

Curriculum Vitae

Stefano Olivieri, Ph.D.

Contact Information

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Current Position

July 2022 – | *Visiting Professor / JdC Fellow* at Department of Aerospace Engineering, UC3M.

Professional Experience

2020 – 2022 | *Postdoctoral Scholar* at Okinawa Institute of Science and Technology (OIST) Graduate University (Japan).
2016 – 2020 | *Ph.D. Student* at Department of Civil, Chemical and Environmental Engineering (DICCA), University of Genoa (Italy).
2020 | *Visiting Ph.D. Student* (1 month) at OIST Graduate University (Japan).
2018 | *Visiting Ph.D. Student* (2 months) at Linné FLOW Center, KTH (Sweden).
2014 – 2016 | *Research Fellow* at DICCA, University of Genoa (Italy).
2012 | *Visiting M.Sc. Student* (6 months) at Linné FLOW Center, KTH (Sweden).

Education

2016–2020 | *Ph.D.* in Fluid Dynamics and Environmental Eng., University of Genoa (Italy)
2010–2013 | *M.Sc.* in Mechanical/Aeronautical Engineering, University of Genoa (Italy)
2006–2010 | *B.Sc.* in Mechanical Engineering, University of Genoa (Italy).

Doctoral Thesis

Title | *Elastically-bounded flapping plates for flow-induced energy harvesting*
Advisor | Prof. A. Mazzino
Defended | April 6, 2020

Master’s Thesis

Title	<i>Analysis of the Forces Acting on Particles in Homogeneous Isotropic Turbulence</i>
Advisors	Prof. J.O. Pralits and L. Brandt
Co-advisors	Drs. G. Sardina and F. Picano
Presented	December 13, 2013

Research Interests

- Computational fluid dynamics
- Flow-structure interaction
- Aeroelastic energy harvesting
- Unsteady aerodynamics
- Multiphase and particle-laden turbulent flows
- Immersed boundary methods
- High-performance computing

Awards and Scholarships

2022	<i>Juan de la Cierva (JdC)</i> - Formación postdoctoral fellowship from the Spanish Ministry of Science and Innovation (2 years).
2020	<i>ECCOMAS Congress</i> scholarship for young investigators.
2012	Scholarship for visiting researchers by “ <i>C.M. Lerici</i> ” Foundation and <i>Italian Culture Institute</i> in Stockholm (Sweden) for carrying out M.Sc. Thesis development.

Publications on Peer-Reviewed Journals

1. S. Olivieri, I. Cannon, and M. E. Rosti. “The effect of particle anisotropy on the modulation of turbulent flows” (2022). (under review)
2. S. Olivieri, A. Mazzino, and M. E. Rosti. “On the fully coupled dynamics of flexible fibres dispersed in modulated turbulence”. *Journal of Fluid Mechanics* (2022). (accepted)
3. S. Olivieri, M. Cavaiola, A. Mazzino, and M. E. Rosti. “Transport and evaporation of virus-containing droplets exhaled by men and women in typical cough events”. *Meccanica* (2022), <https://doi.org/10.1007/s11012-021-01469-2>
4. M. Cavaiola, S. Olivieri, J. Guerrero, A. Mazzino, and M. E. Rosti. “Role of barriers in the airborne spread of virus-containing droplets: A study based on high-resolution direct numerical simulations”. *Physics of Fluids* 34.1 (2022), p. 015104
5. S. Brizzolara, M. E. Rosti, S. Olivieri, L. Brandt, M. Holzner, and A. Mazzino. “Fiber tracking velocimetry for two-point statistics of turbulence”. *Physical Review X* 11.3 (2021), p. 031060
6. S. Olivieri, F. Viola, A. Mazzino, and M. E. Rosti. “Direct numerical simulation of flapping flags in grid-induced turbulence”. *Physics of Fluids* 33.8 (2021), p. 085116
7. S. Olivieri, A. Mazzino, and M. E. Rosti. “Universal flapping states of elastic fibers in modulated turbulence”. *Physics of Fluids* 33.7 (2021), p. 071704

8. M. E. Rosti, S. Olivieri, M. Cavaiola, A. Seminara, and A. Mazzino. “Fluid dynamics of COVID-19 airborne infection suggests urgent data for a scientific design of social distancing”. *Scientific Reports* 10.1 (2020), pp. 1–9
9. M. E. Rosti, M. Cavaiola, S. Olivieri, A. Seminara, and A. Mazzino. “Turbulence role in the fate of virus-containing droplets in violent expiratory events”. *Physical Review Research* 3.1 (2021), p. 013091
10. S. Olivieri, L. Brandt, M. E. Rosti, and A. Mazzino. “Dispersed fibers change the classical energy budget of turbulence via nonlocal transfer”. *Physical Review Letters* 125.11 (2020), p. 114501
11. S. Olivieri, A. Akoush, L. Brandt, M. E. Rosti, and A. Mazzino. “Turbulence in a network of rigid fibers”. *Physical Review Fluids* 5 (7 2020), p. 074502
12. M. Cavaiola, S. Olivieri, and A. Mazzino. “The assembly of freely moving rigid fibres measures the flow velocity gradient tensor”. *Journal of Fluid Mechanics* 894 (2020), A25
13. M. E. Rosti, S. Olivieri, A. A. Banaei, L. Brandt, and A. Mazzino. “Flowing fibers as a proxy of turbulence statistics”. *Meccanica* 55 (2020), pp. 357–370
14. S. Olivieri, C. Boragno, R. Verzicco, and A. Mazzino. “Constructive interference in a network of elastically-bounded flapping plates”. *Journal of Fluids and Structures* 90 (2019), pp. 334–353
15. S. Boi, A. Mazzino, P. Muratore-Ginanneschi, and S. Olivieri. “Generalization of Taylor’s formula to particles of arbitrary inertia”. *Physical Review Fluids* 3 (10 2018), p. 104501
16. G. Boccacero, S. Olivieri, A. Mazzino, and C. Boragno. “Power harvesting by electromagnetic coupling from wind-induced limit cycle oscillations”. *Smart Materials and Structures* 26.9 (2017), p. 095031
17. U. Lācis, S. Olivieri, A. Mazzino, and S. Bagheri. “Passive control of a falling sphere by elliptic-shaped appendages”. *Physical Review Fluids* 2 (3 2017), p. 033901
18. S. Olivieri, G. Boccacero, A. Mazzino, and C. Boragno. “Fluttering conditions of an energy harvester for autonomous powering”. *Renewable Energy* 105 (2017), pp. 530–538
19. S. Olivieri, F. Picano, G. Sardina, D. Iudicone, and L. Brandt. “The effect of the Basset history force on particle clustering in homogeneous and isotropic turbulence”. *Physics of Fluids* 26.4, 041704 (2014)

Communications at Scientific Events

Conference Proceedings

1. S. Olivieri and M. E. Rosti. “Computational study on the flapping motion of a flag in grid-induced turbulence” (2022). 7th International Conference on Jets, Wakes and Separated Flows
2. S. Olivieri and M. E. Rosti. “Flapping flag in grid-generated turbulent flow” (2021). Annual Meeting of the Japanese Society of Fluid Mechanics
3. S. Olivieri, M. E. Rosti, L. Brandt, and A. Mazzino. “Turbulence in a network of rigid fibers” (2021). 25th International Congress of Theoretical and Applied Mechanics
4. S. Olivieri and M. E. Rosti. “Flexible fiber suspensions in homogeneous isotropic turbulence: a numerical study” (2020). 34th Computational Fluid Dynamics Symposium of the Japan Society of Fluid Mechanics

5. G. Boccacero, C. Boragno, S. Olivieri, and A. Mazzino. “Fluttering Energy Harvester for Autonomous Powering (FLEHAP): a synergy between EMc and Dielectric Elastomers Generators”. *Procedia Engineering* 199 (2017). X International Conference on Structural Dynamics, EURO-DYN 2017, pp. 3428 –3433
6. S. Olivieri, G. Boccacero, A. Mazzino, and C. Boragno. “Fluttering Energy Harvester for Autonomous Powering (FLEHAP): aeroelastic characterisation and preliminary performance evaluation”. *Procedia Engineering* 199 (2017). X International Conference on Structural Dynamics, EURO-DYN 2017, pp. 3474 –3479

Contributed Talks

1. S. Olivieri and M. E. Rosti. “Computational study on the flapping motion of a flag in grid-induced turbulence”. 7th International Conference on Jets, Wakes and Separated Flows. (virtual), 15–17 March 2022
2. S. Olivieri, F. Viola, A. Mazzino, and M. E. Rosti. “Flapping flags in grid-induced turbulence”. 74th Annual Meeting of the APS Division of Fluid Dynamics. (virtual), 23 November 2021
3. S. Olivieri and M. E. Rosti. “Flapping flag in grid-generated turbulent flow”. Annual Meeting of the Japanese Society of Fluid Mechanics. (virtual), 21 September 2021
4. S. Olivieri, F. Viola, R. Verzicco, M. E. Rosti, and A. Mazzino. “Fluttering wings for energy harvesting: a numerical study using a parallel immersed boundary method”. 14th WCCM & ECCOMAS Congress 2020. (virtual), 11–15 January 2021
5. S. Olivieri and M. E. Rosti. “Flexible fiber suspensions in homogeneous isotropic turbulence: a numerical study”. 34th Computational Fluid Dynamics Symposium of the Japan Society of Fluid Mechanics. (virtual), 22 December 2020
6. S. Olivieri, C. Boragno, R. Verzicco, and A. Mazzino. “On the dynamics of multiple elastically-bounded flapping plates for flow energy harvesting”. 17th European Turbulence Conference. Turin (Italy), 6 September 2019
7. S. Olivieri, M. E. Rosti, A. A. Banaei, L. Brandt, and A. Mazzino. “Flowing fibers as a proxy for two-point measurements in turbulent flows”. CISM-AIMETA Advanced school on Anisotropic Particles in Viscous and Turbulent Flows. Udine (Italy), 5 July 2019
8. S. Olivieri, G. Boccacero, A. Mazzino, and C. Boragno. “Fluttering Energy Harvester for Autonomous Powering (FLEHAP): aeroelastic characterisation and preliminary performance evaluation”. X International Conference on Structural Dynamics, EURO-DYN 2017. Rome (Italy), 13 September 2017
9. S. Olivieri, G. Boccacero, A. Mazzino, and C. Boragno. “Energy harvesting by an elastically-bounded flapping wing: aeroelastic investigation and performance evaluation”. 4th Workshop in Devices, Materials and Structures for Energy Harvesting and Storage. Oulu (Finland), 17 May 2017
10. S. Olivieri and A. Mazzino. “On the dynamics of a flapping elastically bounded plate in a uniform flow with applications to energy harvesting”. XXII Congresso AIMETA. Genoa (Italy), 14 September 2015
11. S. Olivieri and A. Mazzino. “Flapping prediction for an elastically anchored plate in a uniform flow for energy harvesting purposes”. Workshop HELIX 2015: FSI and Vortex Dynamics in Aerodynamics. Porquerolles (France), 3 July 2015

Posters

1. S. Olivieri and M. E. Rosti. “Spreading of polydisperse droplets in a turbulent puff of saturated exhaled air”. Eighth Project Report Meeting of the HPCI System. (virtual), 29 October 2021
2. S. Olivieri, G. Boccalero, A. Mazzino, and C. Boragno. “FLEHAP: FLuttering Energy Harvester for Autonomous Powering”. 1st Winter School in Multiscale Approaches and Multiphysic Couplings in Fluid and Solid Mechanics. Grenoble (France), 16 January 2017

Invited Seminars

1. S. Olivieri. “Flapping flags in grid-induced turbulent flow”. MEchanics GAthering -MEGA-Seminar, EPFL (Switzerland, virtual). 16 December 2021
2. S. Olivieri. “On the dynamics of finite-size fibers in homogeneous turbulence and its application to novel flow measurement techniques”. MechSE Seminar, The University of Illinois at Urbana-Champaign (U.S., virtual). 29 October 2021
3. S. Olivieri. “Fluid-structure interaction for flow energy harvesting”. OIST Internal Seminar Series. Okinawa (Japan). 27 November 2020

Involvement in Research and HPC projects

2021	(Collaborator) “Turbulence modulation in multiphase flows at high Reynolds number” (hp210269) – Fugaku Supercomputer Small-Scale Project, HPCI, Japan.
2021	(Collaborator) “Direct numerical simulations of barriers and masks” (hp210246) – II Urgent Call for Fighting against COVID-19, HPCI, Japan.
2021	(Collaborator) “Tuning and performance evaluation of large-scale multiphase turbulent flow simulations” (hp210229) – Fugaku Supercomputer Trial Project, HPCI, Japan.
2021	(Collaborator) “Direct numerical simulations of turbulent flows over flexible canopies” (hp210025) – Annual grant for computational resources, HPCI, Japan.
2020	(Collaborator) “Spreading of polydisperse droplets in a turbulent puff of saturated exhaled air” (hp200157) – Urgent Call for Fighting against COVID-19, HPCI, Japan.
2013	(Collaborator) “Energy harvesting by fluid-structure interaction” – Research Project of National Relevance (PRIN), Ministry of Education, University and Research (MIUR), Italy.

Academic Experience

- Teaching assistant in the courses “Transition and Turbulence” (AY 2015/16, 2016/17, 2017/18) and “Turbulence and CFD Modeling” (AY 2018/19), Master’s Degree in Mechanical Eng. – Energy and Aeronautics, University of Genoa.
- Co-advisor of 4 B.Sc. Theses and 1 M.Sc. Thesis in Mechanical Engineering (at Uni.Ge.).
- Mentoring of Ph.D. students in training-through-research (at Uni.Ge. and OIST).
- Peer reviewer for: *Journal of Fluid Mechanics*, *Physics of Fluids*, *Energy*, *Mechanical Systems and Signal Processing*, *Meccanica*, *Sensors & Actuators A: Physical*, *IEEE Transactions on Industrial Informatics*.

Formative Experience

Jul. 2019	Advanced school in <i>Anisotropic Particles in Viscous and Turbulent Flows</i> by CISM/AIMETA, held in Udine (Italy).
Nov. 2018	Course in <i>Debugging and Optimization of Scientific Applications</i> by PRACE/CINECA, held in Bologna (Italy).
Nov. 2018	Course in <i>Introduction to Parallel Computing with MPI and OpenMP</i> by CINECA, held in Milano (Italy).
Feb. 2018	Course in <i>Introduction to Modern Fortran</i> by CINECA, held in Roma (Italy).
Jan. 2017	<i>1st Winter School in Multiscale Approaches and Multiphysic Couplings in Fluid and Solid Mechanics</i> by Tec21 and University of Grenoble Alpes, held in Grenoble (France).
June 2015	<i>HELIX 2015: Fluid-Structure Interactions and Vortex Dynamics in Aerodynamics</i> , (workshop and summer school) by Centre National de la Recherche Scientifique (CNRS), held in Porquerolles (France).
Feb. 2014	<i>OpenFOAM Introductory Training Course</i> by Wolf Dynamics and University of Genoa, held in Genoa (Italy).
June 2012	Student internship at <i>Piaggio Aero Industries</i> , held in Finale Ligure (Italy).

Other Experience

- Collaborator of *Wolf Dynamics s.r.l.* (an academic spin-off company from the University of Genoa) for consultancy and training courses in computational fluid dynamics (2014–2019).

Computer and Programming Skills

- Programming languages: Fortran, Python, Matlab/Octave, C++
- High-performance computing: MPI, OpenMP, CUDA Fortran
- CFD and scientific visualization: OpenFOAM, Paraview, Gnuplot
- Documents: L^AT_EX

Language Skills

Italian	Mother tongue
English	Excellent knowledge of both written and spoken
Spanish	Good
French	Basic
Japanese	Basic

Last update: July 15, 2022