

**Opportunity Title:** Heliophysics: From MHD to Kinetic Scales, Turbulence, Wave Propagation, and Wave-Particle Interactions

**Opportunity Reference Code:** 0065-NPP-NOV23-JPL-HelioSci

**Organization** National Aeronautics and Space Administration (NASA)

**Reference Code** 0065-NPP-NOV23-JPL-HelioSci

**Application Deadline** 11/1/2023 6:00:59 PM Eastern Time Zone

**Description** The heating of the solar corona and acceleration of the solar wind is one of the fundamental problems in all of space science. While different scenarios have been proposed to explain the heating of magnetically confined and open regions of the corona, they all rely on the transfer, storage and dissipation of the abundant free energy present in photospheric convection. Free energy can be transferred from the photosphere through the chromosphere and the transition region into the corona both as a Poynting flux, which has two components - one due to emerging magnetic field, and one due to the constant shaking and tangling of magnetic field lines already threading the corona by the photospheric velocity field - and by a mechanical and enthalpy flux related to mass motions (flows and compressive waves).

This opportunity concerns the modeling of the different aspects of the energy storage and dissipation in the outer solar atmosphere and wind, to be addressed via analytical modeling and/or numerical simulations, at either the large, MHD scales, or the smaller kinetic scales involving non-linear wave-particle interactions.

References: Rappazzo, F., Velli, M., Einaudi, G. and Dahlburg, R., (2008) *Astrophys. J.* 677, 1348, Nonlinear Dynamics of the Parker Scenario for Coronal Heating. Verdini, A. and Velli, M. (2007) *Astrophys J.* 662, P 669, Alfvén Waves and Turbulence in the Solar Atmosphere and Solar Wind

**Location:**

Jet Propulsion Laboratory  
Pasadena, California

**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:

- 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



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application with 1) a valid EAD card and 2) I-485 or I-589 forms in pending status

**Eligibility Requirements** • **Degree:** Doctoral Degree.