



MADRAS 2025

**Mixing And Dispersion in
Rotating And Stratified flows**

February 12-16, 2025

IIT Madras

MADRAS 2025 - Mixing and Dispersion in Rotating and Stratified Flows

Event	Day 1 (12 Feb)	Day 2 (13 Feb)	Day 3 (14 Feb)	Day 4 (15 Feb)	Day 5 (16 Feb)
09:00-10:30	Eric D'Asaro (University of Washington, USA) (Online)	Arjun Jagannathan (IIT Madras)	Eric D'Asaro (University of Washington, USA) (Online)	Mohamed Houssem Kasbaoui (ASU, USA)	Philippe Odier (ENS de Lyon, France)
10:30-11:00	Tea Break	Tea Break	Tea Break	Tea Break	Tea Break
11:00-12:30	Alain Pumir (CNRS-ENS de Lyon, France)	Alain Pumir (CNRS-ENS de Lyon, France)	Philippe Odier (ENS de Lyon, France)	Kannabiran Seshasayanan (IIT Madras)	Mohamed Houssem Kasbaoui (ASU, USA)
12:30-14:30	Lunch	Lunch	Lunch	Lunch	Lunch
14:30-16:00	ECR talks	ECR talks	ECR talks	ECR talks	ECR talks
14:30-14:45	Dipti Ranjan Parida (ICTS-TIFR)	Mayank Kumar Bijay (ICTS-TIFR)	Shipra Verma (IIT KGP)	Rajarshi Chattopadhyay (ICTS-TIFR)	Aditya Chaudhary (SAC-ISRO)
14:45-15:00	Abhilash Kokkiralala (IIT Madras)	Liza Verma (IIT Kanpur)	Harishankar Muppirala (IIT Madras)	Sanjay CP (ICTS-TIFR)	Anoop Pavithran (IIT Madras)
15:00-15:15	Lohit Kaval (IIT Bombay)	Swamali Dhar (IIT Madras)	Shehal Patil (IIT KGP)	Arshdeep Singh (IIT Madras)	Prabhash Kumar (IIT Madras)
15:15-15:30	Anu V S Nath (IIT Madras)	Srikumar Warrier (IIT Madras)	Himanshu Mishra (IIT Madras)	Sai Saandeeep (IIT Madras)	Abhiram DS (IIT Madras)
15:30-15:45	Chandra Shekhar Lohani (IIT KGP)	Peddi Harish Teja (IIT Madras)	Lijin Jayan (IIT Madras)	Deekshith Poojary (IIT Madras)	Shraddha Mandloi (IIT Madras)
15:45-16:30	Tea Break + Poster Session	Tea Break + Poster Session	Tea Break + Poster Session	Tea Break + Poster Session	Tea Break + Poster Session
16:30-18:00	Invited Talks	Invited Talks	Invited Talks	Invited Talks	Invited Talks
16:30-17:00	Vishal Vasan (ICTS-TIFR)	Cristian Marchioli (University of Udine, Italy)	Jim Thomas (ICTS-TIFR)	Basanta Kumar Jena (NIOT)	Partha Sarathi Goswami (IIT Bombay)
17:00-17:30	Prasad Perlekar (TCIS- TIFR)	Nairita Pal (IIT KGP)	Shivsai Dixit (IITM Pune)	Neeraj Aganwal (SAC-ISRO) (Online)	Jossia Joseph K (NIOT)
17:30-18:00	Chandan Sarangi (IIT Madras)	S.Ravichandran (IIT Madras)	Rajaram Lakkaraju (IIT KGP)	Debasis Sengupta (ICTS-TIFR)	Anubhab Roy (IIT Madras)

Detailed program of the workshop

Day 1: Wednesday, Feb 12, 2025

Venue: IC&SR, TTJ Auditorium

8:30 - 9:00	Registration
8:45 - 9:00	Introduction to the workshop and Geophysical Flow Laboratory(GFL)
9:00 - 10:30	Pedagogical lecture 1 - <i>Fluid Dynamics of the Ocean</i> Eric D'Asaro (University of Washington, USA)
10:30 - 11:00	Tea break and Poster Sessions
11:00 -12:30	Pedagogical lecture 2 - <i>Lagrangian turbulence and particle transport</i> Alain Pumir (CNRS-ENS de Lyon)
12:30 - 14:30	Lunch
14:30-16:00	ECR talks (Early Career Researchers)
14:30 - 14:45	Dipti Ranjan Parida (ICTS) <i>Resonant and Non-Resonant Energy Transfers in Weakly Interacting Dispersive Waves</i>
14:45-15:00	Abhilash Kokkiralala (IIT Madras) <i>Near-Inertial Wave Energetics during post-monsoon in the Bay of Bengal: A modeling study</i>
15:00-15:15	Lohit Kayal (IIT Bombay) <i>Focussing of concentric free surface waves</i>
15:15-15:30	Anu V S Nath (IIT Madras) <i>A novel particle-induced instability of a simple shear flow</i>
15:30-15:45	Chandra Shekhar Lohani (IIT KGP) <i>Nonequilibrium Continuous Transition in a Fast Rotating Turbulence</i>
15:45 - 16:30	Tea break and Poster Sessions
16:30-18:00	Invited talks
16:30-17:00	Vishal Vasan (ICTS) <i>State and parameter estimation in fluid systems using observers</i>
17:00-17:30	Prasad Perlekar (TCIS- TIFR) <i>Understanding energy transfers in bubbly flows: KHM relation and filtering approaches</i>
17:30-18:00	Chandan Sarangi (IIT Madras) <i>Impact of urbanisation on extremes over megacities</i>

Day 2: Thursday, Feb 13, 2025

Venue: IC&SR, TTJ Auditorium

9:00 - 10:30	Pedagogical lecture 3 - Submesoscales and Ocean Mixing Arjun Jagannathan (IIT Madras)
10:30 - 11:00	Tea break and Poster Sessions
11:00 -12:30	Pedagogical lecture 4 - Lagrangian turbulence and multiparticle transport Alain Pumir (CNRS-ENS de Lyon)
12:30 - 14:30	Lunch
14:30-16:00	ECR talks (Early Career Researchers)
14:30 - 14:45	Mayank Kumar Bijay (ICTS) <i>Predicting submesoscale tracer dispersion with neural networks</i>
14:45-15:00	Liza Verma (IIT Kanpur) <i>Shallow water waves in Great lakes with island</i>
15:00-15:15	Swarnali Dhar (IIT Madras) <i>Dynamics of mixing in the upper ocean</i>
15:15-15:30	Srikumar Warrier (IIT Madras) <i>Collision rates of charged aerosol particles in a linear flow</i>
15:30-15:45	Peddi Harish Teja (IIT Madras) <i>Impact of Synthetic Inflow Perturbations on Dispersion in Particle-Laden Flow Past a Flat Plate</i>
15:45 - 16:30	Tea break and Poster Sessions
16:30-18:00	Invited talks
16:30-17:00	Cristian Marchioli (University of Udine) <i>Dynamics of slender flexible fibers in turbulent channel flow</i>
17:00-17:30	Nairita Pal (IIT KGP) <i>Barotropic Tides in an Earth System Model</i>
17:30-18:00	S.Ravichandran (IIT Madras) <i>Boundary conditions and secondary circulation in rotating Rayleigh-Benard convection</i>

Day 3: Friday, Feb 14, 2025
IC&SR, TTJ Auditorium

9:00 - 10:30	Pedagogical lecture 5 <i>Diagnosing and Measuring Mixing in the Ocean</i> Eric D'Asaro (University of Washington, USA)
10:30 - 11:00	Tea break / Group Photo and Poster Sessions
11:00 -12:30	Pedagogical lecture 6 - <i>Instabilities, waves, and mixing in stratified flows 1</i> Philippe Odier (ENS de Lyon)
12:30 - 14:30	Lunch
14:30-16:00	ECR talks (Early Career Researchers)
14:30 - 14:45	Shipra Verma (IIT KGP) <i>Effect of radial conductivity variation in Ponomarenko dynamo</i>
14:45-15:00	Harishankar Muppirala (IIT Madras) <i>Generation of waves on a free surface by quadratic shear currents</i>
15:00-15:15	Snehal Patil (IIT KGP) <i>Heat transport and flow structures in inclined circular enclosures</i>
15:15-15:30	Himanshu Mishra (IIT Madras) <i>Orientation dynamics of ice crystals in clouds: Effects of turbulence and electric field</i>
15:30-15:45	Lijin Jayan (IIT Madras) <i>Advective transport in stratified rotating flow past an underwater hill</i>
15:45 - 16:30	Tea break and Poster Sessions
16:30-18:00	Invited talks
16:30-17:00	Jim Thomas (ICTS) <i>S-2DV: A New Reduced Model Generating Submesoscale-Like Flows</i>
17:00-17:30	Shivsai Dixit (IITM Pune) <i>Plane Turbulent Wall jets</i>
17:30-18:00	Rajaram Lakkaraju (IIT KGP) <i>Do we see Bolgiano-Obukhov scalings in Oceans?</i>

Day 4: Saturday, Feb 15, 2025
IC&SR, TTJ Auditorium

9:00 - 10:30	Pedagogical lecture 7 <i>Euler-Lagrange Modelling of Particle-Laden Flows</i> Mohamed Housseem Kasbaoui (Arizona State University, USA)
10:30 - 11:00	Tea break and Poster Sessions
11:00 -12:30	Pedagogical lecture 8 - <i>Turbulence of rotating flows-</i> Kannabiran Seshasayanan, IIT Madras
12:30 - 14:30	Lunch
14:30-16:00	ECR talks (Early Career Researchers)
14:30 - 14:45	Rajarshi Chattopadhyay (ICTS) <i>Role of internal tides in energy transfers across spatio-temporal scales</i>
14:45-15:00	Sanjay CP (ICTS) <i>Waves and tracer dispersion in oceans</i>
15:00-15:15	Arshdeep Singh (IIT Madras) <i>Effects of Rotation in Channel Turbulence</i>
15:15-15:30	Sai Saandeeep (IIT Madras) <i>Topographic internal waves in the presence of barotropic and baroclinic forcings</i>
15:30-15:45	Deekshith Poojary (IIT Madras) <i>Influence of planar shear inflow on the three dimensional dispersion of particles over a normal flat plate</i>
15:45 - 16:30	Tea break and Poster Sessions
16:30-18:00	Invited talks
16:30-17:00	Basanta Kumar Jena (NIOT) <i>Application of High Frequency (HF) Radar Observation along the Indian Coast</i>
17:00-17:30	Neeraj Agarwal (SAC-ISRO) <i>Fine-scale Oceanography using Satellite Observations: Current Capabilities and Way Forward</i>
17:30-18:00	Debasis Sengupta (ICTS-TIFR) <i>Quasi-biweekly oscillations in the Bay of Bengal</i>

Day 5: Sunday, Feb 16, 2025
IC&SR, TTJ Auditorium

9:00 - 10:30	Pedagogical lecture 9 <i>Instabilities, waves, and mixing in stratified flows 2</i> Philippe Odier (ENS de Lyon)
10:30 - 11:00	Tea break and Poster Sessions
11:00 -12:30	Pedagogical lecture 10 - <i>Euler-Euler modeling of particle-laden flows</i> Mohamed Housseem Kasbaoui (Arizona State University, USA)
12:30 - 14:30	Lunch
14:30-16:00	ECR talks (Early Career Researchers)
14:30 - 14:45	Aditya Chaudhary(SAC-ISRO) <i>Relation between the sea surface salinity (SSS) gradients and the lagrangian coherent structures (LCS) derived from surface currents in the Bay of Bengal</i>
14:45-15:00	Anoop Pavithran (IIT Madras) <i>Dust-free regions in Rayleigh–Bénard convection cell</i>
15:00-15:15	Prabhash Kumar (IIT Madras) <i>Asynchrony-driven chaotic mixing in two-dimensional viscous flows</i>
15:15-15:30	Abhiram DS (IIT Madras) <i>Short wavelength instabilities in plane inertia-gravity waves</i>
15:30-15:45	Shraddha Mandloi (IIT Madras) <i>Instability of a dusty vortex</i>
15:45 - 16:30	Tea break and Poster Sessions
16:30-18:00	Invited talks
16:30-17:00	Partha Sarathi Goswami (IIT Bombay) <i>Collapse of fluid turbulence in particle-laden turbulent flows</i>
17:00-17:30	Jossia Joseph K (NIOT)
17:30-18:00	Anubhab Roy (IIT Madras) <i>Falling through a stratified fluid</i>