zintellect
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Opportunity Title: High Fidelity Modeling of Heating during Entry to the Outer Planets
Opportunity Reference Code: 0144-NPP-JUL25-ARC-Interdisc

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0144-NPP-JUL25-ARC-Interdisc

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 7/1/2025 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:

Entry probes entering the Saturn atmosphere are subject to convective and radiative heating by Hydrogen atoms, molecules and ions formed in the shock layer gases. Radiative heating in H2 shockwaves is reproduced in the NASA Ames Electric Arc Shock Tube (EAST) facility, and is used to test models developed to predict the heating mechanisms. The primary models employed are the DPLR computational fluid dynamics code and the NEQAIR radiative solver. Comparisons of DPLR/NEQAIR results to EAST measurements reveal several discrepancies which may be addressed by improving model fidelity and input parameters such as rate and transport coefficients, state-to-state transition data and radiation transition moments. This post-doctoral position will examine higher fidelity approaches that address thermal and chemical non-equilibrium and non[1]Boltzmann kinetics that may impact the Hydrogen simulations. Modifications to calculation procedures in order to account for these higher fidelity approach will be merged into the CFD and radiative codes in a tractable manner that could be used for future studies of entry systems.

Field of Science: Interdisciplinary

Advisors:

Brett Cruden

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

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

Qualifications The successful applicant should have a PhD in science or engineering discipline with experience in running reacting fluid dynamics simulations. Experience with high fidelity, state-to-state and radiation modeling is desired.

Point of Contact Mikeala

Eligibility Requirements

- **Degree:** Doctoral Degree.