

Alberto Bassi

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Summary: PhD candidate in Physics at ETH Zurich, with a strong theoretical and computational background in statistical mechanics, Bayesian statistics, machine learning, and reinforcement learning.

RESEARCH EXPERIENCE

Classification and phase transitions in DNN | *PhD at ETH and EAWAG (ETH)* Aug. 2024 – Present

➤ Investigating the connection between class classification and order/chaos phase transitions in deep neural networks with theoretical statistical mechanics-driven calculations.

Machine Learning for hydrology | *PhD at ETH and EAWAG (ETH)* Oct. 2022 – Present

➤ Retrieved an optimal number of catchment features from streamflow with conditional autoencoders.

➤ Presented at international conferences (such as **EGU 2024**) and summer schools (such as the **Mediterranean ML Summer School 2023**).

Meta Dynamics for Bayesian Statistics | *PhD at ETH and EAWAG (ETH)* Oct. 2022 - Present

➤ Proved the applicability of MD for sampling multi modal high-dimensional posterior of stochastic models.

Presented at international conferences (such as **BayesComp 2023**), won a best poster prize.

INDUSTRY EXPERIENCE

Reinforcement Learning for path optimization | *HHM-AG and ETH Juniors* Aug. – Oct. 2023

➤ Applied RL algorithms (DDQN, PPO) for minimal path optimization problems in construction engineering.

LEADERSHIP EXPERIENCE

Member of PhD committee, *EAWAG (ETH), Switzerland* Aug. 2023 – Jun. 2024

Teaching assistant, *EAWAG (ETH) summer school in Environmental Analysis, Switzerland* June 2023

Invited seminar on BNN and HMC, *Università della Svizzera italiana, Switzerland* May 2023

EDUCATION

ETH Zurich, *PhD in Physics* | Zurich, Switzerland Oct. 2022 – Nov. 2026 (expected)

PI: Sebastian Huber, Carlo Albert, and Antonietta Mira

Galilean School of Higher Education, *MSc in Physics* | Padova, Italy Oct. 2017 – Dec. 2023

PI: Amos Maritan and Carlo Albert, GPA: 29.89/30, Final Grade: 100/100 cum Laude

University of Padova, *MSc in Physics* | Padova, Italy Oct. 2020 – Sept. 2022

PI: Amos Maritan, Valerio Lucarini, and Varun Ojha, GPA: 29.56/30, Final Grade: 110/110 cum Laude

University of Padova, *BSc in Physics* | Padova, Italy Oct. 2017 – Sept. 2020

PI: Sabino Matarrese and Daniele Bertacca, GPA: 28.90/30, Final Grade: 110/110 cum Laude

SKILLS

Programming **Advanced:** Python, C++, Julia, Fortran **Intermediate:** Latex, Git **Basic:** R

Technical Data analysis, collaborative projects (Git), MPI (Python, C++), cluster managing

Languages **Native:** Italian, Friulan **Fluent:** English, German **Conversational:** French, Spanish

PUBLICATIONS

Bassi, A., Höge, M., Mira, A., Fencia, F., and Albert, C.: Learning Landscape Features from Streamflow with Autoencoders, *Hydrol. Earth Syst. Sci. Discuss.*, <https://doi.org/10.5194/hess-2024-47>, accepted, 2024.

AWARDS & SCHOLARSHIPS

Galilean School of Higher Education, Five years full scholarship, awarded to selected students

(acceptance rate of 5 %) with admission tests in mathematics and physics,

additional mandatory exams and final thesis

Oct. 2017 – Sept. 2022

Italian Physics Olympiads, Silver medal (among the first 10 qualified in the national finals)

Apr. 2017