

Adrian M. Ruf – Curriculum Vitae (April 29, 2022)

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Education/Employment

- Since 2022 **Postdoctoral researcher**, University of Oslo, Norway
- 2021–2022 **Lecturer**, ETH Zürich, Switzerland
- 2019–2022 **Postdoctoral researcher**, ETH Zürich, Switzerland
Mentor: Prof. Siddhartha Mishra
- 2019 **PhD in Mathematics**, University of Oslo, Norway
Marie Skłodowska-Curie research position
Supervisors: Prof. Nils Henrik Risebro and Prof. Kenneth Karlsen
- 2016 **MSc in Mathematics**, Technical University of Berlin, Germany
Supervisor: Prof. Etienne Emmrich
- 2013 **BSc in Mathematics**, Technical University of Berlin, Germany

Publications

- [8] J. Badwaik, C. Klingenberg, N. H. Risebro, and A. M. Ruf. Multilevel Monte Carlo finite volume methods for random conservation laws with discontinuous flux. *M2AN Math. Model. Numer. Anal.*, 55: 1039–1065, (2021)
doi.org/10.1051/m2an/2021011
- [7] U. S. Fjordholm and A. M. Ruf. Second-order accurate TVD numerical methods for nonlocal non-linear conservation laws. *SIAM J. Numer. Anal.*, 59(3): 1167–1194, (2021)
doi.org/10.1137/20M1360979
- [6] A. M. Ruf. Flux-stability for conservation laws with discontinuous flux and convergence rates of the front tracking method. *IMA J. Numer. Anal.*, (2021)
doi.org/10.1093/imanum/draa101
- [5] J. Badwaik and A. M. Ruf. Convergence rates of monotone schemes for conservation laws with discontinuous flux. *SIAM J. Numer. Anal.*, 58(1): 607–629, (2020)
[doi:10.1137/19M1283276](https://doi.org/10.1137/19M1283276)
- [4] N. H. Risebro and A. M. Ruf. Numerical investigations into a model of partially incompressible two-phase flow in pipes. *SeMA*, 77: 143–159 (2019)
[doi:10.1007/s40324-019-00207-9](https://doi.org/10.1007/s40324-019-00207-9)
- [3] A. M. Ruf, E. Sande, and S. Solem. The optimal convergence rate of monotone schemes for conservation laws in the Wasserstein distance. *J. Sci. Comput.*, 80: 1764–1776, (2019)
[doi:10.1007/s10915-019-00996-1](https://doi.org/10.1007/s10915-019-00996-1)
- [2] J. Ridder and A. M. Ruf. A convergent finite difference scheme for the Ostrovsky-Hunter equation with Dirichlet boundary conditions. *Bit Numer. Math.*, 59: 775–796, (2019)
[doi:10.1007/s10543-019-00746-7](https://doi.org/10.1007/s10543-019-00746-7)
- [1] A. M. Ruf. Convergence of a full discretization for a second-order nonlinear elastodynamic equation in isotropic and anisotropic Orlicz spaces. *Z. Angew. Math. Phys.*, 68: 118, (2017)
[doi:10.1007/s00033-017-0863-z](https://doi.org/10.1007/s00033-017-0863-z)

Preprints

- [9] S. Mishra, D. Ochsner, A. M. Ruf, and F. Weber. Well-posedness of Bayesian inverse problems for hyperbolic conservation laws. (2021)
arxiv.org/abs/2107.09701

Grants and Scholarships

- 2021 Robert Gnehm Grant, ETH Zürich, Switzerland
- 2020 Research-in-Pairs Grant, Oberwolfach Research Institute for Mathematics, Germany
- 2019 Scholarship for NUMHYP2019, University of Málaga, Spain
- 2018 Scholarship for an academic secondment (3 months), ETH Zürich, Switzerland
Scholarship for HYP2018, Penn State University, USA

Invited talks

- 2021 *Stability and error estimates for conservation laws with discontinuous flux and application to uncertainty quantification and inverse problems*
Karlsruhe Institute of Technology, Germany
- Nonlocal conservation laws: improved regularity and higher-order numerical methods*
Carnegie Mellon University, Pittsburgh, USA
- Convergence rates of numerical methods for conservation laws with discontinuous flux*
TIFR Centre for Applicable Mathematics, Bangalore, India
- Numerical methods for conservation laws with nonlocal and discontinuous fluxes*
University of Freiburg, Germany
- 2020 *Convergence rates of numerical methods for conservation laws with discontinuous flux*
NTNU Trondheim, Norway
- Flux-stability for conservation laws with discontinuous flux and convergence rates of the front tracking method*
University of Oslo, Norway
- 2019 *Convergence rates of monotone schemes in the Wasserstein distance*
Julius Maximilian University of Würzburg, Germany
- Second-order numerical methods for nonlocal conservation laws*
Polytechnic University of Bari, Italy
- Second-order numerical methods for nonlocal conservation laws*
ETH Zürich, Switzerland

Contributed talks

- 2021 *Flux-stability for conservation laws with discontinuous flux and convergence rates of the front tracking method*
Sayas Numerics Seminar, USA
- 2020 *Recent advances in numerical analysis of conservation laws with discontinuous flux*
Graduate Colloquium in Applied Mathematics
ETH Zürich, Switzerland

- 2019 *Convergence rates of monotone schemes for conservation laws with discontinuous flux*
 UiO PDE Seminar
 University of Oslo, Norway
- Second-order numerical methods for nonlocal conservation laws*
 NumHyp2019
 University of Málaga, Spain
- 2018 *A second-order method for nonlocal conservation laws*
 BIT Circus
 Aalto University, Finland
- The Ostrowsky–Hunter equation with Dirichlet boundary conditions*
 HYP2018
 Penn State University, USA
- Multiphase flow in pipelines*
 Modcompshock Midterm Review Meeting
 ETH Zürich, Switzerland

Invited research visits

- 2019 Julius Maximilian University of Würzburg, Germany,
 with Jayesh Badwaik (1 week)
- Polytechnic University of Bari, Italy,
 with Prof. Giuseppe Coclite (1 week)
- 2018 ETH Zürich, Switzerland,
 with Prof. Siddhartha Mishra (3 months)

Academic activities

- 2020 - **ETH Zürich, Switzerland**
 2022 *Instructor*
 Instructed newly hired teaching assistants at the TA Training Day (spring and fall)
- 2019 **Simula Research Laboratory, Fornebu, Norway**
Teaching assistant
 Taught the course ‘Communication Scientific Research’ for PhD students and postdocs
- 2010 - **Technical University Berlin, Germany**
 2016 *Teaching assistant*
 Taught courses in Functional Analysis, Calculus and Calculus for Engineers
- 2015 - **Matheon Research Center, Berlin, Germany**
 2016 *Student assistant*
 Organized the Matheon advent calendar for students, coordinated and revised the calendar puzzles and solutions
- 2015 **TUBS, Berlin, Germany**
Coordinating assistant
 Coordinated the 79th annual meeting of the DPG

- 2011 - **Unitus project Technical University of Berlin, Germany**
 2013 *Student assistant*
 Created and improved activity oriented learning materials used in mathematical courses for engineers, e.g. supporting teaching material, online platform Mumie, guidelines for teaching assistants, exam difficulty analyses
- 2009 - **Uniseminar Education AG, Switzerland**
 2011 *Freelancer*
 Created various mathematical teaching materials for the courses Mathematics I & II and Mathematical economics

Refereeing activity

Referee for: SIAM Journal on Numerical Analysis
 SIAM Journal on Applied Mathematics
 IMA Journal of Numerical Analysis
 ESAIM: Mathematical Modelling and Numerical Analysis
 BIT Numerical Mathematics
 Zeitschrift für angewandte Mathematik und Physik
 Calcolo
 Journal of Elliptic and Parabolic Equations
 International Journal of Computational Methods

Supervision

Supervised the scientific internship of T. Kapoor, 2021, ETH Zürich

Supervised the semester thesis of D. Ochsner, 2020, ETH Zürich

Supervised two students on their semester projects, 2018, University of Oslo

Teaching experience

2021	Fall:	Lectures for ‘Statistical and Numerical Methods for Chemical Engineers’ (ETH Zürich–scheduled)
	Spring:	Lectures for ‘Numerical Methods for Hyperbolic PDEs’ (ETH Zürich)
2020	Spring:	Organization of ‘Numerical Methods for Physicists’ (ETH Zürich)
2019	Spring:	Exercise sessions for ‘Communicating Scientific Research’ (Simula)
2015	Fall:	Tutorials for ‘Calculus I for Mathematicians’ (TU Berlin)
	Spring:	Tutorials for ‘Functional Analysis I’ (TU Berlin)
2014	Fall:	Tutorials for ‘Calculus I for Engineers’ (TU Berlin)
	Spring:	Tutorials for ‘Calculus I for Engineers’ (TU Berlin)
2013	Fall:	Tutorials for ‘Calculus I for Engineers’ (TU Berlin)
	Spring:	Tutorials for ‘Calculus I for Engineers’ (TU Berlin)
2012	Fall:	Tutorials for ‘Calculus I for Engineers’ (TU Berlin)
	Spring:	Tutorials for ‘Calculus I for Engineers’ (TU Berlin)
2011	Fall:	Tutorials for ‘Calculus I for Engineers’ (TU Berlin)
	Spring:	Tutorials for ‘Calculus II for Mathematicians’ (TU Berlin)
2010	Fall:	Tutorials for ‘Calculus I for Mathematicians’ (TU Berlin)

Languages

German	First language
English	Proficient
Finnish	Basic knowledge
Norwegian	Basic knowledge

References

Prof. Siddhartha Mishra
ETH Zürich.
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Prof. Ulrik Skre Fjordholm
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Prof. Nils Henrik Risebro
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