SOPHIA NATASHA WILSON

PhD fellow at the Machine Learning Section, UCPH

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ABOUT ME

PhD Fellow in Computer Science with a background in Physics, focusing on the environmental sustainability of data centers and machine learning. Dedicated to advancing sustainable technologies while contributing as a role model for women in STEM.

PERSONAL LIFE

- International background with dual citizenship (Denmark/New Zealand) and family roots across four countries.
- Passionate traveler, having visited more than 35 countries.
- Active in sports, including running, swimming, biking, and recently tennis.
- Strongly engaged in academic and social life: organized the annual Science ski trip (2022–2023), led the gala committee (2021–2022), tutored bachelor's and master's students (2020–2024), and founded the Physics Running Club (2020). Also a member of Women in Physics (2021–2022) and active in student politics (2019–2020).
- Eight years of competitive cheerleading, competing at European and World Championships and representing Denmark on the national team (2015, 2017).

HIGHLIGHTET WORK EXPERIENCE

PhD Fellow | Dept. of Computer Science, UCPH | Aug 2025 –

Pursuing a PhD in Sustainable Machine Learning with a focus on the environmental impact of "big dark data," i.e. massive amounts of unused or underutilized stored data. My research develops deep learning–based compression methods informed by algorithmic information theory, aiming at automatic profiling of data streams and personalized compression. These methods are designed for privacy-preserving, locally run applications that empower users to manage their digital footprint more sustainably without compromising utility.

Research Assistant | Cosmic Dawn Center, UCPH | Sep 2022 – Jun 2023

Conducted independent research from funding proposal to publication. Led a study on the evolution of metals and dust in early galaxies, resulting in a first-author article in *Astronomy & Astrophysics* (May 2023), and co-authored three additional papers on early star formation and galactic composition. Gained extensive experience in data analysis, scientific writing, and collaborative research.

Teaching Assistant | Niels Bohr Institute, UCPH | Sep 2020 – Jun 2022

Facilitated classroom exercises for *Mathematics for Physicists I & II* (2022–2023) and laboratory exercises in *Mechanics* and *Special Relativity* (2020–2021). Developed strong skills in explaining complex concepts and adapting to diverse learning styles, enhancing both teaching and mentorship abilities.

EDUCATION

MSc in Comp. Physics | Niels Bohr Institute, UCPH | Feb 2023 – 2025

- Graduated with GPA 12.0/12, specializing in machine learning, applied statistics, and astrophysics.
- My master's thesis, *Quantifying the Reduction in Carbon Footprint of Physics-Informed Machine Learning*, supervised by Raghavendra Selvan (Computer Science, UCPH) and Jens Hesselbjerg Christensen (NBI, UCPH), received the top grade (12). Research from the thesis is in preparation for submission to ICLR 2026.
- Completed an exchange semester at the University of Amsterdam (2024).

BSc in Physics | Niels Bohr Institute, UCPH | Sep 2019 – Feb 2023

- Graduated with GPA 11.0/12, focusing on computational physics, astrophysics, and cosmology.
- My bachelor's thesis, *Measuring Cosmological Parameters with Fast Radio Bursts*, received the top grade (12).
- Further achievements include co-authoring a publication based on my first-year project on spectroscopic classification of quasar candidates, and attending international summer schools in astrophysics and machine learning (Astromatic Summer School, University of Montreal, 2022; Nordic Optical Telescope Summer School, La Palma, 2021).

ADDITIONAL WORK EXPERIENCE

Teacher | Falkonergårdens Gymnasium | Feb 2025 – May 2025

Taught advanced mathematics classes two to three times a week, developing strong mentorship and communication skills for a younger audience.

Junior Consultant | PA Consulting | Sep 2023 – Feb 2025

In my role as a junior consultant in the data science capability, I applied my computational abilities to solve complex problems across various client projects. This position has in particular developed my skills in project and stakeholder management and communication and presentation. During my academic exchange, I worked in the Dutch affiliation, where I gained valuable experience working in an international setting.

INTERNATIONAL EXPERIENCE

With a strong international background, I actively seek opportunities to work and study in global environments. Highlights includes:

- Exchange semester at the Institute of Physics, University of Amsterdam, The Netherlands (2024).
- Junior Consultant at PA Consulting, Utrecht, The Netherlands (2024).
- Nordic Optical Telescope Summer School, La Palma, Spain (2021).
- Astromatic Machine Learning Summer School, University of Montreal, Canada (2022).
- Participation in international conferences and workshops in Denmark and Sweden, including presenting research.

OUTREACH

Passionate about science communication and promoting gender balance in STEM, with experience engaging audiences from school children to academic peers. Key initiatives include:

- Speaker at Climate Action Day, Copenhagen Center for Social Data Science, UCPH.
- Delivered talks and workshops at Danish high schools on studying STEM at university and on the environmental sustainability of AI.
- Member of Women in Physics, contributing to initiatives promoting gender balance in STEM.
- Tutor for BSc and MSc students in physics (2020, 2024).
- Tutor at science summer camps for primary school students (2023).