Opportunity Title: ORNL Nuclear Reactor Software Development Post-Master's Research Associate
Opportunity Reference Code: ORNL17-18-RNSD

Organization Oak Ridge National Laboratory (ORNL)

Reference Code ORNL17-18-RNSD

Description The Reactor Physics (RP) Group within the Reactor and Nuclear Systems Division (RNSD), Nuclear Science and Engineering Directorate, Oak Ridge National Laboratory seeks entry-level, highly-motivated applicants for a post-graduate position in nuclear reactor analysis and software development for a range of nuclear reactor challenges using the VERA [Virtual Environment for Reactor Applications] software suite from CASL [Consortium for the Advanced Simulation of LWRs (Light-Water Reactors), www.casl.gov].

The RP Group conducts R&D in nuclear reactor physics and performs analysis and methods development in areas including reactor core physics, lattice physics, cross-section processing, nuclear fuel cycle assessments, radionuclide inventories, source terms, and decay heat. A key characteristic of this group is the combination of methods/software development and applications expertise. In the methods area, the group is responsible for the development, enhancement, and maintenance of several key codes and capabilities in the VERA and SCALE code systems, including those associated with reactor physics, isotopic depletion and decay, and problem-dependent cross-section processing and coupled-physics, in addition to V&V and computational architecture development. In addition, the RP Group collaborates closely with other RNSD and ORNL groups in areas such as radiation transport, criticality safety, nuclear data, thermal-hydraulics, material and fuel irradiation testing, reactor system safety, nuclear nonproliferation, and the development of SCALE, VERA, and other nuclear analysis code systems.

This position will focus on application of the VERA core simulator to current and advanced reactor designs and supporting users through scripting and software development. The objective of this work is to enable research and development (R&D) advancements in the VERA core simulator. The successful candidate will modify VERA (input, output, scripts, and software) to model advanced features in LWRs and advanced reactor/fuel concepts and serve as a key interface between the primary software developers and nuclear industry users. This is a unique opportunity to gain experience in a premier R&D environment with direct application to the nuclear industry to establish a strong foundation before pursuing an advanced degree in nuclear engineering or launch a career as an innovator in the nuclear industry.

Qualifications Familiarity with modern software development practices, such as unit testing and revision control, and the ability to work with FORTRAN and/or C++ is required; experience with Python and Perl is also desirable. Experience with nuclear analysis tools, such as CASMO, SIMULATE, SCALE, or VERA, for reactor physics analysis is highly desirable. Experience with the operation of commercial nuclear power plants is also desirable. Familiarity with a range of nuclear reactor systems and concepts

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and experience with one or more complementary technical areas, such as thermal-fluid dynamics, thermo-mechanics, or nuclear fuel performance, is also desired.

The candidate must have demonstrated problem-solving skills and a willingness to apply those skills to a variety of problems. The candidate will participate as a member of a collaborative reactor analysis team and must possess the associated interpersonal and communication skills. Salary will be determined according to the educational, research skills, and experience of qualified candidates.

Candidates must have completed a M.S. degree in computer science with computational engineering experience or a M.S degree in nuclear engineering with exceptional software development skills.

Applicants cannot have received the most recent degree more than five years prior to the date of application and must complete all degree requirements before starting their appointment.

Eligibility Requirements

- **Degree:** Master's Degree received within the last 60 month(s).
- **Academic Level(s):** Post-Master's.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (4 👁)
  - **Engineering** (1 👁)

Affirmation I certify that I have completed coursework towards a degree in science, technology, engineering, mathematics, or a related field.

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