Samuel LANTHALER

PERSONAL DATA

• GOOGLE SCHOLAR • ARXIV • ORCID • WEBSITE

CITIZENSHIP: Switzerland
EMAIL: slanth@caltech.edu

EMPLOYMENT

SINCE 08/2022	**Postdoc** in Computing + Mathematical Sciences at Caltech, USA
11/2021 – 07/2022	**Postdoc/Lecturer** in Mathematics at ETH Zurich, Switzerland

EDUCATION

11/2018 – 11/2021	**PhD in Mathematics** at ETH Zurich, Switzerland Thesis: "Computation and analysis of statistical solutions of the incompressible Euler equations" | Advisor: Prof. Siddhartha Mishra
08/2015 – 08/2020	**PhD in Physics** at EPF Lausanne, Switzerland Thesis: "Kinetic-MHD stability of virtually collisionless plasmas" | Advisor: Prof. Jonathan P. Graves
09/2013 – 03/2015	**Master of Science in Mathematics**, ETH Zurich
09/2010 – 09/2013	**Bachelor of Science in Mathematics**, ETH Zurich

SELECTED PUBLICATIONS

1. "Error estimates for deeponets: A deep learning framework in infinite dimensions", S. Lanthaler, S. Mishra, G.E. Karniadakis, *Trans Math Appl*, **6**(1), (2022), tnac001,
2. "On universal approximation and error bounds for Fourier neural operators", N. Kovachki, S. Lanthaler, S. Mishra, *JMLR*, **22**(290), (2021), 1-76
3. "Statistical solutions of the incompressible Euler equations", S. Lanthaler, S. Mishra, C. Parés-Pulido, *Math. Models Methods Appl. Sci.* (M^{3}AS), **31**(2), (2021), 223-292
4. "On the conservation of energy in two-dimensional incompressible flows", S. Lanthaler, S. Mishra, C. Parés-Pulido, *Nonlinearity*, **34**(2), (2021), 1084
5. "On the convergence of the spectral viscosity method for the two-dimensional incompressible Euler equations with rough initial data", S. Lanthaler, S. Mishra, *Found Comput Math*, **20**, (2020), 1309–1362

TEACHING EXPERIENCE

- **Lecturer** for "Numerical Methods for Hyperbolic PDEs" (ETH Zurich; Spring 2022)
- **Co-supervision of young researchers:** (ETH Zurich, Spring and Autumn 2021)
  - **master theses (3)** (Fabian Jin, 2021, *awarded ETH Medal*; Patrik Hadorn, 2021; Michael Prasthofer, 2021),
  - **semester theses (2)** (Fabian Jin, 2021; Patrik Hadorn, 2021).
- **Head assistant** for **Linear Algebra** (autumn semesters 2019;2020;2021);
  - Conducting and organizing examinations, **350 students**,
  - Organization of exercise classes and exercises, **8 TAs**,
- **Class-room teaching:** TA for various courses at ETH Zurich and EPF Lausanne, in both *mathematics* and *physics*, including

– Numerical Methods for Hyperbolic PDEs (ETHZ; 2019); Mathematical Methods for Physicists (EPFL; 2017, 2018); Advanced Physics (EPFL; 2017); Computational Physics (EPFL; 2015, 2016); Numerical Mathematics (ETHZ; 2013); Differential Geometry (ETHZ; 2012)

Scientific presentations

- Talk in the Applied Math Seminar, UC Berkeley (2022),
- Minisymposium on "Provable Guarantees for Learning Dynamical Systems" SIAM MD22, San Diego CA (2022),
- Minisymposium on "Operator Learning in PDEs, Inverse Problems, and UQ" SIAM UQ22 (hybrid), Atlanta GA (2022),
- Minisymposium on "Recent Advances on Analysis and Numerics of Multidimensional Compressible Flows", SIAM PD22 (virtual), (2022),
- *Swiss Numerics Day 2021*, EPF Lausanne, Switzerland (2021),
- Seminar on "Physics-Informed Learning Machines for Multiscale and Multiphysics Problems" (PhILMs), *virtual*, invited by G.E. Karniadakis, Brown University (2021),
- Minisymposium on *Incompressible Fluid Mechanics*, SIAM PD19 in La Quinta, CA (2019),
- Workshop on *Interfaces and Instabilities in Fluid Dynamics* at the Hausdorff Research Institute in Mathematics in Bonn, Germany (2019),
- Invited speaker: *Theory of Fusion Plasmas*, Varenna-Lausanne intl. workshop (2018),
- *XV Intl. Conference on Hyperbolic Problems (Hyp2014)*, in Rio de Janeiro, Brazil (2014).

Recognition and Awards

05/2022	ETH Medal (ETH Zurich) Awarded for outstanding doctoral thesis
01/2022 – 12/2024	GAMM Junior Fellow Elected by the International Association of Applied Mathematics and Mechanics (GAMM) for outstanding work in doctoral thesis (10 junior fellows per year)
01/2015	ETH Medal (ETH Zurich) Awarded for outstanding master's thesis
09/2013 – 01/2015	Excellence Scholarship and Opportunity Programme (ETH Zurich) A special scholarship to cover the full study and living costs for the duration of master's degree, as well as specific supervision.
12/2013	Polya prize (ETH Zurich) Awarded for best bachelor's degree in mathematics and physics.

Professional service

- Journal referee for Calcolo, Journal of Scientific Computing, IMA Journal of Numerical Analysis, SIAM Journal on Scientific Computing, Vietnam Journal of Mathematics, Neural Networks, Connection Science, Inverse Problems, Communications in Computational Physics and Nature Computational Science,
- Organizer: Minisymposium "Theoretical foundations and algorithmic innovation in operator learning" ICIAM 2023.

Programming Experience

Extended Experience:	C++, Fortran–90/03 (with MPI-parallelization), MATLAB, Python
Basic Knowledge:	CUDA, OpenACC, HTML

Languages

English:	Fluent (C2)	French:	Advanced (C1)
German:	Mothertongue	Korean:	Intermediate (B1)