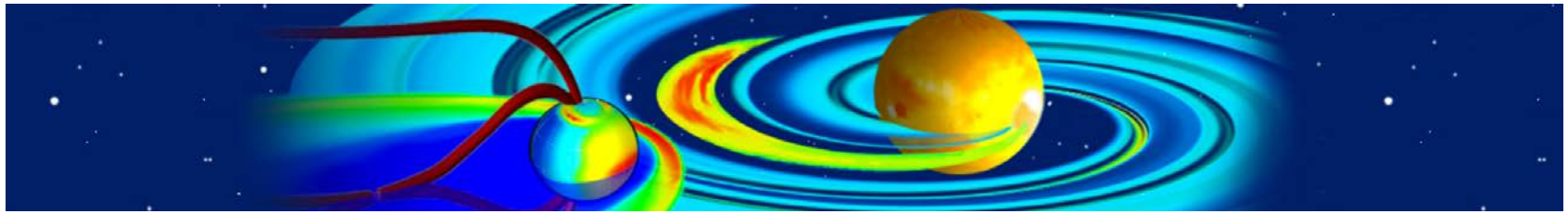


Committee on Space Research (COSPAR) Panel on Space Weather (PSW):

A Forum for Realization of Global Space Weather Roadmap Goals.

Masha Kuznetsova

COSPAR PSW, Chair

UNOSSA
55th Session of STSC

Panel on Space Weather

Outline

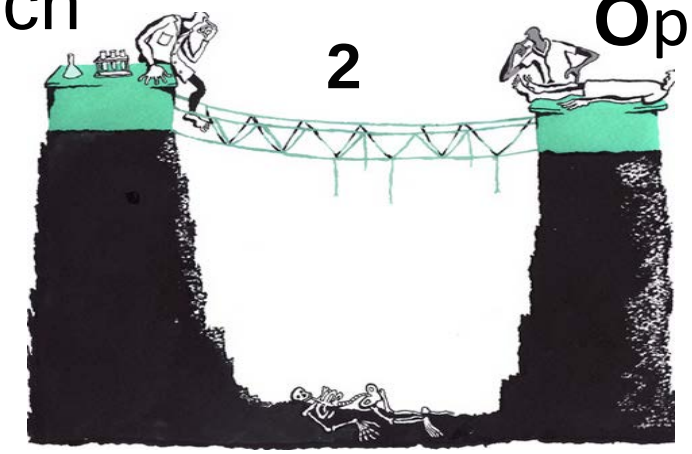
Panel on Space Weather

- Evolution of views on what are top challenges in the field of space weather.
- General recommendations from COSPAR-ILWS Global Space Weather Roadmap, 2015-2025
- Vision and plans for COSPAR PSW activities.
- Opportunities for COSPAR-UN hands-on educations initiatives.
- PSW events at the upcoming COSPAR 2018 General Assembly.

Top Challenge at the Dawn of Space Weather: Bridging the "Valley of Death" Between Research and Operations

Research

Operations



Space *(Heliophysics)*

Basic Research

Weather *(Meteorology)*

Applied Research + Services

Emphasis on R2O and Services

COSPAR Panel on Space Weather established in 1999

- Provide expert knowledge on space environment.
- Encourage development of space weather predictive techniques.

Views on Top Challenges Evolved Over the Years

A need for a hub (vs. a bridge) enabling multi-way connections between key elements of space weather capabilities system

An importance of emphasis on advancing research targeting improvements of space weather services.

RESEARCH

A HUB 4 R2O-O2R

OPERATIONS

A Global Space Weather Roadmap 2015-2025 Commissioned by COSPAR and ILWS

[*Schrijver et al., 2015*]:

Performed gap and feasibility analysis. Identified research priorities & pathways. Analyzed opportunities for improvement. Provided specific recommendations.

Roadmap guidelines:

- Understand and quantify key aspects of space weather: physical processes, impact on technology & society.
- Establish mechanism for rapid implementation of latest advances in understanding, observations and modeling into space weather applications and operations.
- ***Facilitate transition to effectively functioning and operating, information-sharing, global space weather community.***

Current State of Affaires: A Top-Down Approach. Insufficient Global Coordination.

ILWS-COSPAR Roadmap, Policies, Action Plans

Regional / International Coordination Groups

International space weather stakeholders

National / Regional Agencies

RECOMMENDATIONS

CONFERENCES RECOGNITION

OPPORTUNITIES

mission specialists

data providers

model developers

research groups

students

scientists

scientists

software developers

infrastructure engineers

research groups

A Need for a Bottom-Up Component of Global Coordination in Space Weather.

A bottom-up push for innovation. A global community voice.
A joint force to maximize return on investments.
International Space Weather Action Teams (I-SWAT).

COSPAR PSW Plans

https://ccmc.gsfc.nasa.gov/psw/

- Actively contribute to global coordination of space weather efforts. Represent COSPAR scientific community in discussions of Expert Group on Space Weather and future International Space Weather Coordination Group.
- Facilitate establishment of a high performance network of International Space Weather Action Teams (**I-SWAT**) for realization of space weather roadmap goals and continuous roadmap updates.
- Organize ***working meetings*** (in addition to Assemblies and Symposiums) that bring together scientists, space weather service providers, and expert-users of space weather information.
- Create an inviting, dynamic environment that encourage active participation, emergence of new leads and innovative ideas.

Focused Topics for I-SWAT (examples)
grouped by domain, lined-up with impacts

PSW

Space weather origins at the Sun	*Propagation of transient through evolving ambient heliosphere*	*Coupled magnetosphere ionosphere-atmosphere (geospace) system response to solar drivers*	***Primary user groups & Impacts***
Solar output Input to heliosphere and geospace	***Input to geospace***		***Electric power systems, GICs***
S1. Long-term solar variability. Prediction of solar cycles.	**H1.** Time of CME arrival. Plasma parameters and magnetic field structure within CME approaching geospace.	**G1.** Geomagnetic environment.	***Positioning / Navigation / Communication***
S2. Solar magnetic field & heating. Ambient magnetized solar wind and spectral irradiance.		**G2.** Ionosphere / atmosphere variability.	***(Aero)space assets***
S3. Solar eruptions: CMEs, flares, enhanced electromagnetic emissions and high energy particle fluxes.	**H2.** SEP and GCR in heliosphere.	**G3.** Near-Earth radiation & plasma environment.	*- Satellite / debries drag* *- Satellite / aviation funcitions,* *- Astronauts health*

Opportunities for Hands-on Education

- Promote space environment awareness as an important component of the new millennium core education.
- Go beyond organizing Space Weather Schools. Establish international hubs, provide resources and training opportunities for teaches.
- Engage students in activities that are pushing the frontiers of research, development, and experimental operations. Provide exciting hands-on opportunities for undergraduates.
- Create an environment for students from different countries and different career goals to work together for the benefit of society, and strengthen international collaborations.
- Initiate **Space Weather World Relay** that will engage undergraduate students from multiple *time zones* around the globe in innovative and collaborative space weather monitoring, analysis, and forecasting (opportunity for joining forces with UN COPUOS, SCOSTEP/ISWI, COSPAR Capacity Building).

PSW

5 events, 16 x 90 min sessions

42nd COSPAR Scientific Assembly

Pasadena, CA, United States, 14 - 22 July

http://cospar2018.org/

Abstract Deadline: February 9th, 2018

PSW.1 Metrics and Validation Needs for Space Weather Models and Services

PSW.2 Solar System Space Weather

PSW.3 From Ionospheric Indices Towards Standardized Activity Scales

PSW.4 Interoperability of Data Models, Data Holdings and Data Access Tools

PSW.5 Space Weather Initiatives and Coordinated International Efforts to implement COSPAR-ILWS Roadmap Recommendations