

# Aleksandra Rylund Glesaaen

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## Curriculum Vitae

### Work

- 05.2021-present **Researcher**, *SINTEF Digital, Optimization*, Oslo, Norway.  
Solving interesting optimization problems both with a focus on finding real world solutions and application as well as working on more researched focussed projects.
- 10.2018-05.2021 **Software developer**, *Share Control AS*, Oslo, Norway.  
Implementing solutions for the IFRS 16 reporting standard in various systems including Excel VBA, Power BI, and web apps making use of the Office 365 ecosystem
- 10.2016-10.2018 **Postdoctoral researcher**, *Department of Physics, Swansea University*, Swansea.  
Implementation of various algorithms into the *openQCD* code base; study of the complex Langevin algorithm and its behaviour in relation to the *sign problem*; study of baryons at deconfinement, and past-deconfinement temperatures; application of various techniques from machine learning to the problem of spectral reconstruction

### Education

- 08.2013-07.2016 **Ph.D.-Student**, *Johann Wolfgang Goethe-Universität*, Frankfurt am Main.  
Phase diagram of QCD, lattice QCD, analytic methods, cold and dense, heavy QCD, hopping parameter expansion, strong coupling expansion, graph theory.
- 08.2008-05.2013 **Master student**, *Norwegian University of Science and Technology (NTNU)*, Trondheim, Graduate of excellence.  
Phase diagram of QCD, effective models, quark extended linear sigma model, the renormalisation group.

### Theses

- Ph.D.-Thesis **Heavy Quark QCD at Finite Temperature and Density Using an Effective Theory**, *Supervisors: Prof. Dr. Owe Philipsen, and Prof. Dr. Dirk-Hermann Rischke*.  
In this work I used an effective theory approach to study the cold and dense limit of heavy QCD from first principles. I developed both computational and graphical tools and methods for carrying out the necessary mathematics to high order. Much of the work is also dedicated to the methods of resummation and their advantages.
- Master Thesis **The Chiral Phase Transition in QCD: Mean-Field Versus the Functional Renormalisation Group**, *Supervisor: Prof. Jens Oluf Andersen*.  
For my masters work I made use of low energy effective theories, more specifically the quark extended linear sigma model, to analyse the properties of the breaking of chiral symmetry in QCD, and the emerging phase diagram. Also made use of the functional renormalisation group to extract the correct low energy properties of the quantum field theory.

### Experience

#### Teaching, Goethe Universität

- 10.2015 **Introductory Course to the C++ Programming Language**.  
Taught a full week intensive course on the C++ programming language

- 2013-2015 **Teaching assistance.**  
Quantum Field Theory II, Statistical Physics, Introductory Quantum Mechanics, Programming for Physicists  
**Teaching, NTNU**
- spring 2012 **Computational Physics, Prof. Alex Hansen.**  
Created and published solutions to the homework and lectured once a week.
- 2009-2012 **Teaching assistance.**  
Statistical Physics, Quantum Mechanics II, Wave Physics, Vector Calculus, Electricity and Magnetism, Mechanical Physics  
**Other**
- April 2018 **Data Study Group, Alan Turing Institute, London, United Kingdom.**  
Teamwork event where we worked for a week on the challenges of measuring and guaranteeing fairness in algorithmic decision making.
- summer 2011, **Service desk administrator, Petroleum Geo-Services, Oslo, Norway.**  
summer 2012, Management and administration of user databases, PC repair, general support tasks.  
winter 2012
- summer 2010 **Internship, material science, National Institute of Material Science (NIMS), Tsukuba, Japan, Supervision of Prof. Kenji Sakurai.**  
X-ray diffraction experiments on thin film materials.

## Skills

- C++ Experienced in OO programming, Template Meta Programming, unit testing, MPI, the C++14 standard, boost, GSL, and other scientific libraries
- Other Mathematica, JavaScript, Python (tensorflow), Lua, fortran, VBA
- Tools Linux, git, CI (GitLab), shell scripting, Ansible
- Typography L<sup>A</sup>T<sub>E</sub>X, HTML, CSS, Jekyll

## Languages

- Norwegian **Mother tongue**
- English **Excellent** IELTS 8.5
- Japanese **Basic** Basic communication, reading and writing skills

## Publications

- G. Aarts et al., Properties of the QCD thermal transition with  $N_f = 2 + 1$  flavours of Wilson quark, arXiv: 2007.04188
- P. Byfield et al., Alan Turing DSG Report: Fairness in algorithmic decision making, DOI: 10.5281/zenodo.2557795
- O. Philipsen et al., Heavy dense QCD from a 3D effective lattice theory. In *Proceedings, 33rd International Symposium on Lattice Field Theory (Lattice 2015)*, 2015, arXiv: 1511.00967
- O. Philipsen et al., Equation of state for cold and dense heavy QCD. *JHEP*, 03:100, 2016, doi: 10.1007/JHEP03(2016)100
- J. J. M. Verbaarschot et al., Complex Langevin Simulation of a Random Matrix Model at Nonzero Chemical Potential. *JHEP*, 2017, arXiv: 1712.07514