Curriculum Vitae of Asbjørn Bækgaard Lauritsen

General information

Date of birth	9 June 1996
Nationality	Danish
Address	Université Paris-Dauphine, Place du Maréchal de Lattre de Tassigny, 75016, Paris France
Email	`lauritsen@ceremade.dauphine.fr`
Website	`ablauritsen.github.io`

Academic employment

2024/11–current **Postdoc**, *CNRS & CEREMADE, Université Paris-Dauphine*, Paris, France.
In the group of Mathieu Lewin.

2020/9–2024/10 **Ph.D. student**, *Institute of Science and Technology Austria*, Klosterneuburg, Austria.
In the group of Robert Seiringer.

2016/9–2020/6 **Teacher's Assistant**, *University of Copenhagen*, Copenhagen, Denmark.
Teaching various courses on the bachelor level.

Education

2020/9–2024/10 **Ph.D.**, *Institute of Science and Technology Austria*, Klosterneuburg, Austria.
Thesis: "Energies of Dilute Fermi Gases and Universalities in BCS Theory".
Advisor: Robert Seiringer.

2018/9–2020/6 **M.Sc. in Mathematics**, *University of Copenhagen*, Copenhagen, Denmark.
Thesis: "A mathematical formulation of the Bardeen–Cooper–Schrieffer theory of superconductivity".
Advisor: Jan Philip Solovej.
Grade: 12.0/12.0

2018/9–2019/2 *ETH Zürich*, Zürich, Switzerland.
Erasmus semester abroad as part of the master's degree in Copenhagen.

2015/9–2018/6 **B.Sc. in Mathematics**, *University of Copenhagen*, Copenhagen, Denmark.
Thesis: "Representations of the Poincaré Group".
Advisor: Jan Philip Solovej.
Grade: 12.0/12.0

2012/8–2015/6 *Frederiksberg Gymnasium*, Frederiksberg, Denmark
Specialisation: Mathematics, Physics and Chemistry on the highest level.
Grade: 11.8/12.0

2002/8–2012/6 *Nyhollænderskolen*, Frederiksberg, Denmark

Selected awards

2024/10 **Best PhD research paper**, Farchant, Germany.
Awarded by the SFB/TRR 352. (One of two recipients).

2021/9 **Edlund–DMF Thesis Prize 2020**, Copenhagen, Denmark.
Prize for the best master's thesis in mathematics awarded by the Danish Mathematical Society. (Sole recipient).

2015/7 **International Physics Olympiad (IPhO) 2015**, Mumbai, India, *Bronze medallist*.
Physics competition for upper secondary school students. (One of many recipients).

2014/11 **Young Researchers Project (Projekt Forskerspirer) 2014**, Copenhagen, Denmark, *Winner in the category of natural sciences*.
Competition for upper secondary school students to create a research project. (Sole recipient).

Teaching

Université Paris-Dauphine

Autumn 2025 *Introduction to quantum mechanics*, (Course instructor).

Institute of Science and Technology Austria

Spring 2023 *Selected topics in mathematical physics*, (TA).

University of Copenhagen

Spring 2020 *Introduction to number theory*, (TA).
Spring 2020 *Analysis 0*, (TA).
Autumn 2019 *Measure theory and integration*, (TA).
Autumn 2019 *Analysis 2*, (TA).
Spring 2018 *Introduction to number theory*, (TA).
Spring 2018 *Analysis 0*, (TA).
Autumn 2017 *Measure theory and integration*, (TA).
Autumn 2017 *Complex analysis*, (TA).
Spring 2017 *Geometry 1*, (TA).
Autumn 2016 *Introduction to probability and statistics*, (TA).

Other employment

2015/9–current **Teacher**, *the Danish Physics Olympiad*, Lyngby, Denmark.
Part of the Danish delegation to the International Physics Olympiad (IPhO) in 2025, 2023, 2018, and 2017 and to the European Physics Olympiad (EuPhO) in 2025 and 2024.
Grader at the European Physics Olympiad (EuPhO) 2022.

2016/7–2016/8 **Intern**, *NIL Technology*, Lyngby, Denmark.

2014/8-2015/6 **Tutor**, *Frederiksberg Gymnasium*, Frederiksberg, Denmark.

Languages

Danish Native
English Fluent
German Advanced (CEFR level B2)

Other awards

2019/5 **PLANCKS 2019**, Odense, Denmark, *3rd place out of 34*.
Physics competition for teams of 3-4 students.

2018/5 **PLANCKS 2018**, Zagreb, Croatia, *15th place out of 31*.
Physics competition for teams of 3-4 students.

2017/5 **PLANCKS 2017**, Graz, Austria, *12th place out of 36*.
Physics competition for teams of 3-4 students.

2016/10 **the Nordic Mathematical Team Competition**, *4th place out of 15*.
Mathematics competition for teams of up to 4 students.

2016/5 **PLANCKS 2016**, Bucharest, Romania, *Participant*.
Physics competition for teams of 3-4 students.

2015/6 **Marten's memorial scholarship**, *Frederiksberg Gymnasium*, Frederiksberg, Denmark.

2015/3 **the Nordic Mathematical Contest 2015**, *Participant*.
Mathematics competition for upper secondary school students.

2014/3 **the Nordic Mathematical Contest 2014**, *Participant*.
Mathematics competition for upper secondary school students.

Publications

[1] E. Cancès, T. Duez, J. v. Gog, A. B. Lauritsen, M. Lewin, and J. Toulouse. "Geometric theory of constrained Schrödinger dynamics with application to time-dependent density-functional theory on a finite lattice". arXiv: 2601.07719 [cond-mat]. 2026.

[2] É. Cancès, T. Duez, J. v. Gog, A. B. Lauritsen, M. Lewin, and J. Toulouse. "Geometric Time-Dependent Density Functional Theory". arXiv: 2601.07724 [cond-mat]. 2026.

[3] J. Henheik and A. B. Lauritsen. "Universal behavior of the BCS energy gap". *J. Spectr. Theory* **15**.1 (2025), pp. 305–352.

[4] A. B. Lauritsen. "Almost Optimal Upper Bound for the Ground State Energy of a Dilute Fermi Gas via Cluster Expansion". *Ann. Henri Poincaré* **26**.1 (2025), pp. 203–243.

[5] J. Henheik, E. Langmann, and A. B. Lauritsen. "Multi-band superconductors have enhanced critical temperatures". arXiv: 2409.17297 [cond-mat, physics:math-ph]. 2024.

[6] J. Henheik, A. B. Lauritsen, and B. Roos. "Universality in low-dimensional BCS theory". *Rev. Math. Phys.* **36**.09 (2024), p. 2360005.

[7] A. B. Lauritsen and R. Seiringer. "Ground state energy of the dilute spin-polarized Fermi gas: Lower bound". arXiv: 2402.17558 [math-ph]. 2024.

[8] A. B. Lauritsen and R. Seiringer. "Ground state energy of the dilute spin-polarized Fermi gas: Upper bound via cluster expansion". *J. Funct. Anal.* **286**.7 (2024), p. 110320.

[9] A. B. Lauritsen and R. Seiringer. "Pressure of a dilute spin-polarized Fermi gas: Lower bound". *Forum of Mathematics, Sigma* **12** (2024), e78.

[10] A. B. Lauritsen and R. Seiringer. "Pressure of a dilute spin-polarized Fermi gas: Upper bound". arXiv: 2407.05990 [math-ph]. 2024.

[11] F. R. Klausen and A. B. Lauritsen. "Stochastic cellular automaton model of culture formation". *Phys. Rev. E* **108**.5 (2023), p. 054307.

[12] J. Henheik and A. B. Lauritsen. "The BCS Energy Gap at High Density". *J Stat Phys* **189**.5 (2022).

[13] A. B. Lauritsen. "Floating Wigner crystal and periodic jellium configurations". *J. Math. Phys.* **62**.8 (2021), p. 083305.

[14] A. B. Lauritsen. "The BCS energy gap at low density". *Lett. Math. Phys.* **111**.20 (2021).

Conference talks

2025/10 **Oberwolfach arbeitsgemeinschaft: Analysis of many-body quantum systems**, Oberwolfach, Germany.
Lecture: "Thomas–Fermi theory and the limit of a large atom".

2025/9 **Quantissima sur Oise**, Neuville-sur-Oise, France.
Contributed talk: “Cluster expansion for strongly correlated fermionic trial states”.

2025/9 **QMATH16**, Munich, Germany.
Contributed talk: “Universal behaviour of the BCS energy gap”.

2025/2 **Winter School: Physics and Mathematics of Bose-Einstein Condensates**, Dijon, France.
Contributed talk: “Energies of dilute Fermi gases”.

2025/2 **Mathematical Challenges in Quantum Mechanics (MCQM25)**, L’Aquila, Italy.
Contributed talk: “Multi-band superconductors have enhanced critical temperatures”.

2024/12 **Mathematical Physics and PDEs**, Herrsching, Germany.
Invited talk and poster: “Multi-band superconductors have enhanced critical temperatures”.

2024/10 **Mini-workshop on condensed matter physics**, Farchant, Germany.
Invited talk: “Universalities in BCS theory”.

2024/10 **SFB/TRR 352-retreat**, Farchant, Germany.
Contributed talk and poster: “Ground state energy of the dilute spin-polarized Fermi gas”.

2024/8 **Rigorous Renormalization Group Analysis of Collective Phenomena in Fermionic Quantum Systems**, Como, Italy.
Contributed poster: “Ground state energy of the dilute spin-polarized Fermi gas”.

2024/8 **Quantissima in the Serenissima V**, Venice, Italy.
Contributed talk: “Universal behaviour of the BCS energy gap”.

2024/7 **Current Topics in Mathematical Physics**, Zürich, Switzerland.
Contributed talk: “Ground state energy of a dilute spin-polarized Fermi gas”.

2024/7 **International Congress on Mathematical Physics (ICMP)**, Strasbourg, France.
Contributed poster: “Ground state energy of the dilute spin-polarized Fermi gas”.

2024/6 **3rd ISTA Summer School in Analysis and Mathematical Physics** , Klosterneuburg, Austria.
Contributed talk: “Floating Wigner Crystal and Periodic Jellium Configurations”.

2023/8 **Current Topics in Mathematical Physics**, Warsaw, Poland.
Contributed talk: “Pressure of a dilute spin-polarized Fermi gas”.

2023/7 **Workshop of Young Researchers in Mathematical Physics**, Westerham, Germany.
Invited talk: “Dilute Fermi gases: Upper bounds via cluster expansion”.

2022/9 **QMath 15**, Davis, USA.
Contributed (online) talk: “The BCS energy gap at low and high density”.

2022/8 **Quantissima in the Serenissima IV**, Venice, Italy.
Contributed talk: “Floating Wigner Crystal and Periodic Jellium Configurations”.

2022/6 **Mathematical Challenges in Quantum Mechanics (MCQM22)**, Como, Italy.
Contributed talk: “BCS energy gap at low and high density”.

2021/8 **International Congress on Mathematical Physics (ICMP)**, Geneva, Switzerland.
Contributed poster: “The BCS energy gap at low density”.

2021/7 **Summer School on Current Topics in Mathematical Physics**, Zürich, Switzerland.
Contributed talk: “Floating Wigner Crystal and Periodic Jellium Configurations”.

Seminar talks

2025/11 **Seminar, Probability and Mathematical Physics** , KTH Royal Institute of Technology, Stockholm, Sweden.
“Asymptotic behaviour of the Bardeen–Cooper–Schrieffer theory of superconductivity”

2025/11 **Seminar series in PDEs and Applications**, Univeristy of Uppsala, Uppsala, Sweden.
"Cluster expansion for strongly correlated fermionic trial states"

2025/5 **Seminar at the IANS**, University of Stuttgart, Stuttgart, Germany.
"Energies of dilute Fermi gases".

2025/5 **PDE and Mathematical Physics**, University of Zürich, Zürich, Switzerland.
"Energies of dilute Fermi gases".

2024/3 **Séminaire: Problèmes Spectraux en Physique Mathématique**, Institut Henri Poincaré, Paris, France.
"Energies of dilute spin-polarized Fermi gasses".

2023/10 **Itinerant Quantum Math Meetings**, University of Milan, Milan, Italy.
"Ground state energy and pressure of a dilute spin-polarized Fermi gas"

2023/6 **Mathematics of Many-Body Systems**, SISSA, Trieste, Italy.
"Energies of dilute Fermi gases: Upper bounds via cluster expansion"

2023/2 **Quantum Lunch**, University of Copenhagen, Copenhagen, Denmark.
"Dilute Fermi gases: Upper bounds via cluster expansion"

2021/2 **Quantum Lunch**, University of Copenhagen, Copenhagen, Denmark (online).
"The BCS energy gap at low density".

2020/12 **Mathematical Physics and Analysis seminar**, IST Austria, Klosterneuburg, Austria (online).
"Jellium and the Uniform Electron Gas".

Outreach talks

2025/10 **Seminar evening**, Fondation Danoise, Paris, France.
"Why quantum mechanics?"

2023/11 **MIX Colloquium**, IST Austria, Klosterneuburg, Austria.
"From atoms to large quantum systems".

2023/3 **Think & Drink**, IST Austria, Klosterneuburg, Austria.
"Modelling culture formation on the European map"

Paris, 2026-01-13