

Track 8: Fluid Applications

Sponsor: Fluids Engineering Division

Topic 8-1: Aerospace (FMTC)

Organizers:

Javid Bayandor: bayandor@buffalo.edu

Bei Fan: fanbei1@msu.edu

Descriptions:

This topic focuses on complex aerospace flows that lead to enhanced designs in the aerospace industry and drive significant academic research. The symposium will cover broad topics such as fluid dynamics in aerospace, multi-physics dynamics including fluid-solid interactions, and multi-scale investigations with constitutive modeling. Key areas of focus include advancements in aeroacoustics, aerodynamics, aeroelasticity, propulsion, rocket combustion, structural dynamics, aerospace design optimization, flight mechanics, and space fluid systems.

Topic 8-2: Vehicle Flows (Automobile & Train) (FASTC)

Organizers:

Aarathi Sekaran: aarathi.sekaran11@gmail.com

Ravinder Yerram: ravinder1.yerram@ge.com

Descriptions:

This topic will focus on transient external flow past automobiles and trains - presentations on numerical methods and flow control applications related to such settings will also be accepted.

Topic 8-3: Fluid Machinery (FASTC)

Organizers:

Ernesto Primera: eprimera@udel.edu

Aarathi Sekaran: aarathi.sekaran11@gmail.com

Bruno Schiavello: brschiavello@gmail.com

Descriptions:

This topic will include presentations focused on the development and improvement of fluid-driven machinery, including its parts, such as fans, compressors, turbines and blowers.

Topic 8-4: Pumping Machinery (FASTC)

Organizers:

Tamy Guimaraes: guimaraes@psu.edu

Ernesto Primera: eprimera@udel.edu

Ravinder Yerram: ravinder1.yerram@ge.com

Descriptions:

This topic involves developments in pump-driven flows, such as turbopumps, axial and centrifugal pumps, multistage pumps, and others.

Topic 8-5: Turbomachinery (FASTC)

Organizers:

Tamy Guimaraes: guimaraes@psu.edu
Ernesto Primera: eprimera@udel.edu
Ravinder Yerram: ravinder1.yerram@ge.com

Descriptions:

This topic will include presentations on turbomachinery components including but not limited to seals, bearings, turbines spanning experimental and numerical studies.

Topic 8-6: Fluid Power Systems (FASTC, FMTC)

Organizers:

Alexandrina Untaroiu: alexu@vt.edu
Phillip M. Ligrani: pml0006@uah.edu
Javid Bayandor: bayandor@buffalo.edu

Descriptions:

This topic will focus on presentations on developments of fluid mechanics and fluid machinery used specifically for power generation, including systems-level improvements and control.

Topic 8-7: Fluid Structure Interaction (CFDTC, FMTC)

Organizers:

Deify Law: dlaw@csufresno.edu
Caleb Barnes: caleb.barnes.1@us.af.mil
Yuqing Liu: yliu1@bechtel.com
Bo Yin: yinbo@imech.ac.cn

Descriptions:

The topic addresses: 1) the study of multi-physics science and engineering problems involving fluid-structure interactions or fluid-thermal-structural interactions to include (but not limited to) aeroelasticity, vibrations, structural dynamics, stress analysis, thermal transients, and acoustics and 2) development of new and novel approaches to modeling fluid-structure interaction problems. Both CFD and experimental research are welcomed.

Topic 8-8: Manufacturing Processes (FASTC)

Organizers:

Ernesto Primera: eprimera@udel.edu
Aarthi Sekaran: aarthi.sekaran11@gmail.com

Descriptions:

This topic will showcase aspects of fluid flow behavior seen in manufacturing processes across a range of industries spanning traditional metalworking processes to semiconductor fabrication.

Topic 8-9 Plasma Flows (MFTC, FMITC)

Organizers:

Leitao Chen: Leitao.Chen@erau.edu

Jorge Ahumada Lazo: jahumadalazo@ccny.cuny.edu

Yang Liu: yliu7@ccny.cuny.edu

Descriptions:

Plasma, the fourth state of matter, the other three being solid, liquid, and gas, deals with charged particles (like ions and electrons). While plasma is a common topic in physics, particularly in theoretical contexts, our focus will be on its applications in multiphase flow systems, bridging the gap between fundamental studies and practical engineering applications. We invite both numerical and experimental studies. Submissions are encouraged on topics such as plasma engines, fusion reactor flows, plasma-laser interactions, micro/nano manufacturing, medical and bioengineering applications, hydrogen production, decarbonization processes, and anti-/de-icing technologies.