

Contact Information

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Research Interests

Evolution Equations in Fluid Dynamics and Kinetic Theory

Employment

- Oct. 2022 – **University of Vienna**, *Assistant Professor*.
present
- Feb. 2022 – **University of Zurich**, *Assistant Professor*.
present with SNSF Eccellenza Professorial Fellowship
- Aug. 2017 – **EPFL**, *Research Scientist & Lecturer*.
Jan. 2022 Member of PDE group
- Aug. 2016 – **Brown University**, *Tamarkin Assistant Professor*.
July 2017

Education

- Sept. 2011 – **Courant Institute of Mathematical Sciences, New York University**,
May 2016 *PhD in Mathematics*.
 - On Dispersive Effects In Inviscid Fluids And Non-Uniqueness Of Weak Wave Maps
 - Advisor: Prof. Dr. Pierre Germain
- June 2011 **ETH Zurich**, *M.Sc. in Mathematics*.
 - Thesis: Remarks on the Anharmonic Oscillator Model from Nonlinear Optics
 - Advisors: Prof. Dr. Pierre Germain, Courant Institute of Mathematical Sciences, NYU and Prof. Dr. Michael Struwe, ETH Zurich
- July 2010 **ETH Zurich**, *B.Sc. in Mathematics*.
 - Thesis: Das schwache Maximumsprinzip für parabolische partielle Differentialgleichungen (“The weak Maximum Principle for Parabolic Partial Differential Equations”)
 - Advisors: Prof. Dr. Michael Struwe, ETH Zurich

Publications and Preprints

- [18] **On the stability of homogeneous equilibria in the Vlasov-Poisson system on \mathbb{R}^3** ,
with Alexandru D. Ionescu, Benoit Pausader, Xuecheng Wang.
Class. Quantum Grav. 40 (2023) 185007
- [17] **Stability of a point charge for the repulsive Vlasov-Poisson system**,
with Benoit Pausader, Jiaqi Yang.
J. Eur. Math. Soc., to appear – preprint arXiv:2207.05644 (2022)
- [16] **Nonlinear Landau damping for the Vlasov-Poisson system in \mathbb{R}^3 : the Poisson equilibrium**,
with Alexandru D. Ionescu, Benoit Pausader, Xuecheng Wang.
Annals of PDE, to appear – preprint arXiv:2205.04540 (2022)

- [15] **Global Axisymmetric Euler Flows with Rotation**,
with Yan Guo, Benoit Pausader.
Inventiones Mathematicae 231, pages 169–262 (2023)
- [14] **Scattering map for the Vlasov-Poisson system**,
with Patrick Flynn, Zhimeng Ouyang, Benoit Pausader.
Peking Mathematical Journal 6, 365–392 (2023)
- [13] **On the stabilizing effect of rotation in the 3d Euler equations**,
with Yan Guo, Chunyan Huang, Benoit Pausader.
Comm. Pure Appl. Math., Volume 76, Issue 12, December 2023, 3553–3641
- [12] **Mixing and diffusion for rough shear flows**,
with Maria Colombo, Michele Coti Zelati.
Ars Inveniendi Analytica, Paper No. 2 (2021)
- [11] **Stability of a point charge for the Vlasov-Poisson system: the radial case**,
with Benoit Pausader.
Communications in Mathematical Physics 385, 1741–1769 (2021)
- [10] **Stationary Structures near the Kolmogorov and Poiseuille Flows in the 2d Euler Equations**,
with Michele Coti Zelati, Tarek M. Elgindi.
Archive for Rational Mechanics and Analysis 247, 12 (2023)
- [9] **On the asymptotic behavior of solutions to the Vlasov-Poisson system**,
with Alexandru D. Ionescu, Benoit Pausader, Xuecheng Wang.
International Mathematics Research Notices, Issue 12, November 2022, Pages 8865–8889
- [8] **Enhanced dissipation in the Navier-Stokes equations near the Poiseuille flow**,
with Michele Coti Zelati, Tarek M. Elgindi.
Communications in Mathematical Physics 378, 987–1010 (2020)
- [7] **The Surface Quasi-Geostrophic Equation with Random Diffusion**,
with Tristan Buckmaster, Andrea Nahmod, Gigliola Staffilani.
International Mathematics Research Notices, Issue 23, November 2020, Pages 9370–9385
- [6] **On the Global Stability of a Beta-Plane Equation**,
with Fabio Pusateri.
Analysis & PDE, Vol. 11 (2018), No. 7, 1587–1624
- [5] **On Dispersive Effects In Inviscid Fluids And Non-Uniqueness Of Weak Wave Maps**.
Ph.D. Thesis, New York University, May 2016
- [4] **Convergence to Stratified Flow for an Inviscid 3D Boussinesq System**.
Commun. Math. Sci. Vol. 16, No. 6 (2018), 1713–1728
- [3] **Long Time Stability for Solutions of a Beta-Plane Equation**,
with Tarek M. Elgindi.
Comm. Pure Appl. Math., Volume 70, Issue 8, August 2017, 1425–1471
- [2] **Sharp decay estimates for an anisotropic linear semigroup and applications to the SQG and inviscid Boussinesq systems**,
with Tarek M. Elgindi.
SIAM Journal on Mathematical Analysis, 47 (6), 4672–4684 (2015)
- [1] **Non-uniqueness of Weak Solutions to the Wave Map Problem**.
Ann. Inst. H. Poincaré (C) Analyse Non Linéaire, Volume 32, Issue 3, May-June 2015, 519–532

Honors and Awards

- Nov. 2021 Eccellenza Professorial Fellowship, SNSF Grant PCEFP2-203059 (ca. 1.8 Mio CHF)
- July 2015 NYU Dean's Student Travel Grant
- April 2014 Harold Grad Memorial Prize of the Courant Institute, awarded for outstanding performance and promise as a graduate student
- April 2012 Willi Studer Prize of the Department of Mathematics, ETH Zurich, for the best graduating student of the year
- 2011–2016 Henry MacCracken Fellowship, New York University Graduate School of Arts and Sciences
- Spring 2011 Graduated as Master of Science ETH in Mathematics “with distinction”
- Spring 2006 Accepted for the advancement training programme of the Swiss Study Foundation

Conference Organization

- June 2025 Workshop “Blurring the lines between pure and applied through mixing”, ICMS, Scotland
- June 2020 Minisymposium at SIAM Conference on Nonlinear Waves and Coherent Structures, Bremen, Germany – postponed

Mini-Courses

- July 2024 At summer school “Current topics in Mathematical Physics”, Zurich, Switzerland
- Nov. 2023 “Mechanisms of stability in collisionless kinetic theory”, 1st “COMBO” autumn school, Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany
- July 2023 “On stable dynamics in Vlasov-Poisson”, Conference on “Stability and Dynamics in Fluid Mechanics and Kinetic Theory”, Imperial College, London, UK
- August 2021 “Stable Structures in Fluid Flow”, Workshop on “Fluid dynamics: qualitative and asymptotic behavior of solutions”, Peyresq, France
- August 2017 “Introduction to Nonlinear Dispersive Equations”, Summer school at Peking University, Peking, China

Invited Talks

At Conferences and Workshops

- Jan. 2024 SwissMAP conference on “Phase mixing, kinetic theory and fluid mechanics”, Les Diablerets, Switzerland
- Feb. 2024 “International conference on kinetic theory”, Sanya, China
- Sep. 2023 SwissMAP Annual General Meeting, Les Diablerets, Switzerland
- August 2023 Workshop on “Stability, Mixing and Fluid Dynamics”, University of Münster, Münster, Germany
- August 2023 ICIAM Conference, Minisymposium on “Recent Developments in Fluid Dynamics”, Tokyo, Japan
- July 2023 Conference on “Stability and Dynamics in Fluid Mechanics and Kinetic Theory”, Imperial College, London, UK
- Dec. 2022 Conference “MathFlows22”, CIRM Luminy, France

- Sept. 2022 Conference on “Fluid Dynamics”, ICMAT, Madrid, Spain
- June 2022 Summer school on “Fluids and Turbulence”, Institut Camille Jordan, Université de Lyon, Lyon, France
- June 2022 SITE Research Center on Stability, Instability, and Turbulence online conference on “Long Time Behavior and Singularity Formation in PDEs”, New York University, Abu Dhabi
- May 2022 Conference “Nonlinear PDEs in Fluid Mechanics”, CIRM Luminy, France
- March 2022 SIAM PD22 Conference, Berlin, Germany
- Feb. 2022 Conference “Mathematics of Wave Phenomena”, Karlsruhe Institute of Technology, Germany
- May 2020 PDE Meeting, ICMAT, Madrid, Spain – postponed
- October 2021 PDE seminar at ICERM semester program “Hamiltonian Methods in Dispersive and Wave Evolution Equations”, Brown University, Providence, USA
- August 2021 Workshop on “Fluid dynamics: qualitative and asymptotic behavior of solutions”, Peyresq, France – postponed from August 2020
- August 2021 Young Researchers Symposium at the “International Congress on Mathematical Physics”, Geneva, Switzerland
- June 2021 SwissMAP workshop “Emergent Theories for Wave Turbulence and Particle Dynamics”, Les Diablerets, Switzerland
- Dec. 2019 SIAM Conference on Analysis of PDEs, La Quinta, CA, USA
- Sept. 2019 Dynamics, Equations and Applications (DEA 2019), Krakow, Poland
- March 2019 AMS Western Sectional Meeting, Honolulu, USA
- June 2018 Mathematical Analysis of Incompressible Fluids, Sevilla, Spain
- Dec. 2017 SIAM Conference on Analysis of PDEs, Baltimore, USA
- June 2017 Mathematical Questions in Wave Turbulence Theory, AIM San José, USA
- June 2017 Mathematical Analysis of Water Waves and Related Models, Bodega Bay, USA
- May 2016 International Conference on Evolution Equations, Nashville, USA
- March 2015 AMS Eastern Sectional Meeting, Washington D. C. USA
- July 2014 Hausdorff Research Trimester “Harmonic Analysis and Partial Differential Equations”, Bonn, Germany
- October 2012 Oberwolfach Seminar “Dispersive Equations”, Oberwolfach, Germany
- [At Research Seminars](#)
- Nov. 2023 Analysis seminar, University of Bielefeld, Germany
- Sep. 2023 Seminar “Nonlinear Analysis and PDE” joint between ENS Paris, Sorbonne University and University of Paris, Paris, France
- June 2023 Oberseminar Angewandte Analysis, University of Dortmund, Germany
- April 2023 PDE and Applied Math Seminar, UC Davis, USA
- Nov. 2022 MCMP Seminar, Erwin Schrödinger Institute, University of Vienna, Austria
- Sept. 2022 PDE seminar via zoom, Chinese Academy of Sciences, Beijing
- Mar. 2022 Seminar PDE and Mathematical Physics, ETH and University of Zurich, Zurich, Switzerland
- Feb. 2022 Fluids seminar, Princeton University, Princeton, USA
- Feb. 2022 Analysis seminar, Carnegie Mellon University, Pittsburgh, USA
- Nov. 2021 PDE seminar, Lund University, Lund, Sweden

Nov. 2021 Dynamics Seminar, Boston University, Boston, USA
 April 2021 OSSUR–PDE seminar, GSSI, Italy
 March 2021 Online Analysis and PDE seminar, Spain
 Feb. 2021 Korea Institute for Advanced Study, Seoul, South Korea
 January 2021 University of Münster, Münster, Germany
 Nov. 2020 Imperial College / University College, London, UK
 Nov. 2020 University of Maryland, College Park, USA
 Nov. 2020 MIT, Boston, USA
 October 2020 University of Basel, Basel, Switzerland
 April 2020 Princeton University, Princeton, USA
 October 2019 Institut Fourier, Grenoble, France
 April 2019 Max Planck Institute, Leipzig, Germany
 April 2019 EPFL, Switzerland
 October 2018 Imperial College, London, UK
 Feb. 2018 UC San Diego, CA, USA
 Nov. 2017 Université de Lyon, Lyon, France
 May 2017 Stanford University, Palo Alto, USA
 Feb. 2017 Johns Hopkins University, Baltimore, USA
 Nov. 2016 Princeton University, Princeton, USA
 October 2016 UMass Amherst, USA
 Nov. 2015 UC Berkeley, CA, USA
 Nov. 2015 MSRI, Berkeley, CA, USA

Teaching Activities

UZH

- Introduction to Dispersive PDE – Lecturer *Spring 2023*
- Student Seminar on Partial Differential Equations – Organizer *Spring 2023*
- Supervision of Master thesis *2023*
- Supervision of undergraduate research internship *Summer 2022*
(Exchange from Orsay)

U. of Vienna

- Complex and Harmonic Analysis – Lecturer *Winter 2023*
- Topics in Analysis – Lecturer *Winter 2022*

EPFL

- Supervision of Bachelor/Master projects and theses, semester projects
- Dispersive PDEs – Lecturer *Spring 2021*
- Dispersive PDEs – Lecturer *Spring 2020*
- Dispersive PDEs – Lecturer *Spring 2019*
- Harmonic Analysis – Teaching Assistant *Spring 2018*
- Ordinary Differential Equations – Teaching Assistant *Fall 2017 & 2018*

Peking University

- Summer School “Introduction to Nonlinear Dispersive Equations”
– Lecturer *August 2017*

Brown University

- Math1010 Analysis – Lecturer & Course Head *Spring 2017*
- Math0180 Vector Calculus – Lecturer & Course Head *Fall 2016*

NYU	<ul style="list-style-type: none"> ○ Calculus I – Teaching Assistant ○ Analysis II – Teaching Assistant ○ Ordinary Differential Equations – Teaching Assistant ○ Short Course on Special Theory of Relativity – Lecturer 	<p><i>Spring 2015 & Fall 2013</i> <i>Fall 2014</i> <i>Spring 2014</i> <i>March 2011</i></p>
ETH Zurich	<ul style="list-style-type: none"> ○ Exam Preparation Course for Analysis III – Lecturer ○ Analysis III – Teaching Assistant and Grader ○ Analysis I – Teaching Assistant and Grader 	<p><i>Spring 2010</i> <i>Fall 2009</i> <i>Fall 2007</i></p>

Professional Service

Seminars	(Co-)Organization at NYU, Brown University, EPFL, UZH
Outreach	<p>Talks at Courant CSplash, Brown Undergrad Union, Senior University “UZH3” (Spring 2024)</p> <p>Lectures at Winter School “Stabilizing and Destablizing Mechanisms in Fluid Equations” (February 2023), Academy of Scientific Research and Technology, Egypt</p>
Service	<p>Supervision of “Lehramtsprüfungen” (2023), Zurich, Switzerland</p> <p>PhD thesis committee member, University of Sevilla, Spain (June 2023)</p>
Refereeing	<p>For <i>Analysis & PDE</i>, <i>Annali di Matematica</i>, <i>Annals of PDE</i>, <i>Archive for Rational Mechanics and Analysis</i>, <i>Commun. Math. Phys.</i>, <i>Comm. PDE</i>, <i>DCDS–A</i>, <i>Duke Math. Journal</i>, <i>Funkcialaj Ekvacioj</i>, <i>Inventiones Mathematicae</i>, <i>J. Differential Equations</i>, <i>J. Funct. Anal.</i>, <i>J. London Math. Soc.</i>, <i>J. Math. Anal. Appl.</i>, <i>Journal of Mathematical Physics</i>, <i>Nonlinearity</i>, <i>Pacific Journal of Mathematics</i>, <i>Proc. Amer. Math. Soc.</i>, <i>SIAM Journal on Mathematical Analysis</i>, <i>Stud Appl Math.</i>, <i>Trans. Amer. Math. Soc.</i></p>

Languages

native	German
fluent	English, French, Spanish
basic	Italian