Curriculum Vitae with Track Record

Mats Ehrnström

Personal Data

Civil Born a Swedish citizen on August 2, 1976. Married, two children.

Education

2008 Doctor of Philosophy, Mathematics, Lund University.

2006 Licentiate of Philosophy, Mathematics, Lund University.

2004 Master of Science, Lund University.

2003 Master of Education, Mathematics and Psychology, Malmo/Lund University.

Positions

2014– Professor, Department of Mathematical Sciences, Norwegian University of Science and Technology.

2012–2014 Associate Professor (Førsteamanuensis), Norwegian University of Science and Technology.

2008–2012 Assistant Professor (Akademischer Rat a.Z.), Leibniz Universität Hannover.

2005–2008 PhD-position, Department of Mathematics, Lund University.

Main supervision

Postdocs D. Svensson Seth ('21–), K. Varholm ('20–), H. Le ('19–'20), D. Nilsson ('18–'20), M. N. Arnesen ('18–'21) R. Dhara ('17–'18), Y. Wang ('16–19), G. Brüll ('15–'18).

PhDs J. Xue ('23), F. Hildrum ('22), O. I. Maehlen ('21), K. Varholm ('19), F. Remonato ('18), M. Arnesen ('17), L. Pei ('16).

Masters L. Evje ('23), R. Østern Lien ('23), J. Marstrander ('22), J. Pedersen Vean ('22), R. L. Hagen Weltzin ('22). M. C. Ørke ('21), O. I. Mæhlen ('17), O. O. Afram ('17), O. Willumsen Haugå ('16), F. Hildrum ('15), H. Fiskerstrand Gjørtz ('15), H. Debach ('15), A. Aasen ('14), K. Varholm ('14), M. N. Arnesen ('13), F. J. Gjestland ('13).

Organised events last 10 years

2024 *Workshop on PDEs, Spatio-Temporal Statistics, and Data-Driven Methods in Neuroscience and Fluid Mechanics* The Royal Norwegian Society of Sciences and Letters, Trondheim.

The 2024 Bergen–Lund–Trondheim workshop on dispersive and water waves equations. Bergen.

2023 *The Abel Symposium 2023. Partial Differential Equations: Waves, Nonlinearities and Nonlocalities.* Orkanger Mansion, Orkanger. Head of committee.

Nonlinear Dispersive Equations. Mini-symposium at the 29th Nordic Congress of Mathematicians, Aalborg, Denmark.

2022 *Waves and Nonlinear Phenomena*, closing conference of the NFR project WaNP, Trondheim.

2019 *Norwegian meeting on PDEs*, first national meeting on partial differential equations, Trondheim.

2018 *NTNU workshop on PDEs*, Trondheim.

Workshop on *Fluid Dynamics and Dispersive Equations*, Lund.

2016 *Nonlinear Partial Differential Equations: Boundary Value Problems and Equations arising in Fluid Mechanics*, session at the 27th Nordic Congress of Mathematicians, Stockholm.

2015 *Water Waves*, session at the SIAM conference on Analysis of PDEs, Scottsdale, Arizona.

Mini-Workshop on Nonlocal Dispersive Equations, Trondheim.

Grants and leadership

2022 25 million NOK from the Research Council of Norway as project leader of the Large Inter-Disciplinary Research Project project *IMod – Partial differential equations, statistics and data: An interdisciplinary approach to data-based modelling*.

2020 3 million NOK as project manager of the project *Data-driven Models in Neuroscience* from NTNU Enabling Technologies. Shared with T. Bonnevie.

2016 25 million NOK (shared) from the Research Council of Norway as one of sex investigators in the 'Excellence in Science' project *Waves and Nonlinear Phenomena*.

2014 6 million NOK from the Research Council of Norway as principal investigator of the research project *Nonlinear Water Waves*.

8 million NOK as principal investigator for the NTNU educational research project Quality, Availability, and Differentiation in Math Education.

2006–2011 Ten grants from the Swedish Royal Physographical Society and other Swedish funds.

Commissions of trust, memberships, reviewing assignments

2024 Member of PhD committee, Uppsala University.
Head of Section for Differential Equations and Numerical Analysis, NTNU.

2023 Member of PhD committee, Uppsala University.

2021 Member of PhD committee, University of Rennes.
2019 Referee and member of PhD committee, University of Tours.
Referee for the Natural Sciences and Engineering Research Council of Canada.
2018 Member of PhD committee, University of Bordeaux.
Elected member of the *The Royal Norwegian Society of Sciences and Letters*.
2014 Electee of the *Stjerneprogrammet* research programme of excellence, NTNU.
2012–2013 Editor for *ISRN Mathematical Analysis*. Editor for *International Journal of Analysis*.
2011–2012 Editor for *ISRN Mathematical Physics*.
2007–2016 Reviewer, Mathematical Reviews, American Mathematical Society.
2007–2015 Reviewer, Zentralblatt MATH, European Mathematical Society.
2007–2008 Board member, Teacher Appointment Committee, Faculty of Science, Lund University.
2006–2007 Board member, Departmental board, Centre for Mathematical Sciences, Lund University.

Referee for 30+ international quality journals.

— Track-record (10 selected publications, all level 2, MSC citations 808, GS 1404) ——————

46. A maximisation technique for solitary waves: the case of the nonlocally dispersive Whitham equation. **Arch. Ration. Mech. Anal. 248** (2024), 48 pp. With M.N. Arnesen and A.G. Stefanov.
44. Smooth stationary water waves with exponentially localized vorticity. **J. Eur. Math. Soc. (JEMS)** 25 (2023), 1045–1090. With S. Walsh and C. Zeng.
38. 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. With E. Wahlén.
37. Existence of a highest wave in a fully dispersive two-way shallow water model. **Arch. Rational Mech. Anal.** 231 (2019), 1635–1673. With M.A. Johnson and K.M. Claassen.
33. Symmetry and decay of traveling wave solutions to the Whitham equation. **J. Differential Equations** 262 (2017), no. 8, 4232–4254. With G. Bruell and L. Pei.
31. Trimodal steady water waves. **Arch. Ration. Mech. Anal.**, 216 (2015), 449–471. With E. Wahlén.
28. On the existence and stability of solitary-wave solutions to a class of evolution equations of Whitham type, **Nonlinearity**, 25 (2012), 1–34. With M. Groves and E. Wahlén.
26. Steady water waves with multiple critical layers, **SIAM J. Math. Anal.**, 43 (2011), 1436–1256. With J. Escher and E. Wahlén.
15. Linear water waves with vorticity: rotational features and particle paths, **Journal of Differential Equations**, 244 (2008), 1888–1909. With G. Villari.
12. Symmetry of steady periodic gravity water waves with vorticity, **Duke Math. J.**, 140 (2007), 591–603. With A. Constantin and E. Wahlén.

— Selected invitations to programmes, schools and conferences ——————————————

60 invited conferences and programs 2005–2024, Selected venues:

Lectures and lecture series held at Shonan Village Center, Kanagawa ('23), Institut Mittag-Leffler, Stockholm ('23, '22, '16, '13, '05), MSRI, Berkeley ('21), Fields Institute, Toronto ('20,'17), Mathematisches Forschungsinstitut Oberwolfach ('19, '15, '09), Erwin Schrödinger Institute, Vienna ('17, '11, '09), Yau Mathematical Sciences Center, Tsinghua University ('17), Wolfgang Pauli Institute, Vienna ('17, '16, '14), Isaac Newton Institute for Mathematical Sciences, Cambridge ('17), ICERM, Brown University ('17), Banff International Research Station, Banff, Canada ('16), Centre International de Rencontres Mathématiques, Marseilles ('07).

40 additional research visits and talks at Université Paris-Saclay ('24), Universität Halle-Wittenberg ('24), École polytechnique fédérale de Lausanne ('23, '12), Linköping University ('23), Universität Wien ('23), Universität Bonn (Hausdorff Colloquium '21), Ibaraki University (online '21), Lanzhou University (online '21), Warsaw University ('18), Yau Mathematical Sciences Centre, Tsinghua University ('17), Lund University ('17, '11), Leibniz Universität Hannover ('17, '16, '06), Université de Bordeaux ('18, '16, '14), Universität des Saarlandes ('16, '09), Georgia Institute of Technology ('15), University of Missouri ('21,'15,'14), Kansas University ('14), University of Bergen ('13,'10,'07), Università degli Studi di Firenze ('12, '09' 07, '06), Technische Universität Darmstadt ('11), Jacobs University ('10), Norwegian University of Science and Technology ('11,'11, '08,), McMaster University ('08), University of New South Wales ('07).