



# 20th Space Generation Congress

Diversity, Access and Inclusion



SPACE GENERATION  
ADVISORY COUNCIL



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ADVISORY COUNCIL

In support of the United Nations programme on Space Applications

c/o European Space Policy Institute (ESPI)  
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## About SGC

The Space Generation Congress (SGC) is SGAC's annual meeting in support of the United Nations (UN) Programme on Space Applications. Top university students and young professionals with a passion for space travel from all around the globe to attend three days of networking and learning at SGC.

More than 150 delegates enjoyed an inspiring and resourceful engagement with their peers at the congress, held in Paris, from the 14th to the 16th of September 2022, prior to the 73rd International Astronautical Congress (IAC).

Delegates gained exposure 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). Demonstrating the symbiotic relationship, leaders from these space organisations gained fresh, innovative and bold perspectives from the incoming space generation. Several sponsors along with a committee of volunteers supported the preparation of the 20th SGC. Without the support of SGAC's dedicated volunteers and the continual support of our partners and sponsors, the 20th SGC would not have been possible.





## From the Executive Office

### Co-Chair's Foreword

The 20th annual Space Generation Congress has set great standards for the years ahead. It has been an excellent event, with incredible diversity amongst the delegates, truly showcasing what SGAC is.

The SGC Organising Team has put a lot of effort into creating a great programme with world-class speakers and moderators, as so to make it an invaluable opportunity to network with all the delegates and speakers and to learn from the great experiences of those around you.

Our sincere gratitude extends to the SGC organising team, led by Victoria and Shayna, whose tireless efforts over the past year have brought this year's Space Generation Congress to life.

Here's to a remarkable Space Generation Congress 2022 in Paris, where we continue to shape the future of space together.



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Anthony Yuen  
*SGAC Chair*

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Hamza Hameed  
*SGAC Co-chair*

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## Executive Director's Foreword

Over the past 20 years, the Space Generation Congress (SGC) has grown into one of the key events for the next generation of outer space professionals. The event draws in delegates from around the world, heads of space agencies, and high-profile representatives from government, industry, and academia.

The annual SGC 2022 has been an excellent opportunity to share ideas and experiences, initiate collaborative projects, and network with like-minded people in the outer space sector. The discussions and recommendations over the three days at SGC will be presented at the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) sub-committee meeting.

Over the past 12 months, the SGC 2022 Organising Team has put in endless hours of volunteer time to the development and planning of SGC 2022. I would particularly like to acknowledge the SGC 2022 Manager, Deputy Manager and Organising Team for their outstanding contributions to what we believe has been an engaging SGC programme.

I would also like to acknowledge the support of all our sponsors who make it possible for SGAC to host the annual SGC and their commitment to advancing tomorrow's space sector leaders to grow their network.



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Davide Petrillo  
*SGAC Executive Director*

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## From the Event Managers

In 2022, the 20th Space Generation Congress took place in the beautiful city of Paris, France. The event was attended by 135 delegates from 56 countries, representing every SGAC region. This year was particularly special as it was the first time the SGC had an underlying theme expressing what the event aims to highlight, promote, and commemorate. To make it even more unique, the theme chosen for this year sought to celebrate what many considered the most critical and influential mission of SGAC, which is to foster "Diversity, Access, and Inclusion" across the space sector. As expected, the event was a huge success, providing an outstanding experience for the delegates and industry guests, filled with opportunities to learn from one another, voice their opinions, connect, and grow as professionals in the space sector. The event featured six working groups, four panels, one fireside chat, two start-up elevator talks, ten keynote speeches, an art exhibition, and a Sunday Workshop.

The entire SGC 2022 delegation participated in person, returning to the standard event format after two years of online or hybrid events due to the COVID-19 pandemic. As a result, the organizing team had to put in extra effort to keep the attendees engaged and ensure everyone enjoyed the experience. Additionally, the venue layout allowed the programming team to experiment with a new format for the final presentation, which aimed to make it more dynamic and allow all working group members to present the outcomes of their discussion. While this new format was well executed, most feedback suggested that the delegates still preferred the traditional approach of having a selected number of individuals from each working group give the final presentations in the auditorium.

As we reflect on this experience, we want to emphasize how important it is to ensure that the volunteers who dedicate countless hours and energy to make the event happen are well compensated and acknowledged for their efforts. Future SGAC Leadership and Event Managers should always remember that the experience of being a member of the organizing team is just as important as that of the delegates.



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Victoria Carter-Cortez  
*Event Manager*

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Shayna Hume  
*Event Deputy Manager*

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## Programme

### DAY 01 - Tuesday, September 13, 2022

Time	Activity	Location
14:00 - 15:30	Moderators Training	FIAP Jean Monnet
18:30 - 23:00	Opening Night Dinner	La Felicita

## Programme

### DAY 02 - Wednesday, September 14, 2022

Time	Activity	Location
08:00 - 08:30	Registration & Morning Coffee	Hall
08:30 - 09:00	Welcoming Speech + Intro to SGC + WG Overviews	Bruxelles Auditorium
09:00 - 09:30	Keynote Speech by Irene Benito, Senior Manager for European Affairs at Planet	
09:30 - 10:00	Ice-Breaker: Networking Activity	
10:00 - 12:30	Working Group Time	WG Rooms
12:30 - 14:00	<i>Lunch</i>	<i>Restaurant</i>



14:00 - 14:30	Keynote Speech by Ersilia Vaudo, ESA Chief Diversity Officer	Bruxelles Auditorium
14:30 - 15:00	Keynote Speech by Marco Brancati, Chief Technical & Innovation Officer at Telespazio	
15:00 - 15:45	<i>Coffee Break &amp; Art Exhibition Sponsored by CNES</i>	Hall
14:45 - 16:45	Careers Panel with Airbus and Voyager	Bruxelles Auditorium
16:45 - 18:45	Working Group Time	WG Rooms
18:45 - 19:00	SGC Day 1 Closing Remarks	Bruxelles Auditorium
19:00 - 19:30	Travel to Venue for Evening Event	-
19:30 - 23:00	International Night Sponsored by MAXAR	ESSpace







## Programme

## DAY 03 - Thursday, September 15, 2022

Time	Activity	Location
08:00 - 08:30	<i>Welcoming &amp; Morning Coffee</i>	<i>Hall</i>
08:30 - 09:00	<b>SGC Day 2 Welcome</b>	<b>Bruxelles Auditorium</b>
09:00 - 09:30	<b>Keynote Speech by Dylan Taylor, Chairman and CEO at Voyager Space</b>	
09:30 - 10:00	<b>Keynote Speech by Elisa Carcaillon &amp; Gautier Brnuet, Loft Orbital</b>	
10:00 - 12:00	<b>Working Group Time</b>	<b>WG Rooms</b>
12:00 - 12:30	<b>Special Speech by Pamela Melroy, Deputy Administrator of NASA</b>	<b>Bruxelles Auditorium</b>
12:30 - 14:00	<i>Lunch</i>	<i>Restaurant</i>
14:00 - 14:30	<b>Keynote Speech by Amit Ksharitya, NASA Headquarters</b>	<b>Bruxelles Auditorium</b>
14:30 - 15:00	<b>Awards Ceremony</b>	



15:00 - 15:45	<b>Coffee Break &amp; Art Exhibition Sponsored by CNES</b>	<b>Hall</b>
15:45 - 17:00	<b>Space Sustainability Panel with Astroscale, COMPSPOC, Redwire and SWF</b>	<b>Bruxelles Auditorium</b>
17:00 - 18:45	<b>Working Group Time</b>	<b>WG Rooms</b>
18:45 - 19:00	<b>SGC Day 2 Closing Remarks</b>	<b>Bruxelles Auditorium</b>
19:00 - 19:30	<b>Travel to Venue for Evening Event</b>	-
19:30 - 23:00	<b>Space Night Sponsored by Airbus and Leanspace</b>	<b>Belushi's</b>





Programme

DAY 04 - Friday, 16th September 2022

Time	Activity	Location
08:00 - 09:30	<i>Welcoming + Morning Coffee</i>	Hall
08:30 - 09:00	SGC Day 3 Welcome + Photos	Bruxelles Auditorium
09:00 - 09:30	Keynote Speech by Takeshi Hakamada, Founder, Director & CEO at iSpace	
09:30 - 10:00	Keynote Speech by Hazuki Mori, Expert at UNOOSA's Space Applications Section	
10:00 - 11:00	Interagency Operations Advisory Group Panel with NASA ScAN	
11:00 - 12:30	Working Group Time	WG Rooms
12:30 - 14:00	<i>Lunch with Speakers from Oxford Space Systems and Destinys</i>	Restaurant
14:00 - 15:15	Potential careers in Earth Observations Panel with NOAA	Bruxelles Auditorium
15:15 - 16:15	Fireside Chat with Gwen Griffin and Bob Smith from Blue Origin	
16:15 - 16:30	WG Presentations 1-Minute Elevator Pitch	



16:30 - 17:30	Working Group Presentations	WG Rooms
17:30 - 18:00	SGC Closing Remarks + Closing Speech	Bruxelles Auditorium
18:00 - 19:00	Travel to Venue for Evening Event	-
19:00 - 23:00	<i>Gala Dinner Sponsored by Lockheed Martin</i>	<i>The Westin</i>
NASA SCaN Workshop		





## Programme

## DAY 05 - Saturday, 17th September 2022

Time	Activity	Location
08:30 - 08:45	Welcoming	Bruxelles Auditorium
08:30 - 08:45	Keynote Speech - Badri Younes	
09:35 - 10:00	Lecture No 1 - Marcus Watkins	
10:05 - 10:30	Lecture No 2 - Brian Quinn	
10:30 - 11:00	<i>Coffee Break</i>	<i>Hall</i>
11:05 - 11:30	Lecture No 3 - Julia Ross	Bruxelles Auditorium
11:35 - 12:00	Lecture No 4 - Victoria Samson	
12:00 - 12:30	Activity Introduction and Team Organisation	
12:30 - 14:00	<i>Lunch</i>	<i>Restaurant</i>
14:00 - 15:00	Workshop Activity	Bruxelles Auditorium



# Programme

# DAY 06 - Saturday, 17th September 2022

Time		Location
15:00 - 15:30	Coffee Break	Hall
15:30 - 17:00	Workshop Activity	Bruxelles Auditorium
17:00 - 17:15	Presentation and Feedback	
17:15 - 17:30	Closing Remarks	





## Opening Night Dinner

 **La Felicità**



Sponsored by



The Opening Dinner of the 2022 SGC took place on September 13th, 2022, at La Felicità, a food court offering a variety of dining options. Each attendee was given a ticket for a complimentary meal.

Marco Brancati from Telespazio delivered a speech during the event. The gathering occurred in The Central Room, where SGAC organised a session involving Networking Bingo.





## International night

 **ESSpace**



Sponsored by

**MAX'AR**

The International Cultural Night is an annual tradition at the SGC where participants get the chance to present their home countries and share their culture through music, food, stories, and other aspects. Everyone is invited to wear traditional outfits from their respective countries, and delegates from the same region are encouraged to coordinate with each other to come up with ideas for the representation.

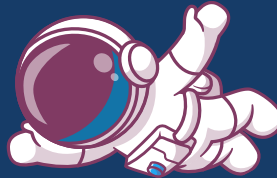






## Space Night

 **Belushi's**



Sponsored by

**AIRBUS**

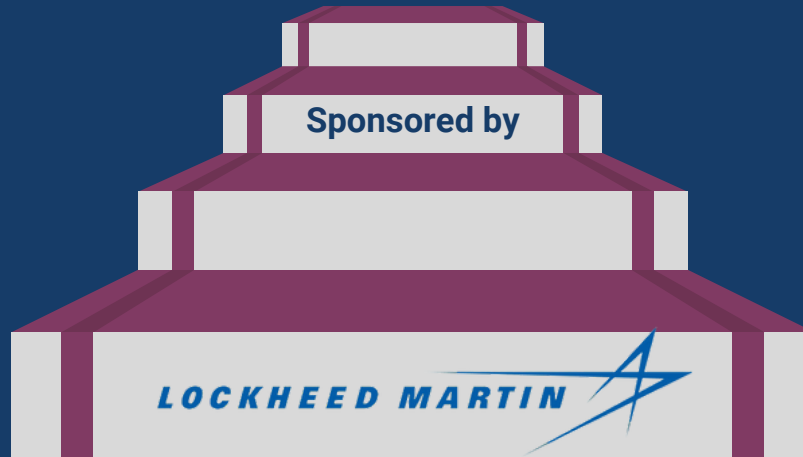
lean space

The Space Night is another cherished tradition of SGC, held in the the evening during the Congress to highlight a specific aspect of the space industry and welcome new members to SGAC. This year, Space Night was sponsored by both Airbus and Leanspace. The Night started with an introductory speech from the head of Airbus US operations, followed by a panel discussion featuring representatives from Leanspace and Airbus. The discussion focused on the collaborative efforts between prime companies and newcomers to shape our Next Space industry and its leading projects. A discussion followed exploring various approaches to blend an engaged and established career with outreach and collaborative side activities in the Space Industry. Food and soft drinks were served.





## Gala Dinner



 **Westin Paris, Hotel Napoleon**

This Gala dinner is the highlight event for SGC, celebrating all of the achievements over the past year and honouring all of the members, alumni, and sponsors of SGAC. The SGC2022 Closing Dinner was held at the magnificent Westin Paris, Hotel Napoleon.





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Side Event Activities

Saturday, 17th September 2022

## NASA SCaN Workshop



Side Event Activities

Wednesday, 14th - Thursday, 15th September 2022

## Art Exhibition

Sponsored by

An exceptional exhibition featuring paintings by SGAC members was curated by the SGC organizers.





## Speakers and Experts

### Working Group Speakers and Subject Matter Experts



#### Working Group 1: NASA Exploration- Expanding Access to Space in the Era of Artemis



**Amelia Batcha** | Executive Officer to the Associate Administrator, Exploration Systems Development Mission Directorate at **NASA**



**Amit Kshatriya** | Assistant Deputy Associate Administrator, Common Exploration Systems Development Division at **NASA**



**Laura Means** | Strategic Communications, Human Landing System Program at **NASA**



**Ashley Peter** | Schedule Analysis Team Lead, Common Exploration Systems Development Division at **NASA**



**Ruth Siboni** | Chief of Staff, Common Exploration Systems Development Division at **NASA**



## Working Group 2: Achieving “Space for All” through investment in Space Entrepreneurship



**Gonzalo Martín de Mercado Pérez** | Business Development Officer, Space Solutions at **ESA**



**Anton Liegert** | Visiting Researcher at **Space Robotics Laboratory**



**Romain Buchs** | Space Policy Analyst at **ClearSpace**



## Working Group 3: TALENTS – or the future of Space



**Bo Byloos** | Project Officer Exploration and Education at **Luxembourg Space Agency**



**Charles Koener** | Policy Officer at **Luxembourg Space Agency**



**Andreas Hein** | Associate Professor of Space Systems Engineering at **SnT, University of Luxembourg**



**Loïck Chovet** | Doctoral Researcher in SpaceR at **SnT, University of Luxembourg**



## Working Group 4: Addressing the Skills Gap in the Space Sector



**Heidi Thiemann** | Director at  
Space Skills Alliance



## Working Group 5: Addressing Food Security with Earth Observation Data



**Stefan Zeller** | Senior  
Space Systems Engineer at  
**Planet**



**Mariana Curdoglo** | Product  
Manager at **Planet**



**Pooja Pandey** | Product  
Manager at **Planet**



## Working Group 6: SGAC Special Track: Space Food



**Christina-Ariadni Valagkouti** | Analog Astronaut / Nutrition Expert at **Interstellar Performance Labs**



**Alain Maillet** | Head of nutrition activities for CNES at **MEDES**



**Christel Paille** | ECLS engineer working on the MELISSA project at **ESA**



**Shahreen Reza** | CEO & Co-Founder of **ASTREAS**



**Joao Pedro Marques Garcia** | Research fellow on cultured meat for human space exploration at **ESA**



**Pascal Rosenfeld** | Deputy VP Space & New Ventures at **ALEPH Farms**



**Sonja Brungs** | Head of nutrition activities for CNES at **MEDES**



**Serge Pieters** | Dietitian and nutritionist in the areas of sports nutrition and astronaut physiology



## Keynote Speakers



**Irene Benito** | Senior Manager  
for European Affairs at **Planet**



**Ersilia Vaudo** | Chief Diversity Officer  
and Special Advisor on Strategic  
Evolution to the Director of European,  
Legal and International Affairs at **ESA**



**Marco Brancati** | Chief  
Technical & Innovation  
Officer at **Telespazio**



**Takeshi Hakamada** | Founder,  
Representative Director and  
CEO at **ispace**



**Dylan Taylor** | Chairman and CEO  
at **Voyager Space**



**Gautier Brunet** | Chief of  
Staff at **Loft Orbital**



**Elisa Carcaillon** | Business  
Development Director at  
**Loft Orbital**



**Amit Kshatriya** | Assistant  
Deputy Associate Administrator  
Common Exploration Systems  
Development Division  
**NASA Headquarters**



**Kathie Bowden** | Skills Lead  
at the **UK Space Agency**





**Hazuki Mori** | Expert to the Space Applications  
Section of the **United Nations Office for Outer  
Space Affairs (UNOOSA)**

**Panel Speakers**

**Building a Pathway to a Career in Space Panel**



**Abby Dickes** | Executive Vice  
President of Marketing at  
**Voyager Space**



**Wendy Carrara** | Senior  
Manager for Digital & European  
Institutions at **Airbus**

**Space Sustainability Panel**



**Al Tadros** | Chief Technology  
Officer of **Redwire**



**Dan Oltrogge** | Director of the Center  
for Space Standards and Innovation,  
Chief Scientist, and space policy  
expert at **COMSPOC Corporation**



**Morgane Lecas** | Business  
Analyst at **Astroscale**



## Interagency Operations Advisory Group Panel



**Angela Peura** | Moderator,  
Space policy practitioner,  
working at **NASA SCaN**



**Sami W. Asmar** | Manager of the  
commitments office for the  
Interplanetary Network Directorate at  
**NASA's Jet Propulsion Laboratory**



**Aude Vignelles** | Chief  
Technology Officer at the  
**Australian Space Agency**

## Potential Careers in Earth Observations Panel



**Stephen Voldz** | Introductor,  
Assistant Administrator for  
Satellite and Information  
Services at **NOAA**



**Arvind Ravichandran** | Moderator  
Demystifying Earth Observation,  
Satellite Data and its Applications  
at **TerraWatch Space**



**Andiswa Mlisa** | Managing  
Director of Earth Observation  
directorate at the **South African  
National Space Agency (SANSA)**



**Kathryn Shontz** | Acting  
Director, Office of Satellite  
Ground Services at **NOAA**



**Pooja Pandey** | Product  
Manager, Retention at **Planet**



**Irene Parker** | Deputy  
Assistant Administrator  
Systems at **NOAA**



Fireside Chat



**Gwen Griffin** | Moderator | Chief Executive Officer, **Griffin Communications Group** & Executive Director, **Club for the Future**



**Robert H. Smith** | Chief Executive Officer of **Blue Origin**



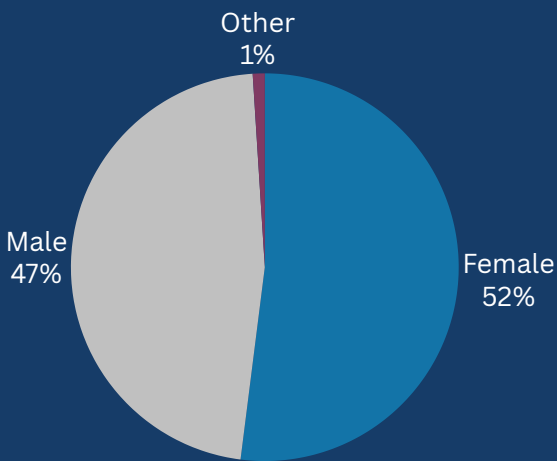


## Event Statistics and Demographics

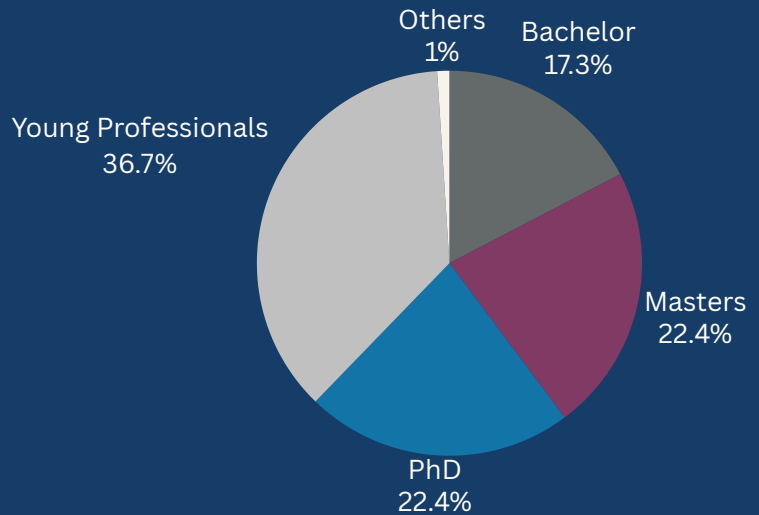
**135 Delegates**

**56 Nationalities**

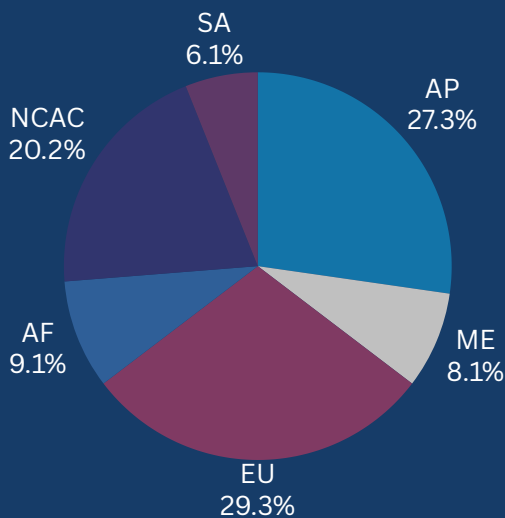
### Gender Distribution



### Professional Background



### Regional Distribution



**6**  
**Working groups**



## Scholarship Sponsors and Recipients

### SGAC Global Rising Star Award

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<b>Gabriel Jaimes illanes</b>	<b>Lena Obaid</b>	<b>Maheen Parbhoo</b>
<b>Selene Cannelli</b>	<b>Yumna Majeed</b>	<b>Carlos Rodriguez</b>

### Space Generation Leadership Award

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<b>Daniel Seybold</b>	<b>Phylis Makurunje</b>	<b>Faith Tng</b>
<b>Matias Campos Abad</b>	<b>Sahba El-Shawa</b>	

### NASA SCaN

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<b>Alyssa Johnson</b>	<b>Julia Ross</b>
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### NASA Exploration Scholarship

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<b>Darcy E. Elburn</b>
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## Loft Orbital

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**Maria Magalhaes**

**Xavier Almenar  
Cendar**

**Blaise Robert**

## AYAA

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**Alison Lockley**

**Laura Breckon**

**Ying Hua Gavin  
Choong**

## OHB SE Scholarship

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**Clément Loneux**

**Anton Liegert**

## Global Grant

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**Ahmed Baraka**

**Kelsey Doerksen**

## Italian Space Agency Scholarship

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**Alessandro  
Masat**

**Alessandro  
Paravano**

**Giuliana Rotola**

**Marco Nugnes**

**Gianmario  
Merisio**



## Emerging Space Leaders

<b>Ramson Nyamukondiwa</b>	<b>Bildad Njenga</b>	<b>Elizaveta Shashkova</b>	<b>Lama Alereeman</b>
<b>Nisanur Eker</b>	<b>María Fernanda del Barco León</b>	<b>Juan Carlos Mariscal Gomez</b>	<b>Isidora Casas del Valle</b>
<b>Adolfo Jara</b>	<b>Hari Ram Shrestha</b>	<b>Sepideh Faghihi</b>	<b>Usman Shehryar</b>
<b>Martina Dimoska</b>	<b>Tensae Ali</b>	<b>Abdulla Hil kafi</b>	<b>Mahhad Nayyer</b>
<b>Niki Sajjad</b>	<b>Saira Roxana Obith Williams</b>	<b>Pooja Lepcha</b>	<b>Kawsihen Elankumaran</b>

## Chris Boshuizen Scholarship

<b>Emirhan Eser</b>	<b>Oluwakorede Adejoro</b>	<b>Ruvimbo Samanga</b>
<b>Clarissa Luk</b>	<b>Sarinya Jiklongsub</b>	



## Future Space Leaders Grant Program

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**Esther Putman**

**Skylar Eiskowitz**

**Elena-Sorina  
Lupu**

**Jack Reid**

**Vera Demchenko**

### ispace

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**Kartikha Rani  
Ramdoss**

**Sejal Budholiya**

### ISEB ESA

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**Juan Garcia  
Bonilla**

**Ric Dengel**

### ISEB KARI

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**Bawoul Chung**

**Jae-Min Kim**

**Eun-Song Shim**

**Jeong-Hwa Heo**

### ISEB NASA

---

**Madelyn Mattier**

**Ronald Rizzo**

**Kevin Walsh**





## ISEB CSA

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**Newsha Naghgoo**

**Sobia Nadeem**

## SGAC4Steam Scholarship

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**Hanzila  
Mubashar**

## ESA

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**Marie Lambert**

## Airbus

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**Shrutika Agarwal**

## Australian Space Agency Scholarship

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**Jack Rintoul**

**Jessica Ovens**



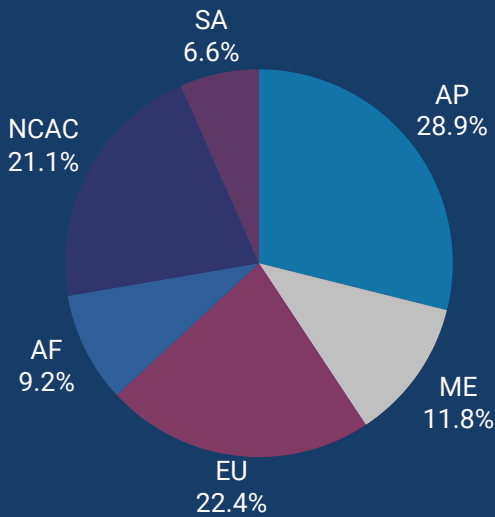
## Scholarship Statistics

**Scholarship  
Winners**  
**77**

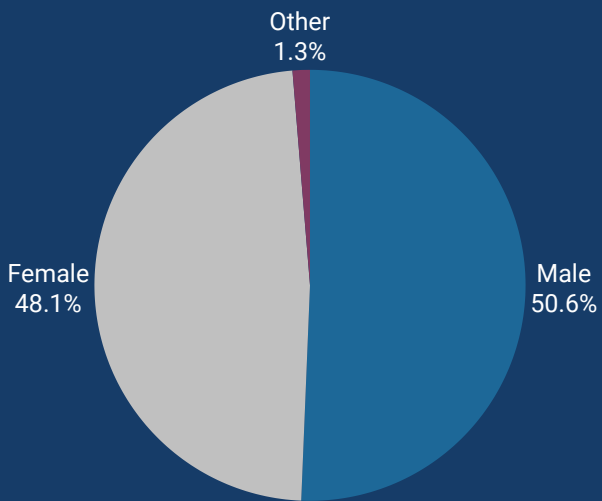
**Nationalities**  
**37**

**Scholarships : Delegates**  
**58%**

**Regional Distribution**



**Gender Distribution**



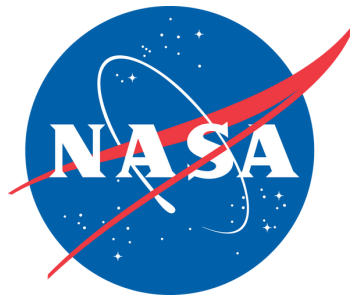


## Working Groups



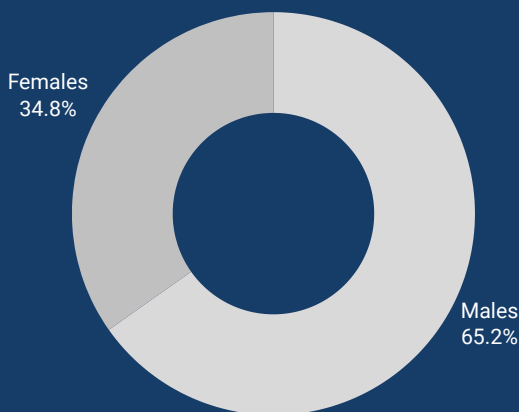
### Working Group 1: Making Space - expanding access to space in the Era of Artemis

Supported by:



NASA's Exploration Working Group aimed to simultaneously inform participants about its plans for sustained lunar exploration, while also challenging the group to provide feedback on these plans through the lens of equity and inclusion. Strategies were presented for space industry stakeholders to engage diverse communities at individual, government agency, private entity, and whole industry levels.

## Working Group Statistics



**Delegates**  
23

**Nationalities Represented**  
17

## Main Objectives

- Inform the Working Group members about NASA's latest plans for Artemis and lunar exploration and development.
- Identify the barriers to entry of communities historically underrepresented in the space industry.
- Identify novel ways of increasing non-traditional parties in the space industry in a way that is meaningful and sustainable.



## Subject Matter Experts



**Amelia Batcha** | Executive  
Officer to the Associate  
Administrator, Exploration  
Systems Development  
Mission Directorate at **NASA**



**Amit Kshatriya** | Assistant  
Deputy Associate Administrator,  
Common Exploration Systems  
Development Division at **NASA**



**Laura Means** | Strategic  
Communications,  
Human Landing System  
Program at **NASA**



**Ruth Siboni** | Chief of Staff,  
Common Exploration Systems  
Development Division at **NASA**



**Ashley Peter** | Schedule Analysis  
Team Lead, Common  
Exploration Systems  
Development Division at **NASA**



**Moderator**

**Kelsey Doerksen** | PhD  
Researcher at **University of  
Oxford**



**Rapporteur**

**Darcy Elburn** | Strategic  
Communications Lead, Artemis  
Campaign Development Division,  
Exploration Systems  
Development Mission Directorate  
at **NASA**



## Guiding Questions

1. How can NASA increase collaboration with emerging space nations? How can emerging space nations contribute to Artemis in meaningful ways? What benefits do emerging space nations gain from contributing to Artemis and collaborating with existing space agencies such as NASA?
2. How does NASA use existing technologies to reach non-abled communities? How can NASA engage and utilize people with more diverse skillsets? How can NASA invest in non-traditional audiences?
3. How can NASA engage non-traditional industries to be involved in space activities? What technological advancements are needed to broaden access for the Artemis missions? In what ways should the role of industry change in the modern space arena?

## Response to questions

1. NASA must meet people where they are by researching emerging audiences, targeting critical communities, and working to communicate with them in a customized way.
2. NASA must build an ecosystem by establishing ambassador-like relationships with passionate people in emerging space communities and diversifying the NASA Artemis workforce by enabling increased access for non-US citizens.
3. NASA must utilize innovative technology to tackle resource challenges and innovate on NASA's procurement strategy to initiate new collaborations.

## Recommendations

### Recommendations to the SGAC

- Encourage delegates (and other event participants) to share their SGAC experiences with their own communities (aerospace and otherwise). Provide resources and examples to make it more likely for delegates to share.



## Recommendations

### Recommendations to UNCOPUOS

- Decouple defense and military activities and space exploration activities in the public narrative through outreach and in program and project planning. This will reduce restrictions and barriers to entry for certain countries and individuals and engage a wider audience in space exploration.

### Recommendations to the sponsor/ industry at large:

- Better establish communications best practices and improve NASA adherence to communications industry standards. For example: devote increased resources to social media teams and empower them to better keep up with the changing landscape.
- Identify areas of potential collaboration within Artemis and use partner research to better target and tailor NASA's communications to specific communities/emerging space countries. For example: produce targeted outreach regarding specialty industries that are strong in an emerging space country.
- Expand upon existing NASA programs for international engagement and add new programs to close gaps. We identified challenges as an area where NASA has a lot of existing Artemis engagement opportunities, but may not have many that are truly open to international participation.
- Establish informal ambassador-like relationships with passionate people in emerging communities. These people can provide first hand information to NASA on their community's interest areas and specialized skills and resources. They will also act as champions for Artemis and gain a direct line to work with NASA.
- Diversify the NASA Artemis workforce and enable increased access for non-US citizens, potentially through NASA's procurement strategy and means of initiating collaborations.



## Working Groups



### Working Group 2: Achieving “Space for All” through investment in space entrepreneurship

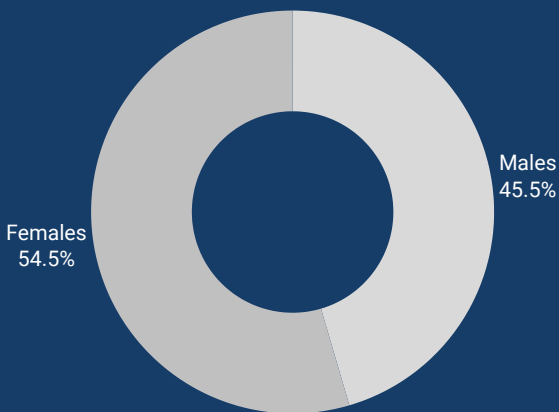
Supported by:



The European Space Agency (ESA) is one of the primary supporters of start-ups and small companies in Europe. The ESA Business Incubation Centers (ESA BICs) comprise the largest network of space incubators in Europe, supporting entrepreneurs with space-based business ideas and stimulating clusters of space-related start-ups across Europe. Additionally, this network connects start-ups with new business partners and enables new companies to get their products off the ground and market ready. ESA believes it is essential to support and guide young entrepreneurs, enabling them to become leaders of the space industry of tomorrow.

For this reason, ESA partnered with SGAC to provide a platform to discuss ideas on how to motivate and prepare young minds so that they can become space entrepreneurs. Additionally, this working group discussed ideas on diversifying and promoting entrepreneurship to gender minorities and young students and professionals in emerging countries to achieve “Space for All” within the next decades.

## Working Group Statistics



**Delegates**  
22

**Nationalities Represented**  
18



## Main Objectives

- Propose tangible solutions to ensure equal opportunities for anyone interested in pursuing entrepreneurship.
- Propose solutions for developing frameworks that facilitate entrepreneurship, considering regional strengths and weaknesses.
- Develop a global roadmap that presents the vision of “Space for all” implemented throughout the space sector across the future decades.

## Subject Matter Expert



**Gonzalo Martín de Mercado Pérez** | Business Development Officer, Space Solutions at **ESA**



**Moderator**

**Romain Buchs** | Space Policy Analyst at **ClearSpace**



**Rapporteur**

**Anton Liegert** | Visiting Researcher at Space Robotics Laboratory

## Guiding Questions

1. How can the space sector invest in the younger generation to take up entrepreneurship, particularly for gender minorities?
2. How can the space sector empower young people to pursue entrepreneurship, especially in emerging nations?
3. How can the space sector achieve collectively “Space for all” within the next decades?





## Response to questions

1. Delegates discussed how the space sector can invest in the younger generation to encourage entrepreneurship, with a particular focus on gender minorities:

**Events** targeted towards **early-stage entrepreneurs** (e.g. high school) to motivate, connect, and learn about entrepreneurship

- Organized by a SGAC Project Group in collaboration with startups, academia

**Mentorship** program targeted towards **all** startup founders as mentees, and **diverse** mentors to change the startup culture to **normalize diversity** in founders, leads, senior positions

- Organized by SGAC together with startup founder network+mentors

**Grants** to start entrepreneurship **initiatives** (e.g. Student female+ hackathon) in collaboration between students and startups/companies

**Diversity** community groups to discuss how to improve diversity in entrepreneurship

- Organized by SGAC as regional events with startups, entrepreneurs, students, academia

2. Delegates explored strategies on how the space sector could empower young people to pursue entrepreneurship in emerging economies:

**Pre-startup event (hackathon)**, targeted towards young people that have **not yet** created a product or founded a startup

- Pre-hackathon **workshop** sessions to learn technical skills to reduce barrier of entry
- Networking opportunity to brainstorm ideas

**Startup event (conference)** targeted towards current founders to receive resources, mentoring, funding, and networking

- Organized by a SGAC Project Group in collaboration with startups, accelerators, academia
- Hosted in emerging nations
- Lectures from startups

**Funding event (pitch competition)** targeted towards startup founders to receive funding and improve startup pitches

- Learning workshops (focus on start-up stories from emerging nations)
- Competition in front of potential investors

**Certification** for diversity for developed country startup to work with emerging country startup

3. The following events and initiatives were discussed by delegates to achieve 'Space for All' within the next decades:

- Organization of yearly conferences by SGAC, focused on entrepreneurship in association with other major space conferences
- Initiation of regional hackathons with additional guidance and teaching in before, especially in emerging countries, providing hands-on knowledge and network
- Setup of free online learning programs by Space Agencies, academia, and industry
- Organization of start-up pitch competitions in front of potential investors by SGAC in collaboration with industry
- Implementation of a certification granting work of established global space businesses with entrepreneurs from emerging countries by the United Nations Committee



## Recommendations

### Recommendations to the SGAC

Organize a yearly **global conference** in association with GLEC/GLEX/GLOC

- use SGAC's inclusive delegate selection process
- bring together, guide, and educate delegates in every phase of entrepreneurship
- highlight the start-ups from emerging countries and minorities
- Organize a **regional Hackathon**
- Provide a **network** and overview of **resources/tools**
- Collaborate with **SGAC's Diversity & Gender Equality Project Group**

### Recommendations to the sponsor/partner and industry at large

**SGAC** through its NPoC collaborates with **space agencies**, companies, NGOs, and academia should bring high-school students and undergraduates in contact with entrepreneurship.

- Offer online learning **programmes** and **material** to educational institutions available in every country
- **Free material** examples: case books and recorded lectures
- Platform examples: SGAC, EDX, and MOOC
- Potential **pitch** competitions utilising this **material**

### Recommendations to UNCOPUOS

The United Nations should create a program which grants certification to global space businesses that promote diverse entrepreneurship in emerging countries.

- Define **thresholds** necessary to award different levels of certification
  - Achieving this through actions such as, but not limited to: financial support, mentorship programs and providing necessary facilities, etc.
- Systematically **evaluate** corporations on a regular basis to ensure continued interest in diverse entrepreneurship promotion
  - For example: annual review by a UN expert



## Working Groups



### Working Group 3: TALENTS – or the future of Space

#### Supported by:



LUXEMBOURG  
SPACE AGENCY

&



UNIVERSITÉ DU  
LUXEMBOURG

STEM students, and talents in general are critical to the future of space. But the space sector has a lot of competition for a relatively small talent pool. The top STEM students represent a highly specific segment of the population, and the aerospace companies are all seeking the same kind of profiles. Yet, those companies are not the only ones looking for talented individuals with a tech-based skill set. They are competing with tech companies such as Apple, Google, Amazon, and Microsoft, or even, as technology development enters every single field of activity, with other industries such as, for instance, finance where incentives are high. The same competition also exists for other profiles. The space industry has a lot of job openings and not enough people to fill them. Space startups are expanding their teams, which puts more and more pressure on the talent pool. Consequently, companies are changing their recruiting techniques, upgrading facilities, allowing more remote work, and in some cases, a willingness to hire from outside the industry to come out on top in the competition.

The working group discussion centered around the question: In such a competitive environment, how should talent be addressed by small countries such as Luxembourg?

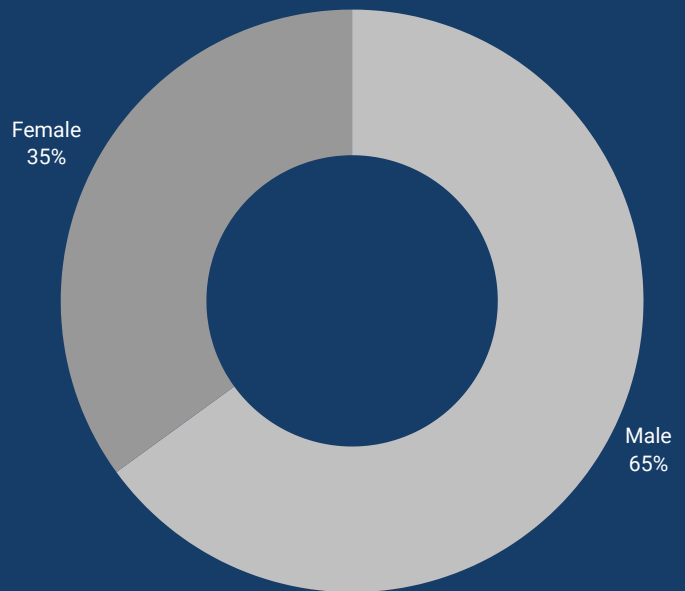




## Working Group Statistics

**Delegates**  
20

**Nationalities represented**  
17



## Main Objectives

- Supply an advisory report to Luxembourg Space Agency about how to address talent deficit in the space industry that can feed into their strategy.
- Develop creative ideas outside of the existing supplied information for Luxembourg that focus on specific challenges for smaller countries/economies.
- Prepare a presentation for the wider SGAC that contains ideas that can be replicated in other countries and environments.



## Subject Matter Experts



**Bo Byloos** | Project Officer  
Exploration and Education at  
**Luxembourg Space Agency**



**Charles Koener** | Policy Officer at  
**Luxembourg Space Agency**



**Andreas Hein** | Associate  
Professor of Space Systems  
Engineering at **SnT,**  
**University of Luxembourg**



**Loïck Chovet** | Doctoral  
Researcher in SpaceR at **SnT,**  
**University of Luxembourg**



**Moderator**

**Tim Searle** | Senior Policy  
Advisor at **New Zealand Space  
Agency**



**Rapporteur**

**Marie Lambert** | ESA - SGAC  
Scholarship winner



## Guiding Questions

1. Existing Initiatives: What are Luxembourg 's current initiatives and what minor changes could be made to maximise their benefit?
2. Training: What are training needs specific to the space sector? What has been effective worldwide and how that could be translated to Luxembourg?
3. Wider industry and switches: How can Luxembourg more people from outside of the space industry to join and how could this be achieved?

## Response to questions

1. Delegates discussed potential training programs (internships, YGT, working student/co-opt, ...) and improvements that could be made. They mentioned a streamlined VISA program and easing international exchange programs for global talent attraction.
2. Delegates discussed new training to be implemented (cross industries and cross national experiences), the established relationships with companies and space programmes and an extended Luxembourg/ESA collaboration. They mentioned missing skills (software, embedded, electronics design, ...) and how many STEM skills can be used for space applications.
3. Delegates discussed mentorship, traineeship and media/communication to raise awareness and support students and professionals. They mentioned a “soft landing program” aiming at helping workers from foreign countries to settle in Luxembourg and highlight the multicultural and welcoming nature of the country.

## Recommendations

### Recommendations to the sponsor/partner and industry at large

- LSA should lead the development of legal and financial policy frameworks (i.e. insurance, transfer of assets) to encourage and monitor commercial space activity, to foster collaboration and create a locus of investment opportunity. They should focus on advertising, awareness raising and engagement activities in a wider market such as targeting APAC, Middle East, Africa and South America where people are seeking opportunities to be involved in the global space industry.



- LSA should propose to the next ESA ministerial agenda to co-found a granting system for start-ups in Luxembourg to hire PhD students and limit the expenses required from start-ups. They should construct a national space traineeships for professionals with engineering backgrounds to be implemented into the Luxembourg space community and promote the program internationally by collaborating/hosting future space events (e.g. SGAC events).
- LSA should ensure that the 'Space Campus' includes a soft-landing program to link foreign workers with existing jobs in the Luxembourg space industry. This initiative should be linked with the jobs portal to target local workers currently working in other industries. (LSA should focus on pragmatic aspects of attracting talent, such as removing administrative barriers like VISA, housing, job pathways). They should coordinate with universities and Luxembourg space companies to engage students in non-space degrees, like software, embedded systems and electrical engineering students: university challenges, space-related courses, career fairs...





## Working Groups



### Working Group 4: Addressing the Skills Gap in the Space Sector

#### Supported by:



The next generation of space missions and capabilities, with their ever-increasing complexity and ambition, could be hampered by skill gaps in the space sector. We see a growing number of vacancies, some for highly-specialised roles, but many asking for business and soft skills allied with technical skills. Employers across this and other hi-tech sectors are reporting difficulties recruiting, particularly at mid-levels, and with an ageing workforce, these challenges are compounded.

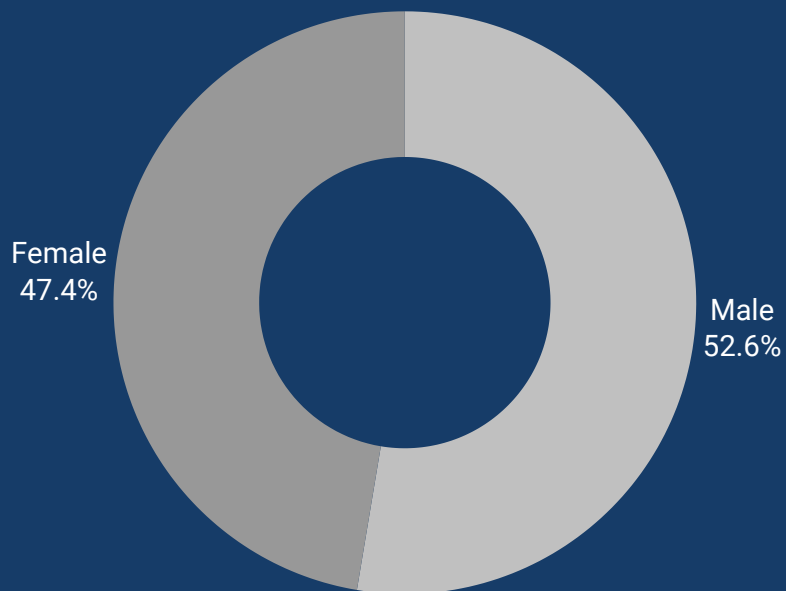
Thus, addressing the skills gap needs innovative ideas to ensure that young, skilled talent wants to work and remain in the space sector by developing their careers.

Hosted by the UK Space Agency, this working group explored different ways to address the skills gap, nationally and internationally, including industry, academia, and government, considering existing initiatives to draw out fresh recommendations.



## Working Group Statistics

**Delegates**  
**19**



## Main Objectives

- Identify the issues and factors involved in skills gaps.
- Determine ways to collaborate among various organisations.
- Determine both short-term and long-term recommendations.



## Subject Matter Experts



**Heidi Thiemann** | Director at  
Space Skills Alliance



**Moderator**

**Morgane Lecas** | Business  
Analyst at **Astroscale**



**Rapporteur**

**Karthika Rani Ramdoss** | Design  
Engineer at **Aadyah Aerospace  
Private Limited**



## Guiding Questions

1. What are the issues facing technical, policy, and research skills retention and pull-through into career pathways?
2. In what ways can the existing collaboration system between government, industry, and academia be enhanced to tackle the skills gap and prepare for future capabilities and challenges?
3. How can improved connections between organizations prevent a potential widening of the skills gap in the future?
4. What are the long-term goals for the space sector to address the skills gap?
5. What short-term objectives can be established for buy-ins, such as how to present and publicise the recommendations and long-term aims?

## Response to questions

1. Delegates discussed how multiple government policy issues create barriers to addressing the skills shortage. Insufficient funds are directed towards education, research grants, and other programmes that could better support training. The working group found that no lobbying body exists within the United Kingdom to push these interests forward within the policy framework, that an old education system lags behind current industry trends, and technical fields are focused on their core domains, ignoring or neglecting the interdisciplinary areas and soft skills needed by the industry. There is no centralised resource of information in multiple languages that could be available for everyone, and government, industry, and academia do not usually have common goals.
2. The industry should encourage cross-talk between departments by getting individuals from one department to spend the afternoon working in another. In academia, universities should interface with industrial experts to identify the existing gaps in the current educational system and work together to tailor guidelines to bridge the aforementioned gaps. The government should create and implement lobbying practices for greater budget increases, and dedicate efforts towards improving the immigration process for skilled workers from abroad. Other organisations should act as mediators between these three main actors, and act as auditors to measure the outcome of actions taken.



3. Better linkages can be developed in order to prevent a future widening of the skills gap. Firstly, with a mentorship programme where company representatives and government can get a better understanding of policies. Secondly, by training employees in new things with one afternoon/day set aside a month for self-directed courses. Thirdly, by regulating UK space activities, including emerging markets such as spaceflight and in-orbit proximity missions. Finally, by consistently promoting STEM careers to students throughout their school career, by collaboration with government, and encouraging teachers to take advantage of ESA Education programmes.

4. The responsibilities of UKSA should be clearly defined so that budget appropriations are implemented and planned properly. The industry must invest in growing talent, and could do so by setting up an industrial association that routinely surveys members once every two years to find the skills requirements over the next 5-10 years. Programmes should be advocated promoting an exchange of students and faculty, and the UKSA should create working groups to create opportunities responsively to raised challenges.

5. Short term objectives could include the following suggestions. Create short-term collaborative programmes with SMART guidelines to provide flexibility for the exchange of students and faculty, and implement a feedback mechanism. Companies could sponsor masters or PhD projects, with an obligation to work for the company for a year afterwards. The UK Space Agency should develop initial collaboration initiatives with groups like the ISO, IAF, and SGAC. Talent gathering and retention could be improved with associations refining the immigration process, making it clearer and more attractive to foreign skilled workers, and by maintaining a list of qualified space employers.

## Recommendations

### Recommendations to the Space Generation Advisory Council

- To encourage young people to consider a career in space as an option, SGAC could create a dedicated project group. This SGAC Project group should initiate monthly newsletters and seminars (online & offline) with the help of volunteers. The opportunities and skills set required to pursue a career in space can be promoted with the above-mentioned activities.
- To upgrade the education system with current industry trends, SGAC should collaborate with industry, schools and universities to conduct a survey to study the curriculum of academic institutions. The outcome of the survey such as findings, feedback and recommendations can be made as open-source material which will promote STEM careers. It can be done once in two years for a period of 5 years.
- Industry should invest in growing talent and inspiring young people to consider a career in space. To help this, the industry can collaborate with SGAC regional and local members and conduct workshops and training at regular intervals.



## Recommendations to UN COPUOS

- The United Nations, in collaboration with organisations like IAF Workforce Development-Young Professionals Programme Committee (WD-YPP), should create space training catalogues in several languages that will bridge the training gap for people doing career shifts
- To address the skills gap, the UN could create a working group to publish quarterly newsletters promoting and advising on best practices in recruitment, training, and inclusion.
- The United Nations, in collaboration with the Space Skills Alliance, should conduct a space census which will evaluate the space workforce at national levels and a ranking list can be generated. These space census documents would be used as a tool to evaluate the skills gap and demand, and necessary recommendations can be given to national space agencies.
- It is suggested that the United Nations audit the performance of recommendations with the help of a volunteer group which can be organised either by the national space agency or industry.

## Recommendations to the sponsor/partner and industry at large

- With relationships spanning across industry, academia and government, space agencies are advised to create recurrent working groups connecting actors of all the three sectors. Those groups will take decisions impacting the whole sector. The virtuous cycle is that agencies act on behalf of governments, which usually partially fund industry and academia.
- Organisations like IAF, UN and SGAC should create a platform to act as mediator between the three actors of government, industry, and academia. This platform would also act as auditor to measure the outcome of the decisions taken. The guidelines must be identified with their responsibility, and the role of the three different stakeholders.
- To address issues of technical jargon or different definitions of technical words, the space sector must use the work which is actively done by organisations like International Organization for Standardization (ISO). ISO develops and publishes standards of different technical definitions of common to operate.
- The industry at large should push for more communications and outreach specialists to join the industry in the UK and other space nations. To make the public more aware of this career path and what it can offer (long-term investment), specialists should have the opportunity to dedicate adequate resources and knowledge to market potential new talent for the industry.



## Working Groups



### Working Group 5: Addressing Food Security with Earth Observation Data

Supported by:

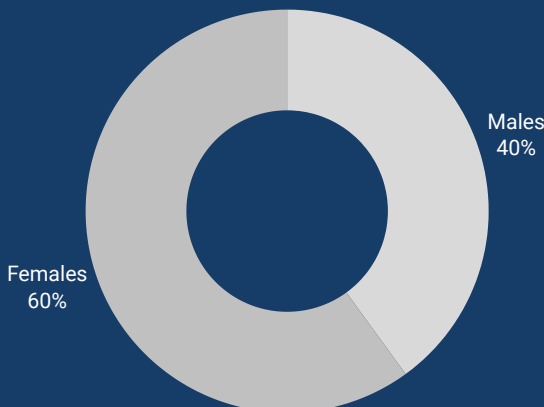


The most effective sustainable development happens at the local levels, namely in cities and small municipalities. Earth observation has been cited as a superior tool to monitor, capture and drive development responsibilities and goals. Large constellations of Earth-observing satellites, like Planet, now produce enormous volumes of potentially actionable information about our Earth, with wide relevance in facilitating the UN SDGs. Yet this trove of information is of little value if it is not synthesized into actionable insights, and then made accessible to those best positioned to take action. Routinely, elite scientific, technical, commercial and intergovernmental bodies produce indicators that never reach communities on the ground and can cause an unfortunate access gap.

Planet has the ability to support 14 out of 17 SDGs. SDG number two is Zero Hunger. According to the United Nations, nearly 690 million people are suffering from hunger and malnutrition (8.9% of the world population).

This Working Group discussed how to address global food security using Earth Observation (EO) data and how to bring the world back on track to achieve Zero Hunger by 2030.

## Working Group Statistics



**Delegates**  
**25**

**Nationalities Represented**  
**19**



## Main Objectives

- Figure out how to alleviate the perils of hunger through Earth Observation data and address global food security.
- Establish the visions and aspirations of the next generation with regards to how policy can be structured to ensure ethical and democratic access to these EO tools, and use these to build new norms towards planetary stewardship and achieving the Zero Hunger initiative.
- Understand the role space technology and EO satellites should play in addressing the “access gap” of diversity, equity, and inclusion caused by food security.

## Subject Matter Experts



**Mariana Curdoglo** | Project Manager at **Planet**



**Pooja Pandey** | Project Manager at **Planet**



**Stefan Zeller** | Senior Space Systems Engineering at **Planet**



**Moderator**

**Natasha Nogueira** | Team Lead SkySat Mission Operations at **Planet Labs**



**Rapporteur**

**Clément Loneux** | Space Systems Engineer at **ISAE-SUPAERO**





## Guiding Questions

1. What role can private companies and governments play in providing data sharing access?
2. What kind of platforms should we build in order to provide insights to achieve the zero hunger initiative?
3. What remote sensing ideas could be used to address food security and how could these be applied globally, especially in high risk geographical areas?
4. How can we leverage space tech and remote sensing to level the global playing field with respect to food insecurity and what are the main hurdles to overcome?
5. How do remote sensing and access to its data have to be designed to contribute to a more egalitarian world?

## Response to questions

1. It has been assessed that governments and private companies have a major role to play in providing data sharing access. Historically, the first first ones were providing platforms, standard, and legislations while filling the platforms with data from their own satellites. But with the recent development of private space businesses, private actors now also hold a strong responsibility to give, to a certain extent, access to important data, and input them in governmental platforms or their own.

2. On top of hosting various observation data, platforms aiming to achieve the zero hunger initiative should also include analysis capabilities. Based on specific indicators (NDVI, NDWI...) standardized conclusions should be delivered along the imagery to allow the appropriate stakeholders to take enlightened actions. This analysis capability can help governments prevent floods' destruction, or private farmers to ensure a food production matching a regional target for example.

3. Two types of ideas were identified based on Earth Observation (EO) data, which should be used to monitor critical regions: indicators and models.

### 1. Earth Observation data based indexes

- **NDWI** → Normalized difference water index - Water presence
- **NDVI** → Normalized difference vegetation index - Vegetation presence and global health
- **NDRE** → Normalized Difference Red Edge Index - Vegetation slight changes of health

### 2. Earth Observation data based models:

- **DSM** → Digital Surface Model
- **DTM** → Digital Terrain Model
- **DEM** → Digital Elevation Model



These indicators and models should be used to increase a database capability through analysis allowing governments to access key information on their country's regions. It could help them monitor floods, food quality per region, production estimates based on a correlation between EO data and ground truth... In the end, these data may help prevent famines.

4. Using space technology and more specifically EO capabilities to monitor change on our planet as early a timeframe as possible is not a new idea. However, the quantity of large climate space missions is limited, and their data hard to access. But considering recent breakthroughs in the private sector on the side of EO, it appears plausible to leverage the current available capabilities to address food insecurity. The main hurdles are two-dimensional: political and technical.

Such projects are typically dependent on public financing and support from political stakeholders, whilst they still require complex data storage and activation for large quantities of imagery.

5. Remote sensing and access to its data must be designed within several frameworks. The international one with organizations like the United Nations which could build the international technical collaboration on food security topics, whilst ensuring egalitarian access to the data produced. The public actors like space agencies or laboratories, which have an impact on the space missions design and how the instruments may answer secondary requirements for food security. And finally, the private stakeholders, who should follow regulations regarding critical EO data access to help other countries, and have a responsibility to contribute to food security models.

## Recommendations

### Recommendations to the Space Generation Advisory Council

SGAC should play a major educational role on the international stage to put forward the zero hunger initiative. This should be done through the creation of partnership with Planet to train SGAC members from limited data accessibility regions to EO topics, as well as the creation of in-person local and regional workshops to raise awareness about EO data and its uses.

### Recommendations to UNCOPUOS

- The United Nations should bring together a Working Group whose goal would be to accurately model the world's food chain. Using this model should help measure the span of catastrophes (natural and human-caused) and their impact and consequences on the food chain. These would then support governments' decision-making on handling food security.
- By acknowledging that shortfalls may exist in understanding developing countries' crops' unique properties thus creating bias in monitoring them, the United Nations should further utilize ground truth analysis of developing countries' crops to complete the current existing Earth Observation datasets.



## Recommendations

### Recommendations to UNCOPUOS

- The United Nations countries should foster identification of unknown fertile land in their country utilizing NDWI based on Earth Observation data, to aid in the prevention of - and recovery from - natural disasters.
- The United Nations, given their strong international regulatory influence, should bring together a working group to rate and identify the highest risk countries in terms of food dependence on the World food chain, to then focus Food Security activities towards them.
- The United Nations should create an organization of local ambassadors in high risk countries with respect to food security, to raise awareness regionally and favor appropriate training for the local farmers.
- The United Nations Sustainable Development Goals sub-committee should create an open-source database of GIS & RS data per region per country along with pertinent software/analysis tools for use anywhere in the world. Moreover, the sub-committee should also offer training to people from susceptible regions/countries to sufficiently train them on the resources and tools. The bottom line is to encourage a polycentric transformational decentralized model of analysis and action to prevent regional catastrophes and calamities. The database should consist of the following features:
  - Time Domain data per region
  - Types of data per region (Pan, NIR, Visible etc)
  - Tools
  - DSM, DTM, DEM
  - Flood Simulations
  - Crop Yields
  - Famine Prediction

### Recommendations to the Sponsor/ Industry at large

- Planet Labs should use their NDWI imagery-based capacity to lead the establishment of a standardized flood risk scale at international level (UN). Moreover arable lands should be mapped based on these indices to then provide national agriculture industries with reliability indices of their food providing capacity.
- Planet Labs should develop their Earth Observation data analysis capabilities (based on indicators like NDVI, NDWI, or NDRE) in order to support their international agriculture clients with standardized conclusions which could lead to prevention of lack of food.
- Vegetation health monitoring using EO-originated factors (NDVI, NDRE) should be used to assess overgrazing in cattle fields to better monitor food production efficiency.
- Planet Labs should build an actionable data platform that relies upon both internal Planet analyses and outsourced external local partner analyses, to reach a broad spectrum of stakeholders.



## Recommendations

### Recommendations to the Sponsor/ Industry at large

- Planet Labs should utilise the large localized network with partners and stakeholders to serve specific identified individualised needs linked to food security.
- Planet Labs should partner with Google Earth Engine or other platforms to enable the company, in association with local partners, to perform computationally expensive analysis.
- Planet Labs should partner with other organizations (Space Generation Advisory Council, United Nations, Group on Earth Observation) to organise local hackathons in order to develop algorithms to become open source services or be integrated to the Planet platform.



## Working Groups



### Working Group 6: Space Food, SGAC Special Track

Supported by:



Having food in space has always been challenging due to the unique logistical requirements for supply and storage. Each aliment needs to be packaged to be consumed adequately and safely by the astronauts. In the last couple of decades, Low Earth Missions have developed new resupply processes and methods, and several food items have been adapted for consumption in space. However, future crewed missions to the Moon, Mars, and more distant planetary bodies will require many modifications as the duration of the mission, the crew diversification and the distance from Earth increase.

First of all, food will have to be produced in situ as an alternative for food resupply, which will become more expensive and eventually unfeasible. Secondly, space food will play a much more critical role in keeping the astronauts healthy, both physically and mentally, since food also has, in addition to nutritional properties, sensorial, cultural and social aspects that can help mitigate problems like low morale and homesickness.

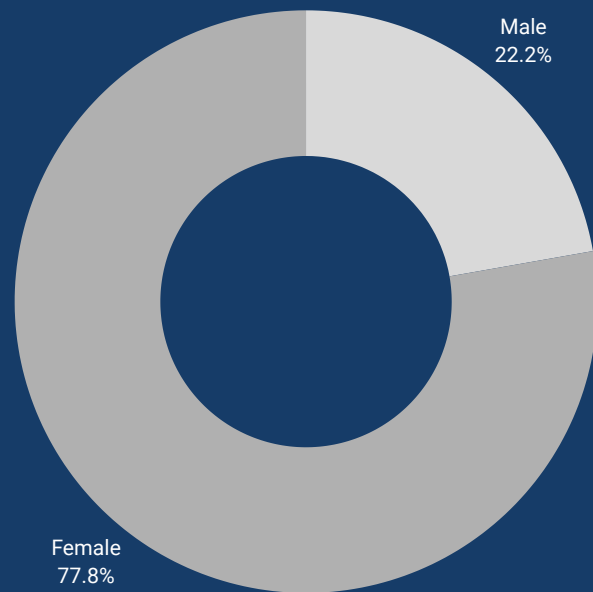
Delegates of this Working Group met to discuss the multilateral roles and possible future applications of food in human spaceflight over three days at the Space Generation Congress 2022. From experts in the industry, delegates learnt about the current and high-level food production technologies and came up with innovative ideas relating to the social and psychological aspects of eating, issues with waste, and the nutritional challenges of short- and long-term space travel. Since the meeting of the Working Group at SGC 2022, a part of the team has now submitted two abstracts to the next IAC at Baku in 2023.



## Working Group Statistics

**Delegates**  
18

**Nationalities represented**  
13



## Main Objectives

- Increase the focus on taste, culture, diversity, and celebration of food
- Propose feasible or sustainable space food systems for long spaceflight missions
- Propose solutions to the creation of a big quantity of non recyclable waste in space



## Subject Matter Experts



**Christina-Ariadni Valagkouti** | Analog Astronaut / Nutrition Expert at **Interstellar Performance Labs**



**Alain Maillet** | Head of nutrition activities for CNES at **MEDES**



**Christel Paille** | ECLS engineer working on the MELISSA project at **ESA**



**Shahreen Reza** | CEO & Co-Founder of **ASTREAS**



**Joao Pedro Marques Garcia** | Research fellow on cultured meat for human space exploration at **ESA**



**Pascal Rosenfeld** | Deputy VP Space & New Ventures at **ALEPH Farms**



**Sonja Brungs** | Head of nutrition activities for CNES at **MEDES**



**Serge Pieters** | Dietitian and nutritionist in the areas of sports nutrition and astronaut physiology



**Moderator**

**Tim Searle** | Diversity and Gender  
Equality Project Group Co-Lead at  
**SGAC** | Onboard Operations  
Engineer at **CNES**



**Moderator**

**Delphine Urbah** | Event  
Coordinator at **SGAC**



**Rapporteur**

**Ahmed Baraka** | Regional  
Communications Manager for the  
Middle East at **SGAC**







## Guiding Questions

1. What are the best food items, attributes, and candidates for consumption in space?
2. How can we improve existing space food production systems and methods?
3. How can developments in space food be reused on Earth to end hunger, achieve food security and improved nutrition (SDG #2) and reduce inequalities (SDG #10)?

## Response to questions

1. Food solutions for consumption in space should focus on the following qualities: safety, stability, nutrition, resource minimisation, usability, reliability, palatability, and variety.
2. Improvements to existing food production systems and methods for space should consider social elements, nutritional factors, and the packaging of food.
3. Developments in space food science may have many applications to the improvement of food science, availability and security on Earth. Some examples of where improvements may spill over include waste management, nutritional improvement, and reducing inequalities in space technology.



## Recommendations

### Recommendations to the Space Generation Advisory Council

- Space Medicine and Life Sciences Project Group should organise a hackathon in emerging space countries for recipes and menu in the next 2 years to improve cultural diversity of meals for future spaceflight missions

### Recommendations to UN COPUOS

- At their next meeting, UNCOPUOS should have a panel with dominant space player nations to develop multi-purpose food and use zero-waste packaging, such as quinoa preservation and edible packaging. This discussion can shape guidelines to UNCOPUOS member countries.
- UNCOPUOS should allocate funding to an international consortium of space agencies dedicated to researching ways to enhance nutrition while preserving a compact food format. Such investment would not only benefit long-duration space exploration but also contribute to advancements in nutrition on Earth.
- UNOOSA should solicit feedback from an international panel of astronauts to share ways to improve the psychological and cultural experience of eating in space. Over the next 2 years, this feedback will be used to create an international standard for future space habitat design.
- The UN, IAC, the World Food Panel in Munich, and other organisations should have keynote panels on the subject of reusing space technology on Earth to reduce hunger and food inequality, as well as in disaster response. Keynote panels can occur in next year's IAC as well as other conferences, since these technologies already exist, as shown by ESA's MELISSA project.



## Recommendations to the sponsor/partner and industry at large

- At IAC 2024, the International Space Exploration Coordination Group (ISECG) of space agencies should open a competition for the public to propose solutions for space food packaging, focused on long duration mission challenges such as shelf life, radiation protection, preparation, and waste management (including reusability and edibility).
- At a future IAC, SGC should form a working group with international space agencies to improve public accessibility to research conducted in and for spaceflight.
- At a future IAC, the Interagency Operations Advisory Group (IOAG) should lead a panel with Disaster Relief operations about adopting modular technologies developed for space to be used on Earth.
- Space Agencies should create a working group of space agencies and industry partners at IAC 2024 for future exploration missions, focused on:
  - Increasing the variety of meals without increasing the need for storage and supplies (mix and match items)
  - Accommodating different food diets
  - Addressing the psychological benefits of hands-on food preparation
- Space Agencies should solicit proposals from industry to research and advance the nutrition of astronauts during EVAs and surface operations. Proposals should be solicited within 2 years, with technology implemented within the next 5 years.
- Space Agencies should share research on advancements in shelf life and food stability with the WHO, to increase the timespan where food can be used in order to reduce waste. This should be presented at the 2023 UN Food Systems Summit.
  - At the UN Food Systems Summit, solicit proposals for eliminating plastic waste that comes from packaging of food, encouraging recycling and reuse. The results of this solicitation can be adapted by the space industry for advancements in packaging of food for space travel.



## Summary of Working Group Findings



### **Working Group 1: NASA Exploration- Expanding Access to Space in the Era of Artemis**

#### Topic excerpt

This Working Group examined extra-terrestrial exploration through the lens of inclusivity. Barriers to entry for underrepresented groups were considered, and how to adapt plans for Artemis and lunar exploration to welcome non-traditional actors in the space industry.

#### Recommended highlights

- This Working Group concluded that NASA must acknowledge their role in disseminating access to space exploration to emerging space faring nations. Ambassadorships, diversified workforce, and outreach were all explored.
- Communications can be improved to increase collaboration in meaningful ways. Artemis can benefit from fostering such networks as well as bring value to novel audiences.



### **Working Group 2: Achieving “Space for All” through investment in Space Entrepreneurship**

#### Topic excerpt

This Working Group unravelled the intricacies of achieving diversity in the space industry through investment and entrepreneurship. Conclusions of this exercise focused on regionalism within the space industry, financing to foster emerging space businesses, and knowledge dissipation from professionals in focused events.

#### Recommended highlights

- Events and mentorship can create valuable links both within already established businesses and those that have not yet created a product.
- The SGAC can support these events in association with other major events in the industry, potential investors, and access to younger cohorts interested in the space industry.



### **Working Group 3: TALENTS – or the future of Space, sponsored by Luxembourg Space Agency & Université du Luxembourg**

#### Topic excerpt

In the highly competitive space industry, small countries like Luxembourg face challenges in securing the essential talent needed for future space endeavors. STEM students and skilled individuals are in high demand, not only from aerospace companies but also from tech giants and other industries. This intense competition results in a talent shortage in space. Consequently, companies are changing their recruiting techniques, upgrading facilities, allowing more remote work, and in some cases, a willingness to hire from outside the industry to come out on top in the competition.

#### Recommended highlights

- LSA should lead in creating legal and financial frameworks to encourage and monitor commercial space activities. LSA should expand its reach to markets in APAC, the Middle East, Africa, and South America where people are seeking opportunities to be involved in the global space industry.
- LSA should propose to the next ESA ministerial agenda to co-found a granting system for start-ups in Luxembourg to hire PhD students and limit the expenses required from start-ups.
- LSA should ensure that the 'Space Campus' includes a soft-landing program to connect foreign workers with existing positions in the Luxembourg space industry. Additionally, LSA should collaborate with universities and space companies in Luxembourg to engage students in courses that are not directly related to space through university challenges, space-related courses, and career fairs.



### **Working Group 4: Addressing the Skills Gap in the Space Sector, sponsored by UK Space Agency**

#### Topic excerpt

The next generation of space missions and capabilities, with their ever-increasing complexity and ambition, could be hampered by skill gaps in the space sector. We see a growing number of vacancies, asking for business and soft skills allied with technical skills. To attract and retain young talent and overcome an aging workforce, innovative solutions are needed. The UK Space Agency is hosting a working group to explore ways to address the skills gap through collaboration among industry, academia, and government, aiming to generate fresh recommendations.



## Recommended highlights

- SGAC should form a dedicated project group for monthly newsletters, seminars, and academic curriculum updates in collaboration with industry and educational institutions.
- The United Nations, in partnership with IAF WD-YPP and the Space Skills Alliance, should devise a comprehensive approach to tackle the space industry's skills gap, encompassing multilingual training resources, quarterly recruitment and training newsletters, national-level workforce assessments, and an audit mechanism for performance evaluation.
- Stakeholders in the space sector should establish cooperative working groups bridging industry, academia, and government, with the aid of organizations like IAF, UN, and SGAC serving as mediating platforms. They should also consider adopting ISO standards for technical terminology. Additionally, the industry should actively recruit communication and outreach specialists to enhance public awareness of space careers and their long-term potential.



## Working Group 5: Addressing Food Security with Earth Observation Data

### Topic excerpt

This Working Group took on the complex issue of food security and examined existing and potential ways Earth Observation data and policy can alleviate environmental stress on food supply. The hurdles identified were twofold: political and technical. A cross-sectoral approach can unlock the benefits of EO to contribute to food security models, with several national and international policy frameworks being observed.

## Recommended highlights

- The most significant role the SGAC and Planet can play is that of an educator. The potential of EO for addressing global crises can be communicated through partnerships, to train individuals with limited data accessibility. This can be further enhanced by the UN supporting global food chain modelling and catastrophe simulation.
- Open source databases of EO data, catastrophe risk indices, and hackathon algorithms can increase the accessibility of this valuable data and begin to address food insecurity globally.



## Working Group 6: Space Food, Special Track by SGAC

### Topic excerpt

Space food presents unique challenges due to supply and storage logistics. The last couple of decades have seen advances in resupply processes and food adaptations for Low Earth Missions. However, future missions to distant planets like the Moon and Mars will require in-situ food production and a more significant role for food in astronauts' physical and mental well-being. A Working Group at the Space Generation Congress 2022 explored these challenges and innovative ideas related to food in space, including waste, social, and psychological aspects.

### Recommended highlights

- Space Medicine and Life Sciences Project Group should organise a hackathon in emerging space countries for recipes and menu in the next 2 years to improve cultural diversity of meals for future spaceflight missions.
- UNCOPUOS should establish a panel of leading space nations to develop multi-purpose food and promote zero-waste packaging, creating guidelines for UNCOPUOS member countries. International space agencies should fund research to enhance compact food nutrition for long-duration space missions and terrestrial nutritional advancements. UNOOSA should gather astronaut feedback to improve psychological and cultural aspects of space dining, leading to an international standard for future space habitat design.
- Organizations like the UN, IAC, and the World Food Panel in Munich should host keynote panels on repurposing space technology to combat hunger, address food inequality, and respond to disasters, taking into account technologies such as ESA's MELISSA project.



## Organising Team



### Victoria Carter-Cortez - Event Manager

Victoria Carter-Cortez is an astrophysicist and aspiring space policymaker. She currently works as a consultant at PwC's Space Practice where she is actively involved in projects that support both the public and private sector in decision-making, space policy development, and carrying out economic impact assessments. Prior to this, Victoria was working at the European Space Agency's Washington D.C. Office as part of ESA's External Relations Department. There, she analysed developments from key space actors and worked to strengthen international partnerships across the Atlantic. Victoria carried out her Master's degree at University College London where, in partnership with the Mullard Space Science Laboratory, she investigated Jupiter's X-ray auroral activity. Opening opportunities in STEM, particularly for women, is close to Victoria's heart. To this end, she has worked as an academic mentor internationally, sharing her passion for space and delivering interactive courses to engage and inspire the next generation of space scientists and engineers.



### Shayna Hume - Deputy Event Manager

Shayna Hume is a Ph.D. student at the University of Colorado, Boulder in the Aerospace Engineering department. Her research focus is on Martian Entry, Descent, and Landing and GNC, and background is in systems engineering. She has a B.S. in Aerospace Engineering from the University of Miami, an M.S. in Aerospace Engineering from CU Boulder, and an .E. in Aerospace Program Management from CU Boulder. She is a 2018 Matthew Isakowitz Fellow and 2021 Future Space Leader Fellow and has interned previously at NASA, Lockheed Martin, the Aerospace Corporation, and the Jet Propulsion Laboratory. Previously at SGAC, Shayna has been part of research TURTLES teams in SEPG for Lunar Sustainability, helped co-found and lead the Mentorship Program for two years, and been part of the 2022 Logistics Team for SGFF. She is now the SGC Deputy Manager for 2022 in Paris.





## Chimira Andres - Delegates Team

Chimira Nicole Andres (MSc) is a Planetary Geophysicist who is a current PhD student at York University, Canada and Université de Nantes, France. She researches the movement of ice in glacial and periglacial (permafrost) environments using ground penetrating radar (GPR), LiDAR, and radar remote sensing in the Canadian High Arctic and uses these cold, high alpine environments on Earth as a basis of

comparison (planetary analogues) to cold environments on Mars for future scientific and technological developments in future human missions. Currently, Chimira is the outgoing president of the Students for the Exploration of Space (SEDS-Canada) and is a huge advocate for STEAM (science, technology, engineering, arts, and mathematics) Education. She most recently finished working for the European Space Agency in ESA-ESTEC, Netherlands as a part of the Earth Observation, Space Technology, and Environmental Sciences STEM Didactics in the ESA Education Team and has been part of the SGAC team for ~4 years now (previously in SGC 2021 Organizing Team and SG[Canada]!



## Annemijn Ooms - Delegates Team

Annemijn is currently pursuing her LLM in International & European Law at the University of Amsterdam, the Netherlands. She is specializing in public international law and international trade and investment law. She is also completing her LLB in Dutch law and holds a BA (Hons.) in Liberal Arts & Sciences, having majored in law and economics. Besides her studies, she is a volunteer for the International Institute of Space

Law (IISL) Knowledge Constellation project and is part of a legal clinic program. Growing up internationally in five countries has developed her interest in global governance and international cooperation, and she hopes to pursue her (academic) career in the field of international space law, policy and diplomacy. Matthew Isakowitz Fellow and 2021 Future Space Leader Fellow and has interned previously at NASA, Lockheed Martin, the Aerospace Corporation, and the Jet Propulsion Laboratory. Previously at SGAC, Shayna has been part of research TURTLES teams in SEPG for Lunar Sustainability, helped co-found and lead the Mentorship Program for two years, and been part of the 2022 Logistics Team for SGFF. She is now the SGC Deputy Manager for 2022 in Paris.



## Clara Moriceau - Delegates Team

Clara is a member of the Gender and Diversity Project Group, leading the PADAWANS long-term project which aims at organizing workshops in school for children, involving their parents, to raise awareness about diversity in the space sector. Previously, she was part of the SG[France]2020 organising team and is now one of the SGC Delegates Team members in 2022. Clara is a project engineer, working on topics related to health and space at MEDES (Institute for Space Medicine and Physiology). She is an engineer in applied mathematics from INSA Rouen and space systems engineering from ISAE-Supaero in France. She did several internships in the space industry, including CNES and ESA during 6 months.





## Fiorella Arias - Delegates Team

Biotechnology Engineering student named by the Allbiotech organization as 2021 Latin American Leader in Biotechnology for her work on Space Mission Design, Space Biology, and gender equality. She is co-founder and Chief Science Officer of Orbital Space Technologies, the first Central American company to provide aerospace consulting, where she is currently working on their first mission related to fungi dual culturing under microgravity conditions.

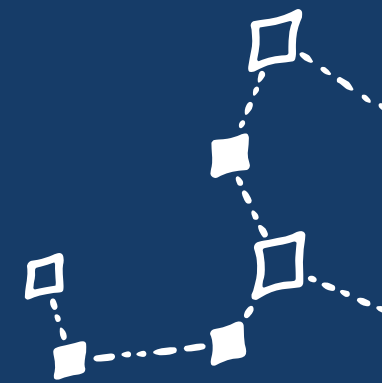
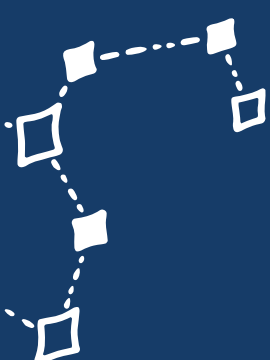
Also, she is part of the MUSA Project team, winner of ICECubes category: First Place and the IAA Award at the Tokyo 2019 Mission Idea Contest hosted by UNISEC. Fiorella was awarded as an Emerging Space Leader 2021 by the IAF, attending the 72nd International Astronautical Congress where she presented her paper "Dual Culture in Microgravity Conditions: Potential Application in the Study of Symbiotic and Antagonistic Interactions for Plant Growth in Space".



## Johanne Ekue - Delegates Team

Johanne is a Physics Graduate from the University of Ghana who has previously served as the general and financial secretary of the Physics Students' Association of Ghana. She is an active member of the Space Generation Advisory Council and was recently assigned as the delegate team leader of the 6th South American Space Generation Workshop and the delegate team member of the 5th African Space Generation

Workshop. In addition to this, Johanne is an advocate for Women in Physics in Ghana and Genus in Africa. Johanne believes that space and outer space is a timeless topics, thus she wants to inculcate deep learning and space to discover characteristics in large datasets to help understand the cosmos. We exist because the cosmos exist.





## Olga Bai - PR & Comms Team

Olga currently works as a Senior Manager of Marketing and Public Relations at Firefly Aerospace, a NewSpace Unicorn, where she helps lead the efforts to build a global brand. Prior to joining Firefly, Olga has worked at Dassault Systemes, Fortune 50 software company, and v(room)), a Paris-based marketing and strategic consultancy agency where she advised top technology and luxury companies on building

brand presence in the digital realm. Among her clients were Moët & Chandon, Hennessy, Audemars Piguet, and SOLIDWORKS. Olga also serves on the Communications Team for SGC 2022, one of the Space Generation Advisory Council's three annual global events bringing together students and young professionals across the space industry. Olga holds a Master In International Marketing from KEDGE Business School, a Master of Science in International Marketing and Management from ISM University of Management and Economics, and a Bachelor of Arts in Business Administration and Management from LCC International University, where she graduated Cum Laude. In her free time, Olga volunteers at Alliance Française enjoys travel, experiencing new cultures, and reading.



## Alexandria Baca - PR & Comms Team

Originally from Las Vegas, Nevada, Alexandria is a first-generation in college Aerospace Engineering student at the University of Central Florida. Her passion lies amongst the stars, as she strives to become an integral leader in expanding access to aerospace through just, equitable, diverse, and inclusive (JEDI) efforts. She has previously interned at NASA and Virgin Galactic, and is an inaugural 2021 Patti Grace Smith Fellow.

Alexandria is the co-founder and Vice President of Naut Normal (NautNormal.org), a nonprofit with a mission to build a community of space-minded individuals that accelerates the commercialization of space and expands the minds of our youth through education, exposure, and simulated astronaut training.





### Ying Rui Neoh - PR & Comms Team

Ying Rui is a second-year undergraduate, majoring in Flight Vehicle Design and Engineering at Beihang University. She is very passionate about aerospace and climate action so she is very active in various youth organizations. She is currently the Vice President at Young Malaysian Engineers and holds the position of column writer at the School of Aeronautical Engineering Media Center. Previously, she joined the AP-SGOW and emerged as the most engaged delegate. She also won the SGAC World Space Week Quiz.



### Smit Patel - PR & Comms Team

Smit Patel was born and brought up in Ahmedabad, India, and currently pursuing his Master's in Aerospace Engineering at Technical University Braunschweig in Germany. He is an International Space University alumnus and successfully completed SSP21. He completed his Bachelor in Mechanical Engineering at Indus University, Ahmedabad, India with the Student of the year award in his 3rd academic year. He is a member of the European Association of Aerospace Students

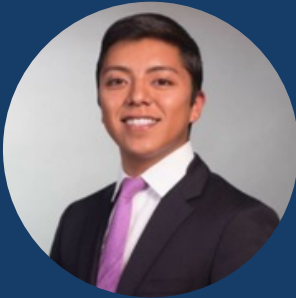
EUROAVIA and president of local society in Braunschweig. He is also SpaceCom at Deep Space Initiative. Smit is a polyglot, science communicator, and space influencer. Smit is striving to build a sustainable future beyond the Earth.



### Rannveig Marie Færgestad - PR & Comms Team

Rannveig is a 1st year PhD candidate at the Norwegian University of Science and Technology (NTNU), where she is modelling hypervelocity impact on spacecraft structures. She finished her MSc in Mechanical Engineering at NTNU in 2021. During her time as a student, she founded and was the project manager for NTNU's student rocket team Propulse NTNU, and co-founded and was president of Space NTNU. She is passionate about showing students all the opportunities they

have in the space sector and motivating them to pursue space-related careers, both in Norway and internationally. Rannveig has been a delegate at SGC in 2018 and 2019 and has served as NPoC for Norway from 2019 to 2022.



## Marcos Eduardo Rojas Ramirez - Programming Team

Marcos is currently part of the Spaceship FR team at the French Space Agency (CNES) and the Space Advanced Concepts Laboratory at the French Engineering School ISAE SUPAERO. His work in space began when he and his friends co-founded a high-powered rocketry student organization to compete at the Spaceport America Cup during his four-year bachelor studies at The University of Texas Rio Grande Valley. They built four rockets and partnered with companies like SpaceX and

United Launch Alliance, who sponsored their team, among many other businesses in their area. His team also promoted space exploration through many different educational events within their college and other schools in their area. In France, he found a chance to work at CNES while getting his master's degree at ISAE SUPAERO, specializing in Space Systems. As a space Systems Engineer, his primary responsibility is to implement Model-Based Systems Engineering (MBSE) Tools and Methods to design and analyze Space Systems for Human Spaceflight.



## Ekaterina Seltikova - Programming Team

Ekaterina is a physicist, she received her Bachelor of Science and Master of Science in Physics in Russia and her Master of Science in Fluid Mechanics and Energetics in France. She has experience in a range of fields and took on roles within research, engineering, strategic planning, fundraising, team and project management, and event organization. As an active member of the SGAC, Ekaterina participated in SGFF 2021 as part of the Organising Team, where she moderated a

breakout session discussion on Innovations for Technologies with Secure World Foundation. In addition, she also moderated the working group of Lockheed Martin on the Science and discovery enabled by a Mars Sample Return during the SGC 2021 in Dubai. As part of SEPG, she participated with the team in the Mars City State Design Competition (top 10 out of 175 teams) and the Moon Base Design Contest (1st place). The Moon Base project grew into a book for which Ekaterina is the Sci &Tech Co-Lead. Ekaterina is also part of the Space Generation Advocacy and Policy Platform as part of the TURTLE (Technical Unit Research for a Thriving Lunar Ecosystem) initiative. Outside of SGAC, she participated in the organization of SpaceCon 2021 (Programs Team), where she designed a panel discussion on business challenges and opportunities in Europe, the USA and China. Her interests include designing station missions on Moon / Mars, advanced space concepts and technologies, technology and exploration roadmaps, and strategic planning. She enjoys working in cross-functional teams and developing people to help them work more efficiently. Ekaterina believes that our background and location is never a problem, but always an opportunity for collaboration.



### Pauline Delande - Programming Team

Graduated from INSA Toulouse (Mechanical Engineering) and ISAE-Supaero (Space Systems Engineering), Pauline Delande is now working at CNES in Toulouse as Satellite Operations Engineer for Earth Observation Satellites. In a few words, her role is to carry out satellite operations, ensure subsystem and equipment performances (for both platform and payload) and investigate anomalies. Previously, she has

been part of the SEEDS 6-month student european program to design facilities to produce propellant by exploiting lunar in-situ resources and during a 6-month internship at CNES, she has been working on an Zero-G experience to test the deployment of CubeSats during a parabolic flight campaign. Within the Space Generation Advisory Council, Pauline is the National Point of Contact for France since 2019 and the Diversity and Gender Equality (Our Giant Leap) Project Group Co-Lead since 2021.



### Sapna Rao - Programming Team

Sapna Rao is a Systems Engineer at Lockheed Martin Commercial Civil Space. She has worked on human space exploration missions ranging from the Artemis missions to cryogenic demonstration missions. Her focuses are on Systems Architecture and applying Machine Learning to space missions. Additionally, she is passionate about Diversity, Equity, and Inclusion and is an active member in Lockheed Martin's Women's

Impact Network where she organizes professional development events for women and minorities. She is also working with the Space Frontier Foundation to create a Diversity Equity and Inclusion toolkit to aid organizations and conferences. She prioritizes STEM outreach and is an advocate for minority representation in engineering. For SGAC, she is currently on the OGL PADAWANS team for STEAM and is leading the SEPG RAISE team to design a Mercury Sample Return Mission. She graduated Virginia Tech with a Bachelor's of Science in Aerospace Engineering in 2018.



### Sejal Budholiya - Programming Team

Sejal Budholiya is an artist, author, anchor, dancer, entrepreneur and mechanical engineering student from India. She is passionate about aerospace product development, space sustainability and utilizing design in space for life on Earth. She serves as the Chairperson of SEDS India and is the National Representative at SEDS Earth. At SGAC, she is the lead co-editor for the Domi Inter Astra book (SEPG) and the research and experiments coordinator at FIGURES. As the Swarovski:

Creatives for our Future Cohort she is leading a campaign 'Gaia' and presented her ideas for menstruation in space at the UN General Assembly-High Segment. Currently, she is interning at Collins Aerospace and is an Offsite student.



### Raphaël Morales - Logistics Team

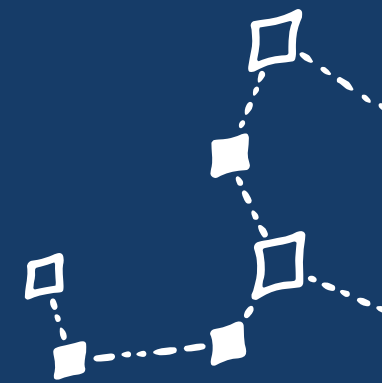
Born in Paris but bred in Toulouse, the only thing Raphael loves more than puns is Space. In this small region of France, where duck is more often met in dishes than in the wild, Raphael studied up to an Engineering master in Telecommunications, Computer Networks and Computer science. Deciding to spread his wings and go off the beaten path, Raphael did a few internships around Europe in companies like SES and Airbus, on software development for space, automated lab

testing and Satcom studies. Raphael is now working as System Engineer in the Future Products department at CPG, Airbus UK, involved in current R&D developments for Airbus Defence & Space Telecom and Navigation processors for satellites. Raphael loves two things in the Space industry : the daily technological breakthroughs and the implied teamwork without which the former would not be made possible. Raphael has always been involved in associations, from homemade consulting company with friends to SGAC as part of the organising team for SG[France]2021. Raphael is always keen to discuss technologies used for Space, and always open to new ideas.



### Emma Batide - Logistics Team

Emma is a young Satellite Operations engineer at Oneweb in London. Born in France, she grew up in Paris and studied engineering at ECE Paris engineering school. She then moved to Toulouse to study Space Systems at ISAE-SUPAERO before starting her first job in London, fulfilling her dream to work in the Space sector.







## Joshua Ingersoll - Logistics Team

Josh Ingersoll is a second-year graduate student at The George Washington University Space Policy Institute. He is a graduate of Georgia Institute of Technology where he holds both a Master of Science and Bachelor of Science in Aerospace Engineering. Josh is currently working as a Satellite Regulatory Engineer at Amazon's Project Kuiper where he works to develop solutions to radiofrequency (RF) interference problems as well as Space Traffic Management and

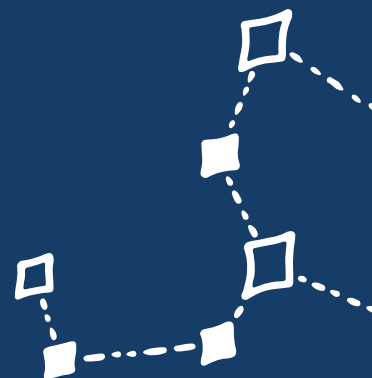
space debris mitigation concerns. Josh is also quite active in the Matthew Isakowitz Fellowship program in which he took part in 2019. The program matches upperclassmen undergraduate and graduate students with executive mentors and internships in the Commercial Space Industry. His research interests include policy surrounding the regulation and environmental impacts of satellite mega-constellations as well as interactions between US commercial entities and foreign governments. Josh is also pursuing an MBA through the George Washington School of Business concurrent with his Space Policy work. In his free time Josh sings baritone with the Fairfax Jubilaires and follows the Buffalo Bills religiously.



## Tania Gres - Logistics Team

Tania is a young aerospace system engineer working in Thales Alenia Space in Turin (Italy). Born in Germany and raised in France, from a family of artists and engineers, today she fulfill her dreams of working in the European space industry. As an engineer at day, and as a SGAC volunteer at night. Within the association, she was the SG[France]2021 event manager and is the leader of the DIVINAS long term project of

the Diversity and Gender Equality Project Group. She is also in the sponsors and communications team of the first SGAC Model UN event in collaboration with the European Center for Space Law. Constantly looking for new challenges and opportunities, she's a very motivated, enthusiastic and quick learner who enjoys space related projects, especially working as a team.





## Sahith Reddy Madara - Alumni Night Team

Sahith Reddy Madara is a Venture Manager for the Space Stream at Creative Destruction Lab – HEC Paris. Previously, he worked as a Space Strategy Consultant for the Euroconsult Paris Office, Research Engineer for the SAASST – UAE Space Agency projects, and Graduate Engineer for Collins Aerospace. He was also privileged to be a part of the most selective Abu-Dhabi’s MASDAR Future Sustainability Leader’s program.

As part of scientific research, Sahith has published 35 research and review papers in various international peer-reviewed journals/conferences across the world. Outside the office, Sahith acts as the UAE’s National Point of Contact for the Space Generation Advisory Council (SGAC) in support of the United Nations program on Space Applications, and he is also an Advisory Board Member for AzurX (space investments and business advisory). Sahith holds an Advanced Master’s degree in Systems Engineering from ISAE-SUPAERO (France) and B.Tech. degree in Aerospace Engineering from Amity University Dubai (UAE).

Notably, international awards Sahith received for his work include: the “Pioneer Award” from the SGAC (Austria), “24 Under 24 Leaders and Innovators in STEAM and Space Award” by The Mars Generation – Aerojet Rocketdyne (USA), Included in the “20 under 35 list” of the Space and Satellite Professionals International (USA), “Research Innovation Award” from the Sharjah Chamber of Commerce and Industry (UAE), Elected as a “Fellow” of the Royal Astronomical Society (RAS) in London, and many more.



## Delphine Urbah - Alumni Night Team

Delphine URBAH is a Human Sciences student specialising in Value Systems and International Relationships at PSL. She is interested in the expansion of the space sector to a broader set of people and wants to take seriously the idea of a future Space for all. In this aspect she studies the inclusion of human of different background, nationalities, and ideas, in space. She is presenting her master thesis this year on the

ritual practices of astronauts in space. Last year she was doing an internship at the CNRS under Sebastian Grevshmuhl guidance and participated in the writing of an article for the CNES on Space Visual History. She was also a delegate at past IAC and SGC and participated in the UN model COPUOS patronized by ESA (ECSL) last May.

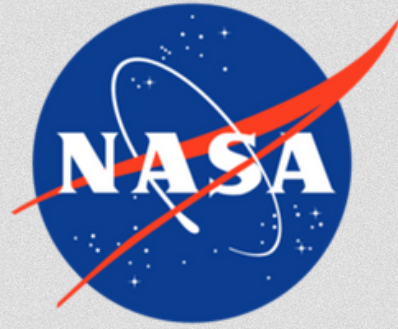


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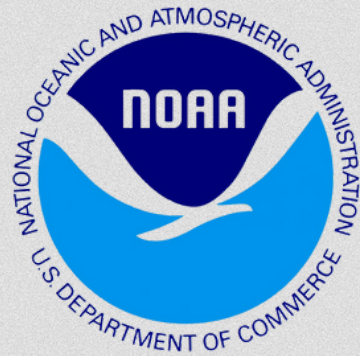
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