

Vegard Børve Sørđal

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EDUCATION

UNIVERSITY OF OSLO

PH.D. IN THEORETICAL PHYSICS

2015-2019 | Oslo, Norway

My main focus has been studying how the possession of information and feedback control affects the efficiency of thermodynamic machines, and how to optimize their operation.

GPA: N/A

M.Sc. IN THEORETICAL PHYSICS

2013-2015 | Oslo, Norway

Specialized in statistical physics.

1 semester at Sorbonne University.

GPA: 3.83 / 4.0

UNIVERSITY OF BERGEN

B.Sc. IN PHYSICS

2008-2011 | Bergen, Norway

2 semesters at The University of Hawaii.

GPA: 3.77 / 4.0

LINKS

Github:// [vegardbs](#)

LinkedIn:// [vegardbs](#)

Google Scholar:// [vegardbs](#)

SKILLS

PROGRAMMING

Python • Matlab • C++ • LaTeX

NumPy • Pandas • Scikit-learn • Keras

Tensorflow • Jupyter Notebook

MATHEMATICS

Optimization • Differential equations

Linear algebra • Calculus • Statistics

PHYSICS

Information theory • Statistical physics

Biophysics • Computational physics

Quantum physics

MACHINE LEARNING

Data cleaning • Data analysis

Machine learning basics (classification, prediction, etc) • Deep learning

Reinforcement learning

GENERAL

Experienced teacher • Public speaking

Project management • Time management

Modeling • Team focused collaborations

Languages

Native Norwegian • Fluent English

Conversational Japanese • Basic French

I have a very broad set of interests, but a recurring theme is systems where complex behaviour arise from simple underlying rules; everything from molecular machines to foreign exchange markets and neural networks. In my early career I focused on nano-physics, performing both experiments and the associated data analysis. Later I moved into theoretical physics, mainly optimizing information processes in physics.

EXPERIENCE

GUEST RESEARCHER | UNIVERSITY OF BARCELONA

June 2016 – Feb 2017 | Barcelona, Spain

- Researched the fluctuations of molecular machines responsible for unzipping DNA helix.
- Helped develop the theoretical background. Cleaned, visualized and analyzed large amounts of noisy data.

SUMMER INTERN | NANOTEC CENTER WEIZ

July 2013 – Aug 2013 | Graz, Austria

- Worked with a team developing organic memory devices coupled to organic LED. I was responsible for the fabrication and characterization of the devices.

RESEARCH ASSISTANT

Jan 2013 – May 2013 | University of Hawaii

Studied properties of graphene. I took initiative to self-learn how to operate atomic force and scanning tunneling microscopes, since their operational knowledge had been lost from the lab.

March 2012 – Oct 2012 | University of Tokyo

Researched quantum spin-filtering. Operated a dilution refrigerator needed to keep the experimental samples close to absolute zero temperature, and performed associated data analysis.

TEACHING ASSISTANT

Every spring 2015-2019 | University of Oslo

Every fall 2017-2019 | University of Oslo

Spring 2013 | University of Hawaii

Fall 2011 | University of Bergen

Statistical Physics
EM & Thermodynamics
Electromagnetism
Introductory physics

- I have ~ 5 full years of teaching experience from various institutions, for both undergraduate and graduate classes.
- Responsibilities include creating weekly problem sets, midterms and exams, as well as guiding the students through the solutions and making difficult concepts easy to understand.

PUBLICATIONS

Deep reinforcement learning for quantum Szilard engine optimization

VB Sørđal, J Bergli

Physical Review A 100, 042314- 2019

Quantum particle in a split box: Excitations to the ground state

VB Sørđal, J Bergli

Physical Review A 9 (2), 022121 - 2019

Influence of measurement error on Maxwell's demon

VB Sørđal, J Bergli, YM Galperin

Physical Review E 95 (6), 062129 - 2017

Cooling by heating: Restoration of the third law of thermodynamics

VB Sørđal, J Bergli, YM Galperin

Physical Review E 93 (3), 032102 - 2016

Monolithically integrated organic resistive switches for luminance and emission color manipulation in polymer light emitting diodes

S Nau, VB Sørđal, C Wolf, S Sax, EJW List Applied Physics Letters 107 (13) 94 - 2015