: National Points of Contact


Africa			
	Cameroon	Ifriky Tadadjeu Sokeng	Aug 2013-Aug 2015
	Cameroon	Elvis Shunyuy	Oct 2012-Oct 2014
	Ethiopia	Getu Hailu	Dec 2013-Dec 2015
	Ethiopia	Beza Tesfaye	Sep 2010-Sep 2014
	Ghana	Abdul-Mumin Yussif	Sep 2011-Sep 2015
	Kenya	Kinyili Antony	Oct 2012-Oct 2014
	Kenya	Nicholas Muinde	Dec 2013-Dec 2015
	Lesotho	Patsa Abram Khosto	Jun 2012-Jun 2014
	Nigeria	Funmi Erinfoami	Sep 2013-Sep 2015












	Nigeria	Suki Dauda Sule	Jul 2013-Jul 2015
	South Africa	Pierre Van Heerden	Feb 2011-Feb 2015
	South Africa	Lumka Msibi	Sep 2013-Sep 2015
	Sudan	Manahil Abdalla	Dec 2013-Dec 2015
	Sudan	Shahd Yousif	Apr 2010-Apr 2014
	Zambia	Misheck Mutuzana	Apr 2010-Apr 2014
	Zimbabwe	Constant Chuma	Nov 2013-Nov 2015
	Zimbabwe	Conrade Muyambo	Jul 2013-Jul 2015

Asia Pacific			
	Afghanistan	Mohsen Zindagi	Aug 2012-Aug 2014
	Australia	Crystal Forrester	Mar 2012-Mar 2014
	Australia	Kristian Grayson	Mar 2012-Mar 2014
	Bangladesh	Khaza Anuarul Hoque	Feb 2014-Feb 2016
	China	Li He	Jun 2012-Jun 2014
	China	Junzi Sun	Dec 2013-Dec 2015
	India	Aafaque R. Khan	Feb 2013-Feb 2015
	India	Muhammad Shadab Khan	Feb 2013-Feb 2015
	Indonesia	Bustanul Arifin	Jul 2012-Jul 2014
	Japan	Daichi Nakamura	Aug 2011-Aug 2015
	Japan	Ryusuke Konishi	Mar 2012-Mar 2014












	Malaysia	Harridon Mohd	Nov 2010-Nov 2014
	Malaysia	Ahmad Kassim	Dec 2011-Dec 2013
	Nepal	Kishor Acharya	Apr 2013-Apr 2015
	Nepal	Ishan Basyal	Sep 2013-Sep 2015
	Nepal	Rijendra Thapa	Sep 2011-Sep 2013
	New Zealand	Vikram Udyawer	Feb 2013-Feb 2015
	New Zealand	Jack Yeh	Dec 2012-Dec 2014
	Pakistan	Waqas Qazi	Oct 2013-Oct 2015
	Pakistan	Ali Butt	Nov 2011-Nov 2013
	Philippines	Pauline Divinagracia	Nov 2012-Nov 2014
	Philippines	Rogel Sese	Jan 2013-Jan 2015

























Asia Pacific			
	South Korea	Ilji Jang	Oct 2013-Oct 2015
	Sri Lanka	Eranga Jayashantha	Dec 2012-Dec 2014
	Sri Lanka	Prasanna Deshapriya	Dec 2012-Dec 2014
	Thailand	Pathara Limsira	Jun 2009-Jun 2013
	Thailand	Ravit Sachasiri	Jul 2010-Jul 2014
	Vietnam	Dao Thu Ha	Mar 2014-Mar 2016
	Vietnam	Thu Vu Trong	Nov 2009-Nov 2013
Europe			
	Albania	Vojna Ngjekar	Nov 2012-Nov 2014
	Armenia	Vardan Semerjyan	Mar 2014-Mar 2016
	Austria	Julia Heuritsch	Aug 2013-Aug 2015
	Austria	Reinhard Tlustos	Aug 2013-Aug 2015












	Belarus	Kiryl Halauko	Dec 2013-Dec 2015
	Belgium	Maarten Adriaensen	Sep 2012-Sep 2014
	Belgium	Sarah Moens	Sep 2011-Sep 2015
	Bulgaria	Raycho Raychev	Dec 2010-Dec 2014
	Bulgaria	Rada Popova	Feb 2011-Feb 2015
	Czech Republic	Ondrej Bruna	Mar 2011-Mar 2015
	Czech Republic	Pavel Paces	Sep 2010-Sep 2014
	Finland	Lauri Neuvonen	Sep 2013-Sep 2015
	France	Lucie Crescenzo	Nov 2010-Nov 2014
	France	Melanie Vincent	Feb 2011-Feb 2015
	Germany	Juergen Hill	Jun 2008-Dec 2013

Europe			
	Germany	Oliver Troll	May 2009-May 2013
	Greece	Angeliki Kapoglou	Apr 2010-Apr 2014
	Hungary	László Bacsárdi	Feb 2012-Feb 2014
	Italy	Matteo Emanuelli	Sep 2011-Sep 2015
	Italy	Giulia Federico	Oct 2013-Oct 2015
	Ireland	Patrick Crowley	Jul 2010-Jul 2014
	Ireland	Norah Patten	Dec 2011-Dec 2015
	Lithuania	Laurynas Mačiulis	Oct 2011-Oct 2015
	Montenegro	Sanja Šćepanović	Jan 2013-Jan 2015
	Montenegro	Aleksandar Jacimovic	Jan 2013-Jan 2015
	Netherlands	Peter Batenburg	Jun 2013-Jun 2015

	Netherlands	Susanne Pieterse	Jun 2013-Jun 2015
	Norway	Tale Sundlisæter	Oct 2011-Oct 2015
	Poland	Szymon Molinski	Jul 2013-Jul 2015
	Poland	Jarosław Jaworski	Apr 2012-Apr 2014
	Portugal	Vera Alves Alfonso	Nov 2010-Nov 2013
	Portugal	Luis Ferreira	Nov 2012-Nov 2014
	Romania	Corina Stiubei	Aug 2013-Aug 2015
	Russia	Aleksandr Khokhlov	Jul 2013-Jul 2015
	Russia	Ekaterina Rezugina	Dec 2009-Dec 2013
	Serbia	Milan Mijovic	Dec 2012-Dec 2014
	Serbia	Nemanja Jovanovi	Mar 2014-Mar 2016

Europe			
	Slovenia	Ziga Valic	Dec 2010- Dec 2014
	Spain	Abigail Calzada	Dec 2010- Dec 2014
	Spain	Jorge Diaz	Jan 2012- Jan 2016
	Sweden	Louise Lindblad	Jul 2013- Jul 2015
	Sweden	Fredrik Persson	Aug 2013- Aug 2015
	Ukraine	Dmytro Faizullin	Feb 2011- Feb 2015
	Ukraine	Mykola Gryshyn	Sep 2012- Sep 2014
	United Kingdom	Ryan Laird	Apr 2012- Apr 2014
	United Kingdom	Jane MacArthur	Apr 2012- Apr 2014
Middle East			
	Egypt	Ayman Mahmoud	Jul 2013- Jul 2015
	Egypt	Ashraf Nabil	Jul 2013- Jul 2015

	Iran	Mohammadreza Rezaei	Oct 2013- Oct 2015
	Iran	Safoura Tanbakouei	Jan 2012- Jan 2016
	Lebanon	Hisham Deek	Jul 2013- Jul 2015
	Lebanon	Rémi Kahwaji	Nov 2011- Nov 2015
	Palestine	Aisha Saleous	Nov 2013- Nov 2015
	Saudi Arabia	Nouf Al-Jaloud	Feb 2011- Feb 2015
	Turkey	Metehan Sezgin	Apr 2010- Apr 2014
	Turkey	H. Tuğça Şener Şatır	May 2010- May 2014
North, Central America & Caribbean			
	Canada	Adam Vigneron	Dec 2013- Dec 2015
	Canada	Kate Howells	Dec 2013- Dec 2015
	Costa Rica	Andres E. Mora Vargas	Jun 2009- Jun 2013












North, Central America & Caribbean			
	Costa Rica	Magaly Sandoval	Nov 2012- Nov 2014
	Jamaica	Marc Cornwall	Dec 2007- Dec 2013
	Mexico	Jorge Vega Rodriguez	Jul 2010- Jul 2014
	Mexico	Carmen Felix	Mar 2011- Mar 2015
	Nicaragua	Mario Aleman	Feb 2014- Feb 2016
	USA	Tiffany Chow	Dec 2011- Dec 2013
	USA	Stephanie Finnvik	Feb 2013- Feb 2015
South America			
	Argentina	Julio Aprea	Jan 2012- Jan 2014
	Argentina	Sergio Taleis	May 2012- May 2014
	Bolivia	Marco Antonio Cabero	Dec 2013- Dec 2015
	Bolivia	Benjamin Pinaya	Jan 2012- Jan 2016

	Brazil	Josué dos Santos	Sep 2013- Sep 2015
	Brazil	Bruno Sarli	Sep 2013- Sep 2015
	Chile	Alejandro Lopez	Jan 2012- Jan 2016
	Colombia	Diego Jimenez	May 2012- May 2014
	Ecuador	Pedro Molina	Jan 2011- Dec 2013
	Peru	Miguel Guillen	Jun 2012- Jun 2014
	Peru	Avid Roman-Gonzalez	Aug 2013- Aug 2015
	Uruguay	Victoria Alonsoperez	Nov 2009- Nov 2013



# Appendix D: Administrative Teams



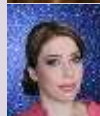


## Communications and Public Relations Team

	Co-Lead	Cynthia Chen	Australia
	Co-Lead	Michael Kretzenbacher	Australia
	Graphics Lead	Marc Cornwall	Jamaica
	Copy Editor	Diana Arias	USA
	Copy Editor	Ross Findlay	UK
	Copy Editor	Justin Park	USA/ Switzerland
	Copy Editor	Laura Rose	Canada
	Reporter	Apoorva Sridhar	India
	Reporter	Sergio Taleisnik	Argentina
	Reporter	Reinhard Tlustos	Austria
	Reporter	Stephanie Hagen	USA

## Web Team

Website  
Supporter





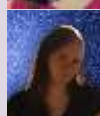
Stylecom

	Web Editor	Scott Fisher	Australia
	Web Editor	Ece Gülfem Dağdeviren	Turkey
	Web Editor	Diana Mutascu	Romania
	Web Editor	Magni Johannsson	Sweden/ Iceland
	Web Editor	Magaly Sandoval	Costa Rica

## ECOSOC Representatives

		Artiom Anisimov	Belarus
		Frédéric Bastide	France

## Translation Team

	Spanish	Ana A. Perez	Venezuela
	French	Assad Anathallee	Mauritius
	German	Klaus Kornfeld	Austria
	Spanish	Rosie Shaddock	UK
	Turkish	H. Tuğça Şener Şatır	Turkey

# Appendix E: Advisory and Honorary Boards

## Advisory Board Members

SGAC's Advisory Board is designed to give strategic direction and advice to SGAC in order to help guide the organisation in its fulfilment of its goals and objectives. It provides comment substantively 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:

<a href="#">Michael Brett</a>	Former SGAC Chair 2012
<a href="#">Catherine Doldirina</a>	Former SGAC Chair 2013
<a href="#">Steve Eisenhart</a>	Senior Vice President - Strategic & International Affairs at the Space Foundation
<a href="#">Norbert Frischauf</a>	Future Studies Systems Engineer for Spacetec
<a href="#">Yasushi Horikawa</a>	Technical Counselor at the Japanese Aerospace Exploration Agency (JAXA)
<a href="#">Agnieszka Lukaszczyk</a>	Former SGAC Chairperson and Brussels Office Director for the Secure World Foundation
<a href="#">Peter Martinez</a>	Chairman of the South African Council for Space Affairs
<a href="#">Tanja Masson-Zwaan</a>	President of the International Institute of Space Law
<a href="#">Clayton Mowry</a>	President, Arianespace, Inc.
<a href="#">Enrique Pacheco-Cabrera</a>	Deputy Director for Space Science and Technology Affairs, Mexican Space Agency
<a href="#">Nicolas Peter</a>	Exploration Strategy Officer in the Director General's Cabinet - European Space Agency
<a href="#">Chris Welch</a>	Director MSc Programmes, International Space University

## 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 furtherance 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:

<a href="#"><u>Barbara Adde</u></a>	NASA SCan Policy and Strategic Communication
<a href="#"><u>Ciro Arevalo</u></a>	Former Chairman of the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS)
<a href="#"><u>Ben Baseley-Walker</u></a>	Legal & Policy Advisor for Secure World Foundation & former SGAC Chair
<a href="#"><u>Yolanda Berenguer</u></a>	Space Education Programme Coordinator for the United Nations Educational, Scientific and Cultural Organization (UNESCO)
<a href="#"><u>James D. Burke</u></a>	US Naval Aviator and NASA Jet Propulsion Laboratory
<a href="#"><u>Caroline Burke</u></a>	Teacher and Arts in Space Advocate
<a href="#"><u>Chris De Cooker</u></a>	Head of International Relations for the European Space Agency
<a href="#"><u>JR Edwards</u></a>	Manager, Human Space Flight Programs Lockheed Martin Washington Operations
<a href="#"><u>Gernot Grömer</u></a>	Professor and Researcher of human mars exploration at the University of Innsbruck
<a href="#"><u>Johannes Ortner</u></a>	Former President of the Austrian Space Agency and of the International Astronautical Federation (IAF)
<a href="#"><u>Kai-Uwe Schrogel</u></a>	Director of the European Space Policy Institute
<a href="#"><u>Loretta Hidalgo-Whitesides</u></a>	Flight Director for ZERO-G
<a href="#"><u>Jim Zimmerman</u></a>	President of International Space Services, Inc. and Former IAF President

# ACKNOWLEDGEMENTS

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ADVISORY COUNCIL

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