



# The 52<sup>nd</sup> Midwest Universities Fluid Mechanics Retreat MUFMECH 2025

April 10-12, 2025

Geneva Center, Rochester, Indiana

## PROGRAM



----- Friday, April 11 -----

7:30 – 8:25am **BREAKFAST**

**Session A:** Chair: Kaz Tajiri, MTU; KOTGOF: Scott Dawson, IIT

Talk	Time	Authors	School	Title
☞	8:25	Top Frog – J. Allen, MTU	☞	Opening Remarks
1	8:30	Martin Erinin	UM	Effects of Surfactants on Plunging Breaking Waves
2	8:45	Jamal Ardister	MSU	Modeling Fish-Like Locomotion With Nonholonomic Constraints: Validation and Comparison
3	9:00	Sathvik Bhat	UM	A filtered coarse-grain Euler–Lagrange approach for simulating fluidized particles
4	9:15	Kazuki Maeda	Purdue	Investigation on the microscopic dynamics of a reactive shock wave in a gaseous H <sub>2</sub> /O <sub>2</sub> mixture
5	9:30	Kayde Bowers	ISU	Advancing Toroidal Propellers: Performance, Efficiency, and Noise Insights
6	9:45	Anurag Rajan	MTU	Reduced-order modeling of low gravity liquid-vapor interfacial dynamics using a vortex sheet evolution equation
7	10:00	Qiwei Chen	UIUC	Dynamics of a data-driven low-dimensional model of Rayleigh–Bénard convection

10:15 – 10:35am **COFFEE**

**Session B:** Chair: Terry Conlisk, OSU; KOTGOF: Andrew Oliva, ND

Talk	Time	Authors	School	Title
8	10:35	Douglas Carter	IIT	Sweeping motions in homogeneous turbulence
9	10:50	Isaac Lewis	UIUC	Data-driven modeling of two-dimensional dispersive falling films
10	11:05	Jincheng Wang	ISU	A machine learning prediction of the transient ice accretion process on a wind turbine blade
11	11:20	Andrew Oliva	ND	Thermodynamically Derived Pressure Evolution Equation
12	11:35	Ross Cruikshank	MSU	An examination of the flow-induced vibrations of rectangular cylinders using energy maps
13	11:50	Kiran Digavalli	ISU	A study to Explore Bi-Phillic Coatings for Aircraft Anti-/De-Icing

12:05 – 1:30pm **LUNCH**, Steering Committee Meeting

**Session C:** Chair: Tianshu Liu, WMU; KOTGOF: Kishan Bellur, UC

Talk	Time	Authors	School	Title
14	1:30	William Schultz	UM	Pucker up
15	1:45	Jeffrey Allen	MTU	Predicting Trapped Saturation
16	2:00	Ahmed El-Nadi	IIT	Galerkin Projection Reduced Order Model of Turbulent Duct Flow
17	2:15	Yilin Lei	MSU	Thermal Analysis of a Diamond Microchannel Heat Sink
18	2:30	Biruk Teka Gidreta	UM	Polygonal liquid patterns on non-wetting microstructured surfaces
⚡	2:45	Lightning Talks Session 1: Maximum 4 minutes, 3 slides each	UC	Unmeelan Chakrabarti: Understanding liquid-vapor interfacial mass transport using molecular dynamics
⚡			IIT	Jonathon Horak: Design and Optimization of Compliant Mechanical Amplifiers for Active Flow Control
⚡			IIT	Sasindu Pinto: Analysis of Vortices in APG-induced Turbulent Separation Bubbles
⚡			MTU	Goutham Viyyapu: Micro Vortex Generators Optimization for Shock Wave-Boundary Layer Control
⚡			UM	Haotian Xie: Imaging Ureter Performance
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3:15– 5:30pm **R & R, Group Photograph, Table Tennis**

5:30– 6:30pm **DINNER**

**Session D: Chair: Bill Schultz, UM; KOTGOF: Ahmed Naguib, MSU**

Talk	Time	Authors	School	Title
19	6:30	Kishan Bellur	UC	Exploring Two-Dimensional Flows in Evaporating Thin Films: A Step Towards a Dynamic Model
20	6:45	Loren Hahn	ND	Quasi-One-Dimensional Modelling of Highly Three-Dimensional Supersonic Flows
21	7:00	Steve Wereley	OU	Teasing out the noise from the noise with machine learning
22	7:15	Syed Assiql Haque	ISU	An Experimental Study of Thermal Flow Characteristics inside a DBD Plasma Reactor for Plastic Upcycling
⚡	7:30	Lightning Talks Session 2: Maximum 4 minutes, 3 slides each	UL	Stuart Williams: Science Olympiad Wind Power with my daughter
⚡			PUNW	David Cambell, Investigating Helium gas injection in supersonic flow
⚡			UC	Saaras Pakanati, Multiscale Simulation of Evaporation in Cryogenic Fuels
⚡			UM	Tomasz Kulakowski, TBD
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8:00 – 11:00pm **Evening Social Gathering at Butler Lodge**

----- **Saturday, April 12** -----

7:30 – 8:25am **BREAKFAST**

**Session E: Chair: Kazuki Maeda Purdue; KOTGOF: Steve Wereley, OU**

Talk	Time	Authors	School	Title
☺	8:25	Top Frog	☺	Announcements and Remarks
23	8:30	Tomasz Kulakowski	UM	Pool boiling on hierarchically engineered micro structures
24	8:45	Fathima Farheen Nambipunnilath Siddique	MTU	Quantifying the topological complexity in turbulent flows
25	9:00	Victor Jimenez Fernandez	IIT	Methods for discovering causal mechanisms in unsteady and chaotic fluid flows
26	9:15	Majed Wardeh	UC	A RANS Study on Shear Stress Over Non-Homogenous Terrain in a Thermally Stable Atmospheric Boundary Layer
27	9:30	Thinnesh Ragupathy	WMU	An investigation of Skin – Friction & Pressure Fields on NASA’s FAITH Hill model.
28	9:45	Amirhosein Sarchami	UC	Utilizing Temperature-Sensitive Wettability for Flow Control in Porous Materials
29	10:00	Rizwan Ullah	Purdue	Scatterer-Induced Resonances for Pressure Nodes Formation in Acoustic Cavities

10:15 – 10:35am **COFFEE**

**Session F: Chair: Tomasz Kulakowski, UM ; KOTGOF: Stuart Williams, UL**

Talk	Time	Authors	School	Title
30	10:35	Tianshu Liu	WMU	Photogrammetry for 3D PIV
31	10:50	Carlos Valentin	ISU	An Experimental Study on the Rain-Erosion Characteristics of Anti-Icing Coatings for UAV Inflight Icing Mitigation
32	11:05	Min-Lin Tsai	IIT	Predicting Two-Point Statistics in Turbulent Channel Flow Using Sparsity-Promoting Resolvent Analysis
33	11:20	Vincent DiFilippo	ND	Experimental and Numerical Characterization of the Performance of a Transonic Axial Compressor Subject to Inlet Distortion
34	11:35	Young Jin Lee	UM	Wrapping layer characterization for quantifying lubricant depletion on SLIPS

11:50pm – 1:30pm **CLOSING REMARKS, LUNCH**