

Opportunity Title: High-Energy Astrophysics Artificial Intelligence and Machine Learning Research

Opportunity Reference Code: 0274-NPP-NOV23-GSFC-Astrophys

Organization

National Aeronautics and Space Administration (NASA)

Reference Code

0274-NPP-NOV23-GSFC-Astrophys

How to Apply

All applications must be submitted in [Zintellect](#)

Application Deadline

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

Description

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High Energy Astrophysics (HEA) data contain a wealth of information about some of the most complex and fascinating astrophysical phenomena. Over 50 legacy missions, 10 active missions, and many planned missions have collected HEA data which have been or will be archived in the NASA High Energy Astrophysics Science Archive Research Center (HEASARC). Due to its complexity, however, much of this data remains unexploited by new techniques involving Artificial Intelligence and Machine Learning (AI/ML).

Galactic and extragalactic high-energy sources span a broad range of astrophysical phenomena: X-ray binaries, black holes, galaxies, cataclysmic variables, and supernova remnants are but a few of these. The HEA data emitted by these sources reveals clues as to the mechanisms driving their processes. This data is as rich and diverse as the sources themselves, worthy of intensive research using the most advanced methods.

As such, NASA seeks a post-doctoral fellow, as part of the NPP program, to examine data contained in the HEASARC using AI/ML methods. This fellow will use both supervised and unsupervised learning techniques to approach HEA data in order to further our understanding of HEA sources.

Examples of areas of interest include, but are not limited to:

- Discovery of new and interesting sources in X-ray survey data
- Classification of unknown HEA sources
- Using X-ray timing data to predict source behavior
- Characterization of chaotic X-ray source emissions
- Source clustering and anomaly detection

Candidates should have a strong background in both astrophysics and data science or machine learning. Candidates must also have experience or training in software and algorithm development, particularly in employing AI/ML techniques on large data sets.

Field of Science: Astrophysics

Advisors:

Brian Powell
brian.p.powell@nasa.gov
(301) 286-3809

Alan Smale
alan.p.smale@nasa.gov
(301) 286-2602

Tess Jaffe

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tess.jaffe@nasa.gov

(301) 286-8904

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

Eligibility Requirements

- **Degree:** Doctoral Degree.

NPP

NASA Postdoctoral Program

 ORAU Pathfinder

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