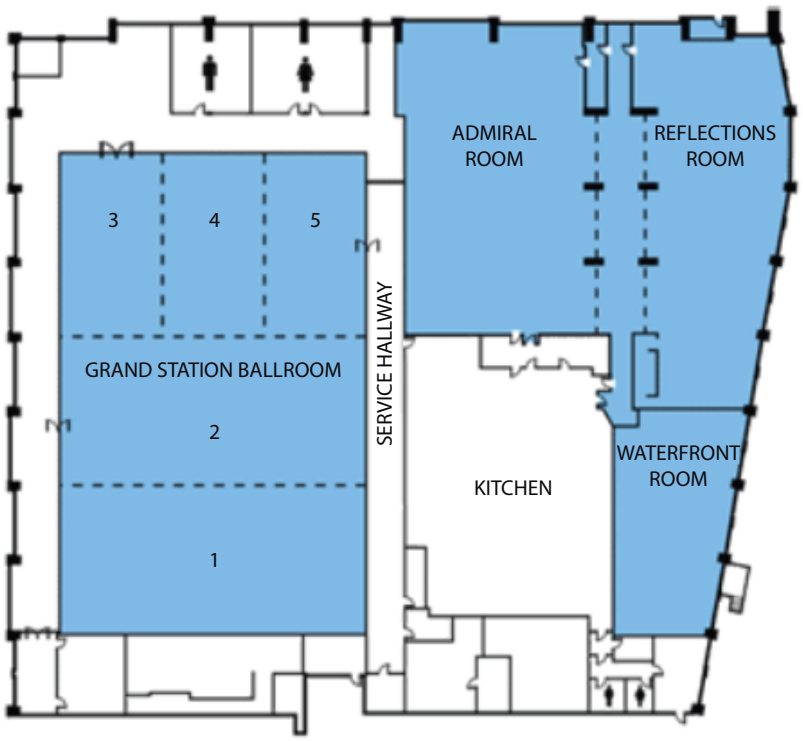
2023 FECM/NETL SPRING R&D PROJECT REVIEW MEETING

April 18-20, 2023

Sheraton Station Square Hotel
Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY
Fossil Energy and Carbon Management



FIRST FLOOR

SECOND FLOOR

TUESDAY, APRIL 18, 2023

7:00 am **REGISTRATION** – Grand Station Ballroom Foyer

7:00 am **CONTINENTAL BREAKFAST** – Admiral Room

8:00 am **OPENING SESSION** – Grand Station Ballroom 1-2

8:00 am **WELCOME**
K. David Lyons, Acting Deputy Director for Science & Technology Strategic Plans & Programs, National Energy Technology Laboratory, U.S. Department of Energy

8:05 am **2023 SPRING MEETING KEYNOTE ADDRESS**
Brian J. Anderson, Ph.D., Director, National Energy Technology Laboratory, U.S. Department of Energy

8:30 am Mark Ackiewicz, Director of Carbon Management Technologies, Office of Fossil Energy and Carbon Management, U.S. Department of Energy

BREAKOUT SESSIONS

TRACK 1
Grand Station Ballroom 3-5

University Training & Research
Moderator: Richard Dunst

9:00 am
Fossil Energy in the Hydrogen Economy - A Carbon-Water-Energy Nexus Adaptive Evaluation Platform (FE0032084)
Juan Ordonez, Florida State University/ Florida A&M University

9:30 am
Infrastructure Assessment for Technology Innovation, Development and Training in Carbon Management (FE0032200)
Salah Faroughi, Texas State University

10:00 am **BREAK** – Admiral Room

University Training & Research/ Fuels, Liquids, & Polygeneration (Gasification)
Moderator: Diane R. Madden

10:15 am
Capabilities Development at the University of Texas at El Paso for Hydrogen Generation (FE0032201)
Md Nawshad Arslan Islam, University of Texas at El Paso

TRACK 2
Reflections Room

Sensors & Controls
Moderator: Robie Lewis

9:00 am
Integration of LIBs with Machine Learning for Real-Time Monitoring of Feedstock in H_2 Gasification Applications (FE0032177)
Carlos Romero and Zheng Yao, Lehigh University

9:30 am
An Autonomous Robotic Inspection System for Coal Ash and Tailings Storage Facilities (FE0032206)
Guilherme Augusto Silva Pereira and Ihsan Tulu, West Virginia University

10:00 am **BREAK** – Admiral Room

Sensors & Controls
Moderator: Omer Bakshi

10:15 am
Advanced Sensors, Controls and Other Novel Concepts for Fossil Energy and Carbon Management Applications (FWP-1022427, FWP-1022456)
Samuel Bayham, National Energy Technology Laboratory

TRACK 3
Grand Station Ballroom 1-2

Reversible Solid Oxide Fuel Cells/ Solid Oxide Electrolysis Cells Commercialization (Reversible Solid Oxide Fuel Cells)
Moderator: Sarah Michalik

9:00 am
Cummins Reversible-Solid Oxide Fuel Cell System Development (FE0031971)
Lars Henrichsen, Cummins, Inc.

9:30 am
Reversible SOC Stacks Based on Rare-Earth Nickelate Oxygen Electrodes (FE0031972)
John Pietras, Saint-Gobain

10:00 am **BREAK** – Admiral Room

Reversible Solid Oxide Fuel Cells/ Solid Oxide Electrolysis Cells Commercialization (Reversible Solid Oxide Fuel Cells)
Moderator: Debalina Dasgupta

10:15 am
Performance Improvements for Reversible Solid Oxide Fuel Cell Systems (FE0031974)
Hossein Ghezel-Ayagh, FuelCell Energy, Inc.

BREAKOUT SESSIONS

TRACK 1
Grand Station Ballroom 3-5

10:45 am
R&D Scoping Study and Infrastructure Self-Assessment of Fossil Energy and Carbon Management Based Research Capabilities California State University (FE0032202)
Matthew Tang (Student Presenter), California State University, Los Angeles

11:15 am
Advanced Reaction Systems (FWP-1022405)
Jonathan Lekse, National Energy Technology Laboratory

11:45 am
Enabling Entrained-Flow Gasification of Blends of Coal, Biomass and Plastics (FE0032042)
Kevin Whitty, University of Utah

12:15 pm LUNCH
– Grand Station Ballroom 1-2

Air Separation (Gasification)
Moderator: Evelyn Lopez

1:15 pm
Magnetocaloric Cryogenic System for High Efficiency Air Separation (FWP-73143)
John Barclay and Corey Archipley, Pacific Northwest National Laboratory

1:45 pm
Pressure Driven Oxygen Separation (FWP-73130)
Josef Matyas and David Reed, Pacific Northwest National Laboratory

2:15 pm
High Selectivity and Throughput Carbon Molecular Sieve Hollow Fiber Membrane based Modular Air Separation Unit for Producing High Purity O_2 (FWP-FE-1049-18-FY19)
Rajinder P. Singh, Los Alamos National Laboratory

TRACK 2
Reflections Room

11:45 am
Development of Disrupted Sensors for Waste Plastics Gasification toward Clean Hydrogen Production (FE0032210)
Kevin Chen, University of Pittsburgh

12:15 pm LUNCH
– Grand Station Ballroom 1-2

Sensors & Controls
Moderator: Adam Payne

1:15 pm
Harnessing Quantum Information Science For Enhancing Sensors In Harsh Fossil Energy Environment (FE0031896)
Xian Wang (Student Presenter), University of California – Riverside (University Training & Research)

1:45 pm
Ultra-Low Disorder Graphene Quantum Dot-Based Spin Qubits for Cyber Secure Fossil Energy Infrastructure (FE0031908)
Aruna N. Nair (Student Presenter) University of Texas at El Paso (University Training & Research)

2:15 pm
Effect of Impurities on Supercritical Carbon Dioxide Compatibility (FWP-FEAA144)
Bruce Pint, Oak Ridge National Laboratory

TRACK 3
Grand Station Ballroom 1-2

10:45 am
A Highly Efficient and Affordable Hybrid System for Hydrogen and Electricity Production (FE0031975)
Heli Wang, Phillips 66 Company

11:15 am
Versatile RSOC System for Hydrogen and Electricity Production (FE0031986)
Alex Vaeth, Nexceris

11:45 am
Development of Stable Solid Oxide Electrolysis Cells for Low-Cost Hydrogen Production (FE0032105)
S (Elango) Elangovan and Jenna Pike, OxEon Energy, LLC

12:15 pm LUNCH
– Grand Station Ballroom 1-2

Solid Oxide Fuel Cell Commercialization (Reversible Solid Oxide Fuel Cells)
Moderator: Patcharin Burke

1:15 pm
MW-Class SOFC Pilot System Development (FE0031639)
Hossein Ghezel-Ayagh, FuelCell Energy, Inc.

Next Generation SOFC Module Development (FE0031648)
Hossein Ghezel-Ayagh, FuelCell Energy, Inc.

1:45 pm
Solid Oxide Fuel Cell Development and Demonstration Test Center (FE0024233-5.1, FE0031977)
Zhien Liu, University of North Dakota Energy and Environmental Research Center

2:15 pm
Improving Cost and Efficiency of the Scalable Solid Oxide Fuel Cells Power System (FE0031941)
Lars Henrichsen, Cummins, Inc.

BREAKOUT SESSIONS

TRACK 1
Grand Station Ballroom 3-5

2:45 pm
Modularization of Ceramic Hollow Fiber Membrane Technology for Air Separation (FE0031473)
Chris Xue, University of South Carolina

3:15 pm **BREAK** – Admiral Room

Clean Hydrogen & Negative CO_2 Emissions (Gasification)
Moderator: Richard Dalton

3:30 pm
Fluidized-Bed Gasification of Coal-Biomass-Plastics for Hydrogen Production (FE0032041)
Sushil Adhikari, Auburn University

4:00 pm
Development and Characterization of Densified Biomass-Plastic Blend for Entrained Flow Gasification (FE0032043)
Kunlei Liu, University of Kentucky

4:30 pm
Performance Testing of a Moving-Bed Gasifier using Coal, Biomass, and Waste Plastic Blends to Generate White Hydrogen (FE0032044)
Horst Hack, Electric Power Research Institute

5:00 pm
Gasification of Coal and Biomass: The Route to Net-Negative-Carbon Power and Hydrogen (FE0031993)
Horst Hack, Electric Power Research Institute

5:30 pm **ADJOURN**

TRACK 2
Reflections Room

2:45 pm
Low Cost High Performance Austenitic Stainless Steels for A-USC (FWP-FEAA133)
Xiang (Frank) Chen, Oak Ridge National Laboratory

3:15 pm **BREAK** – Admiral Room

Advanced Energy Materials for Hydrogen Turbines (Advanced Energy Materials)
Moderator: Heather Hunter

3:30 pm
Advanced Materials Development (FWP-1022406)
Omer Dogan, National Energy Technology Laboratory

4:00 pm
eXtremeMAT - Accelerated Design and Manufacture of Next Generation Extreme Environment Materials (FWP-1022433)
Laurent Capolungo, Los Alamos National Laboratory

4:30 pm
Low-Cost/High Performance Silicon Carbide Composite Shells for Gas Turbines (SC0022704)
Joseph Pegna, Free Form Fibers, LLC

5:00 pm
Rapid SiC: Room Temperate Production of Polymer-Derived SiC (SC0022875)
Josh Smith, Luna Labs USA, LLC

5:30 pm **ADJOURN**

TRACK 3
Grand Station Ballroom 1-2

3:15 pm **BREAK** – Admiral Room

Solid Oxide Fuel Cell Commercialization (Reversible Solid Oxide Fuel Cells)
Moderator: Drew O'Connell

3:30 pm
Roll-to-Roll Manufacturing of Solid Oxide Fuel Cells (TCF-20-20119)
Jianlin Li, Oak Ridge National Laboratory

4:00 pm
Next Generation Durable, Cost Effective, Energy Efficient Tubular Solid Oxide Fuel Cell (FE0031674)
Ted Ohrn, Special Power Sources

4:30 pm
3-D Printed High Temperature Centrifugal Impellers for Low Cost SOFC Recycle Blower (SC0020793)
Jose Luis Cordova, Mohawk Innovative Technology, Inc.

5:00 pm
Low Cost Solid Oxide Fuel Cells for Small-Scale Distributed Power Generation (FE0031976)
Bryan Blackburn, Redox Power Systems, LLC

5:30 pm **ADJOURN**

7:00 am **REGISTRATION** – Grand Station Ballroom Foyer

7:00 am **CONTINENTAL BREAKFAST** – Admiral Room

8:00 am **PLENARY SESSION** – Grand Station Ballroom 1-2

8:00 am
The FECM UTR Program and Student Success at the Aerospace Center
Md Nawshad Arslan Islam, University of Texas at El Paso

8:25 am
Bio-Inspired Acoustic-Based Inspection and Sensing
Ehsan Dehghan-Niri, Arizona State University

BREAKOUT SESSIONS

TRACK 1
Grand Station Ballroom 3-5

Clean Hydrogen & Negative CO_2 Emissions (Gasification)
Moderator: Evelyn Lopez

9:00 am
A Mid-Century Net-Zero Scenario for the State of Wyoming and its Economic Impacts (FE0032150)
Eugene Holubnyak, University of Wyoming

9:30 am
Wabash Hydrogen Negative Emissions Technology Demonstration (FE0031994)
Joshua Pearson and Dan Williams, Wabash Valley Resources, LLC

10:00 am **BREAK** – Admiral Room

University Training & Research (Gasification)
Moderator: Maria Reidpath

10:15 am
Microwave-Assisted Dehydrogenation of Fossil Fuels Using Iron-Based Alumina Nanocomposites (FE0032086)
Zachary Chanoi (Student Presenter) and Evgeny Shafirovich, University of Texas at El Paso (University Training & Research)

TRACK 2
Reflections Room

Welding (Advanced Energy Materials)
Moderator: Andrew Downs

9:00 am
Hybrid Structured Nickel Superalloys to Address Price Volatility and Weld/Weld Repair Based Supply Chain Issues (FE0032071)
Tanner Olson (Student Presenter), Michigan Technological University (University Training & Research)

9:30 am
High-Speed and High-Quality Field Welding Repair Based on Advanced Non-Destructive Evaluation and Numerical Modeling (FE0032067)
Desmond Bourgeois and Wei Zhang, The Ohio State University (University Training & Research)

10:00 am **BREAK** – Admiral Room

Welding (Advanced Energy Materials)
Moderator: Alison Metz

10:15 am
Multi-pass Hybrid Laser Arc Welding of Alloy 740H (FWP-B100-19010)
Tate Patterson, Idaho National Laboratory and Todd Palmer, Pennsylvania State University

TRACK 3
Grand Station Ballroom 1-2

Reversible Solid Oxide Fuel Cells/ Solid Oxide Electrolysis Cells R&D (Reversible Solid Oxide Fuel Cells)
Moderator: Debalina Dasgupta

9:00 am
Reversible Solid Oxide Cell Degradation Characterization, Simulation, and Mitigation at NETL (FWP-1022411)
Harry Abernathy, National Energy Technology Laboratory

9:30 am
Status Update of NETL Techno-Economic Analysis of Solid Oxide Cells (FWP-1022411)
Gregory Hackett, National Energy Technology Laboratory

10:00 am **BREAK** – Admiral Room

Reversible Solid Oxide Fuel Cells/ Solid Oxide Electrolysis Cells R&D (Reversible Solid Oxide Fuel Cells)
Moderator: Patcharin Burke

10:15 am
Multi-Constituent Airborne Contaminants Capture with Low Cost Oxide Getters and Mitigation of Cathode Poisoning in Solid Oxide Fuel Cells (FE0031647)
Prabhakar Singh, University of Connecticut

BREAKOUT SESSIONS

TRACK 1
Grand Station Ballroom 3-5

10:45 am
Low-Temperature Plasma Activation of Catalytic Processes (FE0032091)
Lorenzo Mangolini, University of California – Riverside (University Training & Research)

11:15 am
Multiphysics and Multiscale Simulation Methods for Electromagnetic Energy Assisted Fossil Fuel to Hydrogen Conversion (FE0032092)
Su Yan, Howard University (University Training & Research)

11:45 am
Electromagnetic Energy-Assisted Thermal Conversion of Fossil-Based Hydrocarbons to Low-Cost Hydrogen (FE0032061)
Johannes Van der Watt, University of North Dakota (University Training & Research)

12:15 pm **LUNCH**
– Grand Station Ballroom 1-2

Outreach & Education (Energy Asset Transformation)
Moderator: Barbara Carney

1:15 pm
Durable Low-Cost Pressure Vessels for Bulk Hydrogen Storage (FE0032022)
Ashok Saxena, WireTough Cylinders, LLC

1:45 pm
Outreach for Advanced Storage Integration and Support (OASIS) (FE0032027)
Anantha Narayanan, National Rural Electric Cooperative Association

TRACK 2
Reflections Room

10:45 am
Development of Functionally Graded Materials to Enable Dissimilar Metal Joints (FWP-FEAA151)
Peeyush Nandwana, Oak Ridge National Laboratory

11:15 am
Integrated Process Improvement using Laser and Friction Stir Processing for Nickel Alloys used in Fossil Energy Power Plant Applications (FWP-71843)
Christoper Smith, Pacific Northwest National Laboratory

11:45 am
Robust Dissimilar Metal Friction Welded Spool for Enhanced Capability for Steam Power Components (FE0031907)
Voramon Dheeradhada and Sreekar Karnati, GE Research

12:15 pm **LUNCH**
– Grand Station Ballroom 1-2

Additive Manufacturing (Advanced Energy Materials)
Moderator: Omer Bakshi

1:15 pm
Wire Arc Additive Manufacturing of Advanced Steam Cycle Components Using Location Specific Design Enhanced by High-Throughput Experiments and Machine Learning (FE0026825-06-19)
Wei Xiong, University of Pittsburgh

1:45 pm
Conformal Coatings on Additive Manufactured Robust Alloys for Significant Mitigation of Oxidation, Erosion, and Corrosion (FE0032068)
Xueyan Song, West Virginia University (University Training & Research)

TRACK 3
Grand Station Ballroom 1-2

10:45 am
Durable and High-Performance SOECs Based on Proton Conductors for Hydrogen Production (FE0032115)
Meilin Liu, Georgia Tech

11:15 am
Designing Internal Surfaces of Porous Electrodes in Solid Oxide Electrolysis Cells for Highly Efficient and Durable Hydrogen Production (FE0032112)
Xueyan Song, West Virginia University

11:45 am
Developing Stable Critical Materials and Microstructure for High-Flux and Efficient Hydrogen Production through Reversible Solid Oxide Cells (FE0032111)
Kevin Huang, University of South Carolina

12:15 pm **LUNCH**
– Grand Station Ballroom 1-2

Reversible Solid Oxide Fuel Cells/ Solid Oxide Electrolysis Cells R&D (Reversible Solid Oxide Fuel Cells)
Moderator: Sarah Michalik

1:15 pm
Improving Durability and Performance of Solid Oxide Electrolyzers by Controlling Surface Composition on Oxygen Electrodes (FE0032102)
Bildge Yildiz and Bill Liu, Massachusetts Institute of Technology

1:45 pm
Development of Novel 3D Cell Structure and Manufacturing Processes for Highly Efficient, Durable and Redox Resistant Solid Oxide Electrolysis Cells (FE0032107)
Sanghoon Lee (Student Presenter) and Nguyen Minh, University of California – San Diego

BREAKOUT SESSIONS

TRACK 1
Grand Station Ballroom 3-5

2:15 pm
Overview of APPA's Energy Storage Accessibility for Public Power Utilities Project (FE0032026)
Carole Plowfield, American Public Power Association

3:15 pm **BREAK** – Admiral Room

Hydrogen (Energy Asset Transformation)
Moderator: Jason Hissam

3:30 pm
Hydrogen Storage for Load-Following and Clean Power: Duct-Firing of Hydrogen to Improve the Capacity Factor of NGCC (FE0032008)
John Vega, GTI Energy

4:00 pm
Economically Viable Intermediate to Long Duration Hydrogen Energy Storage Solutions for Fossil Fueled Assets (FE0032001)
Zhili Feng, WE New Energy, Inc.

4:30 pm
Advanced Oxygen-Free Electrolyzer for Ultra-Low-Cost Hydrogen Storage for Fossil Plants (FE0032023)
Pinakin Patel and Ludwig Lipp, T2M Global, LLC

5:00 pm
Low-Cost, Scalable Boron Nitride-Based Sorbents with Balanced Capacity-Kinetics-Thermodynamics for Hydrogen Storage (FE0032010)
Rouzbeh Savary, C-Crete Technologies

TRACK 2
Reflections Room

2:15 pm
Additive Manufactured Graded Composite Transition Joints for Dissimilar Metal Weldments (FE0031819)
Xingbo Liu, West Virginia University

2:45 pm
Evaluating Ni-Based Alloys for A-USC Component Manufacturing and Use (FWP-FEAA152)
Xiang (Frank) Chen and Timothy Lach, Oak Ridge National Laboratory

3:15 pm **BREAK** – Admiral Room

Advanced Supercritical and Ultrasupercritical Materials (Advanced Energy Materials)
Moderator: Robie Lewis

3:30 pm
Corrosion and Erosion Coatings for Biomass with Load Following (FE0031911)
Patrick Shower and Anteneh Kebbede, General Electric

4:00 pm
Continued Development - Real Time and Physics Based Data Analytics for Thermal Power Plants (FE0032035)
Robert Steele and Salvatore A. DellaVilla Jr., Strategic Power Systems, Inc.

TRACK 3
Grand Station Ballroom 1-2

2:15 pm
Development of High-Performance Solid Oxide Electrolysis Cells Diagnostic Methods (FE0032110)
Xiao-Dong Zhou and Yudong Wang, University of Louisiana at Lafayette

2:45 pm
Heterostructured Cr Resistant Oxygen Electrode for SOECs (FE0032116)
Yu Zhong, Worcester Polytechnic Institute

3:15 pm **BREAK** – Admiral Room

Reversible Solid Oxide Fuel Cells/ Solid Oxide Electrolysis Cells R&D (Reversible Solid Oxide Fuel Cells)/ Simulation-Based Engineering
Moderator: Drew O'Connell

3:30 pm
Advanced Manufacturing of Solid Oxide Electrodes Using ALD (SC0022769)
Katherine Hansen, Radiation Monitoring Devices

4:00 pm
Multi-Scale Modeling and Optimization Using IDAES (FWP-1022423)
Anthony P. Burgard, Ben Omell and Steve Zitney, National Energy Technology Laboratory

5:00 pm
Advanced Modeling and Process-Materials Co-Optimization Strategies for Swing Adsorption Based Gas Separations (FE0032069)
Xiangyu Yin (Student Presenter) and Chrysanthos E. Gounaris, Carnegie Mellon University (University Training & Research)

5:30 pm **BREAK**

6:00 pm **RECEPTION/POSTER SESSION** – Admiral Room

8:00 pm **ADJOURN**

7:00 am **REGISTRATION** – Grand Station Ballroom Foyer

7:00 am **CONTINENTAL BREAKFAST** – Admiral Room

BREAKOUT SESSIONS

TRACK 1
Grand Station Ballroom 3-5

Other Technologies (Energy Asset Transformation)
Moderator: Jason Hissam

8:00 am
Development of an All-Aqueous Thermally Regenerative Redox Flow Battery to Support Fossil Fuel Assets (FE0032030)
Jose Rochin (Student Presenter), Pennsylvania State University

8:30 am
Low-Cost Metal-Supported Metal Halide Energy Storage Technology (SC0021566)
Neil Kidner, Nexceris/Adena Power

9:00 am
Titanium-Cerium Electrode-Decoupled Redox Flow Batteries (FE0032011)
Benjamin Kumfer, Washington University in St. Louis

9:30 am
Sand Thermal Energy Storage (SandTES) Pilot Design (FE0032024)
Scott Hume, Electric Power Research Institute

10:00 am **BREAK** – Admiral Room

TRACK 2
Reflections Room

Emissions Control
Moderator: Maria Reidpath

8:00 am
An Update of NETL's Emissions Control Field Work Proposal Research (FWP-1022479)
Eric Grol, National Energy Technology Laboratory

8:30 am
Surface Modified Fly Ash For Value Added Products (Sumo Fly Ash) (FE0032039)
Sanandam Bordoloi (Student Presenter) and Chinmoy Baroi, Illinois Sustainable Technology Center

9:00 am
Facilitating Implementation of High-Volume Fly Ash Use in Precast Concrete Construction to Increase Beneficial Utilization (FE0031931)
Matthew Gombeda, Illinois Institute of Technology

9:30 am
Beneficial Use of Harvested Ponded Fly Ash and Landfilled FGD Materials for High-Volume Surface Mine Reclamation (FE0032038)
Tarunjit Singh Butalia, The Ohio State University

10:00 am **BREAK** – Admiral Room

TRACK 3
Grand Station Ballroom 1-2

Simulation-Based Engineering
Moderator: Richard Dunst

8:00 am
CFD for Advanced Reactor Design (CARD) (FWP-1022463)
Jeff Dietiker, National Energy Technology Laboratory

9:00 am
Unsupervised Learning Based Interaction Force Model for Nonspherical Particles in Incompressible Flows (FE0031905)
Soohwan Hwang (Student Presenter) and Liang-Shih Fan, The Ohio State University (University Training & Research)

9:30 am
Development and Evaluation of a General Drag Model for Gas-Solid Flows Via Physics-Informed Deep Machine Learning (FE0031904)
Pratik Mahyawansi (Student Presenter), Florida International University (University Training & Research)

10:00 am **BREAK** – Admiral Room

BREAKOUT SESSIONS

TRACK 1
Grand Station Ballroom 3-5

Other Technologies (Energy Asset Transformation)
Moderator: Adam Payne

10:15 am
Reversible Methane Electrochemical Reactors as Efficient Energy Storage for Fossil Fuel Power (FE0032005)
Pejman Kazempoor, University of Oklahoma

10:45 am
Ammonia-Based Energy Storage (FE0032014)
Ted Aulich, Energy & Environmental Research Center, University of North Dakota

TRACK 2
Reflections Room

Emissions Control
Moderator: Heather Hunter

10:15 am
High Strength, Encapsulated, Commercially Useful Components and Particles Made from Coal Combustion Residuals (FE0031932)
William Easter, Semplastics

10:45 am
A Data-Driven Multiscale Phytotechnology Framework for Identification and Remediation of Leached-Metals-Contaminated Soil Near Coal Ash Impoundments (FE0032184, DE-FOA-0002596)
Bahreh Nojabaei, Virginia Polytechnic Institute and State University (University Training & Research)

TRACK 3
Grand Station Ballroom 1-2

Simulation-Based Engineering
Moderator: Omer Bakshi

10:15 am
A General Drag Model for Assemblies of Non-Spherical Particles Created with Artificial Neural Networks (FE0031894)
Sergio Molina (Student Presenter), University of Texas at San Antonio (University Training & Research)

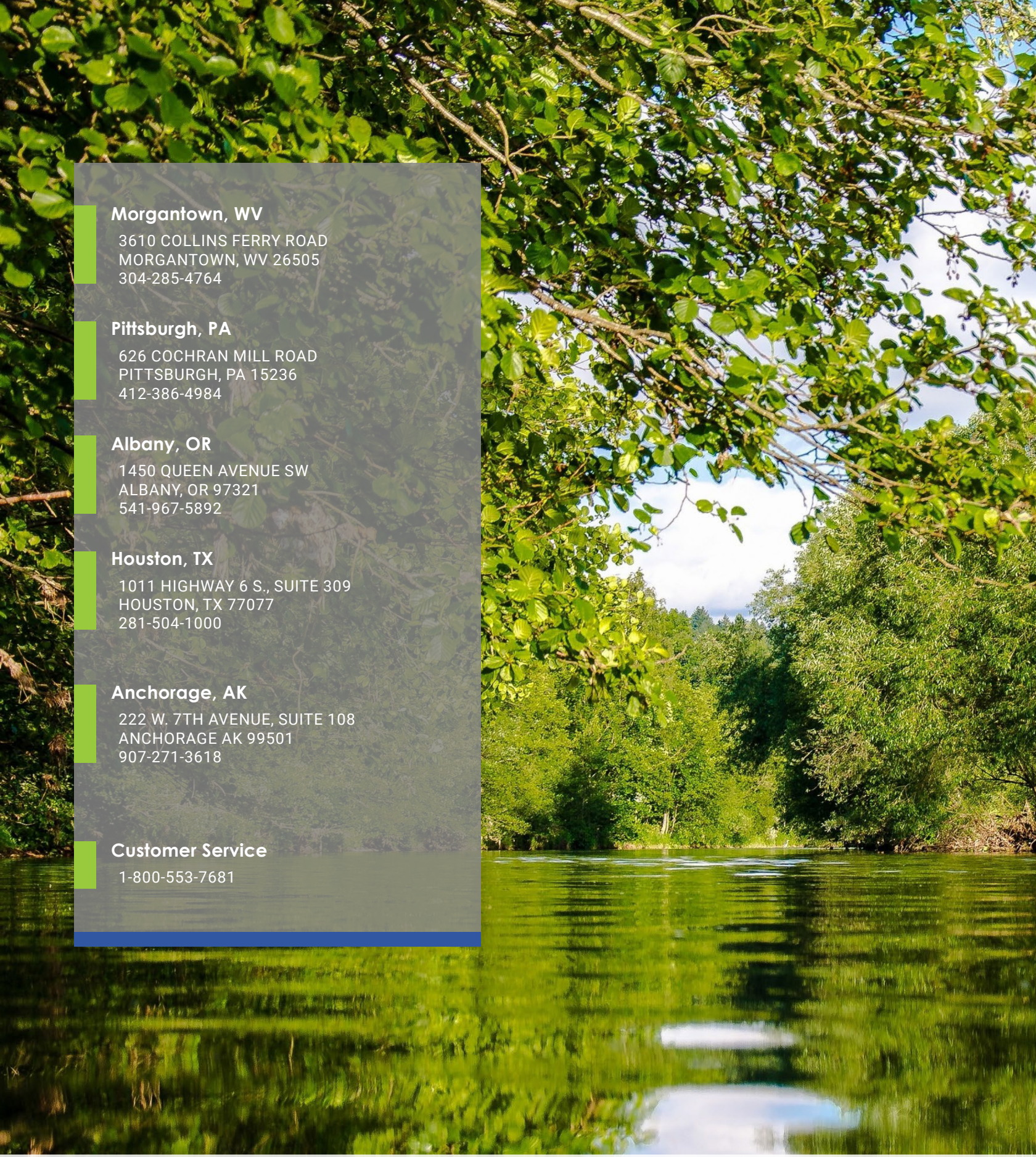
10:45 am
Developing Drag Models for Non-Spherical Particles through Machine Learning (FE0031897)
Rui Ni, Johns Hopkins University(University Training & Research)

11:15 am **BREAK** – Admiral Room

11:30 am **STUDENT AWARD LUNCHEON** – Grand Station Ballroom 1-2

1:00 pm **ADJOURN**

NOTES



Morgantown, WV

3610 COLLINS FERRY ROAD
MORGANTOWN, WV 26505
304-285-4764

Pittsburgh, PA

626 COCHRAN MILL ROAD
PITTSBURGH, PA 15236
412-386-4984

Albany, OR

1450 QUEEN AVENUE SW
ALBANY, OR 97321
541-967-5892

Houston, TX

1011 HIGHWAY 6 S., SUITE 309
HOUSTON, TX 77077
281-504-1000

Anchorage, AK

222 W. 7TH AVENUE, SUITE 108
ANCHORAGE AK 99501
907-271-3618

Customer Service

1-800-553-7681

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