Opportunity Title: Development of a Land Model Testbed (LMT) for Multiscale Complex Biogeochemistry
Opportunity Reference Code: ORNL-HBCU-MEI-2020-0007

Organization Oak Ridge National Laboratory (ORNL)

Reference Code ORNL-HBCU-MEI-2020-0007

How to Apply All documents must be submitted via Zintellect. All application components **must** be completed and received in the system in order to be considered.

Application deadline January 10, 2020 at 11:59 pm EST.

For questions, please contact HBCUMEI@orau.org.

Application Deadline 1/10/2020 11:59:00 PM Eastern Time Zone

Description ORNL is the largest science and energy laboratory in the Department of Energy system. Areas of research include materials, neutron sciences, energy, high-performance computing, systems biology and national security. Visit http://www.youtube.com/watch?v=NSCdUJ8cavw to discover some exciting reasons why ORNL offers a great internship experience!

Benefits:

- Selected faculty spend 10 weeks (Summer Term) at Oak Ridge National Laboratory (ORNL) engaged in a research project under the guidance of a laboratory scientist.
- Faculty members build collaborative relationships with ORNL research scientists, become familiar with ORNL sponsored research programs, scientific user facilities, and potential funding opportunities.
- ORNL may provide laboratory tours, scientific lectures and seminars, workshops on accessing ORNL scientific user facilities.
- Host laboratories provide all required site specific training.

Project:

The objective of this project is to leverage the International Land Model Benchmarking (ILAMBv2) package, developed at ORNL, in the design and development of a land model testbed (LMT) capability to provide a computational framework for systematically assessing model fidelity and supporting rapid development of complex multiscale models. The LMT will provide a general-purpose workflow and test harness for multiple models designed for use on DOE's high performance and cloud-style computing resources. It will include a unified user interface for simulation diagnostics and benchmarking results from comparisons with field measurements and observational data. New multivariate analysis metrics will be developed, employing machine learning methods, to further demonstrate the utility of the system. We will deliver a testing and evaluation system for multiscale models that could also serve as a computational resource for a new DOE User Facility proposed for ORNL.

ORNL Mentor/Point of Contact (email address): Forrest M. Hoffman (hoffmanfm@ornl.gov)

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Qualifications

Applicant must be a faculty member at a HBCU/MEI at the time of application.

Faculty Qualifications/Skills Desired: Experience programming in Python, JavaScript, bash, or Fortran; familiarity with land carbon cycle models; knowledge of terrestrial biogeochemistry and climate system feedbacks; experience with high performance computers and/or dynamically allocated cloud-based clusters; understanding of netCDF file format and the Climate and Forecasting (CF) convention; familiarity with satellite remote sensing data and/or eddy covariance flux site data.

Eligibility Requirements

- **Citizenship:** LPR or U.S. Citizen
- **Degree:** Any degree .
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Communications and Graphics Design** (2 👁)
  - **Computer, Information, and Data Sciences** (16 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (27 👁)
  - **Environmental and Marine Sciences** (14 👁)
  - **Life Health and Medical Sciences** (45 👁)
  - **Mathematics and Statistics** (10 👁)
  - **Other Non-Science & Engineering** (2 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (1 👁)
  - **Social and Behavioral Sciences** (27 👁)

Affirmation

I am a faculty member at one of the nationally recognized HBCU or MEI institutions. I can provide certification of my faculty position, if requested.