

Joos Schoonwater

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<https://www.jooschoonwater.com/>

EXPERIENCE

Various Roles | ALPHA Collaboration, CERN | Meyrin, Switzerland

Researcher (PhD)

JULY 2022 – PRESENT

- ! Led the integration of a cryogenic SiPM detection system from design to completion
 - ! Led the analysis of the first excited-state transition in antihydrogen
 - ! Spearheaded the development of a next-generation Penning trap
- Conducted laser spectroscopy of antihydrogen, including metrology and data analysis
Active participant of ALPHA's international collaborative research programme

Technical Student

FEBRUARY 2021 – APRIL 2022

- Operated and maintained the ALPHA apparatus on a day-to-day basis
- Integrated superconducting magnets for the ALPHA-g experiment
- Conducted research and development of SiPMs at cryogenic temperatures

Summer Student

JUNE 2019 – AUGUST 2019

EDUCATION

Swansea University | Swansea, Wales, United Kingdom

JULY 2022 – PRESENT

PhD, Physics

Thesis: Observation of excited-state transitions in trapped antihydrogen and development of a fluorescence detection system
Supervision: Prof. S. Eriksson and Prof. N. Madsen

Eindhoven University of Technology | Eindhoven, The Netherlands

MSc, Applied Physics

SEPTEMBER 2019 – JULY 2022

Thesis: Towards Observing Antihydrogen Fluorescence: Characterising SiPMs down to 6.1 K
Supervision: Prof. O.J. Luijten and Dr. A. Cridland-Mathad

Internship: Simulations of X-ray Spectra Generated by an Inverse Compton Scattering Source
Supervision: Dr. P. Mutsaers

BSc, Applied Physics

SEPTEMBER 2015 – JULY 2019

Thesis: Designing a 30 MeV Electron Beam Dump with Low Photoneutron Production Using FLUKA
Supervision: Dr. P. Mutsaers and Dr. T. Lucas

PUBLICATIONS

- R. Akbari et al., Be⁺ assisted, simultaneous confinement of more than 15000 antihydrogen atoms, **Nature Communications** 16, 10106 (2025).
J. Nauta et al., Evaluation of a caesium fountain frequency standard for antihydrogen spectroscopy, **Metrologia** (2025)
E. K. Anderson et al., Observation of the effect of gravity on the motion of antimatter, **Nature** 621, 7980 (2023).

SKILLS & INTERESTS

Project management

- Leading projects from concept to completion
- Student supervision (BSc, MSc)
- Timeline and milestone planning
- Collaboration with international and interdisciplinary partners

Technical

- High-frequency PCB and flex design (Altium)
- CAD design (Autodesk Inventor)
- Advanced data analysis in Python
- Electrical circuit simulation (SPICE)
- LabVIEW
- Mathematica and MATLAB
- Version control (Git)

Laboratory

- Silicon photomultipliers
- Front-end electronics design
- Ultra high vacuum systems
- Cryogenic engineering (down to 4 Kelvin)
- Non-neutral plasma diagnostics (MCP, CsI scintillators, SiPMs)
- Penning trap design, assembly and operation
- Superconducting magnet assembly and operation
- Handling of cryogenic liquids
- Complex laser system assembly, operation, and troubleshooting

Languages Dutch (fluent), English (fluent), French (basic)

Interests Playing music, cooking, running