

## 2023 ARMA Future Leader Webinar Series

Every Two Weeks on Fridays 9-10 AM MT



**16<sup>th</sup> lecture: October 20, 2023**

**Please reach out to [shahrzad.roshankhah@utah.edu](mailto:shahrzad.roshankhah@utah.edu) to get the Zoom meeting information.**

**Speaker: Wencheng Jin**

### **Electric-Hydraulic Fracturing in Subsurface Stimulation**

The world is in the midst of a significant energy transition that poses unique challenges and opportunities for subsurface engineers. The success of this transition hinges on unparalleled renewable energy production and extensive mineral extraction. Geothermal energy extraction, in-situ mining, and geological hydrogen production can partially address these issues. However, the success of these subsurface energy engineering relies on robust and efficient stimulation methods so that the permeability of targeted formation can be enhanced and sustained. In this webinar, I will present a novel stimulation technology: electric-hydraulic fracturing (E-HF), which combines electric-conductive slurry injection, electric shocking via pulsed-power releasing, and thermal shocking via joule heating and cold fluid circulation. After sharing literature data and preliminary experimental and modeling results on these topics, we show a fully connected fracture network devoid of short-circuiting can be stimulated via E-HF in low-permeable formation.

#### **Biography:**

Wencheng Jin is a computational scientist at the Energy and Environmental Science & Technology Directorate of Idaho National Laboratory (INL). Before joining INL, he earned his Ph.D. in civil engineering (specializing in Geotechnical Engineering) from the Georgia Institute of Technology and his bachelor's and master's degree in Engineering Mechanics from Sichuan University. Funded by several offices across the Department of Energy, his research focuses on constitutive modeling of particulate and solid materials, computational multi-physics coupling, multi-scale fracture propagation, and AI in geosystems. His research has been applied in granular material handling, energy geotechnics, and subsurface digitalization. Throughout his career, he received many awards and honors, including the Best Ph.D. Thesis Award in 2018 from the School of Civil and Environmental Engineering at Georgia Tech, Selected Future Leader in 2022 from the American Rock Mechanics Association, and the Early Career Achievement Award in 2023 from the Energy and Environmental Science & Technology Directorate at INL.

