Department of Electrical and Computer Engineering

TEXAS TECH UNIVERSITY
Edward E. Whitacre Jr.
College *of* Engineering

Spring 2026 Seminar Series

Seminar Title: ***Unlocking Earth's Potential for Subsurface Hydrogen Production***

Time: 2:00-2:50 PM, Monday, Apr 27, 2026
Location: ECE 101

Speaker:
Qingwang (Kevin) Yuan
Department of Petroleum Engineering, TTU

Abstract:
Subsurface hydrogen has emerged as a new source of clean and potentially low-cost hydrogen energy in recent years. Depending on the nature of rock formations, such hydrogen production can be categorized into (1) in-situ hydrogen generation directly from petroleum reservoirs via thermochemical reactions and (2) natural and stimulated geological hydrogen ($GeoH_2$) production from reactions of water and iron-rich rocks. Although both originate in the subsurface, the involved mechanisms and technologies needed to unlock their potential differ significantly. In this talk, I will first briefly highlight the differences between subsurface hydrogen production and existing technologies and then discuss electromagnetic (EM)-assisted catalytic heating, a new, clean technology for hydrogen production directly from petroleum reservoirs. Following that, I will discuss stimulated $GeoH_2$ production from subsurface iron-rich rock formations including the key fundamental mechanisms involved, stimulated techniques, and an approach to estimate $GeoH_2$ yield and rate from a horizontal well by incorporating the reactive surface areas created by stimulation.

Speaker Bio:
Dr. Qingwang (Kevin) Yuan is an Assistant Professor in the Department of Petroleum Engineering. At TTU, he established The Hope Group at Texas Tech focusing on subsurface hydrogen production, enhanced geothermal recovery, and CO_2 sequestration. Before joining Texas Tech, he worked as a Postdoc at Stanford University and University of Regina. He received his PhD degree from University of Calgary (2015) and MSc and BSc degrees from the China University of Petroleum (East China), all degrees in Petroleum Engineering.