

**Opportunity Title:** Consortium of Hybrid Resilient Energy Systems Faculty Research Program (FRP)  
**Opportunity Reference Code:** NETL-CHRES-2021-FRP

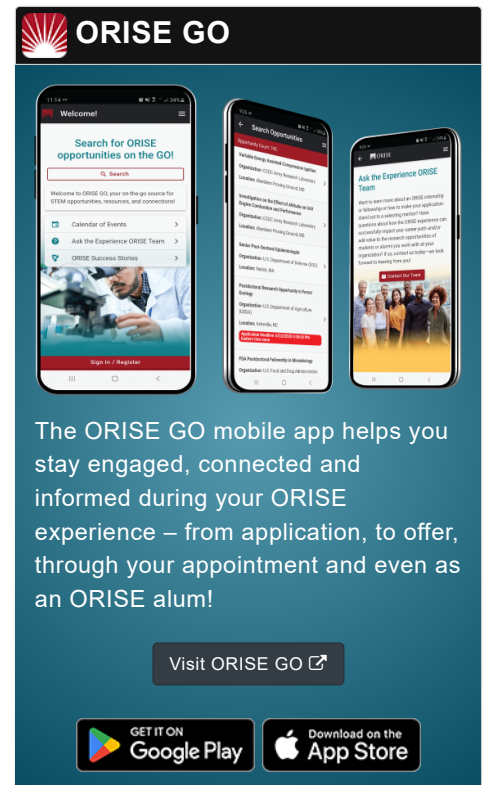
<b>Organization</b>	National Energy Technology Laboratory (NETL)
<b>Reference Code</b>	NETL-CHRES-2021-FRP
<b>How to Apply</b>	Please visit <a href="https://orise.ora.gov/netl/applicants/index.html">https://orise.ora.gov/netl/applicants/index.html</a> to learn more about the program and the application process.
<b>Application Deadline</b>	2/26/2021 11:59:59 PM Eastern Time Zone
<b>Description</b>	NETL has pioneered the use of cyber physical systems(CPS) to develop promising hybrid energy systems. This approach has provided a new paradigm when integrating complex processes, and its utility has been demonstrated on concepts even before a process concept reaches full maturity. NETL's Hybrid Performance (Hyper) project has applied this approach in the case of the FC/GT hybrid power system for around 20 years. NETL now wants to extend this approach to other hybrid systems and other research areas. This education opportunity will establish two CPS systems: CPS reformer and FC/ICE hybrid systems, by coupling real time models with hardware. The research projects include: 1) real-time dynamic simulation; 2) the development of the middleware of the cyber physical systems; 3) component design and modification for the hybrid integration; 4) demonstrations of cyber-physical systems.

Learning objectives for this opportunity include:

- 1) Learn to operate the dSpace real time modeling platform and associated Control Desk to couple the hardware with virtual systems
- 2) Implement the real-time models in the dSpace platform
- 3) Learn to build the middle ware and communication between physical and virtual systems
- 4) Learn to operate a hybrid facility and write test plans. This will include training on thermodynamics, fluid dynamics, power cycles, and cyber physical systems.
- 5) Prepare a research paper and presentation based on the project results.

**Qualifications** To be eligible, you must:

- Be a full-time regular permanent faculty member at an accredited college/university with a research interest in NETL core R&D areas.
- Be a U.S. Citizen
- Be associated with one of the following universities:
  - Universidad Ana G. Méndez
  - University of Texas at El Paso
  - University of New Mexico

The ORISE GO mobile app helps you stay engaged, connected and informed during your ORISE experience – from application, to offer, through your appointment and even as an ORISE alum!

Visit ORISE GO

GET IT ON Google Play | Download on the App Store

**Opportunity Title:** Consortium of Hybrid Resilient Energy Systems Faculty

Research Program (FRP)

**Opportunity Reference Code:** NETL-CHRES-2021-FRP













- University of Puerto Rico at Mayaguez

Additional requirements:

- Must provide a detailed statement of educational objectives and projected benefits to be realized as a result of the appointment.
- Part-time appointment candidates must submit a Part-Time Approval Form.
- Sabbatical appointment candidates must include a statement describing the financial arrangements with their academic institution, including fringe benefits paid by the institution (state as a percentage of salary and itemize)

The ideal candidate would have a strong background in some, but not all, of these elements: Matlab-Simulink programming, thermodynamics, middleware interface, dynamic controls.

**Eligibility  
Requirements**

- **Degree:** Master's Degree or Doctoral Degree.
- **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 )
  - **Other Non-Science & Engineering** (2 )
  - **Physics** (16 )
  - **Science & Engineering-related** (1 )
  - **Social and Behavioral Sciences** (29 )

**Affirmation** I certify that I am

1. currently a full-time or part-time faculty member at an accredited college/university with a research interest in NETL core R&D areas
2. a U.S. citizen
3. affiliated with one of the following universities:
  - Universidad Ana G. Méndez,
  - Universidad of Texas – El Paso
  - University of New Mexico
  - University of Puerto Rico at Mayaguez