Daniel A. Farbowitz

Photonics Graduate

Current Address
9H Landmålervej
2800 Kgs. Lygnby
Denmark

Contact Info
+45 22 66 32 65
dalfa@dtu.dk

Website
farbowitz.github.io

Profile

I am a highly motivated researcher who is able to work meticulously and independently, but also thrives as part of a team and understands its importance in developing high-quality research. I am a determined worker who perseveres through setbacks to achieve my goals. I have a record of excellence in graduate studies, both experimental and theoretical. I seek to dedicate my efforts to collaborative, breakthrough research in quantum optics and integrated photonics at an international level.

Research Interests

- Cavity Optomechanics
- Strong light-matter coupling
- Solid-state physics
- Optoelectronics
- Topology Optimization
- Nanofabrication
- PV technologies
- Cathodoluminescence
- Machine learning
- Nonlinear Quantum Optics

Current Research

***American Anthropologist* – A Meta-Analysis** / Co-author

Wrote Python data harvesting algorithm that organized unique research in the journal's 133-year history into spreadsheet format. Using machine learning, regression analysis, and natural language processing to identify publishing trends.

The Role of Solvents in Non-fullerene Acceptor Photovoltaics / Co-author

Performed fs-µs analysis of organic semiconductor active layers with transient absorption spectroscopy. Analyzed data in glotaran using several self-written programs to characterize using unique mathematical models.

Completed Research

Organic Solar Cells: The Role of Solvents in Device Performance as Studied by Ultrafast Spectroscopy / Master's Dissertation

Performed organic nanoparticle ink fabrication, spin-coating, and vapor

deposition in clean lab environment. Wrote Python scripts for data analysis. Characterized 8 sets of organic solar cells. Received laser certification, studied nonlinear optics principles, and operated ultrafast transient absorption spectroscope.

Education

Technical University of Denmark / PhD Researcher in Nanophotonics
OCTOBER 2022 – CURRENT, Kongens Lyngby, Denmark

PhD candidate under Søren Stobbe performing nanocavity fabrication, process optimization, NEMS device fabrication. Using a bespoke cathodoluminescence setup, I aim to relate electron-cavity interactions to mode volumes.

University of Sheffield / MSc (Distinction) Solar Cell Technology
OCTOBER 2020 - SEPTEMBER 2021, Sheffield, UK

Postgraduate taught program covering principles, implementation, innovation, coding, and analysis in silicon and other developing photovoltaics. My dissertation research involved fabricating solvent-based bulk heterojunction organic solar cells using ultrafast transient absorption spectroscopy.

Johns Hopkins University / Photonics Concentration
SEPTEMBER 2019 – JULY 2020, Online

Excelled in Master's-level courses concurrent with teaching full-time.

Pennsylvania State University / BS, Mathematics; BS, Physics; BA, Philosophy
AUGUST 2008 - DECEMBER 2011, University Park, PA, USA

Summer semester abroad in Germany through Dotterer Fellowship. Additionally received a BA in philosophy concentrating on philosophy of science and philosophy of education.

Work Experience

Technical University of Denmark / PhD Researcher in Nanophotonics
OCTOBER 2022 – CURRENT, Kongens Lyngby, Denmark

Developed background in nanofabrication. Received clean room training on numerous microscopy and nanofabrication devices.

Benjamin Franklin Institute of Technology / Adjunct Instructor in Physics and Mathematics
DECEMBER 2018 - JUNE 2021, Boston, MA

Led up to 20-student classrooms. Taught fundamental math, geometry, pre-calculus, conceptual physics, physics I, and physics lab. Reached out frequently to keep students engaged. Tutored several hours a week.

Arbor Tutoring / Lead Tutor
APRIL 2011 - NOVEMBER 2018, Boston, MA

Spent 3000+ hours teaching college-level STEM as an independent tutor, focused on calculus and statistics. Reviewed relevant coursework; developed lesson plans.

Leadership Experience

University of Sheffield / Student Representative (Physics PGT)
NOVEMBER 2020 - SEPTEMBER 2021, Sheffield, UK

Gathered postgraduate physics students' course concerns and addressed solutions with physics administration to better facilitate learning in an online teaching environment. Organized postgraduate student meetups. Served on the Equality, Inclusion, and Diversity Committee.

Benjamin Franklin Institute of Technology / Senate Organizing Committee
NOVEMBER 2020, Boston, MA

Fostered interest in, held meetings for, and developed procedure for faculty self-governing body. The Senate is dedicated to accountability, preserving the school's mission, and allowing affordable education for its students.

Society Memberships

- Sigma Pi Sigma Physics Honor Society
- International Solar Energy Society
- Solliance

Conferences

Royal Society of Chemistry: Photophysics and Photochemistry Group Early Career Researcher Conference / Presenter
OCTOBER 2021, Online

Summarized dissertation research in three-minute video and participated in panel discussion on Photophysics/Photochemistry for social good.

NanoGe Conference – Spring 2021 / Attendee
MARCH 2021, Online

Other Skills

- Clean Room Procedure and Safety
- Laser Alignment and Safety
- NEMS optical cavity design
- Technical writing
- MATLAB
- xArray
- E-beam Lithography
- SEM operation
- Probe Nanobots
- E-beam evaporation
- React
- R Programming
- Visual Studio Code
- pyGlotaran