

# Elisabetta Perotti

Energy Systems Researcher  
Distribution Grids | Scalable Modeling & Optimization

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I develop scalable computational models for future energy and transport systems, with a focus on distribution grids, demand-side flexibility, and renewable integration.

## Work Experience

- 2025–Present **Postdoctoral Researcher**, *Chalmers University of Technology*, Sweden  
Developing large-scale synthetic models of distribution networks to evaluate grid reinforcement needs under future electrification scenarios, with a focus on integrating distributed energy resources and flexible demand.
- 2022–2024 **Schmidt Science Postdoctoral Fellow**, *University of Colorado Boulder*, USA  
Developed optimization and control algorithms for energy and transportation systems, including renewable-based electric vehicle charging and Volt/Var control for distribution networks. PI: Emiliano Dall'Anese.
- 2021–2022 **Software Engineer**, *COMSOL, Inc.*, Sweden  
Developed multiphysics simulation and optimization tools as a Java developer in the Electromagnetics group.
- 2016–2020 **PhD in Physics**, *Uppsala University*, Sweden  
Developed novel mathematical framework to investigate electromagnetic and spin properties of subatomic particles. Supervisor: Prof. Stefan Leupold.
- 2014–2016 **Research Assistant**, *Uppsala University*, Sweden  
Worked on an extension of my master thesis project. Published first paper. Taught math and physics classes.

## Education

- 2020 **PhD in Physics**, *Uppsala University*, Sweden  
Supervisor: Prof. Stefan Leupold  
Thesis: *Electromagnetic and Spin Properties of Hyperons*
- 2014 **MSc in Physics**, *Uppsala University*, Sweden  
Supervisor: Prof. Stefan Leupold
- 2012 **BSc in Physics**, *University of Turin*, Italy

## Research Grants

- 2022–2024 Schmidt Science Fellowship  
Funding agency: Schmidt Science Fellows; Amount: USD 200 000; Role: Fellow

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## Supervision Experience

### PhD

M. M. Aung, co-supervisor, Uppsala University, 2019–2020

### Master's

A. Gustafsson, supervisor, Chalmers University of Technology, 2025

S. S. Nair, M. Holmberg, O. Junker, T. Vitos, co-supervisor, Uppsala University, 2017–2019 (4 students)

### Project Assistant

F. Da Corte Vecchino, supervisor, Chalmers University of Technology, 2025–present

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## Teaching Experience

- 2025 Developer and instructor, Data Processing and Analysis workshop in the Energy Systems Modelling and Planning course — Chalmers University of Technology (MSc, 30 students)
- 2024 Substitute lecturer, Linear Systems — University of Colorado Boulder (MSc, 50 students)
- 2018–2020 Lecturer and co-developer, Symmetry Breaking and Particle Masses workshop in the Quantum Field Theory course — Uppsala University (MSc/PhD, 30 students)
- 2014–2018 Teaching assistant, laboratory and problem-solving sessions in Energy Technology, Nuclear Physics, Quantum Mechanics, and Mechanics — Uppsala University (BSc/MSc, 20–40 students)
- 2015–2016 Lecturer, Higgs Boson Decays workshop — Uppsala University (MSc/PhD, 30 students)

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## Pedagogical Training

- 2025 Diversity and Inclusion for Learning in Higher Education — Chalmers University of Technology
- 2018 Academic Teacher Training Course — Uppsala University (5 weeks, higher education pedagogy)
- 2017 Research Ethics for Science and Technology — Uppsala University

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## Academic Citizenship

### Academic Service

Referee for Sustainable Energy, Grids and Networks (2025–present)

Referee for International Journal of Electrical Power and Energy Systems (2025–present)

Referee for IEEE Transactions on Vehicular Technology (2023–present)  
Reviewer for Schmidt Science Polymaths (2023–present)  
Referee for Physical Review journals (2018–2020)

### Collegial Roles

Postdoctoral representative, ECEE Department Committee, University of Colorado Boulder (2023–2024)  
PhD representative, Nuclear Physics Division, Uppsala University (2018–2019)

### Leadership and Mentorship

Founder and organizer of a journal club on energy systems modeling, Chalmers University of Technology (2025–present)  
Group facilitator, Oxford Science Leadership Program (2025) — selected and trained to lead interdisciplinary teams in collaborative research and leadership exercises  
Peer mentor, Schmidt Science Fellows (2023)  
Student assistant, Summer School on Diversity in the Cultures of Physics, Sheffield (2017)

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### Invited Presentations

- 2025 Invited lecturer, seminar on Data-driven Support for Cyberphysical Systems — Chalmers University of Technology, Sweden
- 2022 Invited speaker, Best theory PhD thesis (top 3 finalist) related to the PANDA experiment — GSI Darmstadt, Germany
- 2022 Invited speaker, Photonics Open House — KTH, Sweden
- 2022 Invited speaker, International School on Plasmonics and Nano-Optics — Polytechnic University of Turin, Italy
- 2018 Invited speaker, EMMI Workshop on Electromagnetic Structure of Strange Baryons — GSI Darmstadt, Germany
- 2016 Invited speaker, PANDA Collaboration Meeting — Bochum, Germany

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### Memberships

2021–present Schmidt Science Fellows Network

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### Awards

- 2025 Fall 2024 Postdoctoral Association of Colorado (PAC) Research Award
- 2024 Best Paper Award, *IEEE PES Innovative Smart Grid Technologies (ISGT) Europe. A Robust Incremental Volt/VAR Control for Distribution Networks*

- 2024 Best Elevator Pitch at the Front Range Industry and Postdoc Summit 2024, Colorado, USA
- 2022 Finalist (Top 3), Panda Theory PhD Prize for outstanding theory PhD thesis work within the PANDA experiment
- 2019–2020 Liljewalch travel scholarship, Uppsala University (awarded twice)
- 2016–2018 Anna Maria Lundins travel grant, Smålands nation (awarded 3 times)
- 2017 Student Fellowship, 55th International Winter Meeting on Nuclear Physics in Bormio, Italy

## Outreach and Societal Impact

- 2026 Speaker, The Gothenburg International Science Festival — public engagement on renewable energy and climate challenges
- 2024 Outreach, Overland High School, Aurora, USA — mentoring underrepresented students on access to higher education
- 2016–2020 Volunteer, SciFest, Uppsala University — public demonstrations on radiation and particle detection

## Media Coverage

- 2023 **CU Boulder postdoc leads research into decarbonization of transportation sector through EV ride-shares**  
J. Rhoten. News from the College of Engineering & Applied Science, CU Boulder.

## Science Leadership Training

Selected participation in structured leadership and interdisciplinary training programs through the Schmidt Science Fellows network:

- 2025 Schmidt Science Fellows Interdisciplinary Science Summit, Caltech, California, USA
- 2024 Schmidt Science Fellows Interdisciplinary Science Summit, University of Toronto, Canada
- 2023 Schmidt Science Senior Fellows Conference, hosted by Northwestern University, Chicago, Illinois
- 2023 Interdisciplinary Science Networking Convening hosted by CIFAR and Schmidt Science Fellows, Washington, D.C.
- 2022 Schmidt Science Fellows Global Meeting hosted by Stanford University and the University of California, Berkeley
- 2022 Schmidt Science Fellows Global Meeting hosted by MIT, Cambridge, MA
- 2021 Schmidt Science Fellows Virtual Global Meeting hosted by Cambridge University, UK

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## Selected Publications (10)

- 2026 ***Assessing the impact of fleet electrification on low-voltage grids: the role of network tariffs in mitigating power system violations***  
T. Lundblad, M. Taljegard, N. Mattsson, E. Perotti, F. Johnsson. Manuscript under review at International Journal of Electrical Power and Energy Systems.  
*Contributed to model development, data preparation, and implementation; contributed to analysis, supervision and manuscript preparation.*
- 2026 ***The role of network tariffs in steering electric vehicle charging and household peak power demand***  
T. Lundblad, E. Perotti, M. Taljegard, F. Johnsson. Manuscript under review at Sustainable Energy, Grids and Networks.  
*Contributed to model development, data preparation, and implementation; contributed to analysis, supervision and manuscript preparation.*
- 2025 ***Incremental Volt/Var Control for Distribution Networks via Chance-Constrained Optimization***  
A. Colot, E. Perotti, M. Glavic, E. Dall'Anese. IEEE Transactions on Power Systems, vol. 40, no. 6, pp. 4561-4573.  
*Co-first author (equal contribution); initiated the collaboration, co-conceived and co-developed the chance-constrained Volt/Var control method; conducted experiments, analyzed results, and wrote a significant part of the manuscript.*
- 2024 ***A Robust Incremental Volt/VAR Control for Distribution Networks***  
A. Colot, E. Perotti, M. Glavic, E. Dall'Anese. 2024 IEEE PES Innovative Smart Grid Technologies Europe (ISGT EUROPE).  
*Co-first author (equal contribution); initiated the collaboration, co-conceived and co-developed the Volt/Var control method; conducted experiments, analyzed results, and wrote a significant part of the manuscript.*
- 2023 ***Renewable-Based Charging in Green Ride-Sharing***  
E. Perotti, A. M. Ospina, G. Bianchin, A. Simonetto, E. Dall'Anese. Sci Rep 13, 15425.  
*Co-first author (equal contribution); co-developed the optimization framework; implemented the model, conducted experiments, analyzed results, and led the writing of the manuscript.*
- 2024 ***Electromagnetic form factors of the transition from the Delta to the nucleon***  
M. M. Aung, S. Leupold, E. Perotti, Y. Yan. Phys.Rev. D101, 114021.  
*Co-led the project; supervised the PhD student involved in the research; performed the key analytical calculations and contributed to the manuscript.*

- 2020 ***Electromagnetic form factors of the transition from the spin-3/2 Sigma to the Lambda hyperon***  
O. Junker, S. Leupold, E. Perotti, T. Vitos. Phys.Rev. C101, 015206.  
*Co-led the project; performed the main analytical calculations, supervised two Master's students involved in the research and contributed to the writing.*
- 2019 ***Polarization observables in positron-electron annihilation to a baryon-antibaryon pair***  
E. Perotti, G. Fäldt, A. Kupsc, S. Leupold, J. J. Song. Phys.Rev. D99, 056008.  
*First author; led the project; developed the theoretical framework, performed analytical calculations, and led the writing of the manuscript.*
- 2019 ***Constraining P and CP violation in the main decay of the neutral Sigma hyperon***  
S. S. Nair, E. Perotti, S. Leupold. Phys.Lett. B788, 535.  
*Co-led the project; performed the main analytical calculations, supervised the Master's student involved in the research and contributed to the writing.*
- 2018 ***Extraction of Polarization Parameters in the  $\bar{p}p \rightarrow \bar{\Omega}\Omega$  Reaction***  
E. Perotti. J.Phys.Conf.Ser. 1024, 012019.  
*Sole author; developed the theoretical framework, performed all analytical calculations, and wrote the manuscript.*

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## References

### **Stefan Leupold**

Uppsala University, SWE

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### **Mevludin Glavic**

University of Liege, BE

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### **Emiliano Dall'Anese**

Boston University, USA

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