

Tuesday, August 2, 2022

All times are Eastern Daylight Time

Session Chair – William Rogers

- 09:00 – 09:20 AM **Convene, Webex Logistics**
NETL Conference Services
- 9:20 – 09:40 AM **Welcome and Introduction**
Mehrdad Shahn timer, National Energy Technology Laboratory
- 09:40 – 10:00 AM **Bubble Extraction and Analysis of Group-A Gas-Solid Fluidized Beds – A Comparison Between Two-Fluid Simulations and Experiments**
Yuan Yao, Chi-Wei Tsang, Chang Kai (Lance) Wu, Michael Molnar, Matthew Bishop, Quan Yuan, Jörg Theuerkauf, Dow Inc.
- 10:00 – 10:20 AM **Validation and Comparison of CFD-DEM and MP-PIC Simulations of a Gas-Fluidised Bed using Positron Emission Particle Tracking**
C. Windows-Yule, University of Birmingham
- 10:20 – 10:40 AM **Mixing and Segregation in Structured Fluidized Beds: Experiments and Modeling**
Jagan Sanghishetty, Christopher Spitler, Qiang Guo, Chris Boyce, Columbia University
- 10:40 – 11:00 AM **Two Phase Mass Flow and Enthalpy Measurement of Steam Production Lines in a Geothermal Power Plant using Electrical Capacitance Volume Tomography**
Qussai Marashdeh, Benjamin Straiton, Tech4Imaging, LLC.
- 11:00 – 11:20 AM **Importance of Conjugate Heat Transfer in Modeling of Fixed Bed Reactors for Renewable Fuels and Chemicals**
Bruce Adkins, Canan Karakaya, Oak Ridge National Laboratory
- 11:20 – 11:40 AM **CFD Modeling of a Batch Fluidised Chemical Looping Combustor with Different Approaches**
Pietro Bartocci¹, Alberto Abad¹, Arturo Cabello¹, Francesco Fantozzi¹, Margarita de Las Obras Loscertales¹, Lu Wang², Haping Yang², ¹Instituto de Carboquímica, ²Huazhong University of Science and Technology
- 11:40 – 12:00 PM **Eulerian Multiphase Models for Biomass Mixing and Reactions in Bidisperse Gas-Solid Flows**
Barlev R. Nagawkar, Shankar Subramaniam, Alberto Passalacqua, Iowa State University
- 12:00 – 1:00 PM **Break**

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Session Chair – Jeff Dietiker

- 1:00 – 1:20 PM **ACCES: Autonomous Characterisation and Calibration Using Evolutionary Simulation**
Jack Sykes, Andrei Leonard Nicusan, Dominik Werner, Kit Windows-Yule, Tzany Kokalova Wheldon, University of Birmingham
- 1:20 – 1:40 PM **Dense Gas/ Liquid Flow Pattern Transition in Pipes Using Physics Informed Machine Learning**
André Mendes Quintino, Oscar Mauricio Hernandez Rodriguez, University of São Paulo
- 1:40 – 2:00 PM **A Novel Method for Generating Reduced-order Models for Transport Phenomena Using Proper Orthogonal Decomposition**
Paul Cizmas, Texas A&M University
- 2:00 – 2:20 PM **Development and Applications of DEM Digital Twins of Powder Systems**
B. Jenkins¹, A. L. Nicusan¹, A. Neveu², G. Lumay³, F. Francqu², J. Seville¹, C.R.K. Windows-Yule¹, ¹University of Birmingham, ²Granutools SPRL, ³University of Liege
- 2:20 – 2:40 PM **Deep Learning Methods for Time Series Predictions in Multiphase Flows**
Neil Raj Ashwin, Nikhil Muralidhar, Danesh Tafti, Anuj Karpatne, Virginia Tech
- 2:40 – 3:00 PM **Deterministic Neighbor-Influence Accounted Point-Particle Closure Models Using Interpretable Machine Learning**
Bhargav Sriram Siddani, S. Balachandar, University of Florida
- 3:00 – 3:20 PM **Break**

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9:00 – 9:20 AM [Reconvene](#)

Session Chair – Mary Ann Clarke

- 09:20 – 09:40 AM **Simulation of Heater in an Energy Storage in Fluidized Bed (ESFB)**
Z. Liu, A. Ishikawa, IHI Corporation
- 09:40 – 10:00 AM **Fast Estimation of Reaction Rates in Catalysts and Sorbents**
Rebecca Grawe, John Wakefield, Aaron Lattanzi, Jesse Capecehatro, University of Michigan
- 10:00 – 10:20 AM **Enriched Finite Element Formulation for Electrohydrodynamics Problems**
C.Narváez-Muñoz^{1,2}, M.R.Hashemi², P.B.Ryzhakov^{1,2}, J.Pons-Prats^{1,2}, J.Marti², ¹Polytechnic University of Catalonia, ²International Center for Numerical Methods in Engineering
- 10:20 – 10:40 AM **M2E3D: Multiphase Materials Exploration via Evolutionary Equation Discovery**
Andrei Leonard Nicusan, Mehdi Jangi, Jonathan Seville, Kit Windows-Yule, University of Birmingham
- 10:40 – 11:00 AM **Multiscale Modeling of Electrostatic Precipitations of Fly Ash and Mercury Sorbents: Discontinuous Current Density Effects**
Eric Lee, Herek Clack, Northern Illinois University
- 11:00 – 11:20 AM **Increasing Spatial Resolution of Adaptive Electrical Capacitance Volume Tomography by Focusing Electric Stimulation in a Region of Interest through Electronically Activating Synthetic Plate Pairs**
Qussai Marshdeh, Benjamin Straiton, Tech4Imaging, LLC
- 11:20 – 11:40 AM **Effect of Nozzle Design on Solids Motion and Mixing in Fluidised Beds**
Dominik Werner, Jonathan Seville, Kit Windows-Yule, University of Birmingham
- 11:40 – 12:00 PM **Probing the Breakup of Liquid Fuel Droplets with Detonation Waves**
Daniel Dyson¹, Artem Arakelyan¹, Nicolas Berube¹, Sydney Briggs¹, Subith S. Vasu¹, H.S. Udaykumar², Suresh Menon³, ¹University of Central Florida, ²University of Iowa, ³Georgia Institute of Technology
- 12:00 – 12:20 PM **Application of MP-PIC method to Ebullated Bed Reactors**
James Parker, Peter Blaser, CPFD Software
- 12:20 – 12:40 PM [Break](#)

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Session Chair – Subhodeep Banerjee

- 12:40 – 1:00 PM **Modeling Enhancements for Eulerian-Eulerian Two-Fluid Methods in Compressible Particle-Laden Flows with Plume-Surface Interaction Applications**
Raymond L. Fontenot¹, Joseph Talbot¹, Manuel Gale¹, Ranjan Mehta¹, Jesse Capecelatro², ¹CFD Research Corporation, ²University of Michigan
- 1:00 – 1:20 AM **A Statistical Risk Assessment of Airborne Viral Transmission Using High Fidelity Simulations**
K.A. Krishnaprasad, J. Salinas, N. Zgheib, S. Balachandar, University of Florida
- 1:20 – 1:40 PM **Radiation Transport and Multiphase Particle Laden Flows**
Y. Kanarska, B. Isaac, A. Nichols, B. Clary, M. Barham, J. Morris, K. Knight, Lawrence Livermore National Laboratory
- 1:40 – 2:00 PM **Mass Transfer Coefficient of Noble Metals and Gases for Molten Salt Reactor Using Correlations**
Kyoung O. Lee, Dane de Wet, Wesley C. Williams, N. Dianne Ezell, Oak Ridge National Laboratory
- 2:00 – 2:20 PM **Large-Eddy Simulation (LES) Coupled with Lagrangian Particle Tracking – Particles Dispersion and Deposition**
Farid Rousta¹, Bamdad Lessan², Goodarz Ahmadi¹, ¹Clarkson University, ²University of North Carolina
- 2:20 – 2:40 PM **Break**

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Session Chair – Yupeng Xu

- 2:40 – 3:00 PM **Validation of Moving-Overset 6-DOF Algorithm for Gas-Granular Two-Phase Flows**
Raymond L. Fontenot, Manuel Gale, CFD Research Corporation
- 3:00 – 3:20 PM **Stochastic Lagrangian Subgrid-Scale Models for Turbulent Particle-Laden Flows**
Max Herzog¹, Aaron Lattanz², John Wakefield¹, Shankar Subramaniam³, Jesse Capecelatro¹, ¹University of Michigan, ²Leidos, ³Iowa State University
- 3:20 – 3:40 PM **Development of an Eulerian Polydisperse Multiphase Flow Model**
Jacob Posey¹, Ryan Houim¹, Rodney Fox², ¹University of Florida, ²Iowa State University
- 3:40 – 4:00 PM **A Computational Study of Charged Bumpy Particle Adhesion and Detachment from the Rough Surface**
Saeed Siahchehrehghadikolaei, Goodarz Ahmadi, Andrea R. Ferro, Suresh Dhaniyala, Clarkson University
- 4:00 – 4:20 PM **Dust Deposition Minimization on the Solar PV Panel by Solid Wind Barrier: A CFD Modeling**
Saeed Siahchehrehghadikolaei¹, Goodarz Ahmadi¹, Mohammad A. Moghim², ¹Clarkson University, ²Staffordshire University
- 4:20 PM [Workshop Ends](#)

Many thanks to all who present and attend for your support of the NETL Workshop!

Feel free to send your feedback on this meeting and suggestions for future workshops to workshops@mfix.netl.doe.gov

2022 Multiphase Flow Science Workshop Day 1 **Attendee Login Information**

Webinar topic: 2022 - Multiphase Flow Science Workshop - Day 1

Date and time: Tuesday, Aug 2, 2022 9:00 am | (UTC-04:00) Eastern Time (US & Canada)

Join link: <https://doe.webex.com/doe/j.php?MTID=m7a29957ff4dfca36b183d1ca6d6cd0fa>

Webinar number: 2760 485 5781

Webinar password: rDCr2C2ZdP2 (73272229 from phones)

Join by phone

+1-415-527-5035 US Toll

+1-929-251-9612 USA Toll 2

Access code: 276 048 55781

2022 – Multiphase Flow Science Workshop Day 2 **Attendee Login Information**

Webinar topic: 2022 - Multiphase Flow Science Workshop - Day 2

Date and time: Wednesday, Aug 3, 2022 9:00 am | (UTC-04:00) Eastern Time (US & Canada)

Join link: <https://doe.webex.com/doe/j.php?MTID=mebf7d20c7585c8c858c063739a900de5>

Webinar number: 2762 604 4989

Webinar password: D88PiviGmm7 (38874844 from phones)

Join by phone

+1-415-527-5035 US Toll

+1-929-251-9612 USA Toll 2

Access code: 276 260 44989