Sebastian Dick | CV

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EDUCATION

Stony Brook University — **Stony Brook, NY**
Ph.D. student, Physics — *2016–present*

Stony Brook University — **Stony Brook, NY**
M.A., Physics — *2014–2015*

University of Wurzburg, Germany — **Wurzburg, Germany**
B.Sc. with distinction, Physics — *2011–2014*

RESEARCH

Stony Brook University — **Stony Brook, NY**
Research Assistant, Advisor: Dr. Marivi Fernandez-Serra — *May 2017–present*

- Equivariant neural networks on graphs encoding physical symmetries
- Machine learning and Density Functional Theory: Investigating how both can work together to achieve faster and more accurate electronic-structure calculations.
- NeuralXC: Development of a Python framework that lets users create and deploy density functionals based on machine learning.

University of Wurzburg — **Wurzburg, Germany**
Independent research under Dr. Ronny Thomale — *Aug 2015–Aug 2016*

- Studied symmetry protected topological phases and conformal field theory
- Developed a C++ code ed_ising that allows for the exact diagonalization of 1-d quantum Hamiltonians under various symmetries and boundary conditions

Stony Brook University — **Stony Brook, NY**
Master thesis research, Advisor: Dr. Lukasz Fidkowski — *Jan–Jul 2015*

- Analyzed short-range entangled topological phases protected by time-reversal symmetry
- Proved that the microscopic model for these phases proposed by Chen et al. and the non-linear sigma model effective field theory are equivalent.

University of Wurzburg — **Wurzburg, Germany**
Bachelor thesis research, Advisor: Dr. Ronny Thomale — *Jan–Jul 2014*

- Worked with a group-internal Fortran code called FRG that uses the Functional Renormalization Group approach to study phase transitions in strongly correlated systems
- Studied the dependence of high temperature superconductivity in cuprates on doping.

PROFESSIONAL DEVELOPMENT

MLSS 2019 — **London, UK**
Machine Learning Summer School at University College London — *July 2019*

Parallel Computing in Molecular Sciences — **Berkeley, CA**
MolSSI Summer School and Workshop — *Aug 2018*

Software Carpentry — **Stony Brook, NY**
Instructor training program — *Jan 2018*
Became a certified Software Carpentry Instructor

TEACHING EXPERIENCE

Stony Brook University **Stony Brook, NY**
Teaching Assistant *Aug 2016–May 2017*
Taught life science and physics students in the lab sections of introductory physics courses and graded their activities

University of Wurzburg **Wurzburg, Germany**
Teaching Assistant *Oct–July 2016*
Taught recitation for a course on mathematical methods for physicists. Supported and graded students in the theoretical condensed matter physics graduate seminar.

PRESENTATIONS

APS March Meeting **Boston, MA**
Presentation *March 2018*
Title: Learning from the Density to Correct Total Energy and Forces in First Principle Simulations

Gordon Research Conference on Water and Aqueous Solutions **Holderness, NH**
Poster presentation *Jul 2018*
Presented poster: Combining DFT and Machine Learning: towards faster and more accurate ab-initio calculations of water

Joint Science Meeting **Stony Brook, NY**
Poster presentation *May 2018*
Presented poster: Improving DFT calculations of water with Machine Learning

EXTRA-CURRICULAR ACTIVITIES

IACS Diversity & Recruitment Committee **Stony Brook, NY**
Student Member *Sep 2018–present*

Initiative Junge Forscherinnen und Forscher e.V. **Wurzburg, Germany**
Teacher *Jan–July 2016*
Non profit organization dedicated to teaching high school students physics and nano-science with modern classroom experiments

University of Wurzburg **Wurzburg, Germany**
Physics Student Council Member *Feb 2012–July 2014*
Supporting and counseling physics students. Representing students' interests towards university administration.

AWARDS

Jr. Researcher Award **Stony Brook, NY**
Institute for Advanced Computational Science *Sep 2019*

"Seed" Software Fellowship **Blacksburg, VA**
MolSSI *Jan-Jul 2019*

Jr. Researcher Award **Stony Brook, NY**
Institute for Advanced Computational Science *Sep 2018*

DAAD Stipend
USA Exchange Program *Sep 2014*
Stipend to partly cover expenses related to the exchange program during which I obtained my Master's degree at Stony Brook University. The stipend was granted based on academic performance at the University of Wurzburg.

LANGUAGES

German (native), English (fluent verbal and written), Italian and French (basic verbal and written)

PROGRAMMING SKILLS

Python, C++, Fortran, OpenMP, MPI, Tensorflow, Pytorch, MySQL, Bash