Opportunity Title: Nonlinear Dynamical Approach to the Study of Algorithm Development in Computational Fluid Dynamics
Opportunity Reference Code: 0013-NPP-NOV22-ARC-AeroEng

Organization	National Aeronautics and Space Administration (NASA)
Reference Code	0013-NPP-NOV22-ARC-AeroEng
Application Deadline	11/1/2022 6:00:00 PM Eastern Time Zone

Description Long-term basic research focuses on integrating nonlinear dynamics, bifurcation theory, and chaotic dynamics with computational physics and computational sciences. We are particularly interested in improving the understanding of numerical uncertainties and constructing advanced algorithms for practical aeroscience and astrobiology computations. This includes using concepts from nonlinear dynamical systems theory to guide the development of temporally and spatially adaptive numerical schemes that can improve the reliability, nonlinear stability, accuracy, convergence, and efficiency over existing algorithms for steady and unsteady fluid-flow equations that display strong nonlinearity and multiscale physical processes. The nonhomogeneous partial differential governing equations are both hyperbolic and parabolic, with application to flow problems in the NASA Access to Space program, Deep Space Exploration, High Performance Computing and Communications, Planetary and Atmospheric Sciences, and the Computational Astrobiology Initiative. Specific topics include combustion, nonequilibrium reacting flow, high-speed shock-boundary-layer interactions, and direct numerical simulation of turbulent flows.

Location:
Ames Research Center
Moffet Field, California

Field of Science: Aeronautics, Aeronautical or Other Engineering

Advisors:
Helen M.C. Yee
Helen.M.Yee@nasa.gov
650-604-4769

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
- **Degree:** Doctoral Degree.
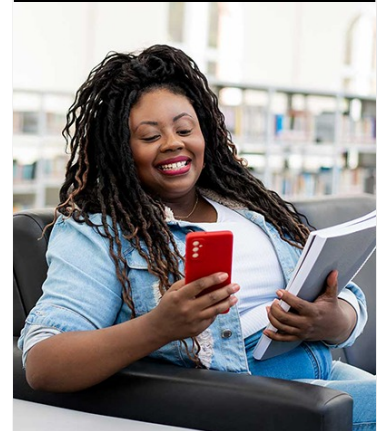
Opportunity Title: Nonlinear Dynamical Approach to the Study of Algorithm
Development in Computational Fluid Dynamics
Opportunity Reference Code: 0013-NPP-NOV22-ARC-AeroEng

Requirements