

SPRING 2024 SEMINAR SERIES



Sarma Pisupati

Professor of Energy and Mineral Engineering, Chemical Engineering, and Director of the Center for Critical Minerals (C²M)



Mineral Security Challenges in Meeting the Goal of Net-Zero Carbon Emissions by 2050

With global dependency on fossil fuels still at 80%, carbon-neutral/low-carbon power generation utilizing nuclear batteries (micro nuclear reactors), solar, wind, green-hydrogen, and biomass, and increased EV usage for transportation are crucial to achieving this target. Carbon capture, utilization, and storage (CCUS) are other vital requirements to accomplish the goal. These sustainable energy options, such as solar, wind, and energy storage (batteries), come with a steep increase in the associated demand for some rare earth and critical elements. China accounts for 84% of mined supply and 100% of refined production. While obtaining these minerals from primary domestic mineral deposits is crucial for sustainable energy security, secondary sources, including byproducts of coal mining and other energy-based waste products, are equally vital to developing a reliable supply chain. This presentation will discuss ongoing efforts at Penn State in multi-metal extraction from secondary sources and the need for global collaborations to reduce import reliance from China.

MARCH 28

4 p.m.* – 5 p.m.

Coffee • Snacks • Connections

EMS ENERGY INSTITUTE
C213 Coal Utilization Laboratory



EMS Energy Institute

* Parking is available at the Institute at 4 p.m.

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FEBRUARY 8

Eugene Morgan

*Associate Head for Undergraduate Education
Undergraduate Program Chair of Energy Engineering
Associate Teaching Professor, John and Willie Leone Family
Department of Energy and Mineral Engineering*
CO₂-SMART: A New Industry-University
Collaborative Research Center for CO₂ Storage
Modeling, Monitoring, Analytics, and Risk
Reduction Technologies

MARCH 14

Erica Smithwick

*Director of the Earth and Environmental Systems Institute
and Distinguished Professor of Geography*
Penn State's Climate Consortium: Partnerships for
People and the Planet

MARCH 28

Sarma Pisupati

*Professor of Energy and Mineral Engineering, Chemical
Engineering, and Director of the Center for Critical Minerals
(C²M)*
Mineral Security Challenges in Meeting the Goal of
Net-Zero Carbon Emissions by 2050

APRIL 18

Thandazile Moyo

*Assistant Professor of Energy and Mineral Engineering
John and Willie Leone Family Department of Energy and
Mineral Engineering*
Integrating Sustainability in Minerals and Energy
Resource Extraction Education

MAY 9

Joshua Robinson

*Associate Dean for Graduate Education and Research
(Acting)*
Silicon Carbide: The Critical Semiconductor for the
Energy Transition

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