7555-01-P

NATIONAL SCIENCE FOUNDATION

Request for Information – National Space Weather Action Plan.

ACTION: Notice for Request of Information.

SUMMARY: The purpose of this Request for Information (RFI) is to seek inputs from the public on establishing space weather research priorities to address Action 5.5.1 in the National Space Weather Action Plan. This RFI is intended to gather information from external stakeholders about potential space weather research activities that will help guide the science and technology priorities of Federal agencies. The public input will be used as guidance by various concerned Federal agencies in planning for targeted research programs. Input is sought from space weather community including researchers in academia and industry, non-governmental organizations, scientific and professional societies, and all other interested members of the public. Suggestions in response to this RFI will assist NSF and other federal agencies including NASA, DOC and DOD in carrying out action 5.5.1.

DATES: Written comments must be submitted by **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].**

ADDRESSES: Email comments to spwxrfi@nsf.gov. Include "RFI Response: SWORM Goal 5.5.1" in the subject line of the message. The response must be an attachment to the email. See the instructions in the **SUPPLEMENTARY INFORMATION** for comment guidelines.

FOR FURTHER INFORMATION CONTACT: Contact spwxrfi@nsf.gov for further information. Any requests for clarification must be received no later than seven (7) business days prior to the close of this RFI in order to receive a timely response.

SUPPLEMENTARY INFORMATION:

I. Background Information

On October 29, 2015, the White House OSTP released the National Space Weather Strategy (NSWS) and Space Weather Action Plan (SWAP). The NSWS identifies several key goals in specific areas of space weather research and operations to make the national critical infrastructure and technologies resilient to space weather events. The NSWS also calls for improving national space-weather services through advancing fundamental understanding of the underlying physical processes and their forecasting. The SWAP document, which accompanied NSWS, specifies actions to develop and continually improve predictive models through enhanced fundamental understanding of space weather and its drivers. In particular, the SWAP Action 5.5.1 directed NSF, NASA, DOC and DOD with documenting priorities for research and development (R&D) efforts to enhance the fundamental understanding of space weather and its drivers and to improve space weather forecasting capabilities.

> ***Action 5.5.1:*** *NSF and NASA, in collaboration with DOC and DOD, will lead an annual effort to prioritize and identify opportunities for research and development (R&D) to enhance the understanding of space weather and its sources. These activities will be coordinated with existing National-level and scientific studies. This effort will include modeling, developing, and testing models of the coupled sun-Earth system and quantifying the long- and short-term variability of space weather.*

Forecasting space weather depends on understanding the fundamental processes that give rise to hazardous events. Continued support for basic research in solar and space physics is essential to achieve the level of understanding required for accurate predictions. Particularly

important is the study of processes that link the Sun-Earth system and that control the flow of energy within the coupled system.

Space weather science as a discipline is still in its nascent phase. There exist significant gaps in the fundamental understanding of many physical processes and coupling mechanisms underpinning various space weather phenomena. This poses a major limiting factor for improving space weather prediction, including some of the most important and immediate operational needs. It is, therefore, essential to continue untargeted investments in basic research into areas that in unforeseeable ways can lead to a better understanding of the physical processes that drive space weather.

High priority space weather research topics and linkages to the SWAP Benchmarks (Goal 1) were assessed by the 5.5.1 interagency working group. The SWAP benchmarks are a set of physical characteristics and conditions against which a space-weather event can be measured. They describe the nature and intensity of extreme space-weather events, providing a point of reference from which to improve understanding of space-weather effects. Addressing research that would advance our physical understanding of the phenomenology behind these benchmarks will ultimately improve our predictive capability necessary for operational advancements.

II. Purpose

Successful execution of Action 5.5.1 requires definitions of research priorities in the context of benchmarks identified by NSWS Goal 1. An interagency working group developed the first set of priorities in fulfillment of this task. To ensure that an optimal list of priorities is

generated, which could benefit all interested parties including Federal agencies, state and local governments, universities, policy groups, and the private sector, the broader community must weigh in. This RFI requests public comments to SWAP Action 5.5.1 to support a public dialogue on developing research priorities to enhance fundamental understanding of space weather and its drivers to develop and continually improve predictive models.

This RFI seeks inputs from the research community on setting research priorities, which will then be used as guidance by various concerned agencies in planning for space weather related research programs. Examples of space weather research topics include ionospheric irregularities and structure, thermospheric neutral density and neutral wind response to external drivers, forecasting of GICs, radiation belt dynamics, SEP events, flare and CME initiation and propagation, forecasting of EUV and proxy F10.7, predictions of ICME amplitudes and directions, magnetosphere-ionosphere coupling during space weather events, etc.

III. Response Instructions

The specific objective of this RFI is to seek information that will assist the Action 5.5.1 Working Group in determining a list of space weather research priorities.

Disclaimer: Federal agencies may or may not use any responses to this RFI as a basis for a subsequent project, program, or funding opportunity. Responses to this RFI will not be returned. The National Science Foundation is under no obligation to acknowledge receipt of the information received, or provide feedback to respondents with respect to any information submitted under this RFI. No requests for a bid package or solicitation will be accepted; no bid package or solicitation exists. In order to protect the integrity of any possible future acquisition, no additional information will be provided and no appointments for presentations will be made

in reference to this RFI. This RFI is issued solely for information and planning purposes and does not constitute a solicitation. Responders to this RFI will have no competitive advantage in receiving any awards related to the submitted input on a potential space weather-related research priority.

Confidential Information: Some contents of the submissions may be made public. Therefore, responses must be unclassified and should not contain any information that might be considered proprietary, confidential, business sensitive, or personally identifying (such as home address or social security number).

Instructions: One page documents per topic, multiple documents are allowed. Reponses must include the following sections; 1) Title – short and descriptive, 2) Brief Summary of Impacts – a bulleted list of systems impacted by the potential study, 3) Description - a succinct discussion of the topic, its importance, and relevant supporting evidence or arguments, 4) 5-10 year Imperatives – a bulleted list of the steps necessary to carry out the research including comments on relative importance to other. A section including references can be added if needed. Responses should follow the template outlined below. Responses may be no longer than 1 page type written in 12-point font.

Response Template

Title of the priority

Brief Summary of Impacts

- One sentence summary of impact 1
- One sentence summary of impact 2

Background and Relevance

A few paragraphs explaining the background of the space weather research priority, its relevance to SWAP Goal 5.5.1 and supporting justification of why this is a high priority issue.

5-10 Year Goals

Over the next 5 to 10 years it is imperative to:

- One sentence summary of goal 1
- One sentence summary of goal 2

References

Include essential references only

References:

National Space Weather Strategy,

https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/final_nationalspaceweatherstrategy_20151028.pdf

National Space Weather Action Plan,

https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/final_nationalspaceweatheractionplan_20151028.pdf

Dated: January 2, 2018

Suzanne H. Plimpton,

Reports Clearance Officer,

National Science Foundation.

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