

Jonas Rylund Glesaaen

Curriculum Vitae

Work

- 10.2016-present **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, which is a prerequisite for the students who wish to attend the numerical physics course taught by Prof. Lindenstruth
- SS15 **Quantum Field Theory II**, *Jun Prof. Dr. Marc Wagner*.
- WS14 **Statistical Physics**, *Prof. Dr. Owe Philipsen*.
- SS14 **Introductory Quantum Mechanics**, *Prof. Dr. Owe Philipsen*.
- WS13 **Programming For Physicists**, *Jun Prof. Dr. Marc Wagner*.

Teaching, NTNU

- autumn 2012 **Statistical Physics**, Prof. Kåre Olaussen.
spring 2012 **Computational Physics**, Prof. Alex Hansen.
Created and published solutions to the homework and lectured once a week.
- autumn 2011, autumn 2012 **Quantum Mechanics II**, Prof. Jan Myrheim.
- autumn 2010 **Wave Physics**, Prof. Jon Andreas Støvneng.
spring 2010 **Vector Calculus**, Førsteamanuensis Heidi Dahl.
spring 2010 **Electricity and Magnetism**, Prof. Jon Andreas Støvneng.
- autumn 2009 **Mechanical Physics**, Prof. Arne Mikkelsen.

Other

- summer 2011, summer 2012, winter 2012 **Service desk administrator**, Petroleum Geo-Services, Oslo, Norway.
Management and administration of user databases, PC repair, general support tasks.
- summer 2010 **Internship, material science**, National Institute of Material Science (NIMS), Tsukuba, Japan, Supervision of Prof. Kenji Sakurai.
Carried out x-ray diffraction laboratory work on thin film materials sputtered with ytterbium crystals. Held and took courses on various material science related subjects. Observed synchrotron experiments at the KEK Photon Factory synchrotron.

Skills

- C++ Experienced in OO programming, Template Meta Programming, MPI, the C++14 standard, boost, GSL, and other scientific libraries
- Other Mathematica, JavaScript, Python (tensorflow), VBA
- Typography L^AT_EX, HTML, CSS, Jekyll

Languages

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

Publications

- J. Bloch, J. Glesaaen, O. Philipsen, J. Verbaarschot, S. Zafeiropoulos, Complex Langevin simulations of a finite density matrix model for QCD, In *Proceedings, 12th Conference on Quark Confinement and the Hadron Spectrum*, 2016, arXiv: 1612.04621
- J. Glesaaen, M. Neuman, O. Philipsen, Heavy dense QCD from a 3D effective lattice theory. In *Proceedings, 33rd International Symposium on Lattice Field Theory (Lattice 2015)*, 2015, arXiv: 1511.00967
- J. Glesaaen, M. Neuman, O. Philipsen, Equation of state for cold and dense heavy QCD. *JHEP*, 03:100, 2016, doi: 10.1007/JHEP03(2016)100
- J. Bloch, J. Glesaaen, J. J. M. Verbaarschot, S. Zafeiropoulos, Complex Langevin Simulation of a Random Matrix Model at Nonzero Chemical Potential. *JHEP*, 2017, arXiv: 1712.07514