

Peter Mlkvik

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SUMMARY

Computational physicist with experience in high-dimensional data analysis, probabilistic modeling, and large-scale numerical simulation. Skilled in Python, HPC, and statistical tools, with a proven ability to extract insights from complex systems. Looking to apply this expertise to quantitative research and data-intensive roles in industry.

EDUCATION

PhD in Materials Theory

ETH Zürich, CH

08/2021 – Expected 12/2025

- Thesis: *Tuning the Metal-Insulator Transition in VO₂ and Related Oxides*
- First-principles computational modeling of materials at the quantum-mechanical level in order to understand and engineer their properties for future technologies
- Analyzed complex material properties data using Python to validate theoretical model predictions
- Published papers and presented results at various international conferences and workshops
- Relevant coursework: Information Systems, Big Data, Introduction to Machine Learning, Probabilistic Artificial Intelligence

MSci Physics with Theoretical Physics

Imperial College London, UK

09/2017 – 06/2021

- Thesis: *B-anomalies at the LHCb via the $B_s \rightarrow \phi_3 \tau^+ \tau^-$ decay* – used gradient boosted decision trees on CERN data
- Graduated with First-Class Honours; Dean's List (Top 10%)
- Relevant coursework: Computational Physics, Statistical Mechanics, Complexity & Networks

EXPERIENCE

Scientific Assistant

ETH Zürich, CH

08/2021 – Present

- Taught and coordinated both Bachelor's and Master's level programming courses with 50+ students
- Outlined, supervised, and mentored three Master's projects resulting in publications
- Performed IT duties in the group (Gitlab, HPC cluster software compilation, technical support)

Research Assistant

Imperial College London, UK

06/2019 – 09/2020

- Designed and performed large-scale first-principles quantum-mechanical simulations to study magnetic effects on stacking faults in superalloys resulting in a publication
- Awarded the Faculty of Engineering UROP Award and the Henry Royce Institute UROP Award

Research Intern

GA Drilling, Bratislava, SK

06/2018 – 09/2018

- Assessed feasibility of plasma-drilling methods through simulation and physical modeling

SKILLS

Programming: Python (pandas, scikit-learn, PyTorch, Tensorflow), Fortran90, SQL, MATLAB

Data and Modeling: Data analysis, Data visualization, Statistical analysis, Simulation

Tools: Git, Bash, Docker, CI/CD, Slurm, HPC clusters, L^AT_EX

SELECTED PUBLICATIONS

L. Haas, **P. Mlkvik**, N. A. Spaldin, and C. Ederer, [Phys. Rev. Research 6, 043177 \(2024\)](#).

P. Mlkvik, M. E. Merkel, N. A. Spaldin, and C. Ederer, [Phys. Rev. Research 6, 033122 \(2024\)](#).

P. Mlkvik, C. Ederer, and N. A. Spaldin, [Phys. Rev. Research 4, 043129 \(2022\)](#).

H. Hasan, **P. Mlkvik**, P. D. Haynes, and V. A. Vorontsov, [Materialia 9, 100555 \(2020\)](#).