Michele Dolce

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Position

2022– **Postdoc**, *École polytechnique fédérale de Lausanne (EPFL)*, Lausanne, 1 Sep 2022.
AMCV group, Head of Laboratory: Prof. Maria Colombo

2020–2022 **Research Associate**, *Imperial College London*, London, 1 Sep 2020–31 Aug 2022.

Education

2017–2020 **PhD in Mathematics**, *Gran Sasso Science Institute*, L'Aquila.
Advisor: Michele Coti Zelati (Imperial College London)
Thesis title: "*Linear stability analysis of stationary Euler flows for passive scalars and inhomogeneous fluids*"
Date of degree: 11 November 2020

2015–2017 **Master's degree in Mathematics**, *University of L'Aquila*, *110/110 cum laude*, Advisor: Donatella Donatelli.

2012–2015 **Bachelor's degree in Mathematics**, *University of L'Aquila*, *110/110 cum laude*, Advisor: Donatella Donatelli.

2014–2015 **Erasmus**, *University of Granada*, September 2014–July 2015.

Grants and awards

2022 **Progetto GNAMPA**, "*Dispersion and stability in incompressible fluid dynamics*".
(P.I: Scrobogna Stefano. With Roberta Bianchini, Biagio Cassano)

2022 **Kovalevskaya Grant and LMS-EPSRC ICM Travel Grant**, To cover all the expenses to attend the ICM22, (event moved online).

2019 **SIAM Early Career Travel Award**, Travel grant for participating at the conference "SIAM Conference on Analysis of Partial Differential Equations PD19".

2019 **Grant UMI-MIT**, Support for visiting students at Massachusetts Institute of Technology.

2019 **Progetto GNAMPA**, "*Esistenza, limiti singolari e comportamento asintotico per equazioni Eulero/Navier-Stokes - Korteweg*".
(P.I: Antonelli Paolo. With Stefano Spirito, Corrado Lattanzio, Lars Eric Hientzsch, Gennaro Ciampa, Raffaele Scandone, Delyan Zhelyavov)

2018 **Thesis award Prof. Aldo Biancofiore**, Award for the best master thesis for students of University of L'Aquila, in memory of the Prof. Aldo Biancofiore.

Professional Service

March 2022 Co-organizer of the minisymposium "Decay, Stability and Growth in Fluids and Wave Systems", SIAM Conference on Analysis of Partial Differential Equations (PD22) (online)

Visiting periods

June 2022 *Simons Center for Geometry and Physics*, Stony Brook, New York (US). Invited to participate in the program "Singularity and Prediction in Fluids: May 31-July 1, 2022".

Dec 2019 *Princeton University*, Princeton, New Jersey (US). Invited by: Theodore D. Drivas (1 week)

Sep-Dec 2019 *Massachusetts Institute of Technology*, Cambridge, Massachusetts (US). Hosted by: Gigliola Staffilani

May 2019 *Imperial College London*, London, England. Invited by: Michele Coti Zelati (1 week)

Publications/Preprints

7. Dolce, M., and Drivas, T. D. *On maximally mixed equilibria of two-dimensional perfect fluids* , arxiv: 2204.03587, submitted.
6. Bedrossian, J., Bianchini, R. , Coti Zelati, M. and Dolce, M. *Nonlinear inviscid damping and shear-buoyancy instability in the two-dimensional Boussinesq equations*, arxiv: 2103.13713, submitted.
5. Coti Zelati, M., Dolce, M., Feng, Y., and Mazzucato, A.L. *Global Existence for the Two-dimensional Kuramoto-Sivashinsky equation with a Shear Flow*, Journal of Evolution Equations, **21**, 5079–5099, (2021) doi: 10.1007/s00028-021-00752-9
4. Antonelli, P. , Dolce, M. and Marcati, P. *Linear stability analysis of the homogeneous Couette flow in a 2D isentropic compressible fluid*, Annals of PDE, **7**, 24, (2021) doi: 10.1007/s40818-021-00112-3
3. Bianchini, R. , Coti Zelati, M. and Dolce, M. *Linear inviscid damping for shear flows near Couette in the 2D stably stratified regime*, to appear in Indiana University Mathematics Journal, arxiv: 2005.09058.
2. Coti Zelati, M. and Dolce, M. *Separation of time-scales in drift-diffusion equations on* $\mathbb{R}^2$, Journal de Mathématiques Pures et Appliquées **142**, 58-75, (2020), doi: 10.1016/j.matpur.2020.08.001.
1. Dolce, M. and Donatelli, D. *Artificial compressibility method for the Navier-Stokes-Maxwell-Stefan system*, Journal of Dynamics and Differential Equations, **33**, 35-62, (2021), doi: 10.1007/s10884-019-09808-4.

Talks (past and upcoming)

2022 Transport, Fluids and Mixing (*Centro De Giorgi*, online, January), Conference on Mathematics of Wave Phenomena 2022 (in the minisymposium "Stability and Instability in Fluids", *KIT*, online, February), London PDE Seminar (online, February), Small Scale Dynamics in Fluid Motion (*Simons center for Geometry and Physics*, Stony Brook, July), 12th Meeting on Nonlinear evolution PDEs, fluid dynamics and transport equations (*University of L'Aquila*, July), Recent trends in fluid mechanics (*ICMAT*, Madrid, September)

2021 Bath Analysis seminar (*University of Bath*, November)

2020 Workshop Dispersive equations of Math Physics (*University of Pisa*), AMS Fall Eastern Sectional Meeting (online talk), PDE-Applied Math Seminar (*University of Maryland*, online talk), Analysis Junior Seminar (*SISSA*, Trieste, online talk), IMS PDE Seminar (*IMS*, Hong Kong, online talk)

2019 SIAM Conference on Analysis of Partial Differential Equations PD19 (La Quinta, California), Summer School in Analysis of PDEs and Fluid Dynamics (*University of Edinburgh*), IperPa2019, (Palermo, Italy), EMS School in Applied Math "Mathematical Aspects of Fluid Flows", (Kácov, Czech Republic), Junior Analysis Seminar (*Imperial College London*), Analysis Junior Seminar (*SISSA*, Trieste, Italy)

Participation to conferences

2022 Mathematical aspects of turbulence: where do we stand? (Week 1-5, *Isaac Newton Institute*), Frontiers in kinetic theory: connecting microscopic to macroscopic scales - KineCon 2022 (Week 1-3, *Isaac Newton Institute*), Oxbridge PDE Conference 2022 (Oxford), 100 UMI - 800 UniPD (Padova, Italy)

2021 New Mechanisms for Regularity, Singularity, and Long Time Dynamics in Fluid Equations (*BIRS*, online), Mathematical Fluid Dynamics Advanced Summer School (*Insitut d'Etudes Scientifiques de Cargèse*)

2020 Winter School: Turbulence in fluids and PDEs (*EPFL*, Losanne), Transport and Fluids SMI Cortona (online school)

2019 Meeting for Simons Collaboration on Wave Turbulence (*Courant Institute*, New York), Young Researchers Workshop: Ki-Net 2012-2019 (*University of Maryland*), Progress in Mathematical Fluid Dynamics (Cetraro, Italy), Transport, Mixing and fluids (*University of Münster*)

2018 Hyperbolic Conservation Laws and Mathematical Fluid Dynamics (*University of Würzburg*), Intensive Program on Fluids and Waves (*GSSI*, L'Aquila), Women in applied and computational Mathematics (*GSSI*, L'Aquila)

2017 Workshop/School on Stochastic PDEs, Mean Field Games and Biology (*GSSI*, L'Aquila), GSSI Summer School on Fluid Dynamics and Related Topics, (*GSSI*, L'Aquila)

Teaching

Fall 2021 "Theory of partial differential equations", *Imperial College London*

Spring 2019 Ph.D. short course on "Shear flows problems", *Gran Sasso Science Institute*

Referee activity for international journals

Archive for Rational Mechanics and Analysis, Communications in Mathematical Physics, International Mathematics Research Notices, Journal of Functional Analysis, Journal of the Institute of Mathematics of Jussieu, SIAM Journal on Mathematical Analysis, Mathematics in Engineering, Zeitschrift für Angewandte Mathematik und Physik