Multiple research assistant and Ph.D. positions are available for students with multidisciplinary interests and experience in ultrasonics, mechanics-based modelling, and laboratory rock deformation/permeability testing. The research involves one or more of the following: acoustic emission, ultrasonic data acquisition and processing, working with servo-hydraulic testing machines, flow and permeability measurements, X-ray computed tomography imaging, machine learning, fracture mechanics, and micro-mechanical modelling. The project is led by Parisa Shokouhi (parisa@psu.edu), Jacques Rivière (riviere@psu.edu), Chris Marone (marone@psu.edu), and Derek Elsworth (elsworth@psu.edu). The successful candidate will work with a postdoctoral researcher and other graduate and undergraduate students on illuminating the mechanisms that relate ultrasonic, hydraulic, and frictional properties of fractured rocks (For related recent publications: Shokouhi et al. Geophysical Research Letters 2020 https://doi.org/10.1029/2019GL083557 & Jin et al. Journal of the Mechanics and Physics of Solids 2020 https://doi.org/10.1016/j.jmps.2019.103769).

We encourage applications from students with interest in mechanics-based modelling, elastic wave propagation, acoustics, geomechanics, geophysics, and machine learning. Programming experience using MATLAB and/or Python is required. Experience in experimental design and execution is preferred. Familiarity with machine learning and deep learning methods is a plus.

If interested, please send your questions/CV to Parisa Shokouhi (parisa@psu.edu). Dr. Shokouhi will be happy to set up a Zoom meeting with you and discuss the available projects further.