Posters Overview

September 18, 2024

Carbon Capture Simulation Initiative for Industry Impact

- Jacobian-based Model Diagnostics and Application to Equation Oriented Modeling of a Carbon Capture System – **Douglas Allan (NETL)**
- Optimal Design and Operation of Intensified Towers for CO2 Capture with Internal, 3-D Printed Heat Exchangers – **Stephen Summits (WVU)**
- Optimal Design and Operation of a Solvent-Sorbent Hybrid CO2 Capture Process for Minimizing the Cost of High Capture – **Pooja Kasturi (WVU)**
- Recent Advances of PyROS: A Pyomo Solver for Nonconvex Two-Stage Robust Optimization in Process Systems Engineering – **Jason Sherman (CMU)**
- Model-Based Sequential Design of Experiments for Pilot Testing of Novel Water-Lean CO2 Capture Solvent - **Anca Ostace (NETL)**
- Techno-Economic Analysis and Optimization of Point Source Solvent-Based Carbon Capture Systems at High CO2 Capture Levels for NGCC Power Plants - **Anuja Deshpande (NETL)**
- Validation Framework for Post-Combustion Carbon Capture CFD Simulations. - **Grigorios Panagakos (NETL)**

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PrOMMiS

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- Software Tools for Optimizing Energy Systems and Market Interactions – **Daniel Laky (Notre Dame)**
- Model Diagnostics for Equation Oriented Models: Roadblocks and the Path Forward – **Andrew Lee (NETL)**
- Beyond Price-Taker: Multiscale Optimization of Wind and Battery Integrated Energy Systems - **Xinhe Chen (ND), Radhakrishna T. Gooty (NETL)**
- Efficient Global Optimization for Design of Chemical Process Families – **Ali Asger (CMU), Georgia Stinchfield (CMU)**
- Optimal Schedule, Design, and Operation of Solid Oxide Electrolysis Cell Systems Accounting for Long-Term Performance and Health Degradation – **Nishant Giridhar (WWU)**
- Optimization Model and Solution Strategy for Infrastructure Planning of Reliable and Carbon-Neutral Power Systems: Application to San Diego County - **Seolhee Cho (CMU)**

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Process Optimization and Modeling for Minerals Sustainability

- PrOMMiS Model Library - **Alejandro Garciadiego (NETL)**
- Design and Optimization of Processes for Recovering Rare Earth Elements from End-of-Life Hard Disk Drives – **Chris Laliwala (CMU)**
- Opportunities for Process Intensification with Membranes to Promote Circular Economy Development for Critical Minerals – **Molly Dougher (Notre Dame)**
- Conceptual Design Optimization of Solvent Extraction Processes for REE/CM Recovery – **Norman Tran (CMU)**
- Robust Optimization of Critical Mineral Membrane Separations Under Uncertainty – **Jason Yao (CMU)**
- Steady-State and Dynamic Modeling of a Solvent Extraction Process for Recovery of Rare Earth Elements – **Arkoprabho Dasgupta (WVU)**
- Systematic Design of Complex Processes using GDP: A Comparison of Reformulations - **Emma Johnson (Sandia), Michael Bynum (Sandia), John Siirola (Sandia)**
- Exchange for the Separation of Rare Earth Elements - **Soraya Rawlings (Sandia), Bethany Nicholson (Sandia), John Siirola (Sandia)**

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Water Techno-Economic Assessment Platform

- Cost-optimal selection of pH control for mineral scaling prevention in high recovery reverse osmosis desalination - **Oluwamayowa Amusat (LBNL)**
- Industry Standard Biological Wastewater Treatment in WaterTAP - **Chenyu Wang, Marcus Holly (NETL)**
- Bipolar Membrane Electrodialysis in WaterTAP - **Johnson Dhanasekaran (ORNL)**
- Value of feed spacer optimization in reverse osmosis - **Charan Samineni (Stanford)**
- Corrosion Informed Costing - **Carson Tucker (Stanford)**
- Multi-period Modeling for Solar Thermal Driven Water Treatment - **Mukta Hardikar (NREL)**

Beyond Our Programs

- **Industrial Collaborations:**
  - DOW: Equation-Oriented Modeling of a Second-Generation Post-Combustion Carbon Capture Process in the IDAES Platform for Economic Optimization – **Ilayda Akkor (CMU)**
  - OLI Software: Thermodynamic Modeling Tool for Critical Materials - **Gaurav Das and Andre Anderko (OLI)**
- **NETL - Carbon Dioxide Removal:**
  - Modeling and Analysis of Climate Variation Effects on Fixed-Bed Direct Air Capture Systems - **Ryan Hughes (NETL)**
- **NETL - Point Source Capture:**
  - Optimization of Membrane-based Carbon Capture using Dimensional Analysis, CFD and Process System Engineering. - **Hector Alejandro Pedrozo (CMU)**
  - CFD Modeling of High-Flux Plate-and-Frame Membrane modules for industrial carbon capture. - **Cheick Dosso (CMU)**

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