

Curriculum Vitae of John Bonini

john@rbonini.science
<https://github.com/jrbp>

RESEARCH INTERESTS

Application and development of computational and data-driven techniques to facilitate the discovery and understanding of functional materials, including ferroelectrics, piezoelectrics, topological insulators and semimetals as bulk, thin films, and heterostructures.

EDUCATION

- 2013- **PhD. in Physics** (expected 2020)
Rutgers University, Condensed Matter Theory
Advisor: Karin Rabe
- 2009-2013 **B.S. in Physics**
Rowan University, Minor in Mathematics, Minor in Computer Science

ARTICLES

- 2020 “Berry Flux Diagonalization: Application to Electric Polarization”
J. Bonini, D. Vanderbilt, and K. M. Rabe
arXiv:2002.02995 [cond-mat.mtrl-sci]
- 2019 “First-principles bulk-layer model for dielectric and piezoelectric responses in superlattices”
J. Bonini, J. W. Bennett, P. Chandra, and K. M. Rabe
Phys. Rev. B 99, 104107
- 2011 “Enhanced resonant magnetoelectric coupling in frequency-tunable composite multiferroic bimorph structures”
P. Finkel, J. Bonini, E. Garrity, K. Bussman, J. Gao, J. F. Li, S. E. Lofland, and D. Viehland
Appl. Phys. Lett. 98, 092905

TALKS

- 2020 “Berry Flux Diagonalization: Application to Electric Polarization”
Fundamental Physics of Ferroelectrics, Silver Springs, Maryland
- 2019 “Fantastic metastable states and where to find them: A computational search for superlattices with enhanced functional properties”
APS March Meeting, Boston, Massachusetts
- “First principles dielectric slab model for dielectric and piezoelectric response in su-

perlattices”

Symposium of the Laboratory for Surface Modification, Rutgers University

“First principles dielectric slab model for dielectric and piezoelectric response in superlattices”

Fundamental Physics of Ferroelectrics, Tampa, Florida

2018 “First principles dielectric slab model for dielectric and piezoelectric response in superlattices”

APS March Meeting, Los Angeles, California

2017 “Efficient computation of spontaneous polarization using Wannier center displacements”

APS March Meeting, New Orleans, Louisiana

2016 “Efficient computation of spontaneous polarization using Wannier center displacements”

Fundamental Physics of Ferroelectrics, Washington D.C.

2015 “High throughput density functional theory calculations for predicting new ferroelectrics”

Student Seminars in Physics and Astronomy, Rutgers University

SCHOOLS/WORKSHOPS ATTENDED

2019 Workshop on Recent Developments in Electronic Structure

University of Illinois at Urbana-Champaign

Poster: “Computing spontaneous polarization without sampling a switching path”

2018 NSF EFRI-2DARE, DMRED-2D & MIP Grantees Meeting

Pennsylvania State University Materials Research Institute

2017 International School on Oxide Electronics

Institut d’Études Scientifiques Cargèse, France

Poster: “Efficient computation of spontaneous polarization using Wannier center displacements”

Workshop on Recent Developments in Electronic Structure

Princeton University

2015 Machine Learning for Materials Science Workshop

University of Maryland

2014 Quantum Espresso Workshop

Pennsylvania State University

2013 NJSGC Annual Summer Research Conference

Rutgers University

Poster: “Engineering the interaction between cold dipolar molecules with external fields to produce novel quantum phases”

2012 NJSGC Academic Year Fellowship Poster Session

Rutgers University

Poster: “Design of a system for Elastic, Electric, and Magnetic Properties of Multi-ferroic Devices ”

STEM Symposium

Rowan University

Poster: “Design of a system for Elastic, Electric, and Magnetic Properties of Multi-ferroic Devices ”

AWARDS

2019 **Best Oral Presentation by student or postdoc (3rd Place)**

Fundamental Physics of Ferroelectrics Workshop

2013 **Excellence Fellowship**

Rutgers University

Medallion for Excellence in Physics

Rowan University

COMPUTER SKILLS

Python, HPC, Linux, MongoDB, Git, Bash, Fortran, Lisp, C

REFERENCES

Karin Rabe

Board of Governors Professor

Department of Physics and Astronomy, Rutgers University

kmrabe@physics.rutgers.edu

David Vanderbilt

Board of Governors Professor

Department of Physics and Astronomy, Rutgers University

dhv@physics.rutgers.edu

Cyrus Dryer

Assistant Professor

Department of Physics and Astronomy, Stony Brook University

Affiliate Associate Research Scientist

Center for Computational Quantum Physics, Flatiron Institute

cyrus.dreyer@stonybrook.edu