

# The role of the Office for Outer Space Affairs in support of the International Space Weather Initiative

International Space Weather Initiative Workshop

20 – 24 May 2019, Trieste, Italy

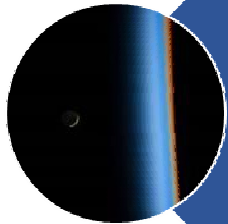
Sharafat Gadimova



UNITED NATIONS  
Office for Outer Space Affairs



## 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.



## Committee on the Peaceful Uses of Outer Space

Space and  
climate change

Disaster  
Management

Space debris  
mitigation

National space  
legislation

International  
mechanisms for  
cooperation

Long-term  
sustainability of  
outer space  
activities

Definition and  
delimitation  
of outer space

Space  
applications for  
socioeconomic  
development

Near-Earth  
objects

Global Navigation  
Satellite Systems

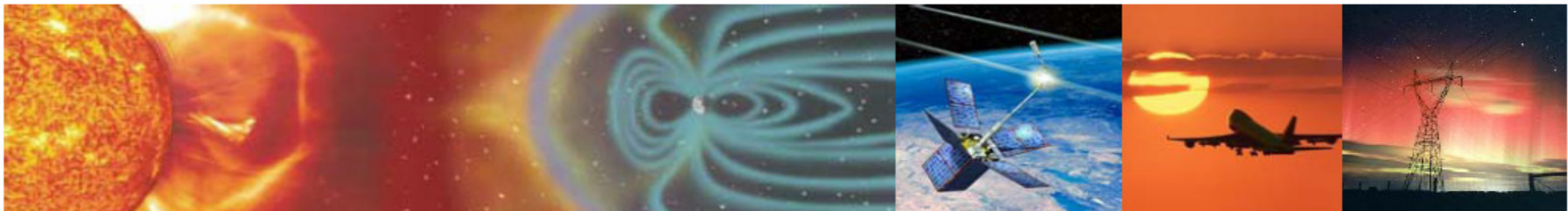
**Space  
Weather**

GGE-report and  
TCBM's



## The Importance of Space Today

- The world has become dependent on **outer space activities** and the **amount of data and information** generated
- **Space weather phenomena** causing interruptions of satellite services may therefore result in severe damage and losses, and have considerable implications on transport, economy and air traffic.
- **Space weather** is increasingly becoming a central topic that requires
  - improved international coordination to respond to extreme space weather events, including an improved international data sharing.
- **Space weather** research and collaboration may help to
  - promote sustainable development through the prevention of catastrophic disruptions space critical infrastructure and space-based services





## Space in the UN system

**UNOOSA** is the only UN office with a number of General Assembly mandates to bridge access to space technologies and space-based information for Member States and other UN agencies and to build capacity in the use of such technologies.

For the attainment of all 17 SDGs and 169 targets **space tools** carry significant relevance:

**Direct** — as enablers and drivers for sustainable development

**Indirect** — as an integral part of the indicators for monitoring progress





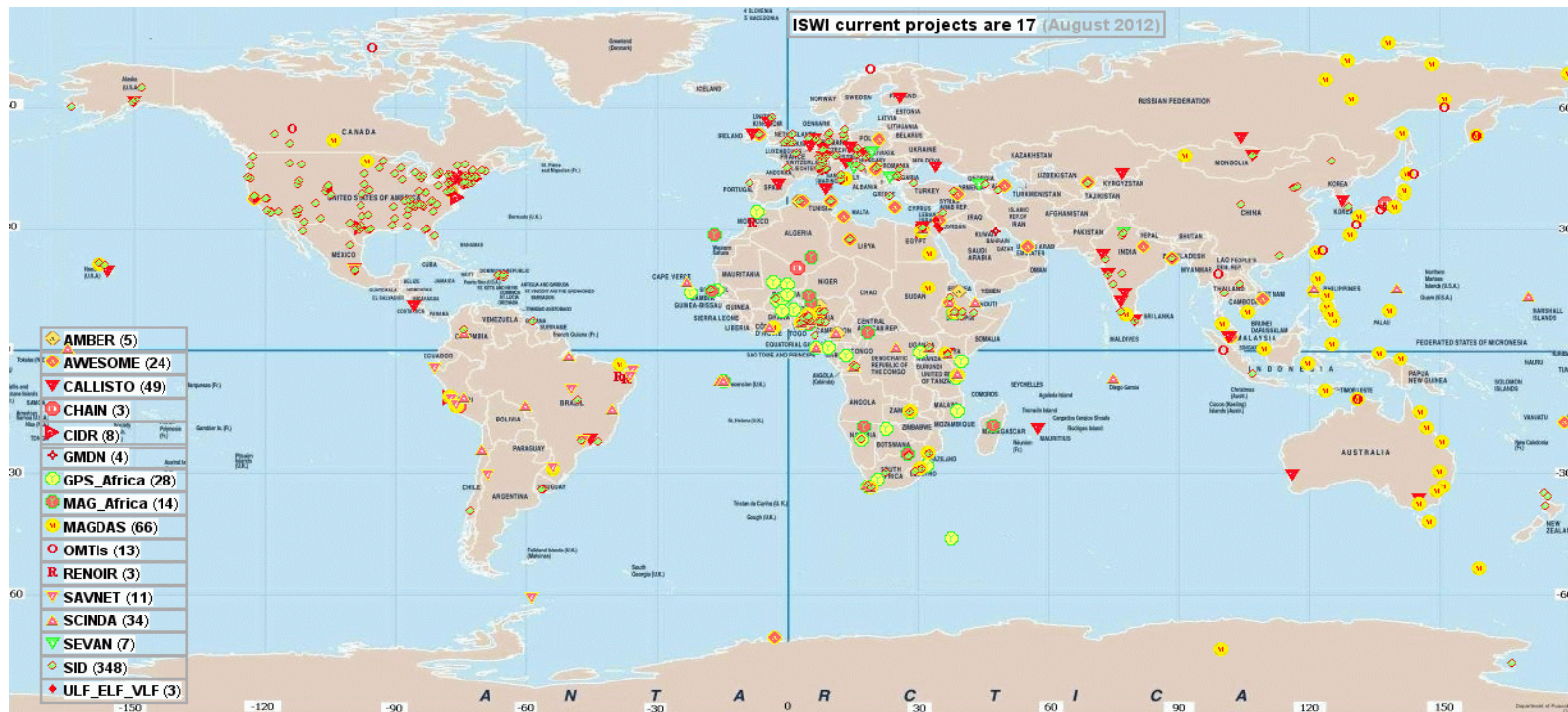
## International Space Weather Initiative

- **2004:** COPUOS called for addressing solar-terrestrial interaction: global climate, **space weather**, Sun-Earth-heliosphere-system
- **2005 - 2009: International Heliophysical Year (IHY):** Workshops
  - to address the lack of observations in key geographical areas to be able to fully understand the global ionosphere and its linkage to the near-Earth space environment;
  - to foster collaboration between research scientists in scientifically interesting geographical locations and researchers in countries with expertise in building scientific instrumentation
- As a result of the Office's activities, scientists from many countries continue to participate in instrument operation, data collection, analysis and the publication of scientific results





## ISWI Instrument Sites



- Scientists from developing/developed nations work together in deploying and operating SW instruments: *> 1000 deployments in >100 countries;*
- *Students and faculty participate at all levels of the instrument project and science;*
- *19 instrument networks from 8 countries* (Armenia, Brazil, France, Germany, Israel, Japan, Switzerland and USA)



## International Space Weather Initiative (cont.)

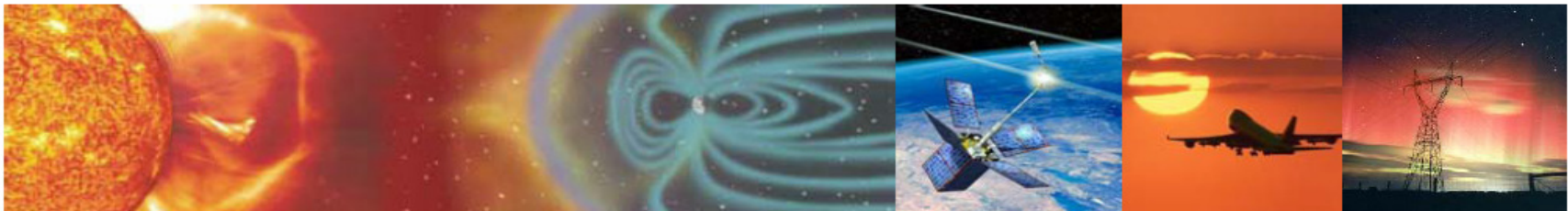
- **2010 - 2012:** STSC agenda item “**International Space Weather Initiative (ISWI)**” & ISWI Workshops (Egypt, Nigeria, Ecuador)
  - A programme of international cooperation to advance the space weather science by a combination of instrument deployment, analysis and interpretation of space weather data
  - **ISWI website:** <http://www.iswi-secretariat.org/>
  - **ISWI Steering Committee**
- **IHY and ISWI** have contributed to significant progress in the development of space science schools that encourage students to consider a career in space science
- **2013: STSC agenda item “Space Weather”**





## International Committee on GNSS

- **2008:** *In cooperation with the Institute for Scientific Research at Boston College, in the United States, and the Abdus Salam International Centre for Theoretical Physics, Italy*
  - A series of outreach workshops on space weather effects on GNSS operations.
  - The lectures designed to give both theoretical and practical training on the physics of space weather and its effects on GNSS, through, for example, equatorial electrodynamics, scintillations and other ionospheric irregularities.





## Capacity Building and Outreach

- **Training** in handling space-weather instruments and data; data analysis and interpretation
- Running **advanced schools** introducing topics from the solar interior to surface of Earth
  - Hands-on experience to handle data sets
  - Promoting the work of students on space weather that can lead to PhD research projects, as well as work in an international context, giving rise to publications
- Running **ISWI workshops** to advance the space weather science by combination of instrument deployment, analysis and interpretation of space weather data, including space weather and its effects on GNSS

2015 (Japan), 2017 (USA), **2019 (ICTP)**



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## Space Weather: A global challenge

- Develop an improved basis for international monitoring, forecasting and warning procedures, especially in the form of more coordinated international communication and coordination of warnings of extreme space weather events
- Define a set of best practices, operating procedures and actions to mitigate the adverse impacts of extreme space weather, which required a prior assessment in each Member States of its exposure to risks from space weather and related socioeconomic impacts, as well as defined operating procedures, developed in partnership with administrations responsible for critical infrastructure and civil protection
  - **Expert Group on Space Weather:** demonstrated a clear need for increased international collaboration to increase international preparedness and resilience against the threat of the adverse effects of space weather on ground- and space-based technology and infrastructure.

THANK YOU



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