

# Luigi Roberti

## Curriculum Vitæ

Leibniz Universität Hannover  
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### Personal Information

Place of birth Brescia (BS), Italy

Citizenship Italian

Title Dr.rer.nat.

### Current Employment

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

### Past Employment

01/10/2021 – **University of Vienna, Faculty of Mathematics.**  
30/09/2025 Universitätsassistent Praedoc (Predoctoral University Assistant).  
Mentor: Prof. Dr. ADRIAN CONSTANTIN.  
01/10/2020 – **University of Vienna, Faculty of Mathematics.**  
30/09/2021 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 – **Dr.rer.nat. in Mathematics**, University of Vienna.  
08/2025 Thesis: *Mathematical aspects of geophysical fluid flows*.  
Advisor: Prof. Dr. ADRIAN CONSTANTIN.  
10/2018 – **MSc in Mathematics**, University of Vienna.  
09/2020 Thesis: *On the decrease of velocity with depth in periodic water waves*.  
Advisor: Prof. Dr. ADRIAN CONSTANTIN.  
10/2015 – **BSc in Mathematics**, University of Vienna.  
08/2018 Thesis title: *Hardy's inequality*.  
Advisor: Prof. Dr. ROLAND DONNINGER.  
10/2014 – **BSc in Physics**, University of Vienna.  
03/2018 Thesis: *Computing the volume distribution of an aerosol from the measurement of its attenuation coefficient* (in German).  
Advisor: Prof. Dr. HELMUTH HORVATH†.  
09/2009 – **Diploma di maturità scientifica (Science High School Diploma)**,  
07/2014 Liceo Scientifico Statale Nicolò Copernico, Brescia, Italy.

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## 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

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## Talks and Presentations

- 18/06/2025 *Well-posedness of a semilinear parabolic equation arising from the modeling 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 modeling 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 modeling 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.

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## 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.

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## 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, 6. November 2025