



Workshop on Compressible Multiphase Flows

Hosted by: **Stanford University** and **University at Buffalo**



November 6-7, 2023

Location: Stanford University

Mackenzie Room

Huang Building, 3rd Floor

Schedule

Day 1: Monday, November 6th, 2023

08:00 AM - 08:30 AM:	Breakfast/Reception
08:30 AM - 08:40 AM:	Welcome and Introduction
08:40 AM - 09:30 AM:	Overview of Stanford and Buffalo PSAAP III Centers
09:30 AM - 10:45 AM:	Session 1: Liquid Atomization I
10:45 AM - 11:15 AM:	Coffee Break
11:15 AM - 12:30 PM:	Session 2: Particle Laden Flows I
12:30 PM - 01:45 PM:	Lunch
01:45 PM - 03:00 PM:	Session 3: Mathematical Formulations and Numerical Methods I
03:00 PM - 03:15 PM:	Coffee Break
03:15 PM - 04:30 PM:	Session 4: Discussion on Benchmark Data for Compressible Multiphase Flows
04:30 PM - 05:30 PM:	Poster Session
06:00 PM - 08:30 PM:	Dinner (Faculty Club)

Day 2: Tuesday, November 7th, 2023

07:30 AM - 08:00 AM:	Breakfast/Reception
08:00 AM - 09:15 AM:	Session 5: Multiphase Reacting Flows
09:15 AM - 09:30 AM:	Coffee Break
09:30 AM - 10:45 AM:	Session 6: Liquid Atomization II
10:45 AM - 11:00 AM:	Coffee Break
11:00 AM - 12:15 PM:	Session 7: Particle Laden Flows II
12:15 PM - 01:30 PM:	Lunch
01:30 PM - 03:10 PM:	Session 8: Mathematical Formulation and Numerical Methods II
03:10 PM - 03:30 PM:	Closing and Adjourn

Monday, November 6th – Day 1

08:00 AM - 08:30 AM – Breakfast/Reception

08:30 AM - 08:40 AM – Welcome and Introduction

08:40 AM - 09:30 AM – Overview of Stanford and Buffalo PSAAP III Centers

Session 1 – Liquid Atomization I (Session Chair: Ali Mani)

09:30 AM - 09:55 AM	Alberto Aliseda (U Washington)	Multiphysics spray control
09:55 AM - 10:20 AM	Olivier Desjardins (Cornell University)	Towards experimentally validated high fidelity simulations of liquid atomization in compressible environments
10:20 AM - 10:45 AM	Rohan Gejji (Purdue University)	Multiphase flow considerations for laser spark ignition in a model rocket combustor

10:45 AM - 11:15 AM – Coffee Break

Session 2 – Particle Laden Flows I (Session Chair: Shahab Mirjalili)

11:15 AM - 11:40 AM	Laura Villafane Roca (UIUC)	Particle dynamics from supersonic jet surface erosion
11:40 AM - 12:05 PM	S Balachandar (U Florida)	Machine learning and multiphase flow
12:05 PM - 12:30 PM	Jesse Capecehatro (U Michigan)	Turbulence transport in compressible gas-particle flows

12:30 PM - 01:45 PM – Lunch

Session 3 - Mathematical Formulations and Numerical Methods I
(Session Chair: David Salac)

01:45 PM - 02:10 PM	Eric Johnsen (U Michigan)	Accurate numerical simulations of gas/liquid interfaces with shocks: Imploding bubbles, high-speed droplets, and vortex rings
02:10 PM - 02:35 PM	Britton Olson (LLNL)	An immersed boundary method for multi-material flow in the presence of shocks using a higher order finite difference method
02:35 PM - 03:00 PM	Florian Schaefer (Georgia Tech)	Information geometric regularization of the barotropic Euler equation

03:00 PM – 03:15 PM – Coffee Break

Session 4 – Discussion on Benchmark Data for Compressible Multiphase Flows (Moderator: Sanjiva Lele)

04:30 PM – 05:30 PM – Poster Session

06:00 PM – 08:30 PM – Dinner (Faculty Club)

Tuesday, November 7th – Day 2

07:30 AM - 08:00 AM – Breakfast/Reception

Session 5 – Multiphase Reacting Flows (Session Chair: Paul Desjardin)

08:00 AM - 08:25 AM	Brian Bojko (NRL)	Reduced order models for compressible reacting flows using discontinuous Galerkin methods
08:25 AM - 08:50 AM	Josette Bellan (JPL)	Multi-species mixing in turbulent high-pressure flows
08:50 AM - 09:15 AM	Kareem Ahmed (U Central Florida)	Detonation and shock Induced breakup and atomization for high-speed propulsion

09:15 AM - 09:30 AM – Coffee Break

Session 6 – Liquid Atomization II (Session Chair: Rozie Zangeneh)

09:30 AM - 09:55 AM	David Salac (U Buffalo)	Shear induced atomization modeling from high speed flows
09:55 AM - 10:20 AM	Shahab Mirjalili (Stanford University)	Machine learning for secondary atomization
10:20 AM - 10:45 AM	Marco Arienti (Sandia National Lab)	Aero break-up of droplets in a ballistic wave system

10:45 AM - 11:00 AM – Coffee Break

Session 7 – Particle Laden Flows II (Session Chair: Makrand Khanwale)

11:00 AM - 11:25 AM	Rodney Fox (Iowa State University)	Eulerian two-fluid models for high-speed polydisperse gas-particle flow
11:25 AM - 11:50 AM	Spencer Bryngleson (Georgia Tech)	Stochastic sub-grid methods for multiphase flows at scale
11:50 AM - 12:15 PM	Jeremy Horwitz (LLNL)	Ejecta/Richmyer-Meshkov instability

12:15 PM - 01:30 PM – Lunch

Session 8 – Mathematical Formulation and Numerical Methods II (Session Chair: James Chen)

01:30 PM - 01:55 PM	Stefan Domino (Sandia National Lab)	Unstructured discretization approaches for low-Mach, multiphase volume of fluid formulations
01:55 PM - 02:20 PM	Peter Brady (LANL)	High order cut-cell methods
02:20 PM - 02:45 PM	Chad Meyer (LANL)	Challenges in multimaterial Eulerian hydrodynamics
02:45 PM - 03:10 PM	Mikhail Shashkov (LANL)	Moments-based interface reconstruction, remap and advection

03:10-03:30 – Closing and Adjourn

Workshop Information

Stanford Wireless Access:

Username: multiphase

Password: stanford

Website:

<https://insieme.stanford.edu/multiphaseflows>



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