Curriculum Vitae

PERSONAL INFORMATION

Name:	Laestadius, Andre
Google Scholar ID:	MNjxHOEAAAAJ
OrcID:	ORCID: 0000-0001-7391-0396
Date of birth:	Dec. 10th, 1984
Nationality:	Swedish
UiO website:	https://www.mn.uio.no/kjemi/english/people/aca/andrelae

EDUCATION

2014 PhD, Department of Mathematics, KTH – Royal Institute of Technology, Sweden
Supervisors: Prof. Michael Benedicks & Prof. Olav Vahtras
Title: *Foundation of density functionals in the presence of magnetic field*
Highlights:
-Extended Lieb's analysis to paramagnetic current-density-functional theory
-Demonstrated the lack of a HK variational principle in total current-density-functional theory
-Interdisciplinary research, crossing the boundaries between mathematics and chemistry

2008 MSc, Department of Biotechnology, KTH – Royal Institute of Technology, Sweden
Supervisor: Prof. Olav Vahtras
Title: *Current-density-functional theory*

2008 Sostrup Summer School in Quantum Chemistry (T. Helgaker, P. Jørgensen, and J. Olsen)

2008 Quantum chemistry, Stockholm University, (M. Blomberg)

CURRENT POSITION

2019 – PI at Young Research Talent project *CCerror* funded by Research Council of Norway
Hylleraas Centre, Department of Chemistry, UiO, Norway
Highlights:
-Supervision of one postdoc within the project
-Studying CC theory using homotopy and topological degree
-Stipend for 3 months research visit at MPI Hamburg

PREVIOUS POSITIONS

2015 – 2019 Researcher at ERC StG project *BIVAQUM*
Hylleraas Centre, Department of Chemistry, UiO, Norway
Highlights:
-Generalized the strong-monotonicity analysis to extended and tailored CC methods
-Initiator with main responsibility of collaboration between UiO and MPI Hamburg
-Cosupervision of one PhD student within the project
-Multiple research visits, Berlin, Hamburg, Prague, Budapest

2014 – 2015 Senior lecturer (temporary position)
Department of Mathematics, Uppsala University, Sweden
Highlights:
-Research visit at University of Innsbruck

2005 – 2008 Teaching assistant (mathematics and chemistry)
Department of Mathematics and Chemistry, KTH – Royal Institute of Technology, Sweden

FELLOWSHIPS AND AWARDS

2019 – 2023 *Young Research Talent*, funded by Research Council of Norway
Funding for a small research group (PI and postdoc fellow) to investigate the mathematical structure of coupled-cluster theory. In particular, error estimates for truncated solutions not only in the ground state.

2021 – 2023 *Peder Sather Grant*
Grant for longer-term stays for Principal Investigators A. Laestadius, M. A. Csirik and L. Lin. for collaboration between UiO and UC Berkeley on unitary coupled-cluster theory.

2021 *Kristine Bonnevie fellowship*, funded by UiO, Norway
Fellowship for 3 months research visit at MPI Hamburg. This is part of an ongoing collaboration between UiO and MPI Hamburg that I initiated in 2018.

2018 *YoungCAS fellow*, Centre for Advanced Study, Oslo, Norway
Awarded funding to hold a workshop (10 participants) on formal density-functional theory. In particular, the role of the Hohenberg–Kohn theorem for magnetic systems was addressed.

2018 *Talman Scholar Award*, awarded at 58*th* Sanibel Symposium, USA
Awarded for mathematical research in quantum chemistry, both in density-functional theory and coupled-cluster theory.

2018 *Young Scientist Mobility Grant*, funded by UiO, Norway
Funding for one month research visit that started the collaboration with MPI in Hamburg.

2014 *Physics students' teacher award*, Uppsala University, Sweden
Awarded best teacher for physics students for my course (lecturer and examiner) on Single Variable Calculus.

2009 *Best Graduate Award of Honor*, KTH – Royal Institute of Technology, Sweden
Graduated with highest possible grade 5.0/5.0.

2008 *PhD Position of Excellence*, KTH – Royal Institute of Technology, Sweden
First recipient of the School of Biotechnology's Excellence position for PhD students.

2004 – 2008 *Student stipends*, KTH – Royal Institute of Technology, Sweden
3 stipends for outstanding study results

SUPERVISION

2020 – Postdoc supervisor of Dr. Mihály A. Csirik

2017 – 2020 PhD cosupervisor of Dr. Fabian M. Faulstich (currently postdoc at UC Berkeley)
Both at Hylleraas Centre, Department of Chemistry, UiO, Norway

TEACHING ACTIVITIES

2020 – Hylleraas Math Help, helping chemistry students with mathematics

2014 – 2015 Full-time lecturer, Department of Mathematics, Uppsala University, Sweden

2008 – 2014 Lecturer and teaching assistant in mathematics, Department of Mathematics, KTH, Sweden

2005 – 2008 Teaching assistant in mathematics and chemistry, KTH, Sweden

ORGANISATION OF SCIENTIFIC MEETINGS

2018 Workshop *Do current densities determine all there is to know?*
Held in Oslo, Norway (10 participants). Organizing committee: A. Laestadius (90%) and Erik Tellgren (10%)

MAJOR COLLABORATIONS

Dr. Markus Penz, mathematical density-functional theory (6 joint publications), Department of Mathematics, University of Innsbruck, Austria

Dr. Michael Rugenthaler, density-functional theory and photon interaction (4 joint publications), Max Planck Institute Hamburg, Germany

Dr. Andrew M. Teale, density-functional theory and optimized effective potential method (1 joint publication), University of Nottingham, UK

Dr. Örs Legeza, tailored coupled-cluster theory (2 joint publication), Wigner Research Center for Physics, Budapest, Hungary

Prof. Reinhold Schneider, mathematical analysis of coupled-cluster theory (2 joint publications), Technical University, Berlin, Germany

Prof. Jürgen Gauss, coupled-cluster theory, University of Mainz, Frankfurt, Germany

Prof. Anna Krylov, diagnostics of coupled-cluster theory, University of Southern California, Los Angeles, USA

Publications

23. **A. Laestadius**, M. Penz, and E.I. Tellgren, Revisiting density-functional theory of the total current density, *Journal of Physics: Condensed Matter* **33**, 295504 (2021)
22. M.A. Csirik and **A. Laestadius**, Coupled-Cluster Theory Revisited, arXiv:2105.13134 (2021)
21. S. Kvaal, **A. Laestadius**, E.I. Tellgren, and T. Helgaker, Lower Semicontinuity of the Universal Functional in Paramagnetic Current–Density Functional Theory, *Journal of Physical Chemistry Letters* **12**, 1421-1425 (2021)
20. M. Penz, **A. Laestadius**, E.I. Tellgren, M. Ruggenthaler, and P.E. Lammert, Erratum: Guaranteed Convergence of a Regularized Kohn-Sham Iteration in Finite Dimensions, *Physical Review Letters* **125**, 249902 (2020)
19. S. Kvaal, **A. Laestadius**, and T. Bodenstein, Guaranteed convergence for a class of coupled-cluster methods based on Arponen's extended theory, *Molecular Physics* **118**, e1810349 (2020)
18. **A. Laestadius** and F. M. Faulstich, One-Dimensional Lieb–Oxford Bounds, *Journal of Chemical Physics* **152**, 234112 (2020)
17. M. Penz and **A. Laestadius**, Convergence of the regularized KS iteration in Banach spaces, arXiv:2003.05389 (2020)
16. **A. Laestadius**, M. Benedicks, and M. Penz, Unique Continuation for the Magnetic Schrödinger Equation, *International Journal of Quantum Chemistry* **120**, e26149 (2020)
15. **A. Laestadius**, F. M. Faulstich, The coupled-cluster formalism - a mathematical perspective, *Molecular Physics* **117**, 2362 (2019)
14. M. Penz, **A. Laestadius**, E.I. Tellgren, and M. Ruggenthaler, Guaranteed Convergence of a Regularized Kohn-Sham Iteration in Finite Dimensions, *Physical Review Letters* **123**, 037401 (2019)
13. **A. Laestadius**, E. I. Tellgren, M. Penz, M. Ruggenthaler, S. Kvaal, and T. Helgaker, Kohn–Sham Theory with Paramagnetic Currents: Compatibility and Functional Differentiability, *Journal of Chemical Theory and Computations* **15**, 4003 (2019)
12. F. M. Faulstich, M. Máté, **A. Laestadius**, M. A. Csirik, L. Veis, A. Antalik, J. Brabec, R. Schneider, J. Pittner, S. Kvaal, Ö. Legeza, Numerical and Theoretical Aspects of the DMRG-TCC Method Exemplified by the Nitrogen Dimer, *Journal of chemical theory and computation* **15**, 2206 (2019)
11. F. M. Faulstich, **A. Laestadius**, Ö. Legeza, R. Schneider, S. Kvaal, Analysis of the tailored coupled-cluster method in quantum chemistry, *SIAM Journal on Numerical Analysis* **15**, 2206 (2019)
10. **A. Laestadius**, Generalized Kohn–Sham iteration on Banach spaces, *Oberwolfach Reports* **13**, 698 (2018)
9. **A. Laestadius**, M. Penz, E. I. Tellgren, M. Ruggenthaler, S. Kvaal, and T. Helgaker, Generalized Kohn–Sham iteration on Banach spaces, *Journal of Chemical Physics* **149**, 164103 (2018)
8. **A. Laestadius** and S. Kvaal, Analysis of the Extended Coupled-Cluster Method in Quantum Chemistry, *SIAM Journal of Numerical Analysis* **56**, 660 (2018)
7. **A. Laestadius** and E. I. Tellgren, Density-Wave function Mapping in Degenerate Current-Density-Functional Theory, *Physical Review A* **97**, 022514 (2018)
6. E. I. Tellgren, **A. Laestadius**, T. Helgaker, S. Kvaal and A.M. Teale, Uniform Magnetic fields in density-functional theory, *Journal of Chemical Physics* **148**, 024101 (2018)
5. **A. Laestadius** and M. Benedicks, Nonexistence of a Hohenberg–Kohn variational principle in total current-density-functional theory, *Physical Review A* **91**, 032508 (2015)
4. **A. Laestadius**, Kohn–Sham Theory in the Presence of Magnetic Field, *Journal of Mathematical Chemistry* **52**, 2581 (2014)
3. **A. Laestadius**, Density Functionals in the Presence of Magnetic Field, *International Journal of Quantum Chemistry* **114**, 1445 (2014)
2. **A. Laestadius** and M. Benedicks, Hohenberg–Kohn Theorems in the Presence of Magnetic Field, *International Journal of Quantum Chemistry* **114**, 782 (2014)
1. **A. Laestadius**, Foundation of Density Functionals in the Presence of Magnetic Field, PhD Thesis (2014)