

# FALL 2024 PETEROLEUM ENGINEERING SEMINAR SERIES

Class Venue: EN305 | September 25, 2024 | 4:30 - 5:20 p.m.

## Barbara Kutchko, Ph.D.

Dr. Kutchko is a senior research scientist with the National Energy Technology Laboratory (NETL) specializing in wellbore isolation, oil well cementing, and subsurface materials characterization. She has a PhD from Carnegie Mellon University's Civil and Environmental Engineering and a M.S. in Geology from the University of Pittsburgh. She works with oil and gas companies, government agencies, and universities to evaluate current cementing practices and research needs to ensure the safe placement of cement related to offshore drilling, shale gas production, and carbon storage. This includes leading and collaborating with teams of diverse researchers, professors, students, and industry experts to plan, manage, and execute research related to energy production. Her research has informed federal policy and increased scientific understanding of the chemical reactions that occur in geological formations under carbon sequestration conditions. She served as an objective expert for the U.S. Department of Justice for the United States v. BP Exploration and Production, Inc. case. She is the recipient of a 2016 Pittsburgh Women in Energy award, a 2015 Pittsburgh Energy Award in Upstream, and a 2014 Federal Executive Board Excellence in Government Award. She was a Finalist for the 2018 Samuel J Heyman Service to America Awards. Dr. Kutchko was a Society of Petroleum Engineer (SPE) Distinguished Lecturer for the 2018-2019 season.



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### ***Performance of cement in underground storage scenarios***

The storage of CO<sub>2</sub> (CCUS – Carbon Capture, Utilization and Storage) and H<sub>2</sub> (UHS – Underground Hydrogen Storage) in the subsurface requires a thorough understanding of the impact with cement in injection wells, active, and/or abandoned wells. This presentation will provide an overview of the current state of the knowledge of cement/CO<sub>2</sub> and cement/H<sub>2</sub> interactions and the impact to well integrity in storage scenarios. Topics of interest include mechanical and chemical properties of CO<sub>2</sub>-and H<sub>2</sub>-exposed cement, effectiveness of self-sealing behavior, zonal isolation, and the ability of cement to protect the steel casing from corrosion. In addition, we will address future needs to ensure safe and economic storage of CO<sub>2</sub> and H<sub>2</sub>.



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