



SPACE GENERATION ADVISORY COUNCIL

In Support of the United Nations
Programme on Space Applications

SGAC Origins

SGAC is a global *non-governmental, non-profit* organisation and network which aims to represent *university students and young space professionals* ages **18-35** to the United Nations, space agencies, industry, and academia.

Conceived at the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) in Vienna in 1999:

“

*To create, within the framework of the Committee on the Peaceful Uses of Outer Space, a consultative mechanism to **facilitate the continued participation of young people from all over the world**, especially young people from developing countries and young women, in cooperative space-related activities...*

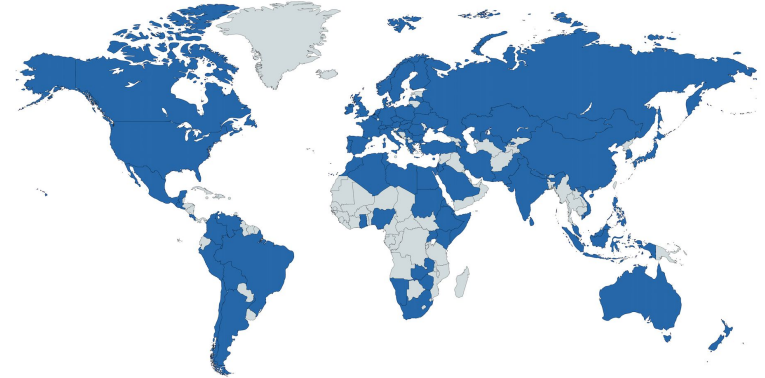
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SPACE GENERATION
ADVISORY COUNCIL

SGAC Network - Metrics

15,000+ Members
and Alumni
6 Regions
150 Countries



Create a **global network** of university students and young professionals in the space sector and give the next generation of space sector leadership opportunities and a **voice** in the space industry



Demonstrate the importance of **diversity** and how further involving the **next generation of space professionals and students** can strengthen the global space community in line with **capacity building** measures



Connect our members to peers and senior space professionals from space agencies, government, industry and academia



SPACE GENERATION
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SPACE GENERATION CONGRESS 2018

WORKING GROUPS RECOMMENDATIONS



Space Generation Congress

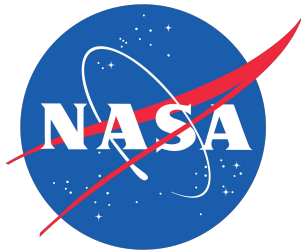
The 17th Edition of the Space Generation Congress was held in Bremen, Germany

- Held in conjunction with the International Astronautical Congress
- 150 delegates from 45 countries
- 27 speakers, and 23 subject matter experts (SME)
- 78 scholarships and awards (>50% of the participants)
- 7 working groups



SPACE EXPLORATION

Supported by:



16 Delegates
11 Countries represented

NASA Advanced Exploration Systems

Objectives:

Working Group members should identify political, economic, strategic, regulatory and practical obstacles to cooperation and provide recommendations for evolving the current global government strategic planning activities to make them more inclusive of and helpful to the growing commercial industry.

RECOMMENDATIONS

1. Recognise different priorities, types of resources, time-scales, & unique opportunities

When exploring commercialisation and private usage of The Gateway, it is important to identify the various factors that contribute to maximising its use. This includes:

- Recognise different priorities of stakeholders
- Distinguish between fixed resources and resources that must be replenished
- Recognise that there are different time scales that evolve over the course of The Gateway:
- Identify key commercial opportunities that can solely be satisfied by a deep space Gateway and not other avenues like the ISS or stations in Low Earth Orbit

2. Explore both government-led rubric & outsourced decision-making options; conduct further research on legal issues

The Working Group proposes two potential governance mechanisms, which can help to promote inclusion of commercial partners and in particular international commercial partners into The Gateway program:

- government-led rubric
- outsourced decision-making

3. Involve industry early, permit fully commercial activities, & revisit regulatory policy
In order to further communicate the value of The Gateway as an outpost for industry, the following are recommended.

- Involving the industry early in development
- Allowing for fully commercial hardware and crews
- Revisiting regulatory policy to allow for profitable use of cislunar space

4. Improve existing cooperation methods, refocus development funds, prioritise new entrants, & form an international strategy committee

The ultimate goal of The Gateway should be to unite all of humanity in deep space exploration while excluding selfish national interests. This can be done by:

- Improving efficiency of international cooperation methods
- Rethinking international development budgets
- Giving priority to projects/modules that seek to enable non-spacefaring/developing nations
- Developing an international strategy committee



SPACE COMMERCIALISATION

Supported by:



German Aerospace Center (DLR)

17 Delegates
12 Countries represented

Objectives:

The main task for the working group is to generate and extend the catalogue of possible space business cases including a critical but constructive discussion. Beside coarse feasibility analyses regarding the new ideas, corresponding questions related to venture capital activity opportunities in LEO, policy and programmatic mechanisms for commercialization, coordination and centralization of operation services at lowest possible cost.

RECOMMENDATIONS

Three (3) key focused questions were considered in the working group so as to properly capture the benefits of this shift in the industry: advertisement in space, collaboration between private industries and public agencies, and collaboration between space and non-space sectors.

Recommendations:

1. encouragement of diversification of investment sources for commercial space activities
2. use of more frequent, incremental technology demonstration missions to quickly build heritage for required technologies
3. establishment of industry groups within cohesive industry regions to advise and guide policymakers
4. advice to commercial ventures to include public outreach endeavours in order to foster a positive public opinion about space and that particular venture
5. develop legal framework defining basic requirements and standards for commercial space companies



SPACE SOCIETY

Supported by:



Caelus Partners

14 Delegates
10 Countries represented

Objectives:

The working group has been asked to identify a framework that enables a global partnership between countries, scientific, technical, and legal communities as well as agencies, the private and public sector in order for us all to profit from the use of outer space resources peacefully.

RECOMMENDATIONS

The increased access to space in the last decades and the subsequent needs of outer space resources has raised the awareness and the notion of a space community.

There is a need to:

1. connect the global community through a common understanding of the benefits and impact that space exploration has on global welfare, economy and advancement of innovation for all of humanity
2. unite communities through the development of mutual resources for combined benefits to the space society is an impetus

Recommendations:

1. raise the awareness of space access and communicate its services to the different social categories
2. establish a framework for a global partnership with a goal to enable an equal access to space in a sustainable way to as many entities as feasible, in order to fulfill the first condition of a balanced community and thus to be adequate with the UNOOSA objectives related to the peaceful uses of outer space
3. ensure that the international communities are involved in one infrastructure development process from the beginning.

SPACE LOGISTICS

Supported by:



ArianeGroup

15 Delegates
11 Countries represented

Objectives:

The diverse participants of the Space Logistics Working Group applied the logistics mindset to determine key logistics nodes and relevant flows of information and material to and from each of these nodes. The considered nodes were Earth orbit, lunar orbit and the lunar surface, for their high relevance in the near future.

RECOMMENDATIONS

The future Earth orbit logistics need is considered to pivot around the topic of space debris on-orbit servicing and constellation services.

To develop this node in a sustainable way it is recommended:

1. creation of international consortium to assign liability for space debris creation and removal solutions
2. standardized spacecraft interfaces to be defined and implemented to permit on-orbit servicing of functional and dysfunctional space vehicles
3. dedicated loitering orbit - similar to graveyard orbits - to be defined for spacecraft traffic management purposes

The lunar orbit space logistics node faces currently many challenges due to its underdeveloped state. Developing the node will most likely rely on lunar resources, which are currently not well regulated.

To develop the lunar node in space logistics terms it is highly recommended:

1. that the utilization of lunar resources is clearly regulated to allow a market to grow
2. that intergovernmental collaboration for the exploration and provision for lunar data providers is encouraged
3. a new International Telecommunication Union (ITU) region for the Moon shall be defined

RECOMMENDATIONS

Further into the future, developments on the lunar surface are foreseen, producing a lunar surface space logistics node. Potential of utilization to the benefit of all humankind is great, with services such as propellant production, manufacturing of goods, data and hardware storage and unique scientific exploration opportunities.

For this purpose, it is highly recommended:

1. that the following legal challenges are solved in a way that enables a peaceful usage of the Moon: ownership of extracted resources and data, priority rights, intellectual property rights
2. that a UNCOPUOS working group shall be created in 2019 to discuss these issues
3. that a dedicated MoonLab research centre should be established accessible to all UN countries among which results are to be distributed



SPACE SAFETY AND SECURITY

Supported by:



European Space Agency (ESA)

18 Delegates
14 Countries represented

Objectives:

This working group invites participants to reflect on the nature of space safety and security – in and from space- considering the priorities of governments, industry in both sectors, and space agencies. Issues include, whether data should remain open source or limited in its availability. Also, possible technical solutions to the challenges described above, and the way forward for space safety and security in and from space.

RECOMMENDATIONS

Recommendations:

1. The countries should have a national regulatory authority (NRA) that is able to comprehensively consult with stakeholders relevant to each country's interest.
2. All countries should evaluate a comprehensive framework for a space traffic management (STM) system and assess how their individual capacities can contribute to it. Safety and security need to be clearly defined at an international level.
3. All countries should provide domestic encouragement for space traffic management through incentives, including but not limited to:
 - sharing data, tools, and best practices
 - reduced registration fees
 - preferential access to launch schedules
 - research, development, engineering, and business development support from the national agencies.



SPACE POLICY

Supported by:



Secure World Foundation

15 Delegates
11 Countries represented

Objectives:

This group will explore how space applications and technologies can be used to address some of the challenges faced in achieving the SDGs.

RECOMMENDATIONS

1. Nurturing the Geospatial Market:

- Fund SDG focused innovation challenges
- Integrate SDG Priorities during the conception of new and emerging space companies
- Implement SDG compliant certification across the space sector

2. Sustainable Expansion of Space-Based Endeavors for Effective Decision-Making:

- Establish opportunities such as workshops to facilitate collaborations between emerging space actors and mitigate the risks associated with working towards addressing the SDGs in their own communities.
- Implement capacity building efforts via the exchange of resources between institutions/countries, and the facilitation of financial incentives such as grants/scholarships to strengthen and sustain the local workforce focused on working towards the 2030 agenda.
- Establish representation from emerging space actors at the UN to contribute towards decision-making efforts
- Present emerging space actors with UN-prepared guidelines to ensure that lawful and acceptable avenues are followed whilst pursuing the 2030s agenda.



3. Ensure Ease of Data Access, Institutional Accountability and National Security:

- Establish a UN-designated organization to manage an 'International Geospatial Data Directory (IGDD)' – a resource that publishes the listings associated with all the available geospatial data, and renders services such as categorical data presentation, connection of data providers/users, data translation based on user-needs, and exploitation of Artificial Intelligence (or other software techniques) to offer recommendations and identify data duplication.

Balancing national security concerns with data transparency are addressed via the following recommendations:

- Establish avenues for IGDD to offer restricted data access options to users.
- Establish The Space Generation Advisory Council (SGAC)-facilitated workshops focused on the topic of balancing national security concerns and space data sharing efforts.

SPECIAL TRACK

Supported by:



SPACE GENERATION
ADVISORY COUNCIL

SGAC

16 Delegates
12 Countries represented

Objectives:

Helped by a large team of worldwide experts, the Space Generation Advisory Council (SGAC) Special Track discussed the symptoms, roots and solutions to the Space Divide within and between large geographical regions. The specific goal of the group was to foster discussion between Space Generation Congress (SGC) delegates and Subject-Matter Experts (SMEs) from all six regions of the world



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RECOMMENDATIONS

Recommendations to SGAC:

- 1) nearly all of the activities of SGAC are tools to bridge the Space Divide, including regional and international events, project groups, and scholarships. SGAC should continue these activities and should involve as many regions and countries as possible while doing so. *
- 2) several actions could be taken by SGAC to increase its impact in Bridging the Space Divide. A worldwide communication platform such as Slack would allow broader networking and sharing of information among SGAC members. A Project Group discussing how to Bridge the Space Divide would be highly beneficial and has been formally proposed to SGAC. The project group would facilitate frequent working groups on this topic at SGAC regional events. *
- 3) connecting as much as possible with local actors in regions where SGAC is not yet well established would maximize its impact in each region. *

*in progress



THANK YOU

More details of the outcomes and discussions of the SGC and the different Space Generation Workshop will be published in the SGAC 2018 Executive Summary and Annual Report

www.spacegeneration.org



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