

Johan Andberger

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SUMMARY

Physicist with a PhD in experimental quantum optics and semiconductor physics (ETH Zürich), combining research expertise with strong engineering, electronics and IT/programming skills. Experienced in developing and automating advanced measurement setups, clean-room fabrication and data-driven problem solving. Proven ability to lead projects, supervising and mentoring students, and delivering solutions bridging research and technology. Formulating and solving all types of problems (whether theoretical, technical or social) is what drives and motivates me.

EXPERIENCE

Quantum Optoelectronics Group, ETH Zürich

May 2018 - May 2024

Research and teaching assistant

Zürich, Switzerland

- Design using finite-element modeling (FEM) and subsequent clean-room fabrication of terahertz sub-wavelength nano-antennas.
- Development and automation of advanced setups for performing terahertz time-domain spectroscopy and electronic magneto-transport measurements at temperatures below 4K, including the use of CAD and PCB design software.
- Signal processing and data analysis of terahertz time-domain spectroscopy and millikelvin electronic magneto-transport measurements.
- Presented results at international conferences, contributed to multiple publications.
- Supervision of semester/master theses.
- Teaching tutorials on introductory physics to mainly first and second year bachelor students (in German).

UBS Switzerland AG

January 2014 - December 2016

Internship

Zürich, Switzerland

- Co-developed SharePoint-based tools improving workflow for business process and offshore management in the context of client data confidentiality.
- Conducted trend and statistical analyses related to offshoring- and outsourcing initiatives.

Studsvik Nuclear AB

June 2009 - December 2009

Internship

Nyköping, Sweden

- Digitized and consolidated data of experimental data on nuclear fuel rods to support analysis.
- Maintained laboratory chemical inventories.

EDUCATION

Doctor of Sciences in Physics, ETH Zürich

May 2018 - December 2024

Institute for Quantum Electronics, Quantum Optoelectronics Group

Thesis project: "[Terahertz chiral cavities breaking time-reversal symmetry via ultra-strong light-matter interaction](#)"

Supervisors: Prof. Dr. Giacomo Scalari & Prof. Dr. Jérôme Faist.

Master of Science in Physics, ETH Zürich

September 2014 - May 2018

Fields: Quantum physics, quantum optics, semiconductor devices

Master's thesis: "Spectroscopy of Quantum Hall transport in the ultrastrong coupling regime"

Semester project: "Optical setup for pulse shaping in the 4-18 THz range"

Bachelor of Science in Physics, ETH Zürich

September 2010 - August 2014

PUBLICATIONS

1. L. Hale, **J. Andberger**, E. Koskas, M. Beck, G. Scalari, J. Faist, "[Multi-mode Deep Strong Coupling in a Multi Quantum Well Fabry-Perot Cavity](#)", arXiv preprint arXiv:2508.19840 (2025)
2. **J. Andberger**, L. Graziotto, L. Sacchi, M. Beck, G. Scalari, and J. Faist, "[Terahertz chiral subwavelength cavities breaking time-reversal symmetry via ultrastrong light-matter interaction](#)", Phys. Rev. B **109**, L161302 (2024)
3. E. Mavrona, S. Rajabali, F. Appugliese, **J. Andberger**, M. Beck, G. Scalari, and J. Faist, "[THz ultrastrong coupling in an engineered Fabry-Perot cavity](#)". ACS Photonics **8**(9), 2692-2698 (2021)
4. H. Hübener, U. De Giovannini, C. Schäfer, **J. Andberger**, M. Ruggenthaler, J. Faist, and A. Rubio, "[Engineering quantum materials with chiral optical cavities](#)", Nat. Mater. **20**, 438–442 (2021)
5. E. Mavrona, F. Appugliese, **J. Andberger**, J. Keller, M. Franckié, G. Scalari, and J. Faist, "[Terahertz refractive index matching solution](#)", Optics express, **27**(10), 14536-14544

LANGUAGES

Swedish	Native language
English	Fluent
German	Fluent (C1 certificate)

TECHNICAL SKILLS

Basic knowledge	C#, Javascript, Verilog, R, SVN/Git, COMSOL, CadSoft EAGLE, Autodesk Inventor
Intermediate knowledge	Adobe Illustrator, AutoCAD, CST Microwave Studio, LaTeX, Linux, Blender 3D, C / C++
Advanced knowledge	Python, VBA, SQL, Mathematica, MATLAB, Microsoft Office Suite, LabVIEW

EXTRACURRICULAR ACTIVITIES

Akademischer Mittelbau Physik <i>Board Member</i>	March 2019 - March 2023
· Contributed to the organization of events (including networking, company visits and career orientation) in the Physics department of ETH Zürich for PhD students and Post-Doctoral researchers. · Participated in departmental activities including department conferences and education commission.	