

Unit Name

Complex Fluids and Flows Unit

Collaborations

Daulet Izbassarov, Finnish Meteorological Institute, Finland, Viscoelastic duct flows
Luca Brandt, Politecnico of Torino, Italy, Two-fluid systems
Guido Boffetta, University of Torino, Italy, Turbulent particle suspensions
Stefano Musacchio, University of Torino, Italy, Turbulent particle suspensions
Pinaki Chakraborty, OIST, Japan, Turbulent flows over rough walls
Marco Terenzio, OIST, Japan, Tracking of neurons
Amy Shen, OIST, Japan, Rheology of elastoviscoplastic fluids
Naoki Takeishi, Kyushu University, Japan, Red blood cells dynamics in confined geometries
Gustavo Gioia, OIST, Japan, Rayleigh-Taylor turbulence
Dhrubaditya Mitra, NORDITA, Sweden, Polymeric turbulence
Parisa Mirbod, University of Illinois at Chicago, United States of America, Particle laden duct flows with porous walls
Andrea Mazzino, University of Genova, Italy, Ocean waves
Lauren Sallan, OIST, Japan, Hydrodynamics of extinct fishes
Vincent Laudet, OIST, Japan, Hydrodynamics of clown fishes
Cristian Marchioli, University of Udine, Italy, Flexible fibers in turbulence
Gautier Verhille, CNRS, France, Flexible fibers in turbulence
Outi Tammissola, KTH Royal Institute of Technology, Sweden, Elastoviscoplastic flows
Paola Laurino, OIST, Japan, Droplet dynamics in liquid-liquid systems
Alfredo Pinelli, City St. George University of London, United Kingdom, Control of canopy flows
Riccardo Vinuesa, KTH Royal Institute of Technology, Sweden, Control of airborne virus transmission
Giorgio Besagni, Politecnico di Milano, Italy, Bubble columns

Research Personnel

Piyush Garg, Postdoctoral Scholar
Rahul Kumar Singh, Postdoctoral Scholar
Aswathy Mukundan Sajila, Postdoctoral Scholar
Vishnu Ravindran, Postdoctoral Scholar, POC project at OIST
Giovanni Soligo, Postdoctoral Scholar
Alessandro Chiarini, Postdoctoral Scholar

Koseki Morie, PhD Student

Simone Tandurella, PhD Student

Mohamed Shoieb Mohamed Abdelgawad, PhD Student

Giulio Foggi, PhD Student

Jean-Paul van, PhD Student

Christian Amor, PhD Student

Scholarly Contributions and Creative Productions (by Faculty)

Journal Article

1. Aswathy, M. S.; Rosti, M. E.
The Dynamics of Fibres Dispersed in Viscoelastic Turbulent Flows. *Journal of Fluid Mechanics* 2024, 984, A72.
2. Takeishi, N.; Rosti, M. E.; Yokoyama, N.; Brandt, L.
Viscoelasticity of Suspension of Red Blood Cells under Oscillatory Shear Flow. *Physics of Fluids* 2024, 36, 041905.
3. Foggi Rota, G.; Koseki, M.; Agrawal, R.; Olivieri, S.; Rosti, M. E.
Forced and Natural Dynamics of a Clamped Flexible Fiber in Wall Turbulence. *Physical Review Fluids* 2024, 9, L012601.
4. Martin, J. A.; Rosti, M. E.; Le Clainche, S.; Navarro, R.; Vinuesa, R.
Direct Numerical Simulations of a Novel Device to Fight Airborne Virus Transmission. *Physics of Fluids* 2024, 36, 023352.
5. Chiarini, A.; Cannon, I.; Rosti, M. E.
Anisotropic Mean Flow Enhancement and Anomalous Transport of Finite-Size Spherical Particles in Turbulent Flows. *Physical Review Letters* 2024, 132, 054005.
6. Brizzolara, S.; Naudascher, R.; Rosti, M. E.; Stocker, R.; Boffetta, G.; Mazzino, A.; Holzner, M.
Immiscible Rayleigh–Taylor Turbulence: Implications for Bacterial Degradation in Oil Spills. *Proceedings of the National Academy of Sciences* 2024, 121, e2311798121.
7. Singh, R. K.; Perlekar, P.; Mitra, D.; Rosti, M. E.
Intermittency in the Not-so-Smooth Elastic Turbulence. *Nature Communications* 2024, 15, 4070.
8. Cannon, I.; Soligo, G.; Rosti, M. E.
Morphology of Clean and Surfactant-Laden Droplets in Homogeneous Isotropic Turbulence. *Journal of Fluid Mechanics* 2024, 987, A31.
9. Dindo, M.; Bevilacqua, A.; Soligo, G.; Calabrese, V.; Monti, A.; Shen, A. Q.; Rosti, M. E.; Laurino, P.
Chemotactic Interactions Drive Migration of Membraneless Active Droplets. *Journal of the American Chemical Society* 2024, 146, 15965–15976.
10. Chiarini, A.; Rosti, M. E.
Finite-Size Inertial Spherical Particles in Turbulence. *Journal of Fluid Mechanics* 2024, 988, A17.
11. Amor, C.; Soligo, G.; Mazzino, A.; Rosti, M. E.
The 2.5-Dimensional Turbulence in Shear-Thinning Jets. *Journal of Fluid Mechanics* 2024, 999, A102.
12. Foggi Rota, G.; Amor, C.; Le Clainche, S.; Rosti, M. E.
Unified View of Elastic and Elasto-Inertial Turbulence in Channel Flows at Low and Moderate Reynolds Numbers. *Physical Review Fluids* 2024, 9, L122602.
13. Abdelgawad, M.; Haward, S. J.; Shen, A. Q.; Rosti, M. E.

- The Interplay of Plasticity and Elasticity in Elastoviscoplastic Flows in Wavy Channels. *Physics of Fluids* 2024, 36, 113127.
14. Soligo, G.; Rosti, M. E.
Laminar Planar Jets of Elastoviscoplastic Fluids. *Journal of Non-Newtonian Fluid Mechanics* 2024, 333, 105322.
 15. Cannon, I.; Olivieri, S.; Rosti, M. E.
Spheres and Fibers in Turbulent Flows at Various Reynolds Numbers. *Physical Review Fluids* 2024, 9, 064301.
 16. Abdelgawad, M.; Haward, S. J.; Shen, A. Q.; Rosti, M. E.
From Yield Stress to Elastic Instabilities: Tuning the Extensional Behavior of Elastoviscoplastic Fluids. *PNAS Nexus* 2024, 3, pgae227.
 17. Chiarini, A.; Rosti, M. E.; Mazzino, A.
Dynamics and Applications of Finite-Size Fibre-like Objects in Turbulent Flows. *European Journal of Mechanics - B/Fluids* 2024, 108, 104–118.
 18. Foggi Rota, G.; Monti, A.; Olivieri, S.; Rosti, M. E.
Dynamics and Fluid–structure Interaction in Turbulent Flows within and above Flexible Canopies. *Journal of Fluid Mechanics* 2024, 989, A11.

Seminars

1. Rosti, M. E.
Review of Recent Research on Elastic Turbulence. 2024.

Honors, Awards & Fellowships

2024-12-31 Outstanding Reviewers 2023, Outstanding Reviewers 2023, 2024, *Journal of Fluid Mechanics*

Honors, Awards & Fellowships (only by unit members)

2025-09-01 Morie Koseki, Scholarship to attend the European Drag Reduction and Flow Control Meeting 2024, Scholarship to attend the European Drag Reduction and Flow Control Meeting 2024, 2024, ERCOFTAC

2024-12-01 Giulio Foggi Rota, Young Researchers' Award for Excellent Presentations, Young Researchers' Award for Excellent Presentations, 2024, Japanese Society of Fluid Mechanics

2024-09-01 Giulio Foggi Rota, Scholarship to attend the European Drag Reduction and Flow Control Meeting 2024, Scholarship to attend the European Drag Reduction and Flow Control Meeting 2024, 2024, ERCOFTAC

2024-07-01 - Ongoing Christian Amor, Scholarship to attend the International HPC Summer School 2024, Scholarship to attend the International HPC Summer School 2024, 2024, RIKEN

External Service

2023-01-01 Editor, *Results in Engineering*

2022-01-01 - Ongoing Associate Editor, *European Journal of Mechanics - B/Fluids*

Outreach Activities (For Unit Members Only)

2025-03-01 Giulio Foggi Rota, SEED program

2025-03-01	Giulio Foggi Rota & Morie Koseki, Technical Lab tour for high-school students from Kyushu
2025-02-01	Mohamed Abdelgawad & Christian Amor & Giulio Foggi Rota & Morie Koseki & Vishnu Ravindran & Simone Tandurella, Help at the OIST Science Festival
2024-12-01	Christian Amor & Giulio Foggi Rota, Meet PhD students from Kitakyushu University and Kyushu Institute of Technology
2024-11-01	Christian Amor & Morie Koseki & Simone Tandurella, Technical Lab tour for the "Gel Symposium"
2024-10-01	Christian Amor & Giulio Foggi Rota & Morie Koseki & Simone Tandurella, Technical Lab tour for the "52nd Symposium of Visualization"
2024-10-01	Morie Koseki, Talk about career and research to Japanese students from Hiroshima Kyoso Junior & Senior High School
2024-10-01	Simone Tandurella & Christian Amor, Researcher Appreciation Month
2024-09-01	Morie Koseki, Meet with a PhD candidate who is the son of the Vice President for Research at Kochi University

Workshops and Seminars (Organized and Hosted by Faculty/Units)

Speaker Name(s)	Title	Location	Co-Organizers	Date
Samridhhi Sankar Ray / International Center for Theoretical Sciences - Tata Institute of Fundamental Research, India	How Universal is Turbulence?	OIST		2025-03-11
Dr. Damir Juric / CNRS, France & Cambridge University, UK	Recent progress in computing complex multiphase flows	OIST		2024-12-02
Prof. Yuichi Murai / Hokkaido University, Japan	Alternation of turbulent boundary layer with bubble injection	OIST		2024-10-29
Dr. Gautier Verhille / CNRS researcher at IRPHE Marseille, France	Dynamics of long fibers in turbulent flow	OIST		2024-10-28
Prof. Cristian Marchioli / University of Udine, Italy	Dynamics of slender flexible fibers in turbulent channel flow: A DNS-based Euler-Lagrange study	OIST		2024-10-28
Prof. Shintaro Takeuchi / Osaka University, Japan	Envelope boundary condition for a flow above the surface of canopy	OIST		2024-09-03
Dr. Emanuele Gallorini / Politecnico di Milano, Italy	Travelling waves in the pipe flow: a short ride on open questions	OIST		2024-08-02
Associate Prof. Izumi Saito / Nagoya Institute of Technology, Japan	Modulation of turbulent fluctuations by small particles	OIST		2024-07-29

Speaker Name(s)	Title	Location	Co-Organizers	Date
Luca Biferale (University of Tor Vergata & INFN, Italy) Emily Ching (The Chinese University of Hong Kong, Hong Kong) Rama Govindarajan (International Centre for Theoretical Sciences, India) Ellen Longmire (University of Minnesota, USA) Eckart Meiburg (University of California Santa Barbara, USA) Alain Pumir (Ecole Normale Supérieure de Lyon, France) Chao Sun (Tsinghua University, China) Bruce Sutherland (University of Alberta, Canada) Federico Toschi (Eindhoven University of Technology, Netherlands) Aiko Yakeno (Tohoku University, Japan), Gustavo Gioia (OIST), Marco Rosti (OIST), Amy Shen (OIST)	Current Advances in Turbulence and multiphase flowS - 24CATS	OIST, Seaside House and Sydney Brenner Lecture Theater	Mahesh Bandi (OIST), Pinaki Chakraborty (OIST)	2024- 04-16