Heterogenous Porous Media from Nano- to Macro-scale

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Abstract:
Many materials surrounding us from man-made materials such as cement, concrete, and ceramics to natural materials such as biological tissue, rocks, and soil are considered as porous materials. Due to their unique properties, such as light weight, heat resistance, sound absorption, thermal conductivity, electrical resistivity, etc. porous materials are appealing to various engineering and scientific applications. However, their heterogenous microstructure spanning across the scales makes their physical and chemical characterization quite challenging. This talk will address, how a systematic integration of theoretical, numerical, and experimental tools would enable us to enhance our fundamental understanding of porous materials/systems. I will discuss some of the challenges associated with porous media followed by some of the recent techniques and advances in both numerical and experimental capabilities.

Bio:
Dr. Pania Newell is an assistant professor in the Department of Mechanical Engineering and adjunct professor in the School of Computing at The University of Utah. Prior to joining the University of Utah, she was a senior member of the technical staff at Sandia National Laboratories. Her research interest lies in investigation of multi-physics, multi-scale phenomena in heterogenous porous media through integration of theory, experiments, simulations, and data science.