Patryk Kubiczek

Computational Physicist · Data Scientist

Hamburg, Germany

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"I solve complex problems through data analysis and quantitative modeling."

Summary

- 5 years of quantitative modeling of physical problems resulting in 5 scientific publications.
- Physics studies-based critical thinking and problem solving skills.
- Strong computational and programming background.
- Competence in management tasks and workflow optimization.
- Professional experience in international and intercultural environment.

Work Experience

Collaborative Research Center SFB 925, University of Hamburg

Hamburg, Germany

Research Assistant

Sep. 2016 - Jun. 2019

- Developed and tested numerical methods of simulating complex quantum systems out of equilibrium (Monte Carlo, Lanczos algorithm, perturbation theory, machine learning).
- Co-invented and implemented a new quantum Monte Carlo method in over 7000 lines of C++ and Python code.
- Published a paper highlighted in a scientific journal and presented own research at 9 conferences, workshops and summer schools.
- Wrote a grant proposal and secured computing time at the HLRN supercomputer.
- Collaborated with partners from Russian Quantum Center, University of Michigan (USA) and Tel Aviv University (Israel).
- Delivered a block course on Monte Carlo methods in quantum physics.
- Provided IT support for other members of the research group.

Institute for Theoretical Physics I, University of Hamburg

Hamburg, Germany

Teaching Assistant

Oct. 2018 - Mar. 2019

- Supervised a class in Statistical Physics for Bachelor students (in German).

Condensed Matter Theory and Nanophysics Group, Jagiellonian University

Kraków, Poland

Student Researcher

Jan. 2015 - Jul. 2016

- Investigated numerically a phase diagram of a model for ferromagnetic superconductors.
- Co-authored 2 peer-reviewed scientific papers resulting from the research.

Chair of Theory of Strong and Electroweak Interactions, University of Warsaw

Warsaw, Poland

Student Researcher

Oct. 2013 - Sep. 2014

- Modeled a novel phenomenon observed in statistical correlations in data from proton collisions at CERN, Geneva.
- Published 2 peer-reviewed scientific papers resulting from the research.

Condensed Matter Theory and Nanophysics Group, Jagiellonian University

Kraków, Poland

Student Intern

Jul. 2013

- Wrote a section on de Haas-van Alphen effect for a new condensed mater physics handbook.

Education

University of Hamburg

Hamburg, Germany

PhD Candidate in Condensed Matter Physics

Sep. 2016 - present

- Supervisor: Alexander I. Lichtenstein, Institute for Theoretical Physics I

Jagiellonian University in Kraków

Kraków, Poland

Master of Science in Theoretical Physics

Oct. 2014 - Jul. 2016

- Erasmus+ exchange student at University of Bonn, Germany during winter semester 2015/2016
- Final grade: 4.93/5.00, award of distinction

University of Warsaw

Warsaw, Poland

Bachelor of Science in Physics

Oct. 2011 - Sep. 2014

- Extended individualized study program
- Final grade: 4.72/5.00

Stays Abroad

Computational Condensed Matter Theory Group, University of Michigan — *Ann Arbor, MI, USA*

Guest Researcher — *Nov. 2017 - Dec. 2017*

- Presented and discussed own research on quantum Monte Carlo methods at a group seminar.

Theoretical Condensed Matter Physics Group, University of Bonn — *Bonn, Germany*

Guest Student — *Oct. 2015 - Feb. 2016*

- Implemented from scratch a quantum Monte Carlo solver for dynamical mean theory in C++.

Institute for Advanced Study in Princeton | Park City Math Institute — *Park City, UT, USA*

Participant of Undergraduate Summer School "Mathematics and Materials" — *Jul. 2014*

Honors & Awards

2015	**Erasmus+ Scholarship**, awarded by Jagiellonian University for a student exchange	*Kraków, Poland*
2015	**Scholarship for student researchers**, awarded by Foundation of the Polish Science	*Kraków, Poland*
2014	**Scholarship for outstanding students**, awarded by the Rector of Jagiellonian University	*Kraków, Poland*
2014	**Best Poster Award**, Winter Kindergarten of Theoretical Physics	*Karpacz, Poland*
2010	**Laureate**, Polish Geography Olympiad	*Supraśl, Poland*

Extracurricular Activities

Climate Hub Hamburg — *Hamburg, Germany*

Co-Founder & Active Member — *Sep. 2018 - present*

- Organized and hosted 9 public events with guest climate experts.
- Consulted scientific literature on topics relevant to the events.
- Delivered 4 presentations on climate change causes, impacts and solutions.

Physics Students Club, University of Warsaw — *Warsaw, Poland*

Chairman & Vice-Chairman — *Mar. 2012 - Jun. 2014*

- Organized and hosted over 15 public lectures, panel discussions and workshops.
- Managed the team and administrative tasks.

Climate Reality Project | Leadership Training — *Berlin, Germany*

Volunteer Climate Reality Leader — *Jun. 2018*

Skills

Technologies

IT Tools	Linux, Bash, Vim, Git, LaTeX, HTML, Markdown, Inkscape, Microsoft Windows, Microsoft Office
Python	NumPy, SciPy, SymPy, Pandas, Matplotlib, Scikit-Learn, Keras, Cython, h5py, mpi4py, Jupyter, PyCharm
C++	Armadillo, GNU Scientific Library, Boost, MPI, OpenMP, CMake, CLion
Other	Mathematica, Matlab, Julia

Transferable

Research	Data Analysis and Visualization, Mathematical Modeling, Critical Thinking
Communication	Scientific Writing, Scientific Presentation
Leadership	Academic Teaching, Public Speaking
Management	Workflow Optimization, Team Management, Event Organization
Languages	English (C2), German (C1), Polish (native)

Interests

Climate Change | Sustainability Science | Complexity Science | Political Science & Economy | Hiking, Skiing & Traveling