

# Jörg Weber

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## Curriculum Vitæ

### Personal information

Title Dr. rer. nat.  
Date of birth 2nd April 1993  
Gender male  
Nationality German  
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### Work experience

- 01/2025– **Principal Investigator of FWF ESPRIT grant**, *University of Vienna*, Faculty of Mathematics
- 10/2023– **Moritz Schlick postdoctoral fellow**, *University of Vienna*, Faculty of Mathematics  
12/2024
- 09/2023– **Junior fellow**, *Institut Mittag-Leffler*  
10/2023
- 09/2022– **Researcher**, *Lund University*, Centre for Mathematical Sciences  
08/2023
- 09/2020– **Postdoctoral fellow**, *Lund University*, Centre for Mathematical Sciences  
08/2022
- 10/2016– **Research assistant**, *University of Bayreuth*, Department of Mathematics  
08/2020

### Education

- 01/2017– **Dr. rer. nat.**, *University of Bayreuth*, Department of Mathematics  
07/2020
- 2014–2016 **Master**, *University of Bayreuth*, Mathematics, secondary subject Physics
- 2011–2014 **Bachelor**, *University of Bayreuth*, Mathematics, secondary subject Physics

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## 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

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- 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

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- 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

- 2026W *Fluid Dynamics* (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*, University of Vienna; held exercise classes
- 2024S *Introduction to Mathematical Methodology*, University of Vienna; held exercise classes
- 2024S *Bachelorseminar*, University of Vienna; provided platform for students to work towards and present their Bachelor thesis
- 2020S *Advanced Complex Analysis*, University of Bayreuth; held and organised seminars; marked written exams
- 2019W *Introduction to Ordinary Differential Equations*, University of Bayreuth; held and organised seminars; marked written exams
- 2018S *Introduction to Advanced Analysis*, University of Bayreuth; held and organised seminars
- 2018W *Vector Calculus & Advanced Mathematics for Physicists B*, University of Bayreuth; held and organised seminars; marked written exams
- 2014–2019 *Analysis 1* and *Analysis 2* (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, L<sup>A</sup>T<sub>E</sub>X, 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1137/19M1275061).