

Peter Mlkvik

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EDUCATION

PhD in Materials Theory

ETH Zürich, CH

08/2021 – Q4 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
- Employed high-performance computing (HPC) architecture software to model large systems, analyse complex material properties, and test theoretical predictions
- Published papers and presented results at various international conferences and workshops
- Relevant coursework: Information Systems for Engineers, Big Data for Engineers, 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 Experiment through the $B_s \rightarrow \phi_3 \tau^+ \tau^-$ Decay and its Geometry* - conceived and implemented a boosted decision tree to identify rare decays in CERN data
- 1st Class Honours, Dean's list (Top 10%) 2017/2018 & 2018/2019
- Relevant coursework: Computational Physics, Statistical Mechanics, Complexity & Networks

WORK EXPERIENCE

Scientific Assistant, Materials Theory

ETH Zürich, CH

08/2021 – Q4 2025

- Taught and coordinated both Bachelor's and Master's level courses with 50+ students
- Outlined, supervised, and mentored 2 Master's projects and 1 Master's thesis
- Performed IT duties in the group (Gitlab, HPC cluster software compilation, technical support)

Research Assistant, Theory and Simulation of Materials

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 on HPC hardware
- Awarded the Faculty of Engineering UROP Award and the Henry Royce Institute UROP Award

Research Intern, GA Drilling

Bratislava, SK

06/2018 - 09/2018

- Contributed to a feasibility study of an eventually implemented novel plasma-drilling concept

SKILLS

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

Tools: L^AT_EX, Git, bash, Docker, Unix, Slurm

Technical: Data analysis, Data visualization, Statistical analysis, High-performance computing

Languages: English (proficient), Slovak (native), German (beginner), Mandarin (beginner)

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).

REFERENCES

Available upon request.