High Meadows Environmental Institute
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Nicolò Scapin

Education

3/2018–6/2022 **Ph.D. in Fluid Mechanics**, *Royal Institute of Technology (KTH)*, Stockholm, SE,
Advisor: Prof. Luca Brandt
Thesis title: *Phase-changing flows: numerical methods and fully resolved simulations*
Defended on June 15th, 2022 (PhD thesis available **here**)

9/2014–4/2017 **MSc in Energy Engineering**, *Politecnico di Milano*, Milan, IT

9/2011–7/2014 **BSc in Energy Engineering**, *Politecnico di Milano*, Milan, IT

Research experience

1/2023–Present **Postdoctoral Research Fellow**, *High Meadows Environmental Institute (HMEI) and Department of Mechanical and Aerospace Engineering*, Princeton University, Princeton, NJ

Mentors: Prof. Luc Deike and Prof. Gabriel Vecchi

Main activities:
- Research topics: ocean-atmosphere interaction, wind-wave interactions, breaking waves, sea sprays, remote sensing, turbulent multiphase flow
- Participation in joint research grants among Princeton University, NASA, the Woods Hole Oceanographic Institution (WHOI) and the French Institute for Ocean Science (IFREMER)
- Writing scientific proposals to secure access to high-performance computing facilities funded by NSF (ACCESS)
- Mentorship of a graduate student working on ocean waves

3/2018–12/2022 **Graduate Research Assistant**, *Department of Engineering Mechanics*, Royal Institute of Technology (KTH), Stockholm, SE

Main activities:
- *FluTAS* project: developed an open-source, modular, and multi-physics code able to run on hybrid CPU/GPU architectures (**GitHub repository**)
- EUROFusion project: developed numerical algorithms for liquid metal-plasma interaction. Read the contributions **here** and **here**
- Writing scientific proposals to access high-performance computing facilities in Sweden, Norway, Italy, and the US
- Mentorship: co-supervision of three younger Ph.D. students working in multiphase flows

Teaching experience

2/2024–Present **Lecturer and Teaching Assistant for the Course *ENV330/MAE330 Ocean Waves***, *High Meadows Environmental Institute*, Princeton University, Princeton, NJ

Main activities:
- Delivered lectures on the physics of ocean waves to 20+ undergraduate students (40 hours per semester)
- Organized hands-on activities to enhance students' understanding of theoretical concepts through practical application (15 hours per semester)
- Assessed student performance through assignment grading and final exams

9/2018–12/2021 **Teaching Assistant in several undergraduate courses in Solid and Fluid Mechanics**, *Department of Engineering Mechanics*, Royal Institute of Technology (KTH), Stockholm, SE

Main activities:

- Performed hands-on activities, enhancing students' understanding of theoretical concepts through practical application (20 hours per semester, 20+ undergraduate students)
- Assessed student performance by grading assignments and the final exam

Industrial experience

6/2017–2/2018 **Research Engineer**, *ENI S.p.A.*, Milan, IT

Main activities:

- Developed two- and three-phase Eulerian solvers to model hydrocarbon transport in complex geometries
- Participated in the start-up and ramp-up activities of the Zhor gas field (Egypt)

Funding acquisition

2023 **HMEI Fellowship** to support research at **Princeton University**

2023 **International Postdoctoral Grant** awarded by the **Swedish Research Council - Vetenskapsrådet** to support the research at **Princeton University**. Declined.

Awards and International Projects

2024 **Seal of Excellence** awarded by the **European Commission** for the Marie Curie Postdoctoral Fellowship (**Evaluation mark:** 96.80%)

2024 Co-PI of the **INCITE project on scalar transport in turbulent bubbly flows** with Dr. Parisa Mirbor (PI). Awarded allocation: 50000 node hours of GPU computing time in Polaris

2023 **Seal of Excellence** awarded by the **European Commission** for the Marie Curie Postdoctoral Fellowship (**Evaluation mark:** 91.40%)

2022 **ERCOFTAC Da Vinci Competition finalist**: among the top five Ph.D. theses in fundamental and applied fluid mechanics across European universities. **Read the interview here**

2022 **Fellowship for the 17th Summer Program** at Center for Turbulence Research, Stanford (CA, USA)

2021 Participation in the **PRACE project on Multiphase Rayleigh–Bénard convection** with Luca Brandt (PI). Awarded allocation: 50M GPU-core hours of computing time on Marconi-100 (CINECA, Italy).

2020 **Fellowship for the 16th Summer Program** at Center for Turbulence Research, Stanford (CA, USA). Suspended due to COVID-19 pandemic

2018 **PhD Research Scholarship** *Hybrid multiscale modelling of transport phenomena for energy efficient processes*, funded by the *Swedish Research Council* (VR) (Grant 2016-06119)

2014-2017 **Merit-based scholarship for excellent students (tuition waiver)**, funded by *the Ministry of Public Education* in Italy

2014 **Scholarship** funded by *ENI S.p.A.* for excellent students in the field of energy engineering

Professional activities & Academic qualifications

12/2025–Present **Faculty applications**, *Finalist (Ranked 2nd), Tenure-Track Assistant Professor Search in Mechanical Engineering, Technical University of Munich (TUM), Munich (DE)*

08/2025–Present **Reviewer of PhD thesis**, *Dr. Abbas Moradi Bilondi (University of Chicago Illinois, IL)*

11/2024–Present **Chair of APS-DFD Sessions**, *See **here** and **here** for the link*

07/2019–Present **Peer reviewer of scientific publication**, *Geophysical Research Letters, Journal of Computational Physics, Computer and Fluids, Journal of Fluid Mechanics, European Journal of Fluid Mechanics/B, Computer Physics Communication, Nature Computational Science, Flow, Turbulence and Combustion*

09/2026–Present **Peer reviewer of Research Grants**, *U.S. National Science Foundation (Physical Oceanography Program)*

07/2019–Present **Membership**, *American Physical Society (APS-DFD), American Geophysical Union (AGU), Euromech*

Languages

Italian (Native Language), English (Proficient)