

## Edward F. Barry, Ph.D.

Postdoctoral Fellow, Nanoscience and Technology Division

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### Education

Ph.D.	Brandeis University	Physics (concentration in Quantitative Biology)	2011
	<i>Advisor:</i>	<i>Dr. Zvonimir Dogic</i>	
	<i>Thesis title:</i>	<i>“Colloidal Self-Assembly: Liquid Crystals, Membranes, and Ribbons”</i>	
B.S.	Fordham University	Physics (minors in Mathematics and Computer Science)	2003

### Research and Professional Experience

2012-Present	<b>Argonne National Laboratory</b> <i>Joseph P. Katz Named Postdoctoral Fellowship</i> Center for Nanoscale Materials / Nanoscience and Technology Division
2011-2012	<b>University of Chicago</b> <i>Postdoctoral Fellow (advised by Heinrich M. Jaeger)</i> Gordon Center for Integrative Sciences
2006-2011	<b>Brandeis University</b> <i>Graduate Researcher (advised by Zvonimir Dogic)</i>
2003-2006	<b>Rowland Institute at Harvard University</b> <i>Research Assistant</i> Complex Fluids Group - Junior Fellow Program

### Selected Honors and Awards

- Named Postdoctoral Fellowship - Argonne National Laboratory (2012)
- Poster Competition Award Winner
  - Soft Condensed Matter Physics Gordon Research Conference (2011)
  - New England Workshop on the Mechanics of Materials and Structures (2011)
- Cozzarelli Prize – Proceedings of the National Academy of Sciences (2010)
- Materials Research Society Graduate Student Award Finalist (2010)
- Interfaces Scholar Award - Howard Hughes Medical Institute (HHMI) and the US National Institute of Biomedical Imaging and Bioengineering (NIBIB) (2009)
- Graduate Student Fellowship - National Science Foundation (NSF) and the Brandeis University Materials Research Science and Engineering Center (2009-2011)
- Stephan Berko Memorial Prize - Outstanding Graduate Research - Brandeis University (2008)
- Outstanding Teaching Fellow Award - Graduate School of Arts and Sciences – Brandeis (2008)
- Victor F. Hess Award – Top Undergraduate Physics Major - Fordham University (2003)

### Publications, Patents, and Press

- 3 patent applications on nanorod arrays, nanoparticle filtration systems, and porous gold films
- Co-recipient of the 2010 Cozzarelli Prize in Engineering and Applied Sciences with Zvonimir Dogic
- “Working in Physics: Life on the Borders” exclusive interview with Physics Today
- 13 journal publications with over 400 combined citations since 2010 (h-index 9)

## List of Publications

- [\*] **E. Barry**, “Green Gold Nanoparticle Membranes and Thin Films,” *in preparation*
- [\*] **E. Barry**, S. Griesemer, J. Yu, W. Bu, and B. Lin, “Synchrotron Studies Investigating the Role of Ligand Length in Nanoparticle Membrane Self-Assembly,” *in preparation*
- [\*] **E. Barry** and H.M. Jaeger, “Nanoparticle Membrane Transporters,” *in preparation*
- [13] Y.F. Wang, P. Kanjanaboos, S.P. McBride, **E. Barry**, X.M. Lin, and H.M. Jaeger, “Mechanical Properties of Self-Assembled Nanoparticle Membranes: Stretching and Bending.” *FARADAY DISCUSSIONS*, DOI: 10.1039/C4FD00243A (2015)
- [12] **E. Barry**, S.P. McBride, H.M. Jaeger, and X.M. Lin, “Ion-Transport Controlled by Nanoparticle Functionalized Membranes,” *NATURE COMMUNICATIONS*, 5, 5847 (2014)
- [11] Y.F. Wang, P. Kanjanaboos, **E. Barry**, S.P. McBride, X.M. Lin, and H.M. Jaeger “Fracture and Failure of Nanoparticle Monolayers and Multilayers.” *NANO LETTERS*, 14, 826-830 (2014)
- [10] M.J. Zakhary, T. Gibaud, C.N. Kaplan, **E. Barry**, R. Oldenbourg, R.B. Meyer, and Z. Dogic, “Imprintable Membranes from Incomplete Chiral Coalescence.” *NATURE COMMUNICATIONS*, 5, 3063 (2014)
- [9] T. Gibaud, **E. Barry**, M.J. Zakhary, M. Henglin, A. Ward, Y.S. Yang, C. Berciu, R. Oldenbourg, M.F. Hagan, D. Nicastro, R.B. Meyer, and Z. Dogic, "Reconfigurable Self-Assembly through Chiral Control of Interfacial Tension." *NATURE*, 481, 348-352 (2012)
- [8] J.C. Zhou, C.M. Soto, M. Chen, M.A. Bruckman, M.H. Moore, **E. Barry**, B.R. Ratna, P. Pehrsson, B.R. Spies, and T.S. Confer, “High Aspect Ratio Biotemplated Nanorods.” *JOURNAL OF NANOBIO TECHNOLOGY*, 10, 18 (2012)
- [7] Y. Yang, **E. Barry**, Z. Dogic, and M.F. Hagan, “Self-Assembly of Membranes from Mixtures of Hard Rods and Depleting Polymers.” *SOFT MATTER*, 8, 707-714 (2012)
- [6] **E. Barry** and Z. Dogic, “Entropy Driven Self-Assembly of Non-Amphiphilic Colloidal Membranes.” *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES*, 107, 10348 (2010)
- [5] **E. Barry**, Z. Dogic, R.B. Meyer, R.A. Pelcovits, and R. Oldenbourg, “Direct Measurement of the Twist Penetration Length in a Single Smectic-A Layer of Colloidal Virus Particles.” *JOURNAL OF PHYSICAL CHEMISTRY B (deGennes Memorial Issue)*, 113, 3910-3913 (2009)
- [4] **E. Barry**, D. Beller, and Z. Dogic, “A Model Liquid Crystalline System Based on Rodlike Viruses with Variable Chirality and Persistence Length.” *SOFT MATTER*, 5, 2563-2570 (2009) (cover)
- [3] C.P. Brangwynne, G.H. Koenderink, **E. Barry**, Z. Dogic, F.C. MacKintosh, and D.A. Weitz, “Bending Dynamics of Fluctuating Biopolymers Probed by Automated High-Resolution Filament Tracking.” *BIOPHYSICAL JOURNAL*, 93, 346-359 (2007)
- [2] **E. Barry**, Z. Hensel, Z. Dogic, M. Shribak, and R. Oldenbourg, “Entropy-Driven Formation of a Chiral Liquid-Crystalline Phase of Helical Filaments.” *PHYSICAL REVIEW LETTERS*, 96, 018305 (2006)
- [1] M.P. Lettinga, **E. Barry**, and Z. Dogic. “Self-diffusion of Rod-like Viruses in the Nematic Phase.” *EUROPEAN PHYSICS LETTERS*, 71, 692-698 (2005)

## Patents and Patent Applications

- [3] “Porous Gold Films: Methods for Making and Using Them” (2016)  
**E. Barry** – Invention Report filed with Argonne National Laboratory
- [2] “Nanoparticle-Based Desalination and Filtration System” (2013)  
H.M. Jaeger, J. He, X.M. Lin, **E. Barry**, and S.P. McBride. - Patent App. No. PCT/US2012/065074
- [1] “Aligned Arrays of Nanorods” (2012)  
**E. Barry**, Z. Dogic, M.F. Hagan, Y.S. Yang, and D. Perlman - Patent App. No. US 14/354,258

## Conference Proceedings

- 2014 • International Workshop on Nanoscale Spectroscopy and Nanotechnology - NSS-8 (Chicago, IL)  
• Argonne National Laboratory - Postdoctoral Seminar (Argonne, IL)
- 2012 • Argonne National Laboratory - Center for Nanoscale Materials Seminar (Argonne, IL)
- 2011 • Gordon Research Conference in Soft Matter - Poster Competition Award Winner (New London, NH)  
• University of Ottawa - Physics Colloquium (Ottawa, Canada)  
• Technische Universität München – Biophysics Seminar (Munich, Germany)  
• University of Maryland - Bioengineering Seminar Series (College Park, MD)  
• Naval Research Laboratory - Seminar (Washington, DC)  
• Rowland Institute at Harvard University - Junior Fellowship Seminar (Cambridge, MA)  
• American Physical Society March Meeting (Contributed Talk) (Dallas, TX)
- 2010 • Materials Research Society Fall Meeting (Award Invitation) (Boston, MA)  
• American Physical Society March Meeting (Contributed Talk) (Portland, OR)  
• Marine Biological Laboratory - Brandeis Biochemistry/Biophysics Retreat (Woods Hole, MA)
- 2009 • Howard Hughes Medical Institute - Interfaces Meeting of Program Directors and Scholars (Bethesda, MD)  
• American Physical Society March Meeting (Contributed Talk) (Pittsburgh, PA)
- 2008 • American Physical Society March Meeting (Contributed Talk) (New Orleans, LA)
- 2006 • American Physical Society March Meeting (Contributed Talk) (Baltimore, MD)

## Teaching Experience

- Fordham University • Undergraduate Teaching Assistant in the Physics and Mathematics Departments:  
*Mathematical Methods in Physics, Quantum Mechanics, Modern Physics, Calculus, Finite Mathematics for Business* (2000-2003)
- Brandeis University • Graduate Teaching Assistant for *Electronics Laboratory I and II, Statistical Mechanics, and Quantitative Biology of the Cell* (2006-2010)  
• Lecturer for the Brandeis Posse Program in Physics (2010-2011)

## Funding Sources

- US Department of Energy - Argonne Named Postdoctoral Fellowship Program – 3 years - \$20,000 annual

## Professional Memberships

- American Physical Society
- Materials Research Society
- Royal Society of Chemistry

## Students Supervised

- Zach Hensel (REU student, Rowland Institute at Harvard, 2004)
- Paula Karpola (REU student, Rowland Institute at Harvard, 2005)
- Timothy H. Sanchez (Graduate student, Rowland Institute at Harvard, 2006)
- Daniel Beller (Undergraduate student, Brandeis University, 2009)
- Thomas Gibaud (Postdoc, Brandeis University, 2009)
- Rebecca Goldblum (Undergraduate student, Brandeis University, 2009)
- Mark J. Zakhary (Graduate student, Brandeis University, 2010)
- Carlos Perez (Undergraduate student, Brandeis University, 2011)
- Perna Sharma (Postdoc, Brandeis University, 2011)