

**Opportunity Title:** Source structure contribution to geodetic VLBI

**Opportunity Reference Code:** 0204-NPP-NOV23-GSFC-Interdisc

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

**Reference Code** 0204-NPP-NOV23-GSFC-Interdisc

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

**Description** The focus of this research is to improve accuracy of the terrestrial and celestial coordinate frames and the Earth orientation parameters determined from Very Long Baseline Interferometry (VLBI) observations under geodesy programs by mitigating one of the sources of systematic error: the presence of structure of observed active galaxy nuclei. The presence of an extended jet and the core asymmetry contributes to path delay that must be accounted for in space geodesy analyses. The frequency dependent core-shift is an additional factor that affects effective position of a source and must be modeled. The goal of the research is to develop the methodology for modeling the contribution of frequency-dependent source structure and core-shift to VLBI observables as well as to evaluate the uncertainty of such models, to develop efficient algorithms for computation of the contribution, to implement these algorithms in software so that they can be incorporated in the operational pipeline for routine data analysis and the production of VLBI products for space geodesy.

The ideal applicant will have experience in imaging using VLBI, theoretical background in physics of active galaxy nuclei, understanding of concepts in geodesy and estimation theory, and advanced programming skills.

**Location:**

Goddard Space Flight Center  
Greenbelt, Maryland

**Field of Science:** Interdisciplinary/Other

**Advisors:**

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**Eligibility Requirements**

- **Citizenship:** LPR or U.S. Citizen
- **Degree:** Doctoral Degree.



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