Johan Andberger

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LinkedIn — Location: Stockholm, Sweden

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 nuclear data to support analysis.
- Managed laboratory chemical inventories ensuring compliance and traceability.

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*

Natural Science Program, Hermods Gymnasieskola *October 2009 - June 2010*
Natural Science Program, Nyköpings Gymnasium *August 2008 - June 2009*

PUBLICATIONS

1. **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)
2. 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)
3. 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)
4. 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 March 2019 - March 2023
Board Member

- 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.