TITLE: Spectroscopist / Materials Scientist / Physicist / Chemist / Chemical Engineer
DEPARTMENT, AGENCY: Department of Energy, National Energy Technology Laboratory
STIPEND RANGE: Depends on level of experience
OPEN PERIOD: Open until filled
LEVEL: Post-Doctoral Research Associate (preferred), Faculty (preferred),or Graduate Student
POSITION INFORMATION: Temporary Appointment: 1 year period between approximately June 1, 2015 and May 30, 2016; Full-Time (40 hours per week).
WHO MAY BE CONSIDERED: United States Citizens and Foreign Nationals with approval

DESCRIPTION:

An opportunity exists for post-doctoral researchers to conduct analytical research in support of NETL Solid Oxide Fuel Cells research. Research efforts associated with this position focuses primarily on: (1) examination of SOFC structures using advanced analytical techniques including FIB-SEM, nano-CT, and plasma FIB; (2) reconstructions of microstructural and generation of high fidelity visualizations; and (3) transfer of data sets to support computational examinations of SOFC performance. Broadly, the project goals are:

1) Support examination of SOFC structural evolution and degradation in response to operating conditions using conventional and advanced microscopy and spectroscopy;
2) Generate suitable specimen for analysis from test specimen generated by collaborating researchers;
3) Generate or support generation of research papers and presentations;
4) Collaborate in an integrated team research environment.

SPECIFIC TASKS:

The specifically envisioned tasks support the broad goals described above, and may include one or more of the following elements.

1) Detailed reconstructions of the electrode microstructures, including any infiltrated components, will be generated to properly inform associated performance and structural evolution models. The microstructural reconstructions will be used to elucidate the probable modes of degradation occurring in the electrode.

2) Detailed analyses of nano-scale features and examination of atomic scale structures via TEM and related techniques. The TEM analyses will be used to elucidate the probable modes of degradation occurring in the electrode, and to assist in the creation of descriptive models.

3) Detailed analyses of crystal orientations, interfacial energies, and dihedral angles at grain interfaces via FIB-OIM or plasma-FIB. The analyses will be used to elucidate the probable modes of degradation occurring in the electrode, and to assist in the creation of descriptive models.

Examples of SOFC analytical research completed by NETL researchers are embodied in the following references:

Yun Chen, Song Chen, Gregory Hackett, Harry Finklea, John Zondlo, Ismail Celik, Xueyan Song*, and Kirk Gerdes, "Microstructure degradation of YSZ in Ni-YSZ anodes of SOFC operated in phosphine-containing fuels " Solid State Ionics, 234 (2013) 25.

Robin Chao, R. Munprom, R. Petrova, Kirk Gerdes, John R. Kitchin, and Paul. A. Salvador, “Structure and relative thermal stability of mesoporous (La,Sr)MnO3 powders prepared using evaporation-induced self-assembly methods”, J American Ceramic Society, 95 (7), 2012, p 2339-2346

Song Chen, Yun Chen, Harry Finklea, Xueyan Song, Gregory Hackett, and Kirk Gerdes, "Crystal defects of yttria stabilized zirconia in solid oxide fuel cells and their evolution upon cell operation", Sold State Ionics 206 (2011) 104

Lam Helmick, Shen Dillon, Kirk Gerdes, Randall Gemmen, Gregory S. Rohrer, Sridhar Seetharaman, and Paul Salvador, "Crystallographic characteristics of grain boundaries in dense yttria-stabilized zirconia" Int'l J of Applied Ceramic Technology, Vol 8, 5, p1218-28, (2011)

QUALIFICATIONS:

The successful candidate will possess demonstrable skill in analytical techniques such as TEM, STEM, nano-CT, FIB-SEM, FIB-OIM, and/or plasma-FIB. The successful candidate will preferably possess basic understanding of the general principles of fuel cell operation. The successful candidate will possess excellent communication skills, and will possess demonstrable experience completing research in a collaborative/team environment.

The successful candidate is NOT required to possess specific experience in solid oxide fuel cells, but preference will be given to candidates with experience in solid oxide fuel cells, electroceramic materials, electrochemistry, or any related systems in sensors, membranes, and other energy conversion devices.

Interested candidates may contact Dr. Kirk Gerdes (kirk.gerdes@netl.doe.gov) directly with a current CV at the earliest opportunity.

HOW TO APPLY:

Applicants should apply through the Oak Ridge Institute for Science and Education (ORISE) program (orise.orau.gov). NETL utilizes the ORISE program to support research and work within NETL's Office of Research & Development.

• Interested applicants should complete the online application at http://www.orau.gov/netl/

• In the online **application list one of the following as your requested mentor** to associate your application with this job posting.

Dr. Kirk Gerdes
Dr. Dustin McIntyre

If you have additional questions please contact the NETL ORISE program coordinator, Nancy Andres, Nancy.Andres@NETL.DOE.GOV.