

Opportunity Title: Modeling and Simulation of Ionized Gas Flows for Electric Propulsion and Related Material Interactions

Opportunity Reference Code: 0340-NPP-NOV26-JPL-Interdisc

Organization National Aeronautics and Space Administration (NASA)

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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 11/1/2026 6:00:59 PM Eastern Time Zone

Description About the [NASA Postdoctoral Program](#)

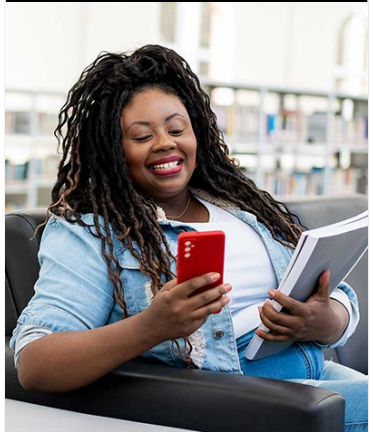
The [NASA Postdoctoral Program \(NPP\)](#) offers unique research opportunities to highly-talented scientists to engage in ongoing NASA research projects at a NASA Center, NASA Headquarters, or at a NASA-affiliated research institute. These one- to three-year fellowships are competitive and are designed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

Description:

New ideas are all around us, but only a few will change the world. That's our focus at JPL. We ask the biggest questions, then search the universe for answers—literally. We build upon ideas that have guided generations, then share our discoveries to inspire generations to come. Your mission — your opportunity — is to seek out the answers that bring us one step closer. If you're driven to discover, create, and inspire something that lasts a lifetime and beyond, you're ready for JPL.

Located in Pasadena, California, JPL has a campus-like environment situated on 177 acres in the foothills of the San Gabriel Mountains and offers a work environment unlike any other: we inspire passion, foster innovation, build collaboration, and reward excellence.

JPL is unique among NASA Centers in that its staff are Caltech employees yet can access NASA technical resources. Cross-discipline teamwork is standard here: colleagues across JPL's science and engineering organizations and on Caltech's academic campus often work together. Learning to speak and understand other disciplines' languages is a doorway to the creativity needed to do what has not been done before. JPL staff are encouraged to create mission concepts that address humanity's core questions through a combination of science and technology. They are



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supported in developing ideas into proposals and hardware, and in communicating funded missions' results to the scientific community and the broader public. JPL seeks to employ scientists and engineers who are passionate about lifelong learning and excited to both contribute to and lead team efforts. We emphasize the importance of partnering across discipline boundaries and creating a friendly, constructive work environment to overcome space exploration's challenges. The Postdoctoral scholars at JPL benefit from an informal mentoring network, an annual conference showcasing their results, a dedicated seminar series, exposure to diverse career paths, and social connections across the JPL and Caltech community for advice on housing, childcare, and other aspects of living in southern California.

This postdoc position seeks a recent Ph.D. in Aerospace Engineering or a related field in science or engineering (within the past 3 years) with a strong background in particle-based (kinetic) and fluid (continuum) methods for the modeling and simulation (M&S) of dense and rarefied ionized gas flows.

Candidates with demonstrated expertise in hybrid (kinetic-continuum) numerical methods — particularly through their doctoral dissertation — are especially sought, as these approaches are used extensively (and are sometimes coupled within a single scientific code) and form an important part of the computational framework supporting the primary M&S activities of this position.

Experience in Particle-in-Cell (PIC) with Monte Carlo Collisions (MCC) methods for the simulation of ionized gases is the primary qualification, as these particlebased tools represent a significant component of the broader kinetic–continuum framework used in Electric Propulsion (EP) plasma modeling and support key elements of the group's M&S activities.

Given that plasma flows in EP carry a strong hydrodynamic component, and that fluid dynamics underlies many of the broader simulation tasks associated with this position, a solid foundation in continuum fluid mechanics and its numerical simulation is also an important qualification.

While a background in plasma processes directly related to EP is highly desirable, the search intentionally spans the broader plasma physics community — expertise in plasma modeling from adjacent fields such as fusion energy, astrophysical plasmas, pulsed power, or other plasma physics disciplines is equally valued. Experience with magnetohydrodynamics (MHD), including previous use of largescale MHD codes developed either in the community or at the candidate's home institution, is viewed favorably, though not required. The most critical qualifications are a strong grounding in particle and continuumbased numerical simulation methods and a solid command of the underlying physics that govern coupled plasma, hydrodynamic, and electromagnetic processes.

Conducted within the collaborative and mission-driven environment of the

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Jet Propulsion Laboratory, the research will leverage both state-of-the-art in-house codes and, where applicable, established community codes. The postdoctoral position is a oneyear appointment, renewable for up to three years based on funding availability and programmatic needs. The selected scholar will contribute to the advancement and application of numerical simulation tools for plasma and propulsion research. In summary, this includes:

- Application, enhancement, and extension of existing in-house and open-source fluid-kinetic (hybrid) codes for the M&S of plasma processes in EP and related laboratory and space applications, with the possibility of developing new tools where programmatic needs warrant; this is the primary assignment of the position;
- Contribution to the validation and verification of simulation tools against laboratory and in-flight data; and
- Dissemination of research results through peer-reviewed publications and presentations at scientific conferences.

Field of Science: Interdisciplinary/Other

Advisors:

Moogega Cooper
Moogega.Cooper@jpl.nasa.gov
(818) 205-5573

Questions about this opportunity? Please email npp@oraui.org

Qualifications Required Qualifications:

- Ph.D. in Aerospace Engineering or a closely related science or engineering field, awarded within the past 3 years
- Demonstrated expertise in kinetic (particle) and/or continuum (fluid) numerical simulation methods, with evidence of substantive application in the doctoral dissertation
- Solid background in the physics of ionized and neutral flows
- Proficiency in scientific programming languages, especially Fortran but also C, C++, Python, or equivalent

Preferred Qualifications:

- Experience with PIC-MCC codes used in plasma physics communities (EP, fusion, astrophysics, pulsed power, or related fields)
- Background in EP plasma physics and its M&S
- Strong publication record commensurate with career stage, including

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peer-reviewed journal articles and/or conference papers of high technical quality

- Demonstrated initiative, creativity, and ability to work collaboratively in a multidisciplinary team environment
- Effective written and oral communication skills

Point of Contact [Mikeala](#)

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| Eligibility | • Citizenship: LPR or U.S. Citizen |
| Requirements | • Degree: Doctoral Degree. |