Jörg Weber

Curriculum Vitæ

Personal information

Title	Dr. rer. nat.
Date of birth	2nd April 1993
Gender	male
Nationality	German
Address	Oskar-Morgenstern-Platz 1, 1090 Vienna, Austria
Email	joerg.weber@univie.ac.at
Phone	+43 1 4277 50478
Website	joerg-weber.github.io
ORCID	0000-0003-3631-7491

Work experience

01/2025– **Principal Investigator of FWF ESPRIT grant**, *University of Vienna*, Faculty of Mathematics

10/2023–12/2024 **Moritz Schlick postdoctoral fellow**, *University of Vienna*, Faculty of Mathematics

09/2023–10/2023 **Junior fellow**, *Institut Mittag-Leffler*

09/2022–08/2023 **Researcher**, *Lund University*, Centre for Mathematical Sciences

09/2020–08/2022 **Postdoctoral fellow**, *Lund University*, Centre for Mathematical Sciences

10/2016–08/2020 **Research assistant**, *University of Bayreuth*, Department of Mathematics

Education

01/2017–07/2020 **Dr. rer. nat.**, *University of Bayreuth*, Department of Mathematics

2014–2016 **Master**, *University of Bayreuth*, Mathematics, secondary subject Physics

2011–2014 **Bachelor**, *University of Bayreuth*, Mathematics, secondary subject Physics

Doctoral thesis

title *The Relativistic Vlasov–Maxwell System with External Electromagnetic Fields*

supervisor Prof. Dr. Gerhard Rein

Conferences and seminars

Organised events

2025– Co-organisation of *Partial Differential Equations and Mathematical Physics Seminar* at University of Vienna

2025 Co-organisation of minisymposium *Bifurcation and Pattern Formation in Dynamical Systems* at *Conference on Mathematics of Wave Phenomena* at Karlsruhe Institute of Technology

2024 Co-organisation of minisymposium *Steady Water Waves* at *SIAM Conference on Nonlinear Waves and Coherent Structures* in Baltimore

2023 Organisation of *Postdoc/PhD seminar* at Institut Mittag-Leffler, Stockholm

2021–2023 Co-organisation of *Seminar on Analysis, Geometry and PDEs* at Lund University

Talks and posters

2025 Invited talk at *SIAM Conference on Analysis of Partial Differential Equations*, Pittsburgh

Invited talk at workshop *Interfaces, Instabilities, and Nonlocality in Fluid Dynamics*, University of Pittsburgh

Invited talk in *PDE and Analysis Seminar*, University of Pittsburgh

Invited talk at workshop *Modelling of fluid propagation: mathematical theory and numerical approximation*, International Centre for Mathematical meetings (CIEM), Castro Urdiales

Invited talk at workshop *Mathematical Advances in Geophysical Fluid Dynamics*, Oberwolfach Research Institute for Mathematics

Invited talk at *The Thirteenth International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory*, Athens, U.S.

Invited talk in *PDE Seminar*, Georgia Institute of Technology

Invited talk at *Conference on Mathematics of Wave Phenomena*, Karlsruhe Institute of Technology

2024 Invited talk at workshop *Nonlinear Water Waves: Rigorous Analysis and Scientific Computing*, Banff International Research Station

Invited talk at workshop *Mathematical theory of water waves*, Lund University

Invited talk in seminar *Partial differential equations*, University of Konstanz

Invited talk in seminar *Material modelling*, Weierstrass Institute for Applied Analysis and Stochastics, Berlin

Talk at *SIAM Conference on Nonlinear Waves and Coherent Structures*, Baltimore

Invited talk at conference *Fluid Flows – Analysis and Modelling*, University of Vienna

Invited talk at *GAMM Annual Meeting 2024*, University of Magdeburg

Invited talk in *Applied Analysis Seminar*, Saarland University

2023 Invited talk in *MCMP Seminar* (for Master students in mathematics and physics), University of Vienna

Invited talk in *Brown PDE Seminar*, Brown University

Invited talk in programme *Order and Randomness in Partial Differential Equations*, Institut Mittag-Leffler, Stockholm

Invited talk in programme *Mathematical Problems in Fluid Dynamics, part 2*, Simons Laufer Mathematical Sciences Institute, Berkeley

Invited talk in *Differential Equations Seminar*, University of Missouri

Invited talk in joint seminar *Asymptotic Models in Fluid Dynamics*, Lund University and University of Stuttgart

2022 Invited talk at *Vienna School of Mathematics*, University of Vienna

Invited talk in *Analysis and Probability Seminar*, Chalmers University of Technology

Poster in *Workshop on spatial dynamics and related approaches*, University of Stuttgart

Talk at *SIAM Conference on Nonlinear Waves and Coherent Structures*, University of Bremen

Invited talk in seminar *Nonlinear problems in Mathematical Physics*, University of Bayreuth

Invited talk in workshop *New Directions in Water Waves*, University of Bath

Poster at conference *When Kinetic Theory meets Fluid Mechanics*, ETH Zürich

Invited talk in *DNA seminar*, Norwegian University of Science and Technology

Poster at *SIAM Conference on Analysis of Partial Differential Equations* (held online)

Talk at *Conference on Mathematics of Wave Phenomena*, Karlsruhe Institute of Technology

2021 Invited talk in *Differential Equations Seminar*, University of Missouri

Talk at *4th IMA Conference on Nonlinearity and Coherent Structures*, Loughborough University

Invited talk in *IntComSin Kolloquium*, University of Regensburg

2020 Talk in *Seminar on Analysis, Geometry, and PDEs*, Lund University

Invited talk in *CAA seminar*, University of Erlangen-Nürnberg

2019 Talk at winter school *Gradient Flows and Variational Methods in PDEs*, University of Ulm

Talk at conference *ENUMATH 2019*, Delft University of Technology

Invited talk in *Analysis and Probability Seminar*, Chalmers University of Technology

Talk at *GAMM Annual Meeting 2019*, University of Vienna

2017 Talk at *Young Researchers Meeting & CSE Workshop 2017*, University of Hamburg

Additional conferences and programmes participated in

2023 *Courant PIs Workshop* and annual meeting *Simons Collaboration on Wave Turbulence*, Courant Institute of Mathematical Sciences and Simons Foundation, New York

Abel symposium, Orkanger

Conference *Aspects of Nonlinear Evolution*, Leibniz University Hannover

2022 Seminar *Free Boundary Problems in Fluid Dynamics*, Oberwolfach Research Institute for Mathematics

Programme *Mathematical Perspectives of Gravitation beyond the Vacuum Regime*, Erwin Schrödinger Institute, Vienna (online)

2021 Programme *Mathematical Problems in Fluid Dynamics*, Mathematical Sciences Research Institute, Berkeley (online)

Teaching

Lectures

2024W *Advanced partial differential equations* (Master level), University of Vienna; designed the course content and created lecture notes; held all lectures and seminars (twice per week, in total 23 lectures, 7 seminars); held oral exams

2023S *Ordinary Differential Equations II* (Master level), Lund University; designed the course content and created lecture notes; held all lectures (twice per week, in total 18); designed and marked written and oral exams

2022S *Fourier Analysis* (Master level), Lund University; designed the course content and created lecture notes; held all lectures (twice per week, in total 16) and seminars (once per week, in total 8); designed and marked written and oral exams

2021W *Linear Analysis* (Bachelor level), Lund University; designed the course content and created lecture notes; held all lectures (twice per week, in total 18); designed and marked written and oral exams

Seminars

2025W *Fluid Dynamics* (Master level, ongoing), University of Vienna; designed the course content, held lectures (once per week, in total 7) and created lecture notes in the first half of the course, followed by presentations by students in the second half

2025S *Analysis 2* (Bachelor level), University of Vienna; held exercise classes

2024S *Introduction to Mathematical Methodology* (Bachelor level), University of Vienna; held exercise classes

2024S *Bachelorseminar* (Bachelor level), University of Vienna; provided platform for students to work towards and present their Bachelor thesis

2020S *Advanced Complex Analysis* (Bachelor level), University of Bayreuth; held and organised seminars; marked written exams

2019W *Introduction to Ordinary Differential Equations* (Bachelor level), University of Bayreuth; held and organised seminars; marked written exams

2018S *Introduction to Advanced Analysis* (Bachelor level), University of Bayreuth; held and organised seminars

2018W *Vector Calculus & Advanced Mathematics for Physicists B* (Bachelor level), University of Bayreuth; held and organised seminars; marked written exams

2014–2019 *Analysis 1* and *Analysis 2* (Bachelor level, several times), University of Bayreuth; held and organised seminars; (partly) designed and marked written exams

(Co-)Supervision

Master's thesis

2023 Anna-Mariya Otsetova, *Axisymmetric capillary water waves on cylindrical fluid jets*, Lund University

Bachelor's thesis

2025 Stefano Mazzeo, *Der Weierstraßsche Produktsatz und der Hadamardsche Produktsatz*, University of Vienna

2023 Abhijeet Vats, *The Path To Gelfand Duality & Spectral Theory*, Lund University

2021 Yining Zhu, *An Elementary Proof of the Jordan Curve Theorem and its Application to the Poincaré–Bendixson Theorem*, Lund University

Training

2025 Workshop *Diversity in Practice*, University of Vienna

2022S Course *Teaching and Learning in Higher Education*, Lund University

Grants

2026 Grant from *Fondation Mathématique Jacques Hadamard* for a research visit at École Polytechnique in Paris, 2,800 EUR

2025–2027 *ESPRIT* project *Overhanging water waves: new challenges and perspectives*, Austrian Science Fund (FWF), 340,819 EUR, DOI: 10.55776/ESP8360524

2025 *Research in Teams* programme *Waves interacting with the Antarctic Circumpolar Current*, Erwin Schrödinger Institute, Vienna, 4,800 EUR

2023 *The Fund of the Walter Gyllenberg Foundation* project *Localised pure-gravity water waves*, The Royal Physiographic Society of Lund, 46,000 SEK

2022 Travel funding for *Workshop on spatial dynamics and related approaches*, University of Stuttgart; *When Kinetic Theory meets Fluid Mechanics*, ETH Zürich; *Conference on Mathematics of Wave Phenomena*, Karlsruhe Institute of Technology (obsolete; conference was held online due to Covid-19), ca. 2,000 EUR

Fellowships and Awards

2023 *Junior fellowship*, Institut Mittag-Leffler, ca. 40,000 SEK

2023 *Seal of Excellence* of the European Commission for a high-quality project proposal submitted under the call for Marie Skłodowska-Curie Actions Postdoctoral Fellowships 2022

2017 Nominated for *Teaching Award of the Faculty of Mathematics, Physics & Computer Sciences*, University of Bayreuth

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Service

Referee for *Adv. Nonlinear Anal.* / *Classical Quantum Gravity* / *Comm. Math. Phys.* / *GEM Int. J. Geomath.* / *J. Differential Equations* / *J. Math. Fluid Mech.* / *Math. Methods Appl. Sci.* / *Math. Model. Anal.* / *Nonlinear Anal. Real World Appl.* / *Phys. D: Nonlinear Phenom.* / *Phys. Scr.* / *Plasma Phys. Control. Fusion* / *Proc. Appl. Math. Mech.* / *Stud. Appl. Math.* / *Z. Angew. Math. Phys.*

2023 Examiner of Master's thesis of Francisco Carvalho, Lund University

Computer skills

C++, HTML, LaTeX, Maple, Mathematica, MATLAB, Office

Languages

native German
fluent English
intermediate Swedish

Preprints

[1] (With A. Constantin). *On the propagation of mountain waves: linear theory*. Submitted. arXiv: 2509.26125.
[2] (With D. S. Seth, K. Varholm and E. Wahlén). *Rigidity of symmetric doubly-periodic water waves near shear flows*. Submitted. arXiv: 2504.20221.
[3] (With E. Lokharu). *An improved upper bound for the Froude number of irrotational solitary water waves*. Submitted. arXiv: 2502.18181.

Publications

[4] (With A.-M. Otsetova and E. Wahlén). 'Axisymmetric capillary water waves with vorticity and swirl connecting to static unduloid configurations'. In: *J. Differential Equations* 411 (2024), 604–618. DOI: 10.1016/j.jde.2024.08.005.
[5] (With J. Bartsch, P. Knopf and S. Scheurer). 'Controlling a Vlasov–Poisson plasma by a Particle-In-Cell method based on a Monte Carlo framework'. In: *SIAM J. Control Optim.* 62.4 (2024), 1977–2011. DOI: 10.1137/23M1563852.
[6] (With E. Wahlén). 'Large-amplitude steady gravity water waves with general vorticity and critical layers'. In: *Duke Math. J.* 173.11 (2024), 2197–2258. DOI: 10.1215/00127094-2023-0054.
[7] (With E. Wahlén). 'Global bifurcation of capillary-gravity water waves with overhanging profiles and arbitrary vorticity'. In: *Int. Math. Res. Not. IMRN* 2023.20 (2023), 17377–17410. DOI: 10.1093/imrn/rnac280.
[8] (With E. Lokharu and E. Wahlén). 'On the amplitude of steady water waves with favorable constant vorticity'. In: *J. Math. Fluid Mech.* 25.3, 58 (2023). DOI: 10.1007/s00021-023-00796-6.
[9] (With A. H. Erhardt and E. Wahlén). 'Bifurcation analysis for axisymmetric capillary water waves with vorticity and swirl'. In: *Stud. Appl. Math.* 149.4 (2022), 904–942. DOI: 10.1111/sapm.12525.

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[10] (With P. Knopf). ‘On the two and one-half dimensional Vlasov–Poisson system with an external magnetic field: global well-posedness and stability of confined steady states’. In: *Nonlinear Anal. Real World Appl.* 65, 103460 (2022). DOI: 10.1016/j.nonrwa.2021.103460.
[11] ‘Weak solutions of the relativistic Vlasov–Maxwell system with external currents’. In: *Math. Methods Appl. Sci.* 44.6 (2021), 4770–4801. DOI: 10.1002/mma.7070.
[12] ‘Optimal control of the two-dimensional Vlasov-Maxwell system’. In: *ESAIM Control Optim. Calc. Var.* 27, S19 (2021). DOI: 10.1051/cocv/2020069.
[13] (With S. Günther, J. Körner, T. Lebeda, B. Pötzl, G. Rein and C. Straub). ‘A numerical stability analysis for the Einstein–Vlasov system’. In: *Classical Quantum Gravity* 38.3, 035003 (2021). DOI: 10.1088/1361-6382/abcbdf.
[14] ‘Confined steady states of the relativistic Vlasov–Maxwell system in an infinitely long cylinder’. In: *Kinet. Relat. Models* 13.6 (2020), 1135–1161. DOI: 10.3934/krm.2020040.
[15] (With P. Knopf). ‘Optimal control of a Vlasov–Poisson plasma by fixed magnetic field coils’. In: *Appl. Math. Optim.* 81.3 (2020), 961–988. DOI: 10.1007/s00245-018-9526-5.
[16] ‘Hot plasma in a container—an optimal control problem’. In: *SIAM J. Math. Anal.* 52.3 (2020), 2895–2929. DOI: 10.1137/19M1275061.

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