

## Krishanu Kumar

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<b>PROFESSIONAL EXPERIENCE</b>	<b>Postdoctoral Research Fellow</b> Department of Mechanical Engineering, University of Michigan, Ann Arbor, MI	Aug 2025 - present
	<b>Senior Researcher</b> Department of Mechanical Engineering, Tel Aviv University, Tel Aviv-Yafo, IL	May 2025 - Jul 2025
	<b>Ph.D. Researcher</b> Department of Mechanical Engineering, Tel Aviv University, Tel Aviv-Yafo, IL	Mar 2020 - Apr 2025
	<b>Research Project Associate</b> Department of Metallurgical and Materials Engineering, Indian Institute of Technology Madras, Chennai, TN	Jun 2019 - Feb 2020
<b>EDUCATION</b>	<b>Tel Aviv University</b> , Tel Aviv, IL <i>Thesis: 'Young Wind-Waves in the Presence of Current'</i> <i>M.Sc. + PhD.</i> , Mechanical Engineering, 2020-2025	Percentage: 94.80%
	<b>SRM Institute of Science and Technology</b> , Chennai, TN <i>B.Tech</i> , Mechanical Engineering, 2015-2019	Percentage: 86.32%
<b>JOURNAL PAPERS</b>	<b>K. Kumar</b> and L. Shemer, <i>Laboratory study of the effect of mean water current on the evolution of young wind waves</i> , J. Fluid Mech., 996, A21 2024	
	<b>K. Kumar</b> and L. Shemer, <i>Spatial growth rates of young wind waves under steady wind forcing</i> , J. Fluid Mech., 984, A22, 2024	
	<b>K. Kumar</b> , M. Geva, and L. Shemer, <i>Turbulent Boundary Layer Profiles in Air-flow over Young Wind Waves in Co- and Counter-Wind Water Current</i> , Int. J. Heat Fluid Flow, 103, 109210, 2023	
	S. K. Singh, <b>K. Kumar</b> , S. V. Singh, and P. Kumar, <i>Investigation of the effect of vibrating flange on flow characteristics of diffuser augmented wind turbine</i> , Int. J. Fluid Mech. Res., 50, 1-12, 2023	
	<b>K. Kumar</b> , S. K. Singh, and L. Shemer, <i>Directional characteristics of spatially evolving young waves under steady wind</i> , Phys. Rev. Fluids, 7, 014801, 2022	
	<b>K. Kumar</b> , A. Freshtman, D. Barnea, and L. Shemer, <i>Evolution of waves in a horizontal pipe propagating on a surface of a liquid film sheared by gas</i> , Phys. Fluids, 33, 062115, 2021	
	V.T. Mantripragada, <b>K. Kumar</b> , P. Kumar, and S. Sarkar, <i>Modeling of powder production during centrifugal atomization</i> , J. Sustain. Metall., 7, 620-629, 2021	
	<b>K. Kumar</b> and P. Kumar, <i>Effect of groove depth on hydrothermal characteristics of rectangular microchannel heat sink</i> , Int. J. Thermal Sc., 161, 106730, 2021	
	<b>K. Kumar</b> , P. Kumar, and S. K. Singh, <i>Aerodynamic performance optimization of multiple slat airfoil based on multi-objective genetic algorithm</i> , Arab. J. Sci. Eng., 46, 7411-7422, 2021	

**K. Kumar**, P. Kumar, and S. K. Singh, *Study on hydrothermal characteristics of a circular microchannel with varying circular and rectangular groove*, Nano Sci. Technol. Int. J., 12, 65-80, 2021

**K. Kumar**, P. Kumar, and S. K. Singh, *Passive control of boundary layer separation using single and multiple slats on the airfoil*, Int. J. Fluid Mech. Res., 48, 17-28, 2021

#### SUBMITTED PAPERS

**K. Kumar** and L. Shemer, *Shear flow instability analysis of young wind waves: coupled air-water Orr-Sommerfeld framework guided by experiment*, under review.

#### CONFERENCES

**K. Kumar** and M. A. Erinin, *Residence time of droplets generated by breaking waves*, 78<sup>th</sup> Annual Meeting of the Division of Fluid Dynamics, 2025, USA.

L. Shemer and **K. Kumar**, *The effect of surface roughness induced by mean turbulent water flow on excitation of waves by wind*, 77<sup>th</sup> Annual Meeting of the Division of Fluid Dynamics, 2024, USA.

**K. Kumar** and L. Shemer, *Wind waves evolution in presence of current under impulsive wind forcing*, 1<sup>st</sup> European Fluid Dynamics Conference (EFDC), 2024, Germany.

L. Shemer and **K. Kumar**, *On direct measurements of growth rates of fetch-limited young wind waves*, 1<sup>st</sup> European Fluid Dynamics Conference (EFDC), 2024, Germany.

L. Shemer and **K. Kumar**, *Spatial Evolution of young wind waves under steady wind forcing*, ICTAM-2024, Korea.

**K. Kumar** and L. Shemer, *On spatial evolution of young wind waves under steady-wind forcing in presence of current*, Wind waves in the earth system (WISE)-2024, France.

L. Shemer and **K. Kumar**, *Effect of mean current on spatial evolution and directional spreading of young wind-waves*, 3rd International Workshop on Waves, Storm Surges, and Coastal Hazards, 2023, USA.

**K. Kumar** and L. Shemer, *Direct estimates of wind-wave growth rates by single-point measurements*, Wind waves in the earth system (WISE)-2023, USA.

M. Geva, **K. Kumar**, and L. Shemer, *The Turbulent Boundary Layer in Air Over Young Wind-Wave in Co- and Counter-Wind Water Current*, Wind waves in the earth system (WISE)-2023, USA.

**K. Kumar** and L. Shemer, *Young wind waves on along- and counter-wind current*, European fluid mechanics conference (EFMC) 14, 2022, Greece.

**K. Kumar**, S. K. Singh, and L. Shemer, *Measurements of directional wave spectra in a wind-wave tank*, Wind waves in the earth system (WISE)-2022, France.

V.T. Mantripragada, **K. Kumar**, P. Kumar and S. Sarkar, *Modeling of powder production during centrifugal atomization*, Molten-2020+1, Korea

J. Barode, **K. Kumar**, V.T. Mantripragada, L. Sahoo, M. Mukherjee, L. Neelakantan, and S. Sarkar, *Fluidization of red mud fines in a reduction atmosphere: recovery of Fe*, INALT-2020, India (Paper Presentation)

V.T. Mantripragada, **K. Kumar**, P. Kumar, and S. Sarkar, *Modeling of droplet formation during centrifugal atomization process*, The first India-Japan Workshop on Science and Technology in Ironmaking and Steelmaking-2019, Japan

## PROJECTS

An analytical approximation of the wall-jet in a moving stream  
Turbulent characteristics, time scales, and correlation in a combined wave-current flow  
Gravity waves retrieval from sea surface elevation images using convolution neural network  
Numerical and experimental investigation of modified blade design  
Study on drag reduction over an airfoil using slats  
Drag reduction using plasma actuator

## AWARDS

**KLA Scholarship for Excellence**, 2022, Tel Aviv University  
**Excellence Scholarship Award**, 2021, Tel Aviv University  
**University Rover Challenge, USA-2019** World Rank: 11<sup>th</sup>  
**University Rover Challenge, USA-2017** World Rank: 20<sup>th</sup>  
**University Rover Challenge, USA-2016** World Rank: 9<sup>th</sup>

## REVIEWER TO

Physical Review Fluids, Physic of Fluids, Ocean Engineering, Journal of Sustainable Metallurgy, Journal of Thermophysics and Heat Transfer

## SOFTWARE

**Programming:** Matlab, Maple, Python, C, C++  
**Simulation:** Ansys Fluent, Comsol Multiphysics, OpenFOAM  
**Design:** Catia V5, Solidworks, Fusion 360, PTC Creo, AutoCAD

## SKILLS

In-line Holography  
Particle Image Velocimetry (PIV)  
Particle Tracking Velocimetry (PTV)  
High-speed imaging  
Flow visualization in Wind Tunnel  
Experimental analysis of Iron ore reduction in Fluidization furnace  
Computational Fluid Dynamics (CFD)  
Computer Aided Designing (CAD)

Krishanu Kumar  
September 22, 2025