MATERIALS AND CHEMICAL SCIENCES FOR DIRECT AIR CAPTURE (DAC) OF CARBON DIOXIDE

FUNDING OPPORTUNITY ANNOUNCEMENT (FOA) NUMBER: DE-FOA-0002481

Award Selection (August 2021)

The Office of Science of the Department of Energy is pleased to announce that 9 projects (listed below) have been selected to receive funding as part of competition for research in Materials and Chemical Sciences for Direct Air Capture (DAC) of Carbon Dioxide sponsored by the Office of Basic Energy Sciences. The research efforts will support breakthroughs in understanding of chemical and materials processes that limit currently available DAC technologies, and can provide the foundation for entirely new and more effective approaches for direct removal of CO_2 from ambient air. These new projects span a range of fundamental materials and chemical science efforts to design and synthesize novel materials with tailored interactions for CO_2 capture; understand the behavior of porous materials during sorption and desorption processes that impact their function and stability; elucidate the interactions of CO_2 with novel solvent systems and membranes that control mechanisms of transport, reaction, and coupled phenomena; and advance energy-efficient approaches to modulate sorption/desorption processes using external stimuli.

Projects announced at this time are selections for negotiation of financial award. The final details for each award are subject to grant and contract negotiations between DOE and the awardees.

Principal Investigator	Institution	City, State	Proposal Title
Bryantsev, Vyacheslav	Oak Ridge National Laboratory (ORNL)	Oak Ridge, TN	Interfacial and Photochemical Control of CO_2 Binding, Transport, and Release in Direct Air Capture
Farha, Omar	Northwestern University	Chicago, IL	Spatio-Temporal Dynamics of CO_2 Capture by Sorbents: Multimodal, In-Situ and Operando Measurements
Gurkan, Burcu	Case Western Reserve University	Cleveland, OH	From Structured Solvents to Hybrid Materials (SS2HM) for Chemically Selective Capture and Electromagnetic Release of CO_2: Mechanisms, Stability and Interfaces
Kuila, Debasish	North Carolina A&T State University	Greensboro, NC	Novel Strategies for Direct Air Capture and Conversion of CO_2 Using Dual-Function Materials
Lin, Hongfei	Washington State University	Pullman, WA	Integrated Direct Air Capture and H_2-Free CO_2 Valorization
Long, Jeffrey	Lawrence Berkeley National Laboratory (LBNL)	Berkeley, CA	New Cooperative Adsorbents and Regeneration Methods for the Efficient Removal of Carbon Dioxide from Air
Nyman, May	Oregon State University	Corvallis, OR	Passive and enhanced capture and conversion of CO_2 by d/f0 molecules and materials
Rodriguez Lopez, Joaquin	University of Illinois Urbana-Champaign	Champaign, IL	Reversible Electrochemical Capture/Release of Carbon Dioxide Mediated by Electrostatically-Enhanced Charge Transfer
Shah, Jindal	Oklahoma State University	Stillwater, OK	Ionic Liquids for Direct Air Capture of CO_2 using Electric-Field-Mediated Moisture Gradient Process