

NRC/ASEE Postdoctoral fellowship at the US Naval Research Laboratory in Computational Stochastic Mechanics

**Location:** Washington, DC, USA

**NRL Code 6353:**

We perform basic and applied research in computation mechanics for a breadth of applications with Navy relevance. Our work includes but is not limited to development and implementation of constitutive models, uncertainty quantification and propagation techniques, and numerical solution algorithms for finite element and finite difference codes.

**Research description:**

Polycrystalline microstructure morphology is comprised of a stochastic assemblage of its constituents' features, which, when subjected to mechanical loading, results in a random field mechanical response whose extreme value locations tend to correlate with crack nucleation sites. This research lies at the intersection of materials science, computational mechanics, and probabilistic methods and the goal is to understand the role of polycrystalline microstructural features on the locations and values of micromechanical stress and strain concentrations under mechanical loading. The approach taken is predominantly computational stochastic mechanics coupled with statistical inference/data analysis. Potential areas of development include crystal plasticity constitutive models, synthetic microstructure models, stochastic simulation techniques, optimal Monte Carlo uncertainty propagation methods, reduced order and surrogate model construction, and statistical inference methods. An example metal alloy that is both conventionally (wrought processed) and additively manufactured will be studied.

**Desired candidate description:**

- US citizen or permanent resident
- Have earned a PhD in an area related to computational mechanics, ideally, no later than Aug 2017
- Proficiency in one of MATLAB, python, or R and one of Fortran, c, or c++
- Experience in one or more of the following topics: crystal plasticity finite elements, stochastic simulation, dislocation dynamics, reduced order models, statistical inference, uncertainty quantification, multi-scale methods, damage mechanics, fatigue

Funding is available for up to 3 years, pending positive evaluation after an initial 1 year contract. The successful candidate will be exposed to a breadth of cutting-edge research facilities in a collaborative, interdisciplinary scientific environment. The postdoctoral fellowship program at NRL is administrated through ASEE, and the website below provides information on stipend and insurance.

Please submit the following information to [kirubel.teferra@nrl.navy.mil](mailto:kirubel.teferra@nrl.navy.mil)

- Detailed CV
- Cover letter with a short description of your research experience and interests
- Names and email addresses of 3 references

For additional information:

<https://nrl.asee.org/>

<https://www.nrl.navy.mil/mstd/>

<https://www.nrl.navy.mil>