Luigi Roberti

Curriculum Vitæ

Leibniz Universität Hannover
Institut für Angewandte Mathematik
Welfengarten 1, 30167 Hannover, Germany
📞 *+49 511 762 3647*
✉ *roberti@ifam.uni-hannover.de*
🌐 *https://luigi-roberti.github.io*
ⓘD *0000-0001-7678-7389*

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 – 30/09/2025	**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

Published articles

[1] (With E. STEFANESCU) Global-in-time existence, uniqueness, and stability of solutions to a model of the Antarctic Circumpolar Current. *Discrete Contin. Dyn. Syst.* (Early Access). doi:10.3934/dcds.2025169

[2] (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

[3] (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

[4] (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

[5] 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

[6] The Ekman spiral for piecewise-constant eddy viscosity. *Appl. Anal.* **101**(15) (2022), 5528–5536. doi:10.1080/00036811.2021.1896709

[7] 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

[8] 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

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.* / *Qual. Theory Dyn. Syst.* / *Pure Appl. Geophys.*

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.

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, 25. November 2025