Curriculum Vitae

Personal Information

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Education

2008	PhD in Mathematics, Lund University, Sweden Supervisor: Adrian Constantin
2004	MSc in Mathematics, Lund University, Sweden

Current position

2013 –	Senior Lecturer (Universitetslektor), Lund University

Previous positions

2009 – 2013	Associate Senior Lecturer (Biträdande universitetslektor), Lund University
2009 – 2010	Humboldt Postdoctoral Research Fellow, Saarland University
2009	Substitute Senior Lecturer, Lund University

Research Interests

Nonlinear Partial Differential Equations, Water Waves, Fluid Mechanics, Bifurcation Theory, Hamiltonian Systems, Variational Methods, Spatial Dynamics

Fellowships, Grants and Awards

2020	The Wallmarkska prize from the Royal Swedish Academy of Sciences (KVA) *'for eminent contributions to nonlinear partial differential equations, especially water waves'*
2019	Grant for hosting a 2 month guest professorship (Prof. M. Haragus, University of Franche-Comté) from the Hedda Andersson fund at Lund University
2017–2020	Project Research Grant from the Swedish Research Council (VR), 'Nonlinear Water Waves and Nonlocal Model Equations', 3 million SEK
2016	The Wallenberg prize from the Swedish Mathematical Society *'for his important contributions to partial differential equations, especially the solution (with M. Ehrnström) of Whitham's conjecture'*
2016 – 2021	ERC Starting Grant, 'Mathematical aspects of three-dimensional water waves with vorticity' (3DWATERWAVES), 1.2 million EUR
2014	Grant for hosting a 6 month guest professorship (Prof. M. D. Groves, Saarland University) from the Knut and Alice Wallenberg Foundation (KAW) and the Royal Swedish Academy of Sciences (KVA)

2014	Strömer-Ferrner Award from the Royal Swedish Academy of Sciences (KVA) *'for his studies of mathematical models for shallow water waves and nonlinear differential equations'.*
2013 – 2016	Project Research Grant for Junior Researchers from the Swedish Research Council (VR), 'Nonlinear Water Waves', 3.2 million SEK
2013	Inclusion in the 'Nonlinearity Highly Downloaded Collection 2012', paper [18] below
2011	Grant for organising a workshop, Royal Physiographic Society in Lund, 100 kSEK
2009 – 2010	Research Fellowship for Postdoctoral Researchers, Alexander von Humboldt Foundation
2004	The Nova Scholarship, Sparbanksstiftelsen Skåne (for my master's thesis)

Invited presentations and research visits

Over 50 talks in seminars, colloquia and conferences.

Selected presentations and research visits:

2019	Workshop: *Analysis & PDE*, Hannover, Germany Invited analysis seminar talk at SISSA, Trieste, Italy
2018	*NTNU workshop on PDEs*, Trondheim, Norway
2017	Participation in the programme *Nonlinear water waves* at the Isaac Newton Institute, Cambridge, UK Invited presentation at the workshop *Water Waves* at ICERM, Providence, USA
2016	Invited presentation at the workshop *Recent progress on the qualitative properties of nonlinear dispersive equations and systems* at the Wolfgang Pauli Institute, Vienna, Austria Participation in the programme *Interactions between Partial Differential Equations & Functional Inequalities* at Institut Mittag-Leffler, Sweden
2015	Invited presentation at the *SIAM Conference on Partial Differential Equations*, Scottsdale, USA Invited presentation at the *Workshop on non-local dispersive equations*, Trondheim, Norway Invited presentation at the workshop *Long time dynamics and regularity for hydrodynamical systems*, Nantes, France
2014	Invited presentation at the workshop *Dispersive equations with nonlocal dispersion* at the Wolfgang Pauli Institute, Vienna, Austria Invited presentation at the *SIAM Conference on Nonlinear Waves and Coherent Structures*, Cambridge, UK Participation in the programme *Theory of Water Waves* at the Isaac Newton Institute, Cambridge, UK Invited presentation at the *Annual meeting of the Swedish Mathematical Society*, Lund Visit at the University of Missouri, USA, for two weeks as a Miller's Scholar in Residence (host Samuel Walsh) Invited presentation at the winter school *Nonlinear Dispersive Waves* at École de Physique des Houches, France
2013	Invited presentation at the *Basel Junior Symposium in Analysis*, Basel, Switzerland
2012	Invited presentation at the *SIAM Conference on Nonlinear Waves and Coherent Structures*, Seattle, USA
2011	Participation in the programme *Nonlinear Water Waves* at the Erwin Schrödinger Institute, Vienna, Austria
2010	Invited presentation at the *8th AIMS Conference on Dynamical Systems and Differential Equations*, Dresden, Germany

2009 Invited presentation at the *SIAM Conference on Partial Differential Equations*, Miami, USA
Participation in the programme *Recent Advances in Integrable Systems of Hydrodynamic Type* at the Erwin Schrödinger Institute, Vienna, Austria
Invited presentation at the workshop *Wave Motion*, Oberwolfach, Germany
Invited presentation at the *Journées EDP*, Évian, France

2005 Participation in the programme *Wave Motion* at Institut Mittag-Leffler, Sweden

Organisation of Scientific Meetings

2020 Co-organiser of the Abel Symposium *Partial Differential Equations — Waves, Nonlinearities and Nonlocalities* (Røros, Norway) — Cancelled

2019 Co-organiser of the workshop *Mathematical Theory of Water Waves* (Oberwolfach, Germany)

2018 Co-organiser of the workshop *Fluid Dynamics and Dispersive Equations* (Lund, Sweden)

2017 Co-organiser of the workshop *Nonlinear Water Waves — an Interdisciplinary Interface* (ESI, Vienna, Austria)
Co-organiser of a minisymposium at the *Meeting of the Catalan, Spanish, Swedish Math Societies* (Umeå, Sweden)

2016 Co-organiser of the workshop *Theoretical and computational aspects of surface waves* (Banff, Canada)
Co-organiser of a minisymposium at the *27th Nordic Congress of Mathematicians* (Stockholm, Sweden)

2015 Co-organiser of a minisymposium at the conference *Equadiff* (Lyon, France)
Co-organiser of the workshop *Mathematical Theory of Water Waves* (Oberwolfach, Germany)

2013 Co-organiser of the *26th Nordic Congress of Mathematicians* (Lund, Sweden)
Co-organiser of a minisymposium at the *SIAM Conference on Applications of Dynamical Systems* (Snowbird, USA)

2012 Co-organiser of the workshop *Nonlinear Waves and Interface Problems* (Lund, Sweden)
Co-organiser of a minisympium at the *DMV-Jahrestagung* (Saarbrücken, Germany)

2011 Co-organiser of minisymposia at the *7th IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena* (Athens, USA), *Equadiff* (Loughborough, UK), *Dynamics Days Europe* (Oldenburg, Germany)

Teaching and Pedagogical Experience

2008 – 2020 Taught 21 courses at basic and advanced level at Lund University

2013 – 2014 Participated in the course *Communication in Natural Science Education*, 1 week, Lund University

2011 Recieved the Pedagogical Prize from the Student Union at the Faculty of Science at Lund University (LUNA)

2009 Participated in the course *Mathematical Didactics at University Level* (Matematikdidaktik för högskolan), 5 weeks, Lund University

2008 – 2009 Taught 3 courses for talented high school students at Katedralskolan, Lund (a secondary school)

2006 Participated in the course *Learning and Teaching in Higher Education: An introduction*, 2 weeks, Lund University

Supervision Experience

- Supervised 1 Ph.D. student:
  Dag Nilsson (2013 – 2018). Thesis: On steady waves in two-layer fluids and ferrofluids
- Currently main supervisor of two Ph.D. students:
  Douglas Svensson Seth (2016 –). Research topic: Three-dimensional ideal flows and water waves with vorticity. Expected to finish 2021
  Tien Truong (2017 –). Research topic: Global bifurcation of solitary waves for nonlocal wave equations. Expected to finish 2022
- Assistant supervisor of one Ph.D. student: Eskil Rydhe (2011–2017). Main supervisor: Sandra Pott
- Supervision and co-supervision of 6 postdoctoral fellows: Evgeniy Lokharu (2017 – 2019), Mark Schlutow (2017 – 2018), Kristoffer Varholm (2019 – 2020), Stefano Pasquali (2020 –), Jörg Weber (2020 –) and André Erhardt (guest postdoc, 6 months, 2020)
- Supervised 6 master's theses and 14 bachelor's theses

Institutional Responsibilities

2019 –	Head of Division, Mathematics, Faculty of Science, Centre for Mathematical Sciences, Lund University
2014 – 2018	Member of the Department Board, Centre for Mathematical Sciences, Lund University
2013 – 2018	Member of the Research Funding Committee, Centre for Mathematical Sciences, Lund University
2014 – 2018	Member of the Infrastructure Committee, Faculty of Science, Lund University
2014 –	Member of the Colloquium Committee, Centre for Mathematical Sciences, Lund University
2011 – 2014	Substitute member of the Department Board, Centre for Mathematical Sciences, Lund University
2011 – 2013	Member of the Student Recruitment Committee, Faculty of Science, Lund University

Commissions of Trust and Other Activities

- Member of the Wallenberg Prize Committee (2020 –)
- Editor for Arkiv för Matematik (2017 –)
- Member of PhD thesis examining committees at NTNU, Trondheim (2017), Uppsala University (2016), Linköping University (2019, 2017, 2016), KTH, Stockholm (2014), Lund University (2015, 2013), University of Bergen (2012), Linnaeus University, Växjö (2011)
- Reviewer for over 20 different journals in mathematics and mathematical physics, including SIAM J. Math. Anal., Nonlinearity, Comm. Pure Appl. Math., J. Differential Equations, J. Fluid Mech., IMRN, Math. Ann, JEMS, ARMA, ANIHP.
  Reviewer of book proposals for Springer.
- 21 reviews for the American Mathematical Society service Mathematical Reviews
- Participated in Lund University's postdoctoral development programme luPOD, 2011

Memberships of scientific societies

2019 –	Member of the Royal Physiographic Society in Lund (elected)
2011 – 2016	Local representative for the Swedish Mathematical Society at Lund University

List of Publications

[1] E. Lokharu, D. S. Seth, and E. Wahlén, An existence theory for small-amplitude doubly periodic water waves with vorticity, *Arch. Rational Mech. Anal.*, 238 (2020), 607–637.

[2] K. Varholm, E. Wahlén, and S. Walsh, On the stability of solitary water waves with a point vortex, *Comm. Pure Appl. Math.*, doi:10.1002/cpa.21891 (2020).

[3] D. Breit and E. Wahlén, A variational approach to solitary gravity–capillary interfacial waves with infinite depth, *Journal of Nonlinear Science*, 29 (2019), 2601–2655.

[4] B. Buffoni and E. Wahlén, Steady three-dimensional rotational flows: an approach via two stream functions and Nash-Moser iteration, *Anal. PDE*, 12 (2019), 1225–1258.

[5] M. Ehrnström and E. Wahlén, On Whitham's conjecture of a highest cusped wave for a nonlocal dispersive equation, *Ann. Inst. H. Poincaré Anal. Non Linéaire*, 36 (2019), 1603–1637.

[6] E. Lokharu and E. Wahlén, A variational principle for three-dimensional water waves over Beltrami flows, *Nonlinear Anal.*, 184 (2019), 193–209.

[7] M. Schlutow, E. Wahlén, and P. Birken, Spectral stability of nonlinear gravity waves in the atmosphere, *Math. Clim. Weather Forecast.*, 5 (2019), 12–33.

[8] B. Buffoni, M. D. Groves, and E. Wahlén, A variational reduction and the existence of a fully localised solitary wave for the three-dimensional water-wave problem with weak surface tension, *Arch. Rational Mech. Anal.*, 228 (2018), 773–820.

[9] V. Duchêne, D. Nilsson, and E. Wahlén, Solitary Wave Solutions to a Class of Modified Green–Naghdi Systems, *J. Math. Fluid Mech.*, 20 (2018), 1059–1091.

[10] M. Haragus and E. Wahlén, Transverse instability of periodic and generalized solitary waves for a fifth-order KP model, *J. Differential Equations*, 262 (2017), 3235–3249.

[11] M. D. Groves, S. M. Sun, and E. Wahlén, A dimension-breaking phenomenon for water waves with weak surface tension, *Arch. Ration. Mech. Anal.*, 220 (2016), 747–807.

[12] M. D. Groves, B. Hewer, and E. Wahlén, Variational existence theory for hydroelastic solitary waves, *C. R. Math. Acad. Sci. Paris*, 354 (2016), 1078–1086.

[13] M. D. Groves, S.-M. Sun, and E. Wahlén, Periodic solitons for the elliptic-elliptic focussing Davey-Stewartson equations, *C. R. Math. Acad. Sci. Paris*, 354 (2016), 486–492.

[14] M. Ehrnström and E. Wahlén, Trimodal steady water waves, *Arch. Ration. Mech. Anal.*, 216 (2015), 449–471.

[15] M. D. Groves and E. Wahlén, Existence and conditional energetic stability of solitary gravity-capillary water waves with constant vorticity, *Proc. Roy. Soc. Edinburgh Sect. A*, 145 (2015), 791–883.

[16] E. Wahlén, Non-existence of three-dimensional travelling water waves with constant non-zero vorticity, *J. Fluid Mech.*, 746 (2014).

[17] B. Buffoni, M. D. Groves, S. M. Sun, and E. Wahlén, Existence and conditional energetic stability of three-dimensional fully localised solitary gravity-capillary water waves, *J. Differential Equations*, 254 (2013), 1006–1096.

[18] M. Ehrnström, M. D. Groves, and E. Wahlén, On the existence and stability of solitary-wave solutions to a class of evolution equations of Whitham type, *Nonlinearity*, 25 (2012), 2903–2936.

[19] M. Ehrnström, J. Escher, and E. Wahlén, Steady water waves with multiple critical layers, *SIAM J. Math. Anal.*, 43 (2011), 1436–1456.

[20] M. Ehrnström, C. C. Tisdell, and E. Wahlén, Asymptotic integration of second-order nonlinear difference equations, *Glasg. Math. J.*, 53 (2011), 223–243.

[21] M. D. Groves and E. Wahlén, On the existence and conditional energetic stability of solitary gravity-capillary surface waves on deep water, *J. Math. Fluid Mech.*, 13 (2011), 593–627.

[22] M. D. Groves and E. Wahlén, On the existence and conditional energetic stability of solitary water waves with weak surface tension, *C. R. Math. Acad. Sci. Paris*, 348 (2010), 397–402.

[23] E. Wahlén, Steady water waves with a critical layer, *J. Differential Equations*, 246 (2009), 2468–2483.

[24] M. Ehrnström and E. Wahlén, On the fluid motion in standing waves, *J. Nonlinear Math. Phys.*, 15 (2008), 74–86.

[25] M. D. Groves and E. Wahlén, Small-amplitude Stokes and solitary gravity water waves with an arbitrary distribution of vorticity, *Phys. D.*, 237 (2008), 1530–1538.

[26] E. Wahlén, Hamiltonian long-wave approximations of water waves with constant vorticity, *Phys. Lett. A*, 372 (2008), 2597–2602.

[27] A. Constantin, M. Ehrnström, and E. Wahlén, Symmetry of steady periodic gravity water waves with vorticity, *Duke Math. J.*, 140 (2007), 591–603.

[28] M. D. Groves and E. Wahlén, Spatial dynamics methods for solitary gravity-capillary water waves with an arbitrary distribution of vorticity, *SIAM J. Math. Anal.*, 39 (2007), 932–964.

[29] E. Wahlén, A Hamiltonian formulation of water waves with constant vorticity, *Lett. Math. Phys.*, 79 (2007), 303–315.

[30] E. Wahlén, On rotational water waves with surface tension, *Philos. Trans. R. Soc. Lond. Ser. A Math. Phys. Eng. Sci.*, 365 (2007), 2215–2225.

[31] E. Wahlén, On the blow-up of solutions to the periodic Camassa-Holm equation, *NoDEA Nonlinear Differential Equations Appl.*, 13 (2007), 643–653.

[32] E. Wahlén, Global existence of weak solutions to the Camassa-Holm equation, *Int. Math. Res. Not.*, (2006), Art. ID 28976, 12.

[33] E. Wahlén, The interaction of peakons and antipeakons, *Dyn. Contin. Discrete Impuls. Syst. Ser. A Math. Anal.*, 13 (2006), 465–472.

[34] E. Wahlén, On the blow-up of solutions to a nonlinear dispersive rod equation, *J. Math. Anal. Appl.*, 323 (2006), 1318–1324.

[35] E. Wahlén, Steady periodic capillary-gravity waves with vorticity, *SIAM J. Math. Anal.*, 38 (2006), 921–943.

[36] E. Wahlén, Steady periodic capillary waves with vorticity, *Ark. Mat.*, 44 (2006), 367–387.

[37] E. Wahlén, A blow-up result for the periodic Camassa-Holm equation, *Arch. Math. (Basel)*, 84 (2005), 334–340.

[38] E. Wahlén, A note on steady gravity waves with vorticity, *Int. Math. Res. Not.*, (2005), 389–396.

[39] E. Wahlén, On steady gravity waves with vorticity, *Int. Math. Res. Not.*, (2004), 2881–2896.

[40] E. Wahlén, Positive solutions of second-order differential equations, *Nonlinear Anal.*, 58 (2004), 359–366.

[41] E. Wahlén, Uniqueness for autonomous planar differential equations and the Lagrangian formulation of water flows with vorticity, *J. Nonlinear Math. Phys.*, 11 (2004), 549–555.