Johannes Dreckhoff

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Expected Grad. Date: December 2025

About me

I am a graduate student in physics and aspiring quantitative researcher with a strong background in mathematical modeling, numerical simulations and high-performance scientific computing. I am experienced in Python and JAX and eager to apply my analytical skills to problems in finance, using my exposure to the physics of finance and machine learning techniques.

Skills & Tools

Programming:	Strong background in Python and **JAX** as well as Numpy and SciPy, Git, GitHub
Technical Skills:	Numerical simulations, object-oriented programming, scientific computing
ML/Statistics:	Basic exposure to machine learning, stochastic modeling, optimisation
Other:	Mathematical modeling, translating models into software, data visualisation, complex data structures, lab work

Education & Relevant Courses

M.Sc. Physics, Heidelberg University (9/2024-12/2025 est., Grade est. 1.3)
- Master thesis in theoretical and computational biophysics, Schwarz-Group (Grade est. 1.3)

B.Sc. Physics, Heidelberg University (10/2019-7/2023, Grade 1.3)
- Bachelor thesis in theoretical biophysics, Mielke-Group (Grade 1.0)
- Internship in the Mielke-Group, on emergence of structure in non-equilibrium systems
- Exchange semester, Physics, University of Leiden (7/2023-2/2024)

Physics of Finance, University of Leiden, Dr. Diego Garlaschelli (2023-2024)
- Covered stochastic processes, market and pricing models, network theory and application of physical methods to financial systems

Abitur (A-level), Theodor Fliedner Gymnasium (8/2011-7/2019, Grade 1.0)

Projects, Research & Publications

Pattern Formation in Lipid Membranes (Bachelor Thesis, Audio Summary, 2023)
- Used statistical mechanics to constrain differential equation solutions for pattern formation in lipid membranes
- Developed mechanism explaining formation of sharp pattern

High-Performance Simulation Framework (Master Thesis, Ongoing)
- Developed python based framework for the simulation of curvature generation in cellular endocytosis
- Using JAX for high performance, cluster-compatability and differentiability
- To be published on GitHub

Work Experience & Internships

Tutor for Physics, Heidelberg University (2024)
- Leading tutorials for students, explaining and solving problem sheets

Laboratory Assistant, Heidelberg University (2025)
- Guiding undergraduates through laboratory experiments

Internship @ German Aerospace Center (DLR) (2018)

Internship @ Engineering Office „Baues & Wicht“ (2018)

Prizes & Awards

German Physical Society (DPG) Abitur & Book Prize (2018)
- For excellent and outstanding achievements in physics

German Mathematical Society (DMV) Abitur Prize (2018)
- For outstanding achievements in mathematics

Third place @ changes.AWARD (2018)
- For creating an innovative start-up business plan with focus on sustainability

Languages

German: Native
English: Fluent (C1-C2)
French: Intermediate (B1)

Interests

Team sports, Ultimate frisbee, Music (Guitar & Piano)