

John Bernard DeBroda

Curriculum Vitae

March 25, 2018

Contact:

Department of Physics
University of Massachusetts Boston
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Boston, Massachusetts 02125
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Education:

Ph.D. Candidate in Physics, University of Massachusetts Boston, Boston, Massachusetts
Advisor: Christopher A. Fuchs.

M.Sc. in Physics, June 2015, University of Waterloo, Waterloo, Canada
Perimeter Scholars International

Thesis: “A Quantum Information Geometric Approach to Renormalization”
Advisor: Ryszard P. Kostecki

B.S. in Physics with Highest Distinction, May 2014

B.S. in Mathematics with Highest Distinction and Honors, May 2014

Indiana University Bloomington, Bloomington, Indiana
Research Supervisor: Srinivasan S. Iyengar

Publications:

1. J. B. DeBroda and C. A. Fuchs, “Negativity Bounds for Weyl–Heisenberg Quasiprobability Representations.” *Foundations of Physics*, 1-22 (2017). doi:10.1007/s10701-017-0098-z.
2. J. B. DeBroda, “A Quantum Information Geometric Approach to Renormalization.” Master’s Thesis (2016). arXiv:1609.09440.
3. P. Phatak, J. Venderley, J. B. DeBroda, J. Li and S. S. Iyengar, “Active site dynamical effects that affect the hydrogen transfer rate-limiting step in the catalysis of linoleic acid by soybean lipoxygenase-1 (SLO-1): Primary and Secondary Isotope effects.” *J. Phys. Chem. B.* **119**, 9532. (2015).

Conference Presentations:

“The Minimal Distinction Between the Quantum and the Classical.” Poster. *International School of Physics “Enrico Fermi”, Course 197—Foundations of quantum theory*, 8-13 July 2016, Varenna, Italy.

“The Minimum Distinction Between the Quantum and the Classical.” Presentation. *Discrete Structures in Quantum Mechanics*, 20-22 June 2016, Linköping, Sweden.

“The Minimum Distinction Between the Quantum and the Classical.” Presentation. *Quantum and Beyond*, 13-16 June 2016, Växjö, Sweden.

Academic Activities:

Undergraduate Research in Theoretical Chemistry, November 2010 – May 2014

Advisor: Srinivasan S. Iyengar

Description: Investigation of hydrogen transfer reaction steps in biological enzyme active sites using *ab initio* molecular dynamics.

REU in Physics, University of Illinois at Urbana-Champaign, May 2013 – August 2013

Advisor: Taylor L. Hughes

Description: Entanglement in Topological States of Matter Protected by Point Group Symmetries.

Wolfram Science Summer School, 2012

Description: **Universal Assemblers in Multiway Systems**

Awards, Marks of Distinction, and Sources of Funding:

Personnel in Foundational Questions Institute (FQXi) Grant, 1 August 2016 – 31 July 2018

Title: “Does Participatory Realism Make Sense? The Role of Observership in Quantum Theory.”

Provides supplemental salary and one-month research time at Oxford University per year.

UMass Boston Distinguished Doctoral Fellowship, September 2015 – May 2019

Four-year full tuition and stipend. Awarded by committee selection among outstanding nominated graduate student applicants.

Indiana University Cox Research Scholarship, September 2010 – May 2014

Merit-based scholarship covering all academic and living expenses and facilitating undergraduate research.

IU National Merit Scholarship, September 2010 – May 2014

Awarded to National Merit Finalists who have chosen to attend Indiana University.

Malcolm A. Kochert Scholarship, College of Arts and Sciences, 2014

Merit-based scholarship available to students entering their senior year.

Marie S. Wilcox Scholarship, Department of Mathematics, 2012, 2013

Awarded by faculty nomination to students who “demonstrate a deep understanding and appreciation of mathematics and who maintain a record of high academic achievement”.

Hutton Honors College Summer Research Scholarship, 2012

Funding for summer research.

Harry G. Day Chemistry Summer Scholarship, Department of Chemistry, 2011

Funding for summer research.

Memberships and Certifications:

American Physical Society, Member

Topical group on Quantum Information

Phi Beta Kappa, elected November 2013

Media Attention:

Hannes Tobiasson, “Kvantfysiken ger svar och ställer frågor,” *Smålandsposten* [a Swedish local newspaper], 17 June 2016.

Appearance in local news special for the Quantum and Beyond conference in Växjö, Sweden:

<https://www.youtube.com/watch?v=HD2SwVOxPVU>.

Community Contributions:

Acknowledged by:

1. R. P. Kostecki, “Local Quantum Information Dynamics.” [arXiv:1605.02063](#). (2016).
2. B. C. Stacey, “Von Neumann was not a Quantum Bayesian.” *Phil. Trans. R. Soc. A.* **374**, 20150235. [arXiv:1412.2409](#). (2016).
3. C. Bény, T. J. Osborne, “The Renormalization group via statistical inference.” [arXiv:1402.4949](#). (2015).