Luigi Roberti

Curriculum Vitæ

Leibniz Universität Hannover
Institut für Angewandte Mathematik
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Personal Information

Place of birth	Brescia (BS), Italy
Citizenship	Italian
Title	Dr.rer.nat.

Current Employment

01/10/2025 – Present **Leibniz Universität Hannover**, Institut für Angewandte Mathematik.
Wissenschaftlicher Mitarbeiter – Postdoc (Postdoctoral Research Assistant).

Past Employment

01/10/2021 – 31/08/2025 **University of Vienna**, Faculty of Mathematics.
Universitätsassistent Praedoc (Predoctoral University Assistant).
Mentor: Prof. Dr. Adrian Constantin.

01/10/2020 – 30/09/2021 **University of Vienna**, Faculty of Mathematics.
Wissenschaftlicher Projektmitarbeiter (Scientific Project Assistant).
Employment within the project "Equatorial wave-current interactions", supported by the WWTF grant MA16-009.
Principal Investigator: Prof. Dr. Adrian Constantin.

Education

10/2020 – 08/2025 **Dr.rer.nat. in Mathematics**, University of Vienna.
Thesis: *Mathematical aspects of geophysical fluid flows*.
Advisor: Prof. Dr. Adrian Constantin.

10/2018 – 09/2020 **MSc in Mathematics**, University of Vienna.
Thesis: *On the decrease of velocity with depth in periodic water waves*.
Advisor: Prof. Dr. Adrian Constantin.

10/2015 – 08/2018 **BSc in Mathematics**, University of Vienna.
Thesis title: *Hardy's inequality.*
Advisor: Prof. Dr. Roland Donninger.

10/2014 – 03/2018 **BSc in Physics**, University of Vienna.
Thesis: *Bestimmung der Volumenverteilung eines Aerosols aus der Messung von dessen Extinktionskoeffizienten.*
Advisor: Prof. Dr. Helmuth Horvath†.

09/2009 – 07/2014 **Diploma di Maturità Scientifica (Science High School Diploma)**, Liceo Scientifico Statale Nicolò Copernico, Brescia, Italy.

Publications

Preprints

- (With C. Puntini and E. Stefanescu) On large-scale oceanic wind-drift currents. arXiv:2602.06473, 50 pp.

Published articles

- (With E. Stefanescu) Global-in-time existence, uniqueness, and stability of solutions to a model of the Antarctic Circumpolar Current. *Discrete Contin. Dyn. Syst.* **49** (2026), 289–310. doi:10.3934/dcds.2025169
- (With B.-V. Matioc and Ch. Walker) Quasilinear parabolic equations with superlinear nonlinearities in critical spaces. *J. Differ. Equ.* **429** (2025), 283–317. doi:10.1016/j.jde.2025.02.039
- (With Q. Ding) Stratified ocean gyres with Stuart-type vortices. *Ann. Mat. Pura Appl.* **203** (2024), 2847–2862. doi:10.1007/s10231-024-01469-5
- (With B.-V. Matioc) Weak and classical solutions to an asymptotic model for atmospheric flows. *J. Differ. Equ.* **367** (2023), 603–624. doi:10.1016/j.jde.2023.05.023
- The surface current of Ekman flows with time-dependent eddy viscosity. *Comm. Pure Appl. Anal.* **21**(7) (2022), 2463–2477. doi:10.3934/cpaa.2022064
- The Ekman spiral for piecewise-constant eddy viscosity. *Appl. Anal.* **101**(15) (2022), 5528–5536. doi:10.1080/00036811.2021.1896709
- Perturbation analysis for the surface deflection angle of Ekman-type flows with variable eddy viscosity. *J. Math. Fluid Mech.* **23**(3) (2021), No. 57. doi:10.1007/s00021-021-00586-y
- On the decrease of velocity with depth in irrotational periodic water waves. *Monatsh. Math.* **193**(3) (2020), 671–682. doi:10.1007/s00605-020-01451-2

Talks and Presentations

10/12/2025 *The mathematical modelling of wind-drift ocean currents.*
Bielefeld Analysis Seminar (invited speaker), Universität Bielefeld.

25/11/2025 *The mathematical modelling of wind-drift ocean currents.*
Oberseminar Analysis und Theoretische Physik, Leibniz Universität Hannover.

18/06/2025 *Well-posedness of a semilinear parabolic equation arising from the modelling of atmospheric flows.*
Workshop Modelling of fluid propagation: mathematical theory and numerical approximation (invited speaker), CIEM, Castro Urdiales.

24/02/2025 *Well-posedness of a semilinear parabolic equation arising from the modelling of atmospheric flows.*
Conference on Mathematics of Wave Phenomena (invited speaker in a minisymposium), Karlsruhe Institute of Technology.

14/11/2024 *Well-posedness of a semilinear parabolic equation arising from the modelling of atmospheric flows.*
Mathematical Sciences Seminar (invited speaker), University College Cork.

22/08/2024 *Existence, uniqueness and stability for a model of the Antarctic Circumpolar Current.*
Workshop Mathematical Theory of Water Waves, Lund University.

12/06/2024 *Classical well-posedness and stability for a model of the Antarctic Circumpolar Current.*
PDE Afternoon Seminar, University of Vienna.

10/06/2024 *Geophysical Fluid Dynamics: An overview and some recent advancements.*
MCMP Seminar (invited speaker), University of Vienna.

21/09/2023 *Weak and classical solutions to an asymptotic model for atmospheric flows.*
ÖMG Tagung 2023, TU Graz.

16/09/2022 *On the surface deflection angle of Ekman flows with varying eddy viscosity.*
DMV-Jahrestagung 2022, Freie Universität Berlin.

18/02/2022 *The oceanic Ekman layer.*
Seminar Applied and Computational PDE, University of Vienna.

20/01/2020 *On the decrease of mean velocity with depth in irrotational water waves.*
Seminar: Applied PDE, University of Vienna.

18/06/2019 *The Bergman kernel and Fefferman's theorem.*
Complex Analysis Seminar, University of Vienna.

Participation in Conferences, Workshops, and Summer Schools

05/2025 Workshop Mathematical Advances in Geophysical Fluid Dynamics, Mathematisches Forschungsinstitut Oberwolfach.

05/2024 EWM-EMS Summer School: Water Waves and Nonlinear Dispersive Equations, Mittag-Leffler-Institut.

04/2024 Fluid Flows – Analysis and Modelling. Conference in Honour of Robin S. Johnson's 80th Birthday, University of Vienna

05/2023 Aspects of Nonlinear Evolution. Conference in Honour of Joachim Escher's 60th Birthday, Leibniz Universität Hannover.

04/2023 Workshop on Nonlinear Dispersive Waves (online attendance), University College Cork.

09/2021 Summer School of the Vienna School of Mathematics, Weißensee.

Teaching

2024W Proseminar "Komplexe und Harmonische Analysis" (Exercise class "Complex and Harmonic Analysis", in German), University of Vienna.

2024S Proseminar "Analysis 2" (Exercise class "Analysis 2", in German), University of Vienna.

2023W Proseminar "Analysis und Lineare Algebra 1" (Exercise class "Analysis and Linear Algebra 1", in German), University of Vienna.

2023S Übungen zu "Funktionalanalysis" (Exercise class to "Functional Analysis", in German), University of Vienna.

2022W Übungen zu "Partielle Differentialgleichungen" (Exercise class to "Partial Differential Equations", in German), University of Vienna.

2022S Übungen zur Einführung in das mathematische Arbeiten und Rechenübungen (Exercise class to Introduction to mathematics and calculations, in German), University of Vienna.

(Co-)Supervision

2025 BSc thesis of Stefano Mazzeo, University of Vienna (co-supervised with Dr. Jörg Weber).

Peer Review Activity

Referee for *Appl. Math. Comput.* / *Appl. Math. Lett.* / *J. Differ. Equ.* / *J. Math. Phys.* / *Monats. Math.* / *Nonlinear Anal. Real World Appl.* / *Pure Appl. Geophys.* / *Qual. Theory Dyn. Syst.*

Training

2025 Workshop Diversity in Practice, University of Vienna.

Computer Skills and Competence

Operating systems: Working knowledge of Windows and Linux OS.

Programming languages: Working knowledge of Python, Fortran, LaTeX language and some of its text editors (Overleaf, Texmaker, TeXworks).

Software programs: Working knowledge of Matlab, Wolfram Mathematica, Gnuplot.

Platforms

arXiv
Google Scholar
ORCID
ResearchGate
Scopus

Languages

Italian: Native speaker.

English: Excellent knowledge and understanding of both written and spoken language.

German: Excellent knowledge and understanding of both written and spoken language.

Hannover, February 9, 2026