

Space Weather Council Update

Presented by:
Patricia Doherty
Space Weather Council Chair

Heliophysics Advisory Committee
(HPAC) Meeting
May 5, 2022

The NASA Heliophysics Division established the Space Weather Council (SWC) in 2020 as a subcommittee to the HPAC.

Space Weather Council (SWC)

Terms of Reference

Established as a means to secure the counsel of community experts across diverse areas, on matters relevant to space weather in support of the Heliophysics Division. The SWC serves as a community-based, interdisciplinary forum for soliciting and coordinating community analysis and input and providing advice. It provides advice to the Heliophysics Advisory Committee (HPAC).

The SWC is a standing subcommittee of the HPAC. It shall report to and be responsive to actions levied by the HPAC. As appropriate, the SWC may seek scientific and programmatic input from the heliophysics and space weather communities at large on matters relevant to their actions.

Examples of the broad range of activities relevant to space weather that the SWC may be called on to address include the following:

- Articulate key scientific drivers for space weather research including focused research-to-operations-to-research topics, strategic observations, and others;
- Evaluate expected capabilities and rideshare opportunities for achieving HPD goals;
- Evaluate HPD space weather goals and objectives;
- Provide input and advice on relevant HPD space weather activities such as actions drawn from the National Space Weather Strategic and Action Plan, collaboration with other national and international agencies, ground-based observations, and its role in the Artemis and human exploration endeavor.

SWC Membership

Patricia Doherty, Boston College (Chair)

space weather, ionosphere, solar-terrestrial physics

Dr. Daniel Baker, University of Colorado

solar-terrestrial couplings, HPD missions (Val Allen Probes, MMS, cubesats), Heliosphysics Decadel Survey Chair

Dr. Michele Cash, NOAA/SWPC

magnetosphere, solar physics, solar wind, new SWPC testbed, R2O - O2R interests

Dr. Angelos Vourlidas, Johns Hopkins University APL

solar boundary, the chromosphere, NASA heliophysics missions – STEREO

Dr. Janet Green, Space Hazards Applications

tools/products for satellite companies to understand space weather impacts

Dr. Valeriy Tenishev, University of Michigan

solar weather, solar particles, cosmic rays, solar magnetic particles magnetosphere

Dr. Alexa Halford, NASA GSFC

ionosphere-thermosphere-magnetosphere, geomagnetic storms

Dr. Piyush Mehta, West Virginia University

satellite modeling, machine learning, Artificial Intelligence

Dr. Ronald Turner, ANSER

homeland security (formerly with NASA)

Ms. Sage Andorka, US Space Force (USSF)

space characterization missions for DoD

Dr. Joachim Raeder, University of New Hampshire

magnetosphere/ionosphere modeling, THEMIS mission

Dr. Paul O'Brien, The Aerospace Corporation

magnetospheric physics, radiations belts

Executive Secretary, Dr. Jesse Woodruffe, HPD Program Scientist

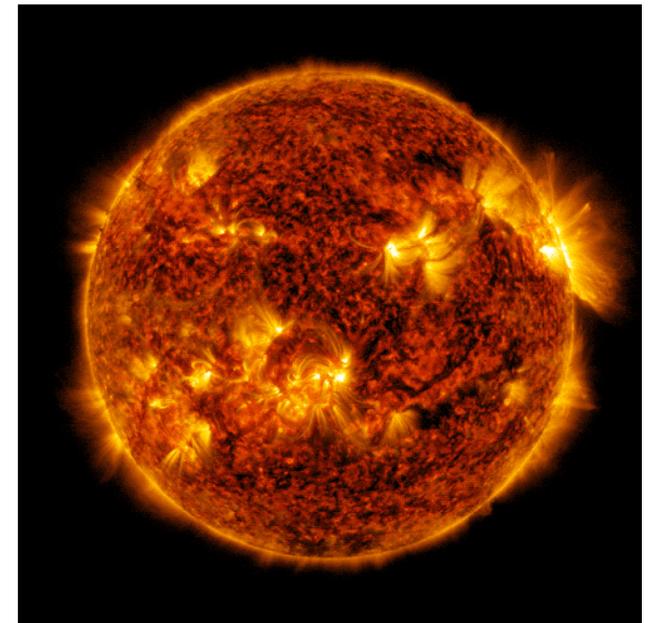
SWC Meetings

- SWC will meet biannually or as otherwise needed based on requirements of ongoing SWC activities.
- The activities will be initiated from the HPAC, in consultation with the HPD.
- The SWC Executive Secretary sets the meeting schedule and the agenda, in consultation with the HPD.

Inaugural Meeting was held on March 2, 2022

1. Introduce the members
2. Establish the purpose and processes of the SWC
3. Provide Background Information

April 30, 2022; X1.1 Solar Flare`



Credit: NASA/SDO

SWC Meeting – March 2, 2022

1. Remarks from NASA Leadership – Dr. Nicola Fox, Director NASA Heliophysics Division

NASA Space Weather Strategy:

- *Vision: Advance the science of space weather to empower a technological society safely thriving on Earth and expanding into space*
- *Mission: Establish a preeminent space weather capability that supports robotic and human space exploration and meets national, international, and societal needs by advancing measurement and analysis techniques, and by expanding knowledge and understanding for transitioning into improved operational space weather forecasts and nowcasts.*

2. Status Report on NASA Space Weather – Dr. James Spann, HPD Space Weather Lead

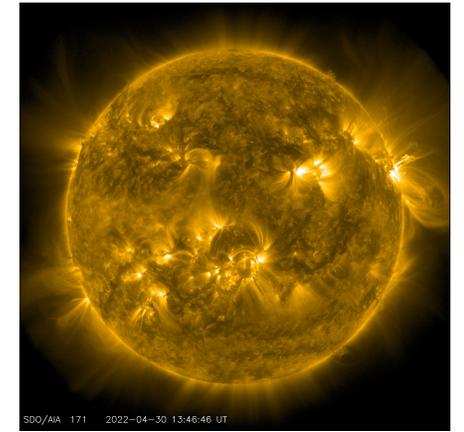
- *In order to understand the space weather environment and its impacts, NASA provides unique observations and data streams for a range of purposes, including modeling, research, and operations. Through HPD, NASA seeks to transition knowledge to operations and applications through collaborations with academia, government, and industry.*
- *Working closely with NOAA and DoD to transition NASA research, techniques and technologies (ROSES R2O2R).*
 - *ROSES R2O2R*
 - *HPD preparation for the Space Weather Centers of Excellence Solicitation*
- *Space Weather Instrument pipeline for future opportunities*

SWC Meeting – March 2, 2022

3. Committee Open Discussion

- The Space Weather Centers of Excellence Solicitation
 - Overall potential is great but..
 - The draft seemed unclear and perhaps insufficient in its level of funding.
 - Could the SWC discuss the optimal levels of effort that may be needed for a COE? Does the solicitation address it?
- Exploiting Existing Capabilities
 - Extending the lives of NASA missions that are no longer scientifically viable but still operable?
 - USSF missions might have a secondary purpose for Space Weather
 - Lots invested in ground and space based assets – but may not be fully utilized
 - Data from Van Allen Probes not well utilized
 - NOAA has operational space weather data that cannot be used due to processing limits. How can this data be made available and used?
- The Need for Rapid Prototyping for R2O
 - Transitioning new techniques, models, capabilities is taking too long
 - With SMAX approaching, there is great need for forecasting tools that do not yet exist
 - The right partnerships can enhance this

SWC Meeting – March 2, 2022



3. Committee Open Discussion

- Gap Analysis
 - Space Weather instrument pipeline for future opportunities
 - Should we consider/update a gap analysis to determine what types of instruments may be needed for this pipeline.
 - SWORM study was performed but may be outdated. NOAA may not be done by SMAX. APL gap analysis also performed. What do we still need to know to identify instruments for the pipeline?
 - Emphasis should be on what is available in the next 3-5 years
- Coordination with other space weather councils (SWAG)
 - It would be helpful to have the groups aware of the others activities
 - SWAG members listened to the meeting and commented that this would be welcome

Space Weather Council Update Summary

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The development of these activities is timely and urgent as we are approaching Solar Maximum.

