



SIGFRID STJÄRNHOLM

NUCLEAR PHYSICIST, PARTICLE PHYSICIST, DEVELOPER

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PROFILE

By exploring the realms of experimental and theoretical physics at great depths, I have gathered experience in utilizing numerical methods, machine learning, Monte Carlo-techniques, and pen-and-paper calculations for solving complex problems. Working as a software consultant alongside my studies have yielded me great experience in how projects develop and has also allowed me to test the waters in a large variety of programming paradigms.

INTERESTS

- 🔬 Nuclear physics
- 🧪 Particle physics
- 📖 Quantum physics
- 🖥️ Simulations
- 🧫 Experiments
- 🔗 Machine learning & AI
- 🔓 Open-source

EDUCATION

MASTER'S DEGREE

Master's Programme in Physics
Uppsala University | 2021 - 2023

A two-year programme at Uppsala University, specializing in the Nuclear and Particle Physics track. The programme reinforces the knowledge within fundamental physics, and with the course collection of mine I have chosen to put a lot of weight on the experimental aspects of particle physics and nuclear physics.

Achievements

- Recipient of the Anders Wall Foundation's Uppsala Student of the Year scholarship 2023
- Co-author of a paper published in Astroparticle Physics, and author of conference proceedings for two international conferences (ICRC 2021 and ARENA 2022)
- Student representative in the Programme Advisory Board for the Masters's Programme in Physics
- Recipient of the award 'Best student presentation' at The Student Conference in Science and Technology 2021
- Recipient of the scholarship Hallberg, Malin and Ivar, which is awarded to a 'talented student'

BACHELOR'S DEGREE

Bachelor's Programme in Physics
Uppsala University | 2018 - 2021

A three-year programme at Uppsala University covering a large portion the fundamental physics - from classical mechanics to advanced quantum physics. The programme also involves plenty of rigour in mathematics and a lot of programming.

Achievements

- Student representative in the Programme Advisory Board for the Bachelor's Programme in Physics
- Vice Chairman in the Student Faculty Council for Physics students
- Recipient of three prizes from the Mathematical Society at Uppsala University for distinctive performance in the courses Geometry and Calculus I, Geometry and Calculus III, and Fourier Analysis
- Recipient of Melanderhjelm's scholarship from the Faculty of Science and Technology at Uppsala University

GYMNASIUM

Natural Science Programme
Björknäsgymnasiet | 2015 - 2018

A three-year programme at Björknäsgymnasiet involving the natural sciences.

Achievements

- Chairman in the Programme Advisory Board for the Natural Science Programme
- Chairman in the Student Council for Björknäsgymnasiet
- Scholarship from the Natural Science Programme for distinctive performance
- Attendee of a 2-week long internship at CERN (HSSIP)
- Finalist in Wallenbergs fysikpris (Swedish national physics competition) and competitor in the Nordic-Baltic Physics Olympiad (NBPhO)
- Attendee of Berzeliusdagarna, a weekend-seminar for students interested in chemistry
- Attendee of Rymdforskarskolan, a 2-week programme at Esrange space center

ENGAGEMENTS

- 🏠 Self-employed at Stjärnholm Consulting
- 🇸🇪 Banner carrier for Norrland's nation (Student association in Uppsala)
- 🏛️ Test supervisor at the Swedish Scholastic Aptitude Test (Högskoleprovet, SweSAT)
- 🗳️ Election worker at the 2022 Swedish general election
- 🗣️ Hometown ambassador for Uppsala University

HOBBIES

- 🏔️ Mountain hiking
- 🍞 Bread baking
- 🎿 Skiing
- 🚲 Cycling
- 🔧 Computer hardware

SKILLS & TOOLS

SOFTWARE

- Python
- C# / C++
- JS / TS / Node.js
- HTML / CSS
- React
- Tailwind / Bootstrap
- SQL
- LaTeX
- Git
- HTTP / DNS
- CI / CD
- Unit testing / TDD

HARDWARE

- Driving licence
- Arduino / Raspberry Pi
- Computer assembling
- Circuits
- 3D printing
- Soldering

WORK EXPERIENCE

NUCLEAR PHYSICIST

Vattenfall Nuclear Fuel AB | 2023 - Present

Vattenfall is the majority owner in 5 of Sweden's 6 nuclear power reactors in operation, and Vattenfall Nuclear Fuel provides nuclear fuel to the reactors in Forsmark and Ringhals. As a nuclear physicist I work with designing the reactor core and optimizing the fuel that is inserted during the annual revision of the nuclear power plants.

Involvements

- Expected work tasks include - among other - core optimization, nuclear design, and follow-up of core operation for both pressurized water reactors (PWR) and boiling water reactors (BWR).
- Act as a connecting link between the nuclear physics group and the method and software group to develop and improve the tools used at Vattenfall Nuclear Fuel.

RESEARCH ASSISTANT AND TEACHING ASSISTANT

Uppsala University | 2021 - 2022

With a part-time employment during the Master's Programme, I have worked as a research assistant at the Department of Physics and Astronomy at Uppsala University. I have been involved within the Astroparticle Physics research group, coupled to the Division for High Energy Physics (HEP). I have also worked as a teacher assistant at the Department of Information Technology.

Involvements

- Teacher assistant during fall 2022 in the course Application-Oriented Deep Learning in Physics, a course which introduces machine learning, deep learning, and neural networks with a focus on applications in physics.
- Research tasks related to using neural networks to reconstruct neutrino properties from radio detector data. The work is to be used for an upcoming detector station at the South Pole called IceCube-Gen2 radio, and was a continuation of my bachelor's thesis.
- Research regarding the use of wind generators and batteries that can handle the extreme cold at the South Pole. The tasks included measuring of generator losses, output voltages, as well as battery capacities.
- Teaching assistant in Computer Programming II during spring 2022. The course was given in Python, and the tasks included correcting assignments and aiding students with the course material.

SOFTWARE CONSULTANT

Jolix AB | 2016 - 2023

Jolix is an IT consulting company specializing in E-commerce applications. At Jolix, I have worked on plenty of projects within varying programming environments. The company also runs a small electronics store in Boden named pålyset.se, in which I have worked as a clerk.

Projects

- Backend development of a checkout system for organizations using C#, Node.js & microservices
- Backend development of a message listener for IoT-devices reporting back to a central hub using Node.js
- Integrating customers to a Storm API in C#
- Frontend development of a dashboard web application for E-commerce admins

EVENT ORGANIZER

Lise Meitner-dagarna | 2019 - 2021

Lise Meitner-dagarna is a yearly weekend-seminar in Stockholm for high-school students interested in physics. During three intensive days, the students get to partake in laboratory experiments, exhibitions, and lectures by prominent physicists in a variety of fields. The organizing group consists of 4 members, and about 130 students from all over Sweden attend the event each year.

Roles

- Head of administration (2019 - 2020): Bookings for hotel, catering, and trips for the whole event. Managing registrations for schools, students, and exhibitors.
- Head of communication and marketing (2021): Designs for mailings. Communication with schools and students. Upkeep of the website. Photography and social media.