

Opportunity Title: Numerical Simulation and Laboratory Analysis of Methane

Hydrate - Postgraduate

Opportunity Reference Code: NETL-2021-PGRP-Seol-1

Organization National Energy Technology Laboratory (NETL)

Reference Code NETL-2021-PGRP-Seol-1

How to Apply Applicants should apply through the Oak Ridge Institute for Science and Education (ORISE) program. The ORISE Program provides opportunities for undergraduate students, recent graduates, graduate students, postdoctoral researchers, and faculty researchers to apply classroom knowledge in a real-world setting to learn about NETL Research and Innovation Center's (R&IC) core mission areas.

A complete application consists of:

- An application
- Transcripts – [Click here for detailed information about acceptable transcripts](#)
- A current resume, including academic history, employment history, relevant experiences
- Two educational or professional references

All documents must be in English or include an official English translation.

If you have questions, send an email to NETLinfo@ornl.gov. Please include the reference code for this opportunity in your email.

Application Deadline 6/30/2022 3:00:00 PM Eastern Time Zone

Description Through the Oak Ridge Institute for Science and Education (ORISE), this posting seeks a post-masters or postdoctoral physical research scientist to engage in projects with the Research Innovation Center (RIC) researchers at the National Energy Technology Laboratory, under the mentorship of Yongkoo Seol.

RIC performs research within the National Gas Hydrate Research and Development Program to obtain pertinent, high-quality information on gas hydrates that will benefit the development of models and methods for predicting the behavior of gas hydrates in their natural environment under natural conditions and production scenarios. RIC supports major gas hydrate production field tests by providing numerical predictions on fluid migration, gas production, and potential reactions occurring during gas production activities, as well as by providing fundamental understanding and knowledge on hydrate behavior derived from experimental investigations on thermal, hydrological, geo-mechanical, and reactive responses of hydrate. RIC research includes, but is not limited to, numerical modeling efforts, including simulations of long-term production tests, laboratory experimental tests on geo-mechanical stress-strain measurements, water conductivity and relative permeability of fluid through hydrate-bearing sediments, high resolution visualizations of hydrate distributions and fluid migration in porous media under in situ conditions, developing state-of-the-art pressure core analysis tools for characterizing geo-mechanical responses of field-retrieved hydrate-bearing pressure cores, and machine learning application to gas hydrate system to develop efficient key parameter estimation tools and large-scale 3D geologic model for gas hydrate reservoir..

The selected applicant will have the opportunity to learn about and gain advanced skillsets to support numerical reservoir simulations for gas production, laboratory characterization of hydrate bearing sediments, basin petroleum system modeling and machine learning application, depending on qualification and background. Successful applicants for this position would have a strong



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background in most, but not all, these elements: high-pressure/low temperature laboratory experiments, geo-mechanical characterization and analysis, hydrologic or fluid transport models, machine learning algorithm and application, programming (C++, Fortran, Matlab, Python), and basin model development (PetroMod). Applications will be accepted and reviewed throughout the year and applicants with specific qualification will be contacted.

For more information about research ongoing in the Hydrate Portfolio at NETL please visit <https://edx.netl.doe.gov/hydrate/>

Qualifications The ideal candidate will have some of, but not all, the following skills:

- High-pressure/low temperature laboratory experiment skill
- Laboratory geo-mechanical characterization and analysis
- Hydrologic or fluid transport models using fully coupled THCM code
- Machine learning algorithm and applications
- Programming (C++, Fortran, Matlab, Python)
- Basin model development (PetroMod)

- Eligibility Requirements**
- **Citizenship:** LPR or U.S. Citizen
 - **Degree:** Master's Degree or Doctoral Degree received within the last 60 months or anticipated to be received by 6/30/2022 11:59:00 PM.
 - **Discipline(s):**
 - **Chemistry and Materials Sciences** ([12](#) )
 - **Communications and Graphics Design** ([2](#) )
 - **Computer, Information, and Data Sciences** ([17](#) )
 - **Earth and Geosciences** ([21](#) )
 - **Engineering** ([27](#) )
 - **Environmental and Marine Sciences** ([14](#) )
 - **Life Health and Medical Sciences** ([46](#) )
 - **Mathematics and Statistics** ([10](#) )
 - **Physics** ([16](#) )
 - **Science & Engineering-related** ([1](#) )
 - **Social and Behavioral Sciences** ([28](#) )

Affirmation I certify that I:

- Have an earned or will receive a doctoral or master's degree by appointment start date.

AND

- Have received the degree no more than three years before the date of application (postmasters' applicants).
Note: current graduate students who have not received a Master's degree or received their Master's degree over 3 years ago should apply to the [Professional Internship Program opportunity](#) for current students.

OR

- Have received the degree no more than five years before the date of application (postdoctoral applicants).

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Note: current faculty members interested in part-time or sabbatical collaboration should apply to the [Faculty Research Program opportunity](#).