

COSTANZA RODDA

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POSITIONS

- Research Associate, Imperial College London 2021-
Department of Civil and Environmental Engineering
Dstratify project, which addresses the outstanding problem of predicting the thermal stratification that is produced by non-uniform heating and cooling within buildings.
- Postdoctoral Fellow, University of Grenoble** 2020-2021
Laboratory of Geophysical and Industrial Fluid mechanics
Gravity wave turbulence study by means of numerical simulations and laboratory experiments in the Simons Collaboration on wave turbulence.
- Postdoctoral Fellow, University of Cottbus** 2019-2020
Department of Mechanical Engineering
Project: Laboratory experiments and climate change
- Internship Royal Netherlands Institute for Sea Research** 2015
Scientific cruise in the MIDAS project on the Research vessel 'Pelagia'
- Internship sail designing factory (Olimpic Sail Trieste)** 2012
3D simulations of turbulent flows and optimisation of sail designs with the software 'AzureProject'.
- Instructor and tutor in the scientific project 'Fisica in Barca'** 2010
Project in collaboration with the National Institute of Nuclear Physics of a series of lectures combined with sailing practices to engage a broad public on the topic of 'Physics and the sea'. Topics covered as an instructor: aerodynamics of the wing (basic fluid mechanics and Bernoulli principle), sail trim in different aerodynamic regimes, and physical principles of sailing.

EDUCATION

- PhD, University of Cottbus (GPA Summa cum Laude - highest grade)** 2015-2019
Department of Mechanical Engineering
Dissertation: Gravity waves emission from jet systems in the differentially heated rotating annulus experiment
Advisor: Uwe Harlander
- MSc, University of Trieste (GPA 110 cum laude/110 - highest grade)** 2013-2015
Department of Physics
Research thesis: The ocean in a tank: numerical simulations on the wave-mean flow interactions in a rotating box
Supervisors: Leo Maas, Andrea Cimattori, Matias Duran Matute
- BSc, University of Trieste** 2007-2012
Department of Physics
- Diploma, Conservatory of Music of Trieste** 2009-2012
Opera Singing

PUBLICATIONS

1. **C. Rodda**, G. Hughes, J. Craske, “A CO_2 budget model for mechanically ventilated spaces”, In preparation for Building and Environment.
2. P. Haynes, **C. Rodda**, P. Mannix, “Mathematical fluid dynamics workshop Cargèse Corsica, Chapter 4: Atmospheric and Oceanic flows”, Book chapter, In preparation.
3. M. Vincze, C. Hancock, U. Harlander, **C. Rodda**, & K. Speer “Laboratory experiments on the scaling properties of extreme temperature fluctuations in the mid-latitude atmosphere”, submitted to Scientific Reports, 2022
4. **C. Rodda**, C.Savaro, G. Davis, J. Revenue, P. Augier, J. Sommeria, T. Valran, S. Viboud, & N. Mordant “Experimental observations of internal wave turbulence transition in a stratified fluid”, Physical Review Fluids, 2022,
<https://doi.org/10.1103/PhysRevFluids.7.094802>
5. **C. Rodda**, M.Vincze & U. Harlander “Jet stream variability in a global warming scenario—a laboratory perspective”, Weather and Climate Dynamics, 2022,
<https://doi.org/10.5194/wcd-3-937-2022>
6. U. Harlander, I.D.Borcia, M. Vincze, & **C. Rodda** “Probability Distribution of Extreme Events in a Baroclinic Wave Laboratory Experiment”, Fluids, 2022,
<https://doi.org/10.3390/fluids7080274>
7. M. Vincze, T. Bozóki, M. Herein, I. D. Borcia, U. Harlander, A. Horicsányi, A. Nyerges, **C. Rodda**, A. Pál, J. Pálffy “The Drake Passage opening from an experimental fluid dynamics point of view”, Scientific Reports, 2021,
<https://doi.org/10.1038/s41598-021-99123-0>
8. **C. Rodda** & U. Harlander “Transition from geostrophic flows to inertia-gravity waves in the spectrum of a differentially heated rotating annulus experiment”, Journal of the Atmospheric Sciences, 2020,
<https://doi.org/10.1175/JAS-D-20-0033.1>
9. **C. Rodda** “Gravity wave emission from jet systems in the differentially heated rotating annulus experiment”, Cuvillier Verlag, 2019, <https://cuvillier.de/de/shop/publications/8132>
10. **C. Rodda**, S. Hien, U. Achatz & U. Harlander “A new atmospheric-like differentially heated rotating annulus configuration to study gravity wave emission from jets and fronts.” Experiments in Fluids, 2019, <https://doi.org/10.1007/s00348-019-2825-z>
11. **C. Rodda**, I.D. Borcia, P.Le Gal, M. Vincze & U. Harlander “Baroclinic, Kelvin, and inertia-gravity waves in the barostrat instability experiment.” Geophysical and Astrophysical Fluid Dynamic Journal, 2018, <https://doi.org/10.1080/03091929.2018.1461858>.

GRANTS AND AWARDS

HPC-Europa3 Transnational Access programme , grant to visit Hossein Kafiabad of the School of Mathematics, University of Edinburgh.	2020
Max-Grünebaum prize , BTU Cottbus-Senftenberg (Awarded for the best PhD dissertation, 5k €)	2020
Early-Career-Scientist Award DFG grant for collaboration (5k €)	2019
Outstanding Student Poster and PICO (OSPP) Award , EGU conference	2017

INVITED TALKS

Gravity wave emission from jet systems in the differentially heated annulus experiment
 SPARC Gravity Wave Symposium, Frankfurt, Germany. March 2022

Laboratory experiments to investigate the atmospheric dynamics and beyond
 Spinning Fluids symposium 2021: Laboratory fluid dynamics for disks and planets, Ringberg Castle, Germany September 2021

Can laboratory experiments help to explain the atmosphere and ocean's energetics?
 Colloquium speaker at Fluid Talks webinar Leeds University May 2021

Can laboratory experiments reach regimes relevant for oceanic dynamics?
 Colloquium speaker at Woods Hole Oceanographic Institution May 2021

Gravity wave emission from jet systems in the differentially heated rotating annulus experiment
 Seminars at LEGI, University of Grenoble, France. December 2019

CONFERENCE PRESENTATIONS

Multiscale Wave-Turbulence Dynamics in the Atmosphere and Ocean (Invitation only), Oberwolfach, Germany September 2022

International Symposium on Stratified Flows, Cambridge, UK September 2022

European General Assembly Conference EGU, online April 2021

European General Assembly Conference EGU, online April 2020

European Turbulence Conference ETC, Turin, Italy September 2019

Waves, Instabilities and Turbulence in Geophysical and Astrophysical Flows Summer school and Workshop, Cargese/France July 2019

Instabilities and Turbulence in Strato-Rotational Flows Workshop, Cottbus, Germany June 2019

European General Assembly Conference EGU, Vienna, Austria April 2018

European General Assembly Conference EGU, Vienna, Austria April 2017

Instabilities and Turbulence in Strato-Rotational Flows Workshop, Le Havre, France April 2017

IUGG Conference of Mathematical Geophysics, Paris, France June 2016

REVIEWS FOR SCIENTIFIC JOURNALS

Journal of Physical Oceanography, Geophysical and Astrophysical Fluid Dynamics, Technisches Messen

TEACHING

Matlab Primer (Imperial College London, 2022)

Role: Course Leader

Fluid mechanics (University of Grenoble, 2021)

Role: Lecturer

Matlab for data analysis (University of Cottbus 2019)

Role: Lecturer

Laboratory experiments in Fluid mechanics (University of Cottbus 2017, 2018, 2019, and 2020) Role: Lecturer

CO-SUPERVISORY ROLES

MSc dissertations

Guanhua Cheng (Imperial College 2022), Ruohan Wu (Imperial College 2022), Lavinia –Nicoleta Aparachivei (BTU Cottbus 2019)

Master and Undergraduate internships

Wenying Zu (BTU Cottbus 2020), Lavinia –Nicoleta Aparachivei (BTU Cottbus 2017), Tudor Cimpanu (BTU Cottbus 2017), and Dumitru Sandu (BTU Cottbus 2016)

COMPUTER SKILLS

Programming C, Python, MATLAB, Bash scripting

LANGUAGE SKILLS

Italian	Native
English	C1 (IELTS score 8)
French	B2
German	B2
Farsi	A1

OUTREACH AND EXTRA-CURRICULAR ACTIVITIES

During my studies, I faced several widespread challenges among women in the academic world. Since then, I've been involved in initiatives to help other women to overcome such challenges as, in my experience, having encouragement to other women (but men too) can be fundamental. I was part of a beautiful initiative in this area, giving my story for a comic book called "Of course!" https://www.wavestoweather.de/equal_opportunity/activities/comic-book/index.html, which has been designed, produced, printed and distributed in November 2020 by LMU Munich. In particular, the comic book project aims to encourage young female students that would like to start a career in science by showing examples of how making positive changes can lead to a happy and fulfilled life as a scientist. My story is featured among other eight illustrated interviews of researchers who experienced gender biases and imbalance at home, during their education, and at their workplace. The book has been distributed in schools, and due to its success, a second edition is planned. My contact details are listed in the book and on the website so that students can contact me if they need help or support. Following this initiative in Germany, I was interviewed by the journalist Benedetta Moro for a paper in the Italian newspaper "Il Piccolo" in 2021. The article talks about my involvement in the project "Of course!" as an inspiring female role model and gives more insights into my story and the problems women in STEM face in Italy. The article has triggered great interest with a follow-up article in the national newspaper "Il Corriere della sera" https://www.corriere.it/buone-notizie/21_marzo_07/costanza-rodde-altre-noi-scientiate-cerca-parita-2a6705a2-7f6e-11eb-b700-62d4180eb118.shtml, and I was interviewed for the national radio program "Tutti in classe" <https://www.raiplaysound.it/audio/2021/02/TUTTI-IN-CLASSE-cad2ea83-6dd6-4b77-ada2-aac8a078ea53.html>.

Also related to offering help to younger researchers, I am particularly passionate about mentoring students, and I participated in the EGU 2021 mentoring program.

As a side activity, I was involved in organising tours of the laboratory facility for the public and visiting authorities. I was also one of the co-organisers of the LIA-ISTROF workshop in 2019 at BTU, which gave me some experience in managing the conference budget for the participants' activities and structuring the scientific program.