



Education

- Ph.D., Physics, California Institute of Technology** (GPA: 4.0/4.0) June 2008
Thesis: Dynamics and Simulation of Open Quantum Systems (unofficially 2007)
- M.S., Physics, Virginia Polytechnic Institute** (GPA: 4.0/4.0) May 2003
Thesis: DNA Electronics
- Honors Baccalaureate, Virginia Polytechnic Institute** (GPA: 3.82/4.0) May 2002
- **B.S., Chemical Engineering; B.S., Chemistry; B.A., Philosophy**
 - **Minors:** Mathematics and Physics
 - *Summa Cum Laude*
 - **Thesis:** Acceptor Behavior of Functionalized C₆₀

Selected Honors

- Richard P. Feynman Postdoctoral Fellowship** 2008 – 2011
Los Alamos National Laboratory three-year fellowship
- EMPD Postdoctoral Award** 2010
American Vacuum Society, Electronic Materials & Processing Division
- Director's Postdoctoral Fellowship** 2007 – 2008
Los Alamos National Laboratory two-year fellowship
- William A. Fowler Fellowship** 2003 – 2007
California Institute of Technology four-year fellowship
- National Science Foundation Graduate Fellowship** 2003 – 2006
- Featured article in *Selected papers on Nanotechnology—Theory and Modeling*** 2006
Edited by F. Wang and A. Lakhtakia (SPIE, 2006)
- Best student speaker, Luis Alvarez Award** 2005
American Physical Society California Section meeting in Sacramento, CA
- Sigma Xi Grant-in-Aid of Research** 2005
\$960 grant to study *Entanglement and Correlations in Low-Dimensional Quantum Systems*
- James Lewis Howe Award** 2002
Most outstanding Virginia Tech student in Chemical Engineering, American Chemical Society, Virginia Blue Ridge Section

Selected Recent Publications

1. **M. Zwolak**, C. J. Riedel, and W. H. Zurek, “Amplification, redundancy, and the Quantum Chernoff Information,” *Phys. Rev. Lett.* 112, 140406 (2014)
2. C.-C. Chien, D. Gruss, M. Di Ventra, and **M. Zwolak**, “Interaction-induced conducting-nonconducting transition of ultra-cold atoms in 1D optical lattices”, *New Journal of Physics* 15, 063026 (2013)



3. **M. Zwolak** and W. H. Zurek, "Complementarity of quantum discord and classically accessible information", *Scientific Reports* 3, 1729 (2013)
4. J. Dziarmaga, W. H. Zurek, and **M. Zwolak**, "Non-local quantum superpositions of topological defects", *Nature Physics* 8, 49 (2012)
5. P. J. Coles, R. Colbeck, L. Yu, and **M. Zwolak**, "Uncertainty relations from simple entropic properties", *Phys. Rev. Lett.* 108, 210405 (2012)

Other Highlights

- Theoretical and computational research at the interface of biophysics, nanotechnology, materials, condensed matter, quantum information, and biotechnology
- Authored and co-authored 50 publications
- Articles and chapters cited over 1500 times (1538 ISI, 2173 Google Scholar)
- Gave 114 presentations (59 invited, 48 contributed, 7 for students)
- Editorial board member of the journals *Scientific Reports* (Nature Publishing Group) [for Biological Physics] and *ISRN Nanotechnology* (Hindawi Publishing)
- Co-organized *Quantum Coherence and Decoherence* workshop in Benasque, Spain (2008 & 2010)
- Member of American Physical Society, American Vacuum Society, Biophysical Society, Sigma Xi
- Referee for *Nature Phys.*, *Nature Comm.*, *Phys. Rev. Lett.*, *Sci. Rep. (Nature)*, *EPL*, *JCP*, *Industrial & Engineering Chemistry Research*, *Langmuir*, etc.