# The Department of Chemical Engineering Presents:

# E V A N  G R A N I T E

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***Novel Utilization and Products from Abundant Domestic Coal***

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3:25PM via Zoom https://rochester.zoom.us/s/98875611576

**A**bstract: Coal is a precious resource, both in the United States and around the world. The United States has at least a 250-year supply of coal and generates 20% of its electricity through coal combustion. Coal has greatly contributed to world prosperity, and with a little imagination, will continue to help humanity for hundreds of years. Approximately 1 Gt of coal has been mined annually in the United States from 1990-2014, although the 2020 total will be closer to 500 Mt. Most of the coal produced in the United States is burned for power generation, but substantial quantities are also employed in the manufacture of steel, chemicals, activated carbons and for exports. Coal has a positive impact upon many industries, including mining, power, rail transportation, manufacturing, chemical, steel, activated carbon, and fuels. Everything that is in the earth's crust is also present within coal to some extent, and the challenge is always to utilize abundant domestic coal in clean, environmentally friendly, novel and profitable manners. Much of the recent research on coal utilization in the United States has focused upon the capture of pollutants such as acid gases, particulates, and mercury, and the greenhouse gas carbon dioxide from combustion at power stations. Novel processing and uses for coal is an exciting new research area, representing a dramatic paradigm shift. I will briefly summarize some of my previous research on emissions control and coal-related separations (mercury, arsenic, selenium, carbon dioxide and oxygen) and highlight emerging research areas. Some of these emerging areas include recovery of critical elements from coal and byproducts; manufacture of value added carbons such as activated carbon, composites; carbon fiber; graphite; and graphene; oxygen separation from air; carbon dioxide utilization; minor modification of existing coal-burning power plants; near zero emissions from power and gasification plants; and management/utilization of legacy byproduct impoundments.

**B**io: Evan J. Granite initiated, developed and led the Department of Energy's National Energy Technology Laboratory Research and Innovation Center (NETLR&IC) research program on Rare Earth Detection and Recovery; is developing a new Emissions Control research program; is a Research Chemical Engineer and Task/Group Leader at NETL; and an Adjunct Professor of Chemical and Petroleum Engineering at the University of Pittsburgh. Dr. Granite did postdoctoral research at the Department of Energy, received a PhD in Chemical Engineering from the University of Rochester, and BS and MS degrees in Chemical Engineering from The Cooper Union. His research interests are in fossil fuels; separation technologies; pollution clean-up; catalysis, sorbents and surface chemistry; photochemistry; electrochemistry; energy/utility systems; capture, storage, and utilization of carbon dioxide and methane; recovery of critical elements from coal and byproducts; and novel utilization and products from abundant domestic coal.