Opportunity Title: Coronal and Solar Wind Models and the Data Used to Drive and Validate Them

Opportunity Reference Code: 0176-NPP-NOV23-GSFC-HelioSci

Organization	National Aeronautics and Space Administration (NASA)
Reference Code	0176-NPP-NOV23-GSFC-HelioSci
Application Deadline	11/1/2023 6:00:59 PM Eastern Time Zone

Description Accurate knowledge of the state of the corona and solar wind is critical for reliably modeling and forecasting, days in advance, geomagnetic disturbance events. These events are produced by high speed streams emerging from coronal holes and Corona Mass Ejections (CMEs), which are large eruptions of solar plasma and field. Individuals interested in working with coronal and solar wind models and/or the input data used to drive them are highly encouraged to apply for this opportunity. The modeling side of this work will involve using simple physics and empirical based models, or depending on experience and interest, advanced numerical models such as magnetohydrodynamic (MHD) codes. The data aspect of this effort involves working with a variety of ground and space based solar disk observations, as well as in-situ data from multiple spacecraft. These data are used to both validate and/or drive the models. For instance, work to improve the identification of coronal holes in solar disk observations is highly desired as they can be used for validating models of the solar coronal, solar wind, and for forecasting purposes. Photospheric magnetic field observations are available from a number of different solar observatories and are key data for driving solar models. Experience has shown that the data from each observatory are unique and require careful handling before they can be assembled into global maps of the sun that are then used in the models. There are also many different ways of making these maps, depending on their application. The most sophisticated method that we are actively working on makes use of a magnetic field evolution model that is routinely updated with new observations using rigorous data assimilation techniques.

Location:
Goddard Space Flight Center
Greenbelt, Maryland

Field of Science: Heliophysics Science

Advisors:
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Applications with citizens from Designated Countries will not be accepted at this time, unless they are Legal Permanent Residents of the United States. A complete list of Designated Countries can be found at: https://www.nasa.gov/oiir/export-control.

Eligibility is currently open to:
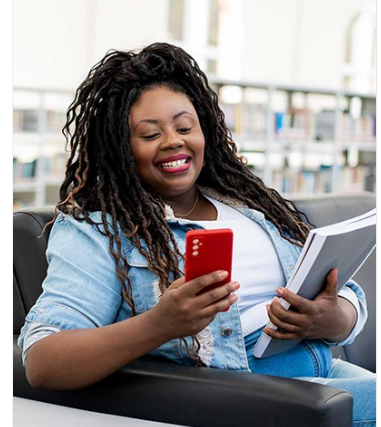
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- U.S. Citizens;
- U.S. Lawful Permanent Residents (LPR);
- Foreign Nationals eligible for an Exchange Visitor J-1 visa status; and,
- Applicants for LPR, asylees, or refugees in the U.S. at the time of application with 1) a valid EAD card and 2) I-485 or I-589 forms in pending status

Eligibility Requirements

- **Degree:** Doctoral Degree.