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# UNISPACE+50 and the Importance of Space Technologies for Water and Development Related SDGs

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UNITED NATIONS  
Office for Outer Space Affairs



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# UN Office for Outer Space Affairs

## Vision

*Bringing the benefits of space to humankind*

## Mission Statement

The core business of the Office is to promote

International Cooperation

in the use of outer space to achieve  
development goals





## Roles of UNOOSA



**CAPACITY-BUILDER:** UNOOSA brings the benefits of space to humankind by building space capacity of non-space-faring countries



**GLOBAL FACILITATOR:** UNOOSA plays a leading and facilitating role in the promotion of the peaceful uses of outer space



**GATEWAY TO SPACE:** UNOOSA is the main UN agency on space matters and facilitates the coordination of UN activities using space-related technology to improve the human condition globally.



## Space yesterday

- **Moving Frontier** – improving technology and its impact
- Need for **governance**
  - 5 Treaties and 5 Principles
  - 50 Years of the Outer Space Treaty
- Call for **trust and cooperation**
- **Interlinkages** –cross-sectoral impact as applicability of space technologies has been broadening
- **Dependency** – space offers critical infrastructure and we have become more and more dependent on it





## Space today

- Impact on society, economy, security...
- Total **global space value** – \$330 Billion
  - Government = \$76 Billion (24 %)
  - Commercial = \$253 Billion (76 %)
- **Vulnerability** of technology
- Space **workforce**
- Number of **publications** has almost doubled since 1990s
- Connecting the world



**Space is a “global commons”:** The advancements of space technology benefit all member states of the UN in one way or another.



## Space in the future

- The future of the **safety, security and sustainability of outer space activities**
- Stronger bonds between **states and private sector**
- **Cooperative missions** in LEO and beyond
- Increasing number of space technology **users**
- **Space workforce** on rise
- Broader **socio-economic benefits** from space
- **Climate change** mitigation and risk reduction
- **Capacity-building and learning** rather than starting from zero





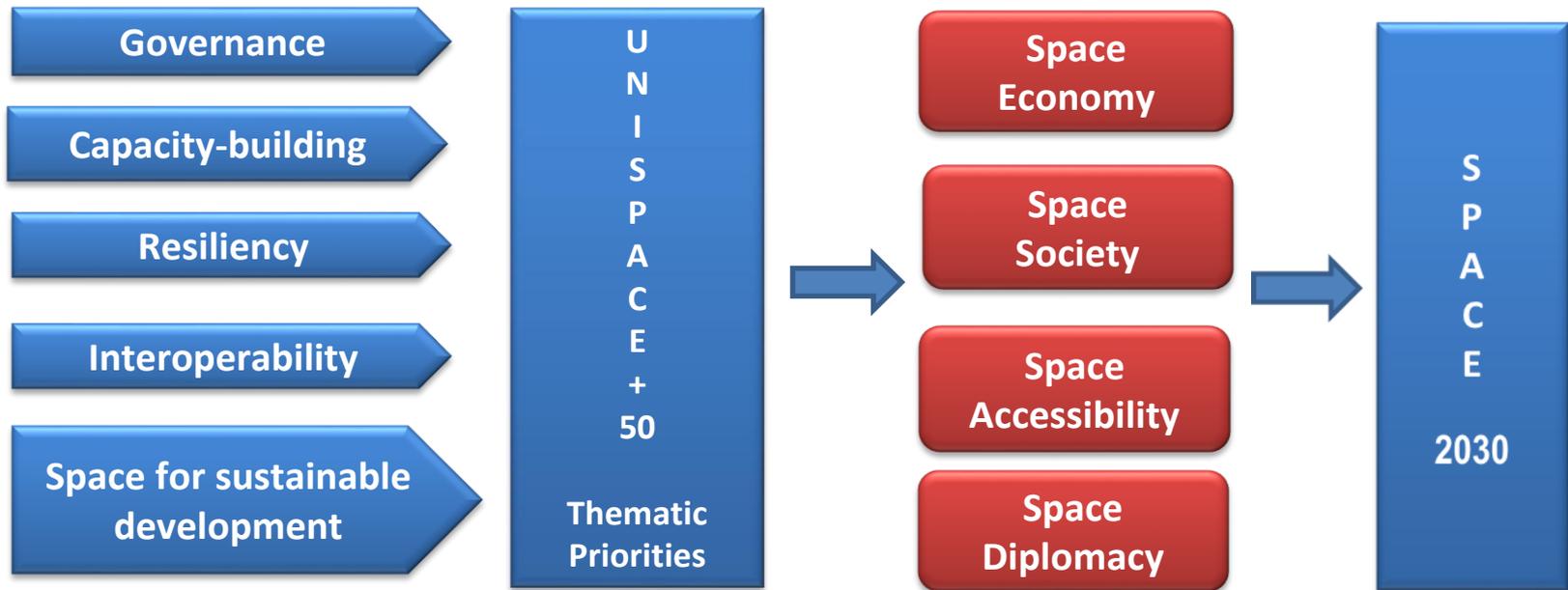
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# UNISPACE+50 Process



# Space and SDGs

All countries and all stakeholders act in **collaborative partnership to implement the 2030 Agenda** for Sustainable Development.

**UNOOSA** is currently developing new approaches to address the targets enshrined in the SDGs.

**One joint vision** has to be employed to protect space as a limited resource **for the benefit of humankind.**





# The Past of the UNISPACE+50 Process

There are **5 cross-cutting areas** as defined by COPUOS and its Subcommittees that serve as a base for the 7 thematic priorities of UNISPACE+50:

## Governance

UN treaties and principles on outer space, COPUOS guidelines, GA resolutions on outer space

## Capacity-building

The use of space science and technology and their applications for the benefit of all countries

## Resiliency

Disaster risk reduction, near-Earth objects, space weather

## Interoperability

Including the International Committee on Global Navigation Satellite Systems (ICG) and other current and new coordination mechanisms, such as IAWN, SMPAG

## Space for sustainable development

Efforts by the Committee and its member States as well as UNOOSA to meet the 2030 Agenda for Sustainable Development



# The Present of the UNISPACE+50 Process

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7  
Thematic  
Priorities

Today, there is a revolution in space, the beginning of a new era in space (new stakeholders, renewed interest for space, growing private sector involvement)

➔ UNISPACE+50 will be an **unprecedented event** during the 61<sup>st</sup> Session of COPUOS (June 2018), 50 years after UNISPACE I, a **milestone to steer and strengthen** the Committee's mandates to **address current challenges and opportunities**



People



Planet



Prosperity



Peace



Partnership



## Focus on thematic priority 6: *International cooperation towards low-emission and resilient societies*

### Objectives:

- **Define synergies** between climate change mitigation efforts, disaster risk reduction and global development.
- **Provide requirements to new developers** for coverage in geographical areas not sufficiently monitored or applications that need further development.
- **Improve integrated space applications approaches** and the **interoperability** of space-based systems and ground/in situ systems.

**UN-SPIDER** has been providing direct support to developing countries in accessing and using Earth observation data in preparing for and responding to disasters



### Activity

United Nations/Germany International Conference on International Cooperation Towards Low-Emission and Resilient Societies (to be held)

### TIMELINE

**2018:** Roadmap for enhanced resiliency

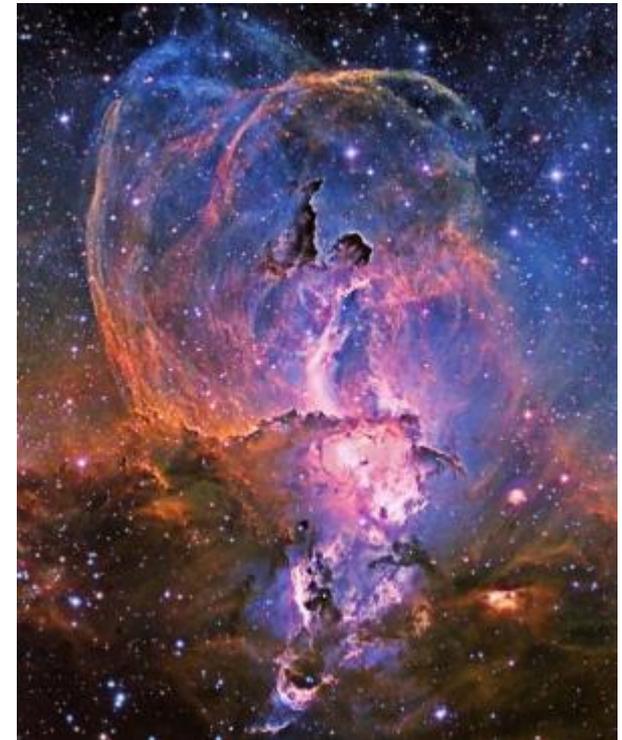
**2020:** Strategy for an international coordination of constellation of constellations supporting 2030 Agenda



## Focus on thematic priority 7: *Capacity-building for the 21st Century*

### Objectives:

- **Define new innovative and effective approaches** to overall capacity-building and development needs as a fundamental pillar of global space governance.
- **Strengthen comprehensive capacity-building** and outreach activities of the Office for Outer Space Affairs.
- **Develop infrastructure** for cross-sectoral and integrated applications, with combined scientific, technical, legal and policy outputs.
- **Enhance existing partnerships and forge new ones**  
**Promote efforts to encourage STEM education**, especially for women in developing countries.



### TIMELINE

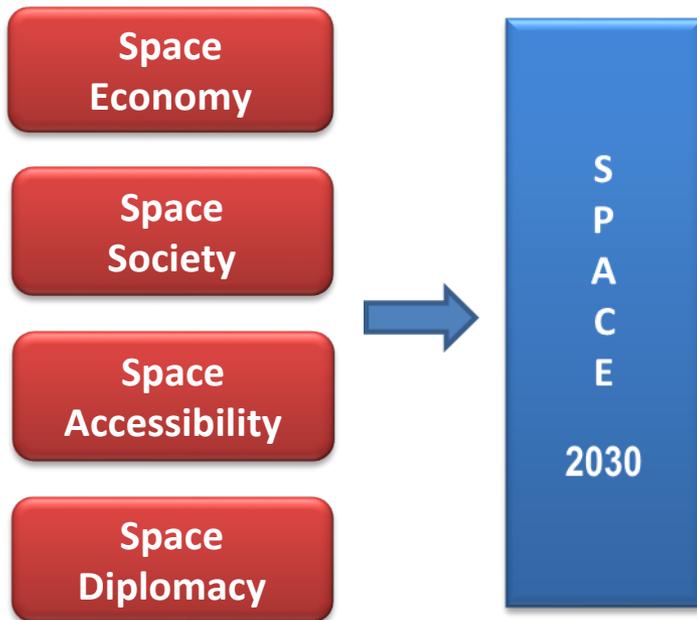
**2017:** Upgrade capacity-building strategy; UN/Austria flagship Symposium on TP7

**2018:** Strategy to be presented to MS; Space for Women project to be initiated, OpenUniverse to be initiated

**2020:** Consolidated engagement with tertiary education institutions; strengthen network of regional centres



# The Future of UNISPACE+50 Process



Development of space-derived **economic benefits**.

Evolution of **society and societal benefits** stemming from space-related activities.

**All communities** using and **benefitting** from space technologies.

Building **partnerships** and strengthening international **cooperation** in space activities.

Focus on the UN frameworks: The 2030 Agenda for Sustainable Development, The Sendai Framework on Disaster Risk Reduction 2015-2030 and the Paris Agreement on climate change



People



Planet



Prosperity



Peace



Partnership

# Space 2030 agenda and its strategic objectives

- The outcome of UNISPACE+50 process and its thematic priorities will form, at the UNISPACE+50 in 2018, a **dedicated General Assembly resolution**
- The **Space2030 agenda for strengthened cooperation and governance** of outer space activities and their contribution in addressing overarching, long-term development concerns will be an output of UNISPACE+50
- The strategic objectives of Space2030 agenda, based on objectives and results of work under **UNISPACE+50 thematic priorities** as well as **targeted inputs** from other related activities, **conferences** in the lead-up to UNISPACE+50, will be presented under the **four pillars of Space Economy, Space Society, Space Accessibility and Space Diplomacy.**
- **This Conference is one of those activities!**





# The Way Forward on Space2030

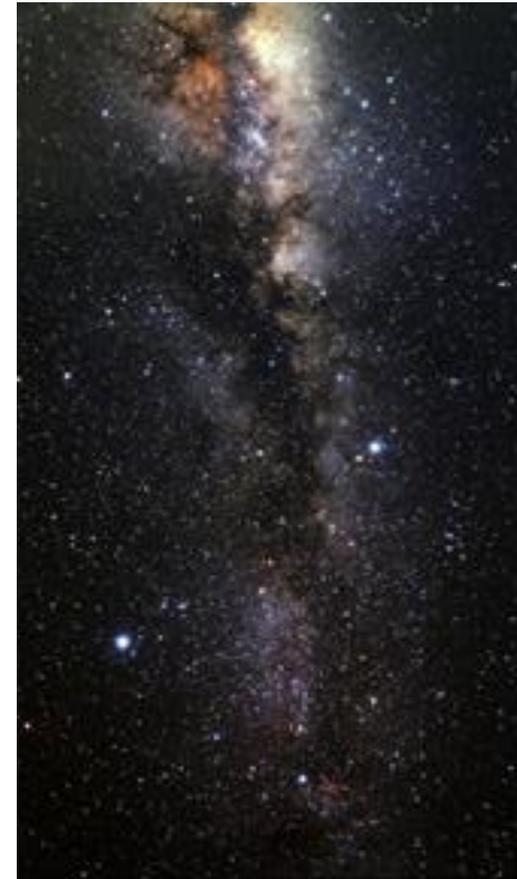
Space2030 is a **unique agenda** combining global governance of outer space activities, space science, technology, policy, and law

In line with **Secretary General's overall reform agenda and its tree pillars** – peace and security, development, and human rights

**Strengthen UN inter-governmental platforms** to contribute to achievement of SDGs and other goals and targets enshrined in the international frameworks

**Reduce 'Space divide'** - Partnership to provide countries with space capabilities and enhance their opportunities to access space

**Build stronger partnership and coordination** in the peaceful uses of outer space at all levels – demonstrate space as a contributor to the well being of people





# The Way Forward on Space2030

- Stronger cooperation in global partnerships
  - Stronger engagement with private sector, as mandated by COPUOS
  - Identify the specific needs countries have and attempt to close the existing gaps between countries
  - Improve cost-effectiveness of the process
  - Support and coordinate programmes which focus on emerging space nations and those with limited space capabilities
  - Introduce exchange programme aimed at capacity-building
  - Strengthen the role of Regional Centres for Space Science and Technology Education
  - Establish global compact for Space to involve more sector entities



# Addressing the growing role of private sector

- The General Assembly agrees that the Office should pursue **greater engagement with industry and private sector entities** to further their support for and contributions to the overall work of the Office (A/C.4/72/L.2)





## The Way Forward – High Level Fora (HLF)

- Building **stronger partnerships and international cooperation** and coordination in the peaceful uses of outer space at all levels
- Utilize HLF as a forum to express views on the initiatives and further recommendations leading to UNISPACE+50
- Present lessons-learned and ideas on the four pillars
- Discuss the **importance of space for society** and the need to guarantee **universal access** to space activities to address sustainable development challenges
- Establish basis for **Space2030**



## The Future of HLF

- Convene on a yearly basis to discuss the future course of space exploration, technology and policy
- Participation open to all Member States and to broader space community
- Results of the HLF to be shared with COPUOS
- Interest in hosting the HLF to be expressed 3 years in advance
- Potential to select permanent/long-term location
- UNOOSA to cooperate with the hosting country
- 2018 Bonn, Germany; 2019 TBD



## In summary: UNISPACE+50

- Recommendations from HLF and other UNISPACE+50 related events will be reviewed and discussed
- Future of space sector to be decided in June 2018
- Space2030 Agenda as an expected outcome, linked to other global development agendas
- Seen as one of the most important space-related events of this milenium





# Space for Water

- Just in the last 10 years, 4 major UN-sponsored events addressed space technology for water management, on request from Member States
- In 2008, first in Saudi Arabia, when the World was still in the middle of the MDG cycle; then 2011 in Argentina
- In 2013, also here in Pakistan, considered food and water security applications
- In 2014, the Morocco conference took place as the World was about to agree on the new and more inclusive SDGs
- Now it is time to identify very concrete actions well linked to the SDGs, and to follow up on some recommendations of the past conferences too!





## **UN/Saudi Arabia/UNESCO Conference on the Use of Space Technology for Water Management. Riyadh, 12 – 16 April 2008**

- A pilot project to study watershed management for optimal utilization of land and water resources, using space technology, in arid or semi-arid regions.
- Application of remote sensing to address hydrological problems in arid and semi-arid areas with the objective of filling the gap that exists between optical and microwave data.
- Snow cover monitoring in the HinduKush-Himalayan area with the objective of observing glaciers in order to monitor the global impact of climate change.
- Setting up early warning systems for flood, drought, food security, desertification, land use change, groundwater pollution and illegal drilling of wells.
- The need to establish a regional centre for space science and technology education in the Arabic language



## **UN/Saudi Arabia/UNESCO Conference on the Use of Space Technology for Water Management Riyadh, 12 – 16 April 2008 (cont.)**

- Improve both spatial and temporal availability of data to assess sources of water deterioration.
- Aim for minimum cost of space-based services for water management for public-oriented projects.
- Encourage the development of value-added services for water resource management, based on Earth observation data and driven by end-user needs.
- Assist institutions and agencies in developing countries to build capacity in the use of space technology for water management through medium-term and long-term fellowships and programmes organized in cooperation with Member States.
- All participants were encouraged to better utilize educational and training opportunities offered by the Space Applications Programme



## **UN /Argentina International Conference on the Use of Space Technology for Water Management. Buenos Aires, 14-18 March 2011**

- Pilot studies are important, especially in arid and semi-arid areas. The Andean basins of Argentina, Bolivia, Chile and Peru would provide a broad context for such projects.
- Both microwave and optical images should be used for pilot projects. In situ data validation is important.
- Common methodology needs to be developed.
- More international coordination and a long-term self-sustainable educational framework need to be established.



**UN /Argentina International Conference on the Use of Space  
Technology for Water Management. Buenos Aires, 14-18 March 2011  
(cont.)**

- Nine-month postgraduate courses considered beneficial in developing countries, but both long- and short term needed too. *(Still limited resources today)*
- Networks like G-WADI and PERSIANN need to be strengthened
- Internet-based water portal for data sharing – participants were encouraged to provide relevant information and educational materials



**UN/Pakistan International Workshop on Integrated Use of Space Technologies for Food and Water Security, Islamabad, 11-15 March 2013**

Applications of space technology and data for water security and water management

- major themes identified: droughts and floods, crop water requirements and water quality
- main areas for efforts to be made: data sharing and capacity-building
- most important data categories: water resource inventories, population and census data, soil moisture maps, water flow models, evapotranspiration data, meteorological data and land cover maps



## **UN/Pakistan International Workshop on Integrated Use of Space Technologies for Food and Water Security, Islamabad, 11-15 March 2013 (cont.)**

- importance of mountain ecosystems for water security is emphasized;
- monitoring of glaciers was an important task in order to better understand climate change in the HinduKush-Himalayan region
- The work on mapping decadal changes should be taken further with the use of better quality satellite images in order to identify hot spot areas and to carry out regular monitoring
- gap between the academic community and local users should be bridged using traditional and social media or through workshops and specific events such as mountain information days



## **UN/Morocco International Conference on the Use of Space Technology for Water Management, Rabat, 1-4 April 2014**

- Support existing and create new UN-affiliated regional centres of expertise, education and training, to ensure capacity-building and knowledge dissemination.
- Integrate the use of space technology in education curricula, through the practice of knowledge-sharing, online education, international symposiums and workshops, scholarships, and student exchange programmes.
- Support Internet-based portals focusing on the use of space technology for water management, so that they could be a platform for sharing data and information. Participants commended efforts of PSIPW and the OOSA in developing such a portal.
- Further promotion and support of data-sharing principles of GEO and the data democracy principles developed by CEOS



3 GOOD HEALTH  
AND WELL-BEING



## Space for SDG 3



### Applications:

Telemedicine and telehealth, population mapping, distribution of medication, treatment of diseases, water supply, healthcare equipment, early warning of threats, disease epidemiology, outbreak preparedness and response, vaccination strategy, forecasting of extreme weather and climate change, monitoring air quality, controlling water quality, tracking of vector-borne diseases, responding to epidemics, disaster preparedness and response, human health research and spin-off technologies, traffic management, navigation



15  
LIFE  
ON LAND



# Space for SDGs

## Applications:

Prevention and mitigation of climate change, prevention of desertification, protection of biodiversity, drought effect mitigation, weather prediction, water management, disaster preparedness and management, fire prevention monitoring and mitigation, sustainable land development, resource management, monitoring air quality



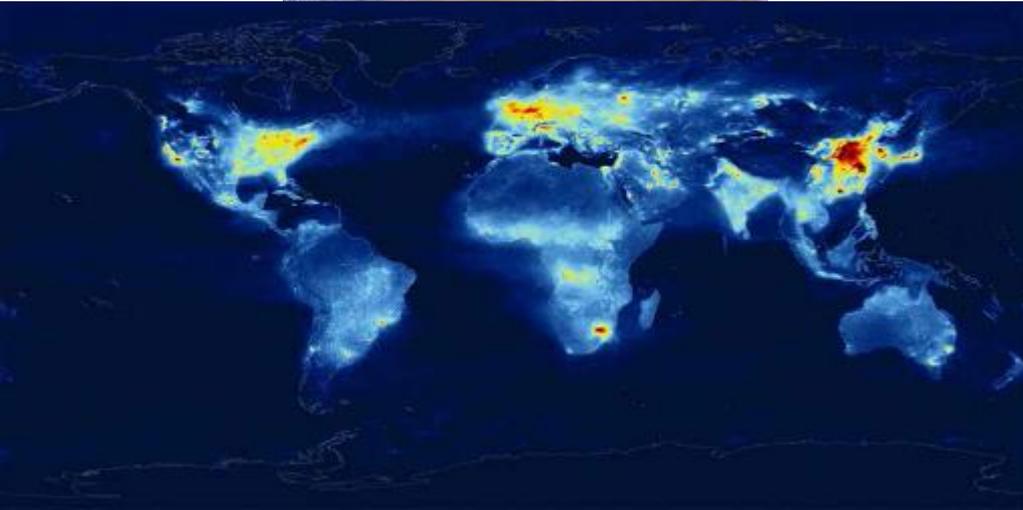


# Space for SDGs

15  
LIFE  
ON LAND



- Space technology supports efforts to understand and forecast changes in the environment. By integrating GNSS measurements into operational methods used by meteorologists, the atmosphere's water content can be determined, improving the accuracy of weather forecasts.





## Conclusion

- Clear user requirements collected over many years (and still valid today), current global development agenda and concrete SDG targets and indicators, in particular those water management related, require access to and frequent use of space technology and space based data
- It is time for implementing necessary operational monitoring services and open data access initiatives for this purpose, in close partnership

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