Education

- Jan.2020- Sep, 25. 2023 Ph.D. QMATH, University of Copenhagen, Supervisor: Albert H. Werner. Thesis: *Random Problems in Mathematical Physics.* Research stays with Simone Warzel at TU-Munich.

- 2017-2019: M.Sc. Mathematics, University of Copenhagen, GPA: 12/12. Two exchange semesters on ETH Zürich specialising in mathematical physics.
  Thesis: *Exponential decay of truncated correlation functions for the 2d-Ising model at the critical temperature.* Supervision: Aran Raoufi and Wendelin Werner, ETH Zürich.

- 2016-2017: B.Sc. Physics, University of Copenhagen (some courses transferred from math),
  GPA of additional courses: 12/12.

- 2013-2016: B.Sc. Mathematics, University of Copenhagen. GPA: 11.7/12. Exchange semester at LMU Munich, 2015. Thesis: *Causal structure in General relativity.*

Employment

- Postdoctoral Research Fellow, Princeton University, Oct 2024-Oct 2025.
  Research in mathematical physics with mentor Michael Aizenman.

- Postdoc, Niels Bohr Institute, University of Copenhagen, Feb 2024 - Sep 2024.
  Research and supervision in quantum software, representing PhDs and postdocs in the university-wide Senate, member of the national standardisation council for quantum technologies.

- Postdoc, Department of Mathematical Sciences, University of Copenhagen, Jul 2023-Jan 2024.
  Continuing research as well as lecturing the 3rd semester course "Mathematical Analysis".

- PhD Student, Department of Mathematical Sciences, University of Copenhagen, Jan 2020-Jul 2023.
  Research in mathematical physics and quantum information, PhD and postdoc representative in the Department Collaboration Committee, teaching a freshman project on quantum information theory twice, supervision of two master's students (Boris Kjær, Mie Glückstadt) on statistical mechanics.

- Scientific Assistant, Department of Mathematical Sciences, University of Copenhagen, Nov-Dec 2019.

- Member of the working group of the Danish Mathematical Olympiad Dec 2015-
  (Correcting tests, posing problems, teaching on training camps, fundraising, organization development and leading the Danish Team in IMO 2017, 2018 and Baltic Way 2015-2020).

- Trading Intern, Jane Street, London, Jul-Sep 2022.
  Financial training and data analysis in Python and Excel.

- Teaching Assistant, University of Copenhagen Sep 2014-Jul 2018.
  Introduction to Mathematics, Linear Algebra (x 3), Complex Analysis, Analysis 0 (x 2), Geometry 1, Electrodynamics, Analysis 2, Measure and Integration Theory, Statistical Physics.

- Consulting Intern, McKinsey & Company, Copenhagen, May-Jun 2016.

- Astronomy Guide, Tycho Brahe Planetarium Mar 2014-Aug 2016.
  (Explaining astronomy to the public by public shows, guided tours, lectures for school kids etc.)

- Badminton Coach, Charlottenlund Badmintonklub Sep 2007-Jul 2012.

Awards

- 1st. prize: China Adolescent Science and Technology Innovation Contest, 2014.
- 1st. prize: Physical Science, Young Scientists Denmark, 2014.
- Bronze medal, International Physics Olympiad (IPhO), 2013.
- Honorable Mention, International Mathematical Olympiad (IMO), 2013.
- 1st: The Danish Physics Olympiad 2013.
- 2nd: Danish Mathematical Olympiad (Georg Mohr-Konkurrencen), 2013.

Grants

- *Fluctuating Random Surfaces in Magnetic Systems*, two year postdoc grant for research stays at Princeton and Cambridge,(1.020.000 DKK). Carlsberg Foundation, 2024.
- *Company sponsorship* for the Danish math olympiad. (100.000 DKK per year for 7 years), Jobindex, 2018-.
- *Kovalevskaya Travel Grants*, for participating in ICM 2022 (cancelled).
- *Travel grant for master's studies* at ETH, (40.000 DKK) from Augustinus Foundation, Oticon Foundation, ETH, 2018.
- *Diligence award*, 5.000 DKK, Gammel Hellerup Gymansium, 2013.

Volunteer Work

- Treasurer, Nordisk Kollegium, 2023.
- Member of the pre-selection jury 2016-2025 and the final jury 2017-2024, Young Scientists Denmark.
- Correcting the Danish Physics Olympiad 2014 and teaching at the Danish Physics Olympiad 2015.
- The Danish Youth Association of Science 2011 - 2014. (*Arranging lectures, excursions, MathCamps.*)

Scientific Talks

- *The Hammersley stratagem*, Tübingen, 19/12-2024.
- *Decoherence is an echo of Anderson localization in open quantum systems*, Quantissima 13/8-2024, Rutgers 20/5-2024,ICMP 2/7-2024.
- *Phase transitions for graphical representations of the Ising model using the uniform even subgraph*, Princeton, USA 30/4-24, Lund, Sweden 5/4-24, Tsinghua, China, 31/1-2024, Nancy, France, 30/11-23, Cambridge, UK, 7/11-2023, Chalmers, Sweden, 17/10-2023.
- *Problems in mathematics of quantum systems from the beginning*, Fribourg, Switzerland, 1/12, 2023.
- *Two-tier electoral systems, the Danish election in 2022, unclarities and impossibility results*, QMATH, Copenhagen 21/12-2022.
- *Single particle open quantum systems in one dimension: dissipation and disorder imply decoherence*, Oberseminar, TU Munich, 15/11-2022.
- *Spectra of translation-invariant Lindbladians in infinite volume*, QMATH, Copenhagen 1/6-2022.
- *Critical exponents for the Ising model in a magnetic field with random currents*, QMATH, Copenhagen, 4/9-2020, Percolation Today, 15/6-2021, Current Topics in Mathematical Physics, 20/7-2021.
- *QMATH tracks the spread of Danish Coronavirus from genetic data*, University of Copenhagen, 30/5-2020, Data@Breakfast, Online, South Africa. 19/6-2020.

Outreach Talks

- *Unclarities in the Danish election law*, Prime Minister's Office, 23/10-24.
- *Problems with graphs and probabilities*, Farum Mathematics Seminar, 13/2-24.
- *The Ising model its the phase transition*, Tea with a researcher, 3/11-23.
- *Math research through pictures*, Culture night, 13/10-23.
- *Doing a PhD*, UCPH career day, 11/5-23.
- *What can a quantum computer do for you?*, Culture night, 14/10-22.
- *Why Quantum Computing is fundamentally different*, UCAPS Late night PhD talks. 24/2-22.
- *From spectra to quantum physics*, Alumni association. 30/11-21.
- *Quantum Computing is fundamentally different* poster pitch to; EU comissioner Margrethe Vestager 22/2-22, staff of the American embassy in Denmark 22/3-22, group from the ministry of education 21/2-22, senior staff from Novo Nordisk 1/11-22, Board of the Danish Quantum Community, 14/12-22, Public Audience 11/6-22.

Personal Information:

Contact: frederik.ravn.klausen@gmail.com Citizenship: Danish.

Languages: Danish (native), English (fluent), German (fluent), Python (experienced), R (intermediate).

List of Publications

Peer-reviewed publications:

- D. Harley, I. Datta, **F.R. Klausen**, A.Bluhm, D.S.França, A.Werner, M.Christandl. Going Beyond Gadgets: The Importance of Scalability for Analogue Quantum Simulators, Nature Communications, 2024.

- **F.R. Klausen**, A. Lauritzen. A stochastic cellular automaton model of culture formation, Phys.Rev.E 108,054307,2023.

- U.Hansen, **F.R. Klausen**. Strict monotonicity, continuity and bounds on the Kertész line for the random-cluster model on $\mathbb{Z}^d$, Journal of Mathematical Physics, 2023.

- **F.R. Klausen**, A.Raoufi. Mass scaling of the near-critical 2D Ising model using random currents, Journal of Statistical Physics, 2022.

- **F.R. Klausen**. On monotonicity and couplings of random currents and the loop-$O(1)$-model, 2022, ALEA. Latin American Journal of Probability and Mathematical Statistics.

- A. Bluhm, M.Christandl, F. Gesmundo, **F.R. Klausen**, L. Mančinska, V. Steffan, D.S.França, A. Werner. SARS-CoV-2 transmission routes from genetic data: A Danish case study, 2020, PloS one.

- P. Jensen, **F.R. Klausen**, P.Rasmussen. Combinatorial classification of quantum lens spaces, 2018, Pacific Journal of Mathematics.

- S. Holdum, **F.R. Klausen**, P.Rasmussen. Powers in Prime Bases and a Problem on the Central Binomial Coefficient, 2014, Integers: Electronic Journal of Combinatorial Number Theory.

- S. Holdum, **F.R. Klausen**, P.Rasmussen. On a Conjecture on the Representation of Positive Integers as the Sum of Three Terms of the Sequence $\left\lfloor \frac{n^2}{a} \right\rfloor$, 2014, The Journal of Integer Sequences.

In Press

- **F.R. Klausen**, S.Warzel. Decoherence is an echo of Anderson localization in open quantum systems, arXiv 2310.09880, 2023, Annales Henri Poincaré.

Preprints

- U.T. Hansen, **F.R. Klausen**, P.Wildemann . Non-uniqueness of phase transitions for graphical representations of the Ising model on tree-like graphs, arXiv 2410.22061, 2024.

- U.Hansen, B.Kjær, **F.R. Klausen**. The Uniform Even Subgraph and Its Connection to Phase Transitions of Graphical Representations of the Ising Model, arXiv 2306.05130, 2023.

- **F.R. Klausen**, A. Werner. Spectra of Lindbladians on the infinite line: From non-Hermitian to full evolution via tridiagonal Laurent matrices, arXiv: 2206.09879, 2022.

- J. Elklit, S. Holudm, **F.R. Klausen**, What is wrong with the proportionality in the Parliamentary Elections Act—and what can be done about it?, 2024

Outreach and debate papers

All titles translated from Danish to English.
- *Proposal for Adjustments to the Danish Parliamentary Election Act*, Memo to the Ministry of the Interior upon request, 2024.
- *Give Temporary Researchers Better Conditions*, Uniavisen, 2023.
- *Mathematicians Reveal COVID-19 Transmission Routes*, Aktuel Naturvidenskab, 2020.
- *Denmark Hosted Baltic Way 2017*, on behalf of the Georg Mohr Competition, LMFK-bladet, 2018.
- *Meditation on the Central Binomial Coefficient*, FAMØS, 2015.
- *Physics in the Olympiad Class*, Aktuel Naturvidenskab, 2013.
- *Talented Students Must Not Forget the Community*, Politiken, 2012.