Eric Nilsson | Curriculum vitæ

Department of Physics – Chalmers University of Technology – Gothenburg, Sweden
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Date of birth: April 1 1997 Updated: January 29, 2026
Citizenship: Swedish

Education

Ph.D. Physics (Ongoing) **Chalmers University of Technology**
Gothenburg, Sweden *2021–2026*
Funded by the Area of Advance Nano (formerly Excellence Initiative Nano).
Research focus: Holographic models for strongly correlated electron systems and unconventional transport in 2D materials.
Supervisor: Prof. Ulf Gran. **Planned defense date: June 11, 2026**
Licentiate thesis: "Electron Transport and Collective Modes in Fermi and non-Fermi Liquids" *(link)*. Defended April 2024.
Visiting Ph.D. student with Prof. Koenraad Schalm at Leiden University, Sep-Dec 2024.

M. Sc. Physics **Chalmers University of Technology**
Gothenburg, Sweden *2019–2021*
Average grade: 5.0/5.0.
Thesis: "Surface Plasmon Polaritons in Strongly Correlated Media" *(link)*. Supervisor: Prof. Ulf Gran.

B.Sc. Engineering Physics **Chalmers University of Technology**
Gothenburg, Sweden *2016–2019*
Average grade: 4.87/5.0.
Thesis: "Simulating Many-Particle Systems on an Emulated Quantum Computer" *(link; in Swedish)*.
Supervisors: Profs. Christian Forssén and Andreas Ekström.

Awards

CBA Poster Prize *2025*
Prize for best poster at the yearly Community Building Nano at Chalmers University of Technology. Received 10 000 SEK in travel funds.

Excellence Initiative Nano Ph.D. Fellowship *2021*
Allows for freely chosen research within the field of Nanoscience at Chalmers. Chosen as one of three out of more than 300 applicants.

Guldkärnan award for best T.A. *2018, 2021*
Received the prize for best Teaching Assistant (twice) by the students at the Engineering Physics and Engineering Mathematics programs at Chalmers.

Publications

Journal Articles

E. Nilsson, U. Gran, and J. Hofmann (Oct. 2025). "Nonequilibrium Relaxation and Odd-Even Effect in Finite-Temperature Electron Gases". **Physical Review X** 15.4, p. 041007. arXiv:2405.03635.

Preprints

E. Nilsson and K. Schalm (Dec. 2025). "Quantum Critical Theories in a Periodic Potential: Strange Metallic Thermoelectric and Magnetotransport". arXiv:2512.19480.

U. Gran, E. Nilsson, and J. Hofmann (Dec. 2023). "Shear Viscosity in Interacting Two-Dimensional Fermi Liquids". arXiv:2312.09977.

Theses

E. Nilsson (2024). "Electron Transport and Collective Modes in Fermi and non-Fermi Liquids". Licentiate thesis. Chalmers University of Technology.

E. Nilsson (2021). "Surface Plasmon Polaritons in Strongly Correlated Media". M.Sc. thesis. Chalmers University of Technology.

Teaching experience

Lecturing

String Theory FFM485 — **Chalmers University of Technology**
Department of Physics — *2022–2025*
Co-responsible for lecturing, course administration and oral examination.

Supervision

Main supervisor, M.Sc. thesis — **Chalmers University of Technology**
Department of Physics — *2024*
Eli Ismailov, *Fermi Surfaces of Holographic Metals (link)*.

Main supervisor, B.Sc. thesis group — **Chalmers University of Technology**
Department of Physics — *2024*
Group of six B.Sc. students; thesis on holographic methods in condensed matter physics.
Konduktiviteten hos ett starkt kopplat 2D-material (link; in Swedish).

Teaching assistantships

Teaching Assistant — **Chalmers University of Technology**
Department of Physics — *2021–2026*
Mechanics I (FFM516) and II (TIF375): exercise classes and grading.

Teaching Assistant/Amanuensis — **Chalmers University of Technology**
Department of Mathematical Sciences — *2017, 2019–2020*
Analysis (single- and multivariable), Linear Algebra, Statistics; Engineering Physics/Mathematics programs.

Conferences & Schools

SCGP, Stony Brook University — **Stony Brook, New York, USA**
Black holes and strongly coupled thermal dynamics — *2025*

KITP, UCSB — **Santa Barbara, California, USA**
Quantum Matter with and without Quasiparticles — *2023*

NORDITA — **Stockholm, Sweden**
Quantum Connections Summer School — *2023*

NORDITA — **Stockholm, Sweden**
Recent Developments in Strongly-Correlated Quantum Matter — *2022*

Grants received

The Royal Swedish Academy of Sciences
General announcement for physics ("Stiftelsen Hierta Retzius fond för vetenskaplig forskning") — *2024*
24 400 SEK (∼2400 €). Funded travel to the Simons Center for Geometry and Physics.

The Royal Swedish Academy of Sciences
General announcement for physics ("Stiftelsen Olof Ahlöfs fond") — *2022*
23 100 SEK (∼2300 €). Funded travel to KITP.

Talks given

Quantum matter group seminar — **Leiden University**
"Quantum critical theories in periodic potentials: Toward Holographic EMT" — *2025-12-08*

Nano SmallTalk — **Chalmers University of Technology**
"Holographic Effective Medium Theory", Invited talk — *2025-12-01*

SHP seminar — **Chalmers University of Technology**
"Quantum critical theories in periodic potentials: Toward Holographic EMT" — *2025-11-07*

Popular science presentation to high school students — **Solbergagymnasiet**
"Från rostig koppar till svarta hål" — *2025-10-07*

Quantum matter group seminar — **Leiden University**
"Nonequilibrium relaxation and odd-even effect in 2D Fermi liquids" — *2024-09-25*

Licentiate Seminar — **Chalmers University of Technology**
"Electron Transport and Collective Modes in Fermi and non-Fermi Liquids" — *2024-04-26*

Quantum Materials seminar — **Chalmers University of Technology**
"Holographic Models for Plasmons in Strange Metals" — *2022-11-30*

SHP seminar — **Chalmers University of Technology**
"Electromagnetic response in strongly correlated media" — *2022-06-10*

Languages

Swedish: Native

English: Advanced — *Fluent, 8.5/9.0 IELTS*

Spanish: Basic

Computer skills

Numerical methods: Discretization of PDEs (finite difference and spectral methods); large-scale linear and nonlinear eigenvalue problems; Krylov subspace methods and preconditioning.

Scientific computing: C, Python, PETSc, SLEPc, MPI, HDF5.

Tools: Linux, Git, Bash, LaTeX, Mathematica.