

**Opportunity Title:** Characterization of ionospheric dynamics through application of machine learning techniques to GPS measurements

**Opportunity Reference Code:** 0202-NPP-MAR26-JPL-HelioSci

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

**Reference Code** 0202-NPP-MAR26-JPL-HelioSci

**How to Apply** All applications must be submitted in [Zintellect](#)

Please visit the NASA Postdoctoral Program website for application instructions and requirements: [How to Apply | NASA Postdoctoral Program \(orau.org\)](#).

A complete application to the NASA Postdoctoral Program includes:

1. Research proposal
2. Three letters of recommendation
3. Official doctoral transcript documents

**Application Deadline** 3/1/2026 6:00:59 PM Eastern Time Zone

**Description** About the [NASA Postdoctoral Program](#)

The [NASA Postdoctoral Program \(NPP\)](#) offers unique research opportunities to highly-talented scientists to engage in ongoing NASA research projects at a NASA Center, NASA Headquarters, or at a NASA-affiliated research institute. These one- to three-year fellowships are competitive and are designed to advance NASA's missions in space science, Earth science, aeronautics, space operations, exploration systems, and astrobiology.

**Description:**

The Earth's upper atmosphere and ionosphere respond dynamically to geomagnetic storms and driving from the Sun. Ionosphere demonstrates local response to a geomagnetic storm superimposed on daily, seasonal and solar cycle dependent variabilities. These different phenomena make characterization of regional ionospheric dynamics a complex problem. New observational capabilities and sophisticated data analysis tools provide an opportunity to improve our understanding of ionosphere dynamics during storms as compared to quiet times. Specifically, the Total Electron Content (TEC) of the ionosphere is readily available from GPS measurements. Analysis of TEC dynamics over ground-based GPS sites using network analysis is of major interest. Characterizing network topology, connections between TEC measurements at different locations, directionality of the network can lead to better understanding of ionospheric dynamics and advances in space weather forecasting. We seek highly motivated candidates to participate in research on ionospheric dynamics and data analysis. We are particularly interested in candidates who will analyze satellite and ground-based observations to improve our understanding of space weather. Knowledge of basic signal processing techniques and system science approaches are encouraged.

References:



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1. Verkhoglyadova, O. P., Komjathy, A., Mannucci, A. J., Mlynczak, M., Hunt, L. & Paxton, L.J. (2017). Revisiting Ionosphere-Thermosphere Responses to Solar Wind Driving in Superstorms of November 2003 and 2004. J. Geophys. Res., 122. <https://doi.org/10.1002/2017JA024542>.

2. McGranaghan, R. M., A. J. Mannucci, O. Verkhoglyadova, and N. Malik (2017), Finding multiscale connectivity in our geospace observational system: Network analysis of total electron content, J. Geophys. Res., 122, doi:10.1002/2017JA024202.

3. J. Dods, S. C. Chapman, and J. W. Gjerloev, Network Analysis of Geomagnetic Substorms Using the SuperMAG Database of Ground Based Magnetometer Stations, JGR, 120, doi:10.1002/2015JA021456 (2015)

**Location:**

Jet Propulsion Laboratory  
Pasadena, California

**Field of Science:**Heliophysics Science

**Advisors:**

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**Questions about this opportunity?** Please email [npp@orau.org](mailto:npp@orau.org)

**Point of Contact** [Mikeala](#)

**Eligibility** • **Citizenship:** LPR or U.S. Citizen

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