Adrian Beckert

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OrcID (0000-0001-7218-4214)
Google Scholar

Employment & research experience

Senior Quantum Engineer at Photonic 09/2024 – present

Postdoctoral Scholar with Andrei Faraon 10/2021 – 09/2024
at *Nanoscale and Quantum optics* group (Caltech, Pasadena, CA)
- Establishing a new research branch: Silicon color centers (T-center)
- Erbium in novel host materials: ZnO and molecular magnets

Dr. sc. ETH Zürich in Physics with Gabriel Aeppli 05/2017 – 08/2021
Quantum Technologies group (Paul Scherrer Institut, Switzerland)
- Coherent crystal field level manipulation in $LiY_xTb_{1-x}F_4$ with EPR
- Ultra-high resolution FTIR spectroscopic studies of coherence and hyperfine coupling in rare-earth quantum magnets ($LiY_xRE_{1-x}F_4$ family)
- Recommissioning of ultra-high resolution FTIR at the Swiss Synchrotron Light Source with low-temperature sample environment.

Research assistant, with Andreas Wallraff 05/2016 – 04/2017
at *Quantum Device Lab* (ETH Zürich, Switzerland)
- Study of longitudinal transmon qubit readout circuits
- Preparation and execution of the “Big Bell Test” experiment
- Decoherence mechanism studies on superconducting circuits

Master’s thesis, with Andreas Wallraff 09/2015 – 04/2016
at *Quantum Device Lab* (ETH Zürich, Switzerland)
- Title: Towards the realization of a transmon longitudinally coupled to a lumped element resonator

Education

Dr. sc. ETH Zürich in Physics with Gabriel Aeppli 05/2017 – 06/2021
at *Quantum Technologies Group* (Paul Scherrer Institut, Switzerland)
- Quantum information and solid-state physics with rare-earth ions
- Defense: June 2021

Master of Science ETH in Physics with Andreas Wallraff 09/2014 – 04/2016
at *Quantum Device Lab* (ETH Zürich, Switzerland)
- Quantum information, solid-state physics, superconducting circuits

Bachelor of Science ETH in Physics at ETH Zürich (Switzerland) 09/2011 – 08/2014

Teaching activities

Certificate of Practice (CTLO, Caltech)	2022 – 2023
Two replacement lectures (EE/APh130, 90 min) for Prof. Faraon	Fall term 2022
Columbia EdX course (6 x 2.5h) on "Inclusive Teaching"	Spring term 2022
Learning to Teach certificate (ETH Zürich)	01/2017
TA in Physics I (ETH Zürich)	02/2017 – 04/2017
Tutoring in physics, mathematics and Swiss matura subjects	05/2009 – present

Awards and honors

Fellowship of the Swiss National Science foundation (Postdoc.mobility)	10/2021 – 09/2023
Member of the Swiss Study foundation for highly skilled students	11/2011 – 01/2022
Award "best degree of the year" (valedictorian) for the Swiss Matura	*06/2010*

Publications in peer-reviewed scientific journals

[1] **A. Beckert**, M. Grimm, G. Matmon, N. Wili, R. Tschaggelar, G. Jeschke, M. Müller, S. Gerber, and G. Aeppli, "*Emergence of highly coherent two-level systems in a noisy and dense quantum network*", Nature Physics **20**, 472-478 (2024).

[2] **A. Beckert**, M. Grimm, R. I. Hermans, J. R. Freeman, E. H. Linfield, A. G. Davies, M. Müller, H. Sigg, S. Gerber, G. Matmon, and G. Aeppli, "*Precise determination of the low energy electronuclear Hamiltonian of* $LiY_{1-x}Ho_xF_4$", PRB **106**, 115119 (2022).

[3] M. Grimm, **A. Beckert**, G. Aeppli, and M. Müller
"*Universal quantum computing using electro-nuclear wavefunctions of rare-earth ions*"
PRX Quantum **2** (1), 010312 (2021).

[4] **A. Beckert**, H. Sigg, and G. Aeppli
"*Taking advantage of multiplet structure for lineshape analysis in Fourier space*"
Opt. Express 28, 24937-24950 (2020).

[5] **A. Beckert**, part of the 'BIG Bell Test Collaboration'
"*Challenging local realism with human choices*"
Nature, **557**, 7704, 212–216, (2018).

Patents and licenses

[1] M. Grimm, **A. Beckert**, G. Aeppli, and M. Müller, "*Universal quantum computing using electronuclear wavefunctions of rare-earth ions*", EP20191158

Outreach activities

Talks & live demonstration of experiments

- Talk & discussion at symposium, "*Bell's inequality and its implication on our reality*", Lenzburg, Switzerland — 09/2020
- 10 experiments & talk at Martin foundation for mentally disabled children, "*See, amaze & levitate*", Zürich, Switzerland — 08/2016
- 5 experiments & talk at youth event, "*Laws of nature*", Lenzburg, Switzerland — 01/2014