

# Jörg Weber

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## *Curriculum Vitæ*

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### Personal information

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

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

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### Education

01/2017– **Ph.D.**, *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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### PhD thesis

title *The Relativistic Vlasov–Maxwell System with External Electromagnetic Fields*  
supervisor Prof. Dr. Gerhard Rein

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## Conferences and seminars

### Organised events

- 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

- 2024 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

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- 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 seminar
- Programme *Mathematical Perspectives of Gravitation beyond the Vacuum Regime*, ESI, University of Vienna (online)
- 2021 Programme *Mathematical Problems in Fluid Dynamics*, Mathematical Sciences Research Institute, Berkeley (online)

## Teaching

### Lectures

- 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) as the only teacher; 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

- 2024S *Introduction to Mathematical Methodology*, University of Vienna; held exercise classes
- 2024S *Bachelor seminar*, 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; designed and marked written exams

#### Taken courses in teacher training

- 2022 *Teaching and Learning in Higher Education*, Lund University

### (Co-)Supervision

#### Master's thesis

- 2023 Anna-Mariya Otsetova, Lund University

#### Bachelor's thesis

- 2023 Abhijeet Vats, Lund University
- 2021 Yining Zhu, Lund University

### Grants

- 2023 *The Fund of the Walter Gyllenberg Foundation* project *Localised pure-gravity water waves*, The Royal Physiographic Society in 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)

### Fellowships and Awards

- 2023 *Junior fellowship*, Institut Mittag-Leffler
- 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

### Service

Referee for *Advances in Nonlinear Analysis*, *Classical and Quantum Gravity*, *Journal of Differential Equations*, *Journal of Mathematical Fluid Mechanics*, *Mathematical Methods in the Applied Sciences*, *Physica D (Nonlinear Phenomena)*, *Plasma Physics and Controlled Fusion*, *Proceedings in Applied Mathematics and Mechanics*, *Zeitschrift für angewandte Mathematik und Physik*

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

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## Computer skills

C++, HTML, L<sup>A</sup>T<sub>E</sub>X, Maple, Mathematica, MATLAB, Office

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## Languages

native German  
fluent English  
intermediate Swedish

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## Publications

- [1] J. Bartsch, P. Knopf, S. Scheurer and J. Weber. ‘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.
- [2] A.-M. Otsetova, E. Wahlén and J. Weber. ‘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.
- [3] E. Wahlén and J. Weber. ‘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.
- [4] E. Lokharu, E. Wahlén and J. Weber. ‘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.
- [5] E. Wahlén and J. Weber. ‘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.
- [6] A. H. Erhardt, E. Wahlén and J. Weber. ‘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.
- [7] P. Knopf and J. Weber. ‘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.
- [8] S. Günther, J. Körner, T. Lebeda, B. Pötzl, G. Rein, C. Straub and J. Weber. ‘A numerical stability analysis for the Einstein–Vlasov system’. In: *Classical Quantum Gravity* 38.3, 035003 (2021). DOI: 10.1088/1361-6382/abcbdf.
- [9] J. Weber. ‘Optimal control of the two-dimensional Vlasov–Maxwell system’. In: *ESAIM Control Optim. Calc. Var.* 27, S19 (2021). DOI: 10.1051/cocv/2020069.
- [10] J. Weber. ‘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.
- [11] P. Knopf and J. Weber. ‘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.
- [12] J. Weber. ‘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.

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- [13] J. Weber. ‘Hot plasma in a container—an optimal control problem’. In: *SIAM J. Math. Anal.* 52.3 (2020), 2895–2929. doi: 10.1137/19M1275061.