Daniela Tordella,
Associate Professor, Fluid Dynamics, POLITECNICO DI TORINO, DISAT

Research Interests: Internal travelling waves in sheared flows, Hydrodynamic stability and turbulence in mixing layers, jets and wakes. Application to cloud microphysics and astrophysical systems (YSO jets, Solar Wind), subgrid-turbulence modeling.

Education:

Laurea in Ingegneria Aerospaziale, Politecnico di Torino (1981)

M.S., Von Karman Institute for Fluid Dynamics Bruxelles (1983), Environmental Fluid Dynamics

Employment and Visiting.

Politecnico di Torino, Department of Aerospace Engineering, Associate Researcher, 1984-1985, 1988-1991

University of Washington, Department of Aerospace Engineering, Associate Researcher 1986-1987

Karl Weierstrass Institute of Applied Mathematics, Berlin, Visiting Scholar, 1992

UCSB, Kavli Institute for Theoretical Physics, The Nature of Turbulence, Visiting Scholar, 2011

Politecnico di Torino, Associate Professor, Fluid Dynamics
Department of Aerospace Engineering 1992-2012
Department of Mechanics and Aeospace Engineering 2012-2017
Department of Applied science and Technology, 2017 –

Professional Activities

Over 200 publications on various fluid dynamics topics.

Member, American Physical Society, Fluid Dynamics Division, 1987-present.

Member, European Mechanics Society, 1994

Recent projects

Principal Investigator, Proof of Concept LIFTT: MIGRE WARM CLOUD MINI GREEN ULTRALIGHT EXPENDABLE RADIO SONDE, 2021-2022

Principal Investigator, **H2020 Marie Sklodowska Curie Action, ITN ETN COMPLETE**, Cloud Microphysics, Turbulence and Telemetry, 2016-2021 Project 675675

Co-Investigator, Connecting the Sun to the Local Interstellar Medium in the Era of IBEX, New Horizons, PSP, and Voyagers, NASA Heliophysics Phase I DRIVE Science Centers, 2020-2023

Principal Investigator, MISTI SEEDS FUNDS, MITOR, Long term interaction in flow system, CO-I, G.Staffilani MIT-Math, 2014-2016, 2018-021

CO-Investigator, MISTI SEEDS FUNDS, MITOR, PI JD Richardson, MIT, Kavli Inst., Laboratory Simulation of Planet-Solar Wind And Interstellar Medium/Heliosphere Interactions, 2013-2016.

Referee: Physical Review Letters, Physical Review E, Physical review Fluids, New Journal of Physics, Physics of Fluids, Journal of Fluid Mechanics, Physica D Nonlinear Phenomena, Physics Letters A, Computer Physics Communications, Experiments in Fluids.

Guest Editor, Physica D Nonlinear Phenomena, 2012-2013

Guest Editor, New Journal of Physics, 2014-2015

Selected Publications

M. Golshan, S. Abdunabiev, M. Tomatis, F. Fraternale, M. Vanni, and D. Tordella. **Intermittency acceleration of water droplet population dynamics inside the interfacial layer between cloudy and clear air environments.** International Journal of Multiphase Flow, 140:103669, 2021.

F. Fraternale; N. Pogorelov, J. Richardson, D. Tordella **Magnetic Turbulence Spectra and Intermittency in the Heliosheath and in the Local Interstellar Medium, ASTROPHYSICAL JOURNAL** Volume: 872 Issue: 1 Article Number: 40, 2019.

F. Federico; D. Loris; G. Staffilani, D. Tordella, **Internal waves in sheared flows: Lower bound of the vorticity growth and propagation discontinuities in the parameter space**, PHYSICAL REVIEW E Volume: 97 Issue: 6, 063102, 8 2018.

F. De Santi, F. Fraternale, D. Tordella, **Dispersive to nondispersive transition and phase velocity transient for linear waves in plane wake and channel flows**, *Physical Review E*, **93**, 033116, 2016.
L. Gallana, F. Fraternale, M. Iovieno, S. M. Fosson, E. Magli, M. Opher, J. D. Richardson, D. Tordella, **Voyager 2 solar plasma and magnetic field spectral analysis for intermediate data sparsity,** *Journal of Geophysical Research: Space Science*, 121(5), 3905-3919, 2016.

F. Fraternale, L. Gallana, M. Iovieno, J. D. Richardson, M. Opher, D. Tordella, **Turbulence in the solar wind: spectra from Voyager 2 data at 5 AU**, *Physica Scripta,* 91(2), 023011 (2016)

M Iovieno, F. Fraternale, L. Gallana, M. Opher, J. D. Richardson, D. Tordella, **Cross and magnetic helicity in the outer heliosphere from Voyager 2 observations,** *European Journal of Mechanics / B - Fluids* 55, 394-401, (2016)

D. Tordella, S. Di Savino, L. Sitzia, **Large fluctuations of the nonlinearities in isotropic turbulence. Anisotropic filtering analysis**, *Physica D-Nonlinear Phenomena,* 284, 16-26, (2014).

M. Belan, D. Tordella, S. De Ponte, A. Mignone, S. Massaglia, **Hypersonic jets in astrophysical conditions: focus on spreading and asymmetric stability properties**, *New Journal of Physics* 16(8), 085002-085015, (2014) .

M. Iovieno, S. Di Savino, L. Gallana, D. Tordella, **Mixing of a passive scalar across a thin shearless layer: Concentration of intermittency on the sides of the turbulent interface**, *Journal of Turbulence* 15(5), 311-334, (2014)

M. Belan, S. Massaglia, D. Tordella, **The hydrodynamics of astrophysical jets: scaled experiments and numerical simulations**, *Astronomy & Astrophysics* 554, A99, (2013)

P. Bailey, A. Abbà, D. Tordella, **Pressure and kinetic energy transport across the cavity mouth in resonating cavities**, *Physical Review E* 87, 013013, (2013)

D. Tordella, M. Iovieno, S. Massaglia, A. Mignone, **Large-eddy simulation of hypersonic flows. Selective procedure to activate the sub-grid model wherever small scale turbulence is present**, *Computer Physics Communications* 184(12), 2651-2661, (2013)

D. Tordella, M. Iovieno, **Decaying turbulence: what happens when the correlation length varies spatially in two adjiacent zones**, *Physica D - Nonlinear Phenomena* 241(3), 178-185, (2012) .

D. Tordella, K. R. Sreenivasan, **Preface**, *Physica D - Nonlinear Phenomena* 241(3), 135-136, (2012)

D. Tordella, M. Belan, S. Massaglia, S. De Ponte, A. Mignone, E. Bodenschatz, A. Ferrari, **Astrophysical jets: insights into long-term hydrodynamics**, *New Journal of Physics* 13, 041011, (2011)

D. Tordella, M. Iovieno, **Small scale anisotropy in turbulent shearless mixing**, *Physical Review Letters* 107(19), (2011)

M. Belan, S. De Ponte, D. Tordella, **Highly underexpanded jets in the presence of a density jump between an ambient gas and a jet**, *Physical Review E* 82, 026303, (2010)

S. Scarsoglio, D. Tordella, W.O. Criminale, **The role of long waves in the stability of the plane wake**, *Physical Review E* 81(3), 036326, (2010) .