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| **TITLE:** | Fluidization Research Engineer |
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| **DEPARTMENT:** | U.S. Department of Energy/National Energy Technology Laboratory (NETL) |
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| **NETL CONTACT:** | Samuel Bayham, samuel.bayham@netl.doe.gov |
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| **DUTY LOCATION:** | Morgantown, WV |

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| **ACADEMIC LEVEL:** | **x** | PhD | **X** | MS |  | BS |  | Undergrad |  | Faculty |

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| **POSITION**  **INFORMATION:** | 1-year appointment; full time (40 hours per week) with the possibility of extension |
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| **CLOSING DATE:** | October 1, 2018 |
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| **WHO MAY BE**  **CONSIDERED:** | United States Citizens, LPRs, & Foreign Nationals with appropriate approval which includes F-1 OPT with EAD (STEM extension not valid), J-1 Exchange Visitor, and LPR with EAD |

**SUMMARY:**

NETL is a multi-disciplinary, scientific and technical-oriented U.S. Department of Energy National Laboratory. NETL is developing innovative technology solutions to the nation’s energy challenges through effective resource development, efficient energy conversion and responsible stewardship of the environment. NETL is exercising its world-class capabilities in fossil energy science and engineering to enhance America’s future.

The successful candidate will support the Thermal Sciences Team within the Energy Conversion Engineering Directorate for the Research and Innovatin Center.

One major objective of the advanced reactor systems field work proposal is to develop an optimized 1-MWth gasifier capable of converting coal into syngas at thermal efficiency greater than 60% and a volumetric heat flux greater than 0.5 MWth per cubic foot. A number of designs with the potential to be modularized have been proposed to fulfill this objective, namely (1) vortexing circulating fluid bed (VCFB), (2) traditional circulating fluid bed with internals, (3) rotating fluid bed (4) jetting spout bed, and potentially others.

The successful candidate will assess the viability of these reactor designs as a modular gasifier based on experimental studies of hydrodynamics as well as basic modeling to fulfill the research proposal objective. The research will consist of experimental measurement of the flow phenomena in small laboratory multiphase flow test units ranging from 4 cm to 30 cm in diameter and from 0.5 m to 15 m in height. The modeling portion will consist of utilizing a CFD software package, Barracuda Virtual Reactor, to assess the performance of these proposed modular reactors. Alternatively, zero-order or first-order kinetic models may be developed or used as needed. Experimental research of the hydrodynamics of these units will help validate the models used for the assessment. With the performance information in hand, the team can assess which configuration will be ultimately designed and constructed. A PhD in chemical engineering or a closely related discipline is required, which the successful candidate will play a large role in. The candidate must have a strong background in gas-solid multiphase flow (experimental and modeling), reactor design, kinetics, and heat/mass transfer as well as experience using Barracuda Virtual Reactor (or other open-source or commercial code). Experience with Python is a plus.

**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’s core mission areas.

* Interested applicants should complete the online application at <http://www.orau.gov/netl/>. For questions or issues, please email both [Terry.Howard@orau.org](mailto:Terry.Howard@orau.org) and [Kerri.Fomby@orau.org](mailto:Kerri.Fomby@orau.org) .
* In the online application, **list** **Samuel Bayham as your requested mentor.** This will associate your application with this research opportunity. Please send a CV to [samuel.bayham@netl.doe.gov](mailto:samuel.bayham@netl.doe.gov).
* If you have additional questions, please contact Patricia Adkins-Coliane, [Patricia.adkins-coliane@netl.doe.gov](mailto:Patricia.adkins-coliane@netl.doe.gov), who is the NETL Graduate Education Program Manager.

The participant(s) will be assigned to the program solely for the educational benefit it provides. The assigned project should not include activities that are reserved for federal employees nor should it require a participant to perform inherently governmental functions such as: supervise or mentor federal employees or federal contractor staff, hire or fire anyone; have budget, program management, or signature authority; carry an official job title; or function in any way as a representative of the federal government.