Opportunity Title: Probabilistic Structural Mechanics
Opportunity Reference Code: 0008-NPP-NOV23-GRC-AeroEng

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0008-NPP-NOV23-GRC-AeroEng

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

Description **Opportunity Restricted to U.S. Citizens Only**

Research is conducted for the development of probabilistic structural mechanics, solution/computational algorithms, and computer codes to quantify uncertainties associated with the parameters and variables required for structural analysis/design and thereby evaluate respective reliability and success. The research focuses mainly on developing probabilistic theories/models for predicting the thermomechanical behavior of propulsion structures made from high-temperature materials, which include metal matrix, ceramic matrix, and carbon-carbon composites. Two other areas include probabilistic simulation of the human factor and software reliability.

In addition, research is contemplated to demonstrate similarity and differences between probabilistic simulations and comparable simulations from (1) internal arithmetic, (2) chaos theory, (3) fuzzy logic/theory, (4) Taguchi methods, (5) design of experiments, and (6) neural networks, (7) structural optimizations, (8) genetic algorithms, and (9) error bounds. It is important to demonstrate that results from any or all of the above methods can be readily obtained by the appropriate use of only one method (e.g., probabilistic methods).

Location:
Glenn Research Center
Cleveland, Ohio

Field of Science: Aeronautics, Aeronautical or Other Engineering

Advisors:
Rula M. Coroneos
Rula.M.Coroneos@nasa.gov
216.433.5205

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.