Lukas Palm

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Education

Currently	PhD Candidate Physics, **University of Chicago**, United States Currently at **Stanford University**, Advisor: Prof. Jonathan Simon
Aug 2018	M.Sc. Physics, **University of Heidelberg**, Germany Thesis: "Exploring fractional quantum hall physics using ultracold fermions in rotating traps" | Advisor: Prof. Selim Jochim Grade: 1.0 (German tertiary scale, approx. equivalent to 'A+')
Sep 2015	B.Sc. Physics, **University of Heidelberg**, Germany Thesis: "Setup of a new XUV source and 2D simulation of wave packet dynamics in H_2^+ molecules" | Advisor: Prof. Thomas Pfeifer Grade: 1.4 (German tertiary scale, approx. equivalent to 'A')
July 2012	Abitur (high-school diploma) **Bischöfliches Willigis Gymnasium**, Mainz Final Grade: 1.0

Scholarships and Certificates

2012 - 2018	Fellow of the German Academic Scholarship Foundation (*Studien stiftung des deutschen Volkes*) awarded to 0.4% of german students

Publications

Danial Shadmany, Aishwarya Kumar, Anna Soper, Lukas Palm, Chuan Yin, Henry Ando, Bowen Li, Lavanya Taneja, Matt Jaffe, David Schuster, and Jon Simon. *Cavity QED in a High NA Resonator*. arXiv:2407.04784 [cond-mat, physics:physics, physics:quant-ph]. July 2024

Claire Baum, Matt Jaffe, Lukas Palm, Aishwarya Kumar, and Jonathan Simon. "Optical mode conversion via spatiotemporally modulated atomic susceptibility". en. In: *Optics Express* 31.1 (Jan. 2023), p. 528. DOI: 10.1364/OE.476638

Matt Jaffe, Lukas Palm, Claire Baum, Lavanya Taneja, Aishwarya Kumar, and Jonathan Simon. "Understanding and suppressing backscatter in optical resonators". en. In: *Optica* 9.8 (Aug. 2022), p. 878. DOI: 10.1364/OPTICA.463723

Matt Jaffe, Lukas Palm, Claire Baum, Lavanya Taneja, and Jonathan Simon. "Aberrated optical cavities". en. In: *Physical Review A* 104.1 (July 2021), p. 013524. DOI: 10.1103/PhysRevA.104.013524

L Palm, F Grusdt, and P M Preiss. "Skyrmion ground states of rapidly rotating few-fermion systems". In: *New Journal of Physics* 22.8 (Aug. 2020), p. 083037. DOI: 10.1088/1367-2630/aba30e

Andrea Bergschneider, Vincent M. Klinkhamer, Jan Hendrik Becher, Ralf Klemt, Lukas Palm, Gerhard Zürn, Selim Jochim, and Philipp M. Preiss. "Experimental characterization of two-particle entanglement through position and momentum correlations". en. In: *Nature Physics* 15.7 (July 2019), pp. 640–644. DOI: 10.1038/s41567-019-0508-6

Experience

Sep 2019 - *present*
PhD Candidate, Stanford University.
Researcher in the Simon Lab.
Led multimode cavity experiment for several years. Designed and built first highly degenerate, asphere based twisted cavity. Demonstrated first real space imaging of cavity Rydberg polaritons. Realized Rydberg blockade at high principal quantum numbers. Developed new in-situ LIC cleaning method. Supervised and mentored four graduate and three undergraduate students, overseeing their research projects. Relocated and rebuilt experimental apparatus from Chicago to Stanford in six months.

Aug 2018 - *Mar 2019*
Research Assistant, University of Heidelberg, Physikalisches Institut.
Experimental ultracold atoms in the group of Prof. Selim Jochim.
Development of an FPGA based DDS source with PID stabilization including RF electronics design, software development and system simulation. Contributions to LabView based experimental control software for precise measurements of optical aberrations.

Sep 2016 - Nov 2017
Teaching Assistant,University of Heidelberg.
Tutored physics lab courses for undergraduate students. Supervised experiments and graded reports.

Apr 2012- Jun 2012
Internship GSI Helmholtz Centre for Heavy Ion Research, Darmstadt, Germany.
Instrumentation development for FAIR particle accelerator. Participated in high current power supply development and FPGA interface design.

Presentations

Sep 2024 Berkley Quantum Seminar (invited talk), UC Berkley, Berkley, California, USA
Jun 2024 CalMuniQ Summer School, MPQ Garching, Munich, Germany
Jun 2024 DAMOP, Fort Worth, Texas, USA
Jun 2023 DAMOP, Spokane, Washington, USA
Jun 2022 DAMOP, Orlando, Florida, USA
Jul 2020 Research Seminar (invited talk), LMU Munich, Munich, Germany
Jul 2020 Research Seminar, Physikalisches Institut, Heidelberg, Germany

Skills

Experimental: Quantum simulation, Quantum Hall theory and ED numerics, ultracold atoms, optical cavities, ultrafast (fs) laser experiments.
Physics: RF circuit and electronic system design, embedded and FPGA programming. Digital holography.
Programming: Python, C/C++, CUDA, MATLAB, Linux.
Frameworks: Xilinx Vivado, PyTorch, NI LabView, Tensorflow.
Languages: German, English.