

Curriculum Vitae

Elias Arnqvist

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Academic Education

Ph.D. in Applied Nuclear Physics. Uppsala University, Uppsala, Sweden. Jan 2025 – Present
Thesis: *Instrument Development for Radionuclide Monitoring and Disarmament Verification* (preliminary). Division representative for the PhD Student Council (Oct 2025 – present).

M.Sc.Eng. Engineering Physics. Uppsala University, Uppsala, Sweden. Aug 2019 – Oct 2024
Thesis: *CLLBC Scintillation Detector Gamma-Ray and Neutron Response Characterization: For Tagged Neutron Time-of-Flight Measurements*. Specialization in applied physics.

Research Experience

Doctoral Researcher. Uppsala University, Uppsala, Sweden. Jan 2025 – Present
Developing coincidence HPGe γ -ray spectrometers with optimized minimum detectable activity using Geant4 simulations for radionuclide monitoring. Modeling HPGe detectors and comparing simulations to measurements.

Summer Student. GSI FAIR, Darmstadt, Germany. Jul 2024 – Sep 2024
Integrated a position-sensitive MCP ion detector with a TDC-based data acquisition system using the time-over-threshold technique at the FRS Ion Catcher multiple-reflection time-of-flight mass spectrometer, allowing for simultaneous ion time-of-flight and position measurements.

Master's Thesis Student. JRC Geel, Geel, Belgium. Feb 2024 – Jun 2024
Characterized CLLBC scintillation detector γ -ray and neutron response using the tagged-neutron time-of-flight technique and pulse-shape discrimination. Utilized LaBr₃:Ce and LaBr₃:Ce,Sr detectors for γ -ray tagging. Collaborated with the Belgian Nuclear Research Center SCK CEN.

Graduate Project Student. Uppsala University, Uppsala, Sweden. Oct 2023 – Jan 2024
Developed a method for neutron spectrometry using activation detectors. Activated several element samples with an AmBe neutron source, measured activities with an HPGe γ -ray spectrometer, and unfolded the neutron energy spectrum using nuclear reaction cross sections.

Summer Student. CERN, Geneva, Switzerland. Jun 2023 – Aug 2023
Characterized SiC semiconductor sensors before and after 24 GeV/c proton irradiation. Utilized current-voltage, capacitance-voltage, and ultraviolet transient current technique measurements to evaluate semiconductor characteristics.

Undergraduate Project Student. Uppsala University, Uppsala, Sweden. Mar 2022 – Jun 2022
Constructed an α -particle spectrometer from scratch based on an inexpensive photodiode. Designed the circuit, pulse-shaping amplifier, and PCB, assembled the device, and measured α -particle sources.

Publications

Peer-Reviewed Journal Articles

E. Andersson Sundén, **E. Arnqvist**, C. Gustavsson, L. Hägg, R.E. Kelley, P. Andersson, *Delayed Phase Neutron Energy (DAPHNE) analysis for discrimination of fissile and fertile uranium*, Nucl. Instrum. Methods Phys. Res. A 1091 (2026) 171769. [doi:10.1016/j.nima.2026.171769](https://doi.org/10.1016/j.nima.2026.171769)

E. Arnqvist, S. Dar, V. Khotiaintsev, P. Jansson, A. Göök, E. Andersson Sundén, C. Gustavsson, J. Nyberg, P. Andersson, *Determining the minimum detectable activity of coincidence HPGe γ -ray spectrometers using simulation tools*, Nucl. Instrum. Methods Phys. Res. A 1087 (2026) 171461. [doi:10.1016/j.nima.2026.171461](https://doi.org/10.1016/j.nima.2026.171461)

E. Arnqvist, S. Oberstedt, A. Al-Adili, C.L. Fontana, A. Borella, R. Rossa, W. Geerts, M. Macías, M. Vidali, A. Oberstedt, M. Lantz, *Characterization of CLLBC scintillation detector response to γ -rays and neutrons*, Nucl. Instrum. Methods Phys. Res. A 1076 (2025) 170470. [doi:10.1016/j.nima.2025.170470](https://doi.org/10.1016/j.nima.2025.170470)

Conference Proceedings

S. Dar, V. Khotiaintsev, **E. Arnqvist**, E. Andersson Sundén, C. Gustavsson, A. Göök, P. Jansson, J. Nyberg, P. Andersson, *Development of background model for a shielded HPGe detector*, revised manuscript submitted to the proceedings of the CTBT: Science and Technology 2025 Conference (SnT2025).

S. Dawn, **E. Arnqvist**, G. Ericsson, L. Hägg, S. Jarl Holm, M. Lantz, A. Lindner, E. Andersson Sundén, S. Pomp, *NESSA: a compact 14 MeV D-T neutron source facility at Uppsala University*, submitted to the proceedings of the 16th Nuclear Data for Science and Technology Conference (ND2025).

E. Arnqvist, M. Lantz, M. Ragot, L. Pratabuy Tran-Quang, J. Brodin, S. Dawn, S. Pomp, E. Andersson Sundén, C. Gustavsson, G. Ericsson, S. Jarl Holm, A. Hjalmarsson, R. Frost, P. Andersson, M. Weiszflog, *Preparatory work for the NESSA D-T neutron source at Uppsala University*, submitted to the proceedings of the 16th Nuclear Data for Science and Technology Conference (ND2025).

N.G. Sorgenfrei, **E. Arnqvist**, Y. Gurimskaya, M. Moll, U. Parzefall, F. Rizwan, M. Wiehe, *Characterisation of crystalline defects in 4H Silicon Carbide using DLTS and TSC*, J. Instrum. 20 (2025) C07006. 20th Anniversary Trento Workshop on Advanced Silicon Radiation Detectors (TREDI2025). [doi:10.1088/1748-0221/20/07/C07006](https://doi.org/10.1088/1748-0221/20/07/C07006)

Conferences

Oral Presentations

Developing coincidence gamma-ray spectrometers with optimized minimum detectable activity for radionuclide monitoring. Alva Myrdal Centre Multidisciplinary Conference, Uppsala, Sweden, 2026.

Designing coincidence gamma-ray spectrometers with optimized minimum detectable activity. 15th Nordic Meeting on Nuclear Physics, Visby, Sweden, 2026.

A simulation approach to evaluating the minimum detectable activity of coincidence gamma-ray spectrometers. Annual Swedish Nuclear Physics and SFAIR Meeting 2025, Gothenburg, Sweden, 2025.

Poster Presentations

Gamma and neutron response characterization of CLLBC-based scintillation detectors. 16th Nuclear Data for Science and Technology Conference (ND2025), Madrid, Spain, 2025.

Learning to walk – Preparatory work for the coming NESSA D-T neutron source. 16th Nuclear Data for Science and Technology Conference (ND2025), Madrid, Spain, 2025 (co-author, presented in absence of first author).

Advanced course on verification of nuclear test explosions. 16th Nuclear Data for Science and Technology Conference (ND2025), Madrid, Spain, 2025 (co-author, presented in absence of first author).

Workshops and Schools

EURO-LABS Advanced Training School on Collaborative Software Development Practices. GANIL, Caen, France, 1 week, 2026.

Geant4 Advanced Course 2025 @ CERN. Online, 1 week, 2025.

Neutron Resonance Analysis School. JRC Geel, Geel, Belgium, 1 week, 2024.

Grants and Scholarships

2024, *ENEN2Plus Mobility Grant*, European Nuclear Education Network (ENEN). For a research exchange and master's thesis project at JRC Geel and SCK CEN. €5539.

Teaching Experience and Supervision

Teaching Experience

Modelling and Simulation Methods of Particle Transport, 1FA451, 5 ECTS. 2026
Second-cycle course. Graded the assignments for the Geant4 part of the course.

Activity Measurements With Germanium Detectors, 1 week. 2025
Contract education course for industry. Assisted in laboratory sessions and held one lecture.

Fluid and Thermodynamics, 1FA430, 5 ECTS. 2025
First-cycle course. Assisted in hands-on laboratory sessions and seminar sessions.

Reactor Physics, 1FA421, 5 ECTS. 2025
First-cycle course. Assisted in reactor simulation laboratory sessions.

Electric Measurement Methods, 1TE759, 5 ECTS. 2023
First-cycle course. Assisted in hands-on electronics laboratory sessions.

Electric Measurement Techniques, 1TE720, 5 ECTS. 2023
First-cycle course. Assisted in hands-on electronics laboratory sessions.

Supervision

Olov Rahm, *Feasibility of Nuclear Warhead Verification Using Passive Gamma Signatures*, master's thesis, 2026.

Outreach and Community Contributions

Presented my research at the Uppsala University **Three Minute Thesis (3MT)** competition, 2026.

Participated in the **SciFest** science festival in Uppsala, Sweden. Demonstrated and supervised interactive experiments with radiation detectors and discussed applied nuclear physics with children and adults, 2025.

Identified and reported Geant4 bugs (Bugzilla id [2644](#) and [2706](#)).

Skills

Software	Linux, Python, C++, Matlab, Geant4, FLUKA, L ^A T _E X, ROOT
Technical	Oscilloscopes, soldering, 3D printing, PCB design, Arduino, lathes
Languages	English (native), Swedish (native), Spanish (basic)
Other	Swedish driving licence