



The 51st Midwest Universities Fluid Mechanics Retreat MUFMECH 2024

April 11-13, 2024

Geneva Center, Rochester, Indiana

PROGRAM



----- Friday, April 12 -----

7:30 – 8:25am **BREAKFAST**

Session A: Chair: S. Dawson; KOTGOF: S. Morris

Talk	Time	Authors	School	Title
	8:25	Top Frog		Opening Remarks
1	8:30	K. Figueroa-Ibrahim, S. Morris	ND	Design and testing of acoustic-to-flow energy conversion devices
2	8:45	T. Liu	WMU	Can lift be generated in steady inviscid flow?
3	9:00	A. Dhulipalla, A. Samad, H. Hu	ISU	An experimental study on the detrimental effects of rainfall on a drone propeller
4	9:15	H. Sista, A. Dhulipalla, H. Hu, A. Kumar, H. Hu	ISU	An experimental study on the detrimental effects of rainfall on the aerodynamic performance of a wind turbine blade model
5	9:30	R. Cruikshank, P. Lavoie	MSU	Wake three-dimensionality of profiled blunt trailing edge bodies with varying chord length
6	9:45	A. Mohit, J. Stolzman, M. Wooldridge, J. Capecealatro	UM	A computational study of flame blow-off in waste gas flares using a flamelet progress variable approach
7	10:00	S. Roy	WMU	Detailed mechanism generation and reduction of oxygenated fuel for multidimensional simulation

10:15 – 10:35am **COFFEE**

Session B: Chair: T. Conlisk; KOTGOF: S. Wereley

Talk	Time	Authors	School	Title
8	10:35	S. Dasgupta	UC	Effect of hydrophobicity on optical transmission through sessile water droplet undergoing solidification
9	10:50	U. Chakrabarti, K. Bellur, J. Allen	UC	Explicating assumptions in phase change models using International Space Station (ISS) data
10	11:05	T. Kim, E. Esmaili, S. Milind Athalye, <i>et al.</i>	PU	Acoustofluidic device focusing viral nanoparticles for Raman microscopy
11	11:20	U. Sharma, J. Allen	MTU	Understanding particle distribution in nanofluids due to thermophoresis
12	11:35	A. EL-Nadi, S. Dawson	IIT	Prediction of secondary mean flow in turbulent ducts using Galerkin projection models
13	11:50	V. Shah, H. Jung, S. Cheng, P. Fischer, L. Chamorro	UIUC	1) Turbulent boundary layer over standing waves. 2) Model reduction for fluid flows

12:10 – 1:30pm **LUNCH**, Steering Committee Meeting

Session C: Chair: T. Liu; KOTGOF: C. Wark

Talk	Time	Authors	School	Title
14	1:30	K. Bowers, M. Rahman, J. Wang, A. Samad, <i>et al.</i>	ISU	An experimental study of polydisperse fine particles removal using an impinging supersonic air jet
15	1:45	D. Moussa, T. Ragupathy, C. Fajardo-Hansford, T. Liu	WMU	Self-similarity of obliquely impinging jet heat flux fields in a range of the Mach numbers from 0.1 to 1.0
16	2:00	A. Gautam, R. Mejia Alvarez, D. Livescu	MSU	Growth of coherent motions within a single stream shear layer: 4D-PTV measurements
17	2:15	B. Tao, Z. Chen, S. Wereley	PU	Ramp approach in 3D defocusing particle tracking
18	2:30	C. Park, K. Turner	LTU	Direct velocity measurements of a hydrodynamically confined microflow
19	2:45	S. Pinto, M. Aghaeijouybari, <i>et al.</i>	IIT	Experimental analysis of refraction in porous materials
⚡	3:00	Lightning Talks Session 1: Maximum 4 minutes, 3 slides each	IIT	Designing a subsonic cavity flow tunnel
⚡			IIT	Kinematic decomposition of volumetric multi-pulse particle tracking velocimetry data
⚡			MSU	Quantum dot thermometry
			PU	Deep particle diffusometry-v2: improving performance of deep learning-based particle diffusometry algorithms by optimizing their training
⚡			UIUC	Desing of optimized manifold for uniform flow at low Reynolds number

3:20– 5:30pm **R & R, Group Photograph, Table Tennis**

5:30– 6:30pm **DINNER**

Session D: Chair: B. Schultz; KOTGOF: S. Williams

Talk	Time	Authors	School	Title
20	6:30	N. Mirzaeian, B. Palmer, T. Gao	MSU	Elucidating interfacial instability of apolar active suspensions
21	6:45	A. Rajan, J. Allen, K. Bellur	MTU	Modeling of liquid-vapor interfacial dynamics using a vortex sheet evolution equation
22	7:00	T. Kulakowski, S. Adera	UM	Is there an optimal contact angle of condensation?
23	7:15	A. Yasin, K. Bellur	UC	Modeling evaporation without tuning
24	7:30	H. Xie, K. Kalayeh, B. Schultz	UM	A new inverse method for determining ureter peristalsis
⚡	7:45	Lightning Talks Session 2: Maximum 4 minutes, 3 slides each	UM	Have you tuned up your ureter lately?
⚡			MSU	Advancements in hypersaline wastewater treatment: the promise of quasi-liquid surfaces to reduce salt scaling
⚡			PU	Reciprocal theorem for shear thinning flows in deformable channel
⚡			PU	Particle motion nearby electrode under alternating electric field in electrolyte
⚡			IIT	Co-flow jet optimization
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8:15 – 11:00pm **Evening Social Gathering at Butler Lodge**

----- **Saturday, April 13** -----

7:45 – 8:25am **BREAKFAST**

Session E: Chair: K. Tajiri; KOTGOF: D. Olson

Talk	Time	Authors	School	Title
☞	8:25	Top Frog	☞	Announcements and Remarks
25	8:30	K. Digavalli, H. Sista, A. Kumar, A. Samad, H. Hu	ISU	Unsteady heat transfer characteristics of aircraft anti-/de-icing with continuous and pulsed surface heating
26	8:45	A. Kumar, K. Digavalli, H. Hu, H. Hu	ISU	An experimental investigation on ice accretion characteristics over a heated airfoil surface upon the impacting of ice crystals
27	9:00	Y. Liu, B. Li	PNW	Hovering hawkmoths exploit unsteady circulation to produce aerodynamic force
28	9:15	A. Oliva, J. Szcudlak, A. Jemcov, S. Morris	ND	Entropy transport for quasi-one-dimensional flow
29	9:30	M. Remer, X. Chen, B. Teka, S. Adera	UM	Water drop friction on the hemi-solid hemi-liquid surfaces
30	9:45	K. Chaudhuri, J. Pham	UC	Temperature dependent soft wetting on polymer melts
31	10:00	L. Hao, B. Fan	MSU	Unraveling the influence of polymer brush thickness on droplet impact behavior on quasi-liquid slippery surfaces

10:15 – 10:35am **COFFEE**

Session F: Chair: H. Hu; KOTGOF: K. Bellur

Talk	Time	Authors	School	Title
32	10:35	T. Kailu, R. Mejia Alvarez, S. Arshad, <i>et al.</i>	MSU	Arterial hemorrhage model creation from a porcine in-vivo comparator – A table top simulator
33	10:50	S. Bhat, J. Capecehatro	UM	A new formulation for simulating gas-particle flows
34	11:05	L. Hahn	ND	Unsteady simulation of passive mass-exchanging unstart control in an isolator
35	11:20	M. Hamid, K. Smith	UIUC	A transient theory for solute transport through redox flow battery electrodes in the creeping flow regime
36	11:35	T. Mahajani	UC	Experimental and numerical investigation of isothermal bubbling in shear-thinning liquids
37	11:50	V. Do, E. Reale, I. Loud IV, P. Rozzi, <i>et al.</i>	UIUC	Embedded micro-interdigitated flow fields for efficient intercalation-based desalination at seawater scale

12:05pm – 1:30pm **CLOSING REMARKS, LUNCH**