

## Jonathan K. Whitmer

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Dept. of Chemical and Biological Engineering  
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### Education

Ph.D. Physics, University of Illinois, 2011, 3.97 GPA.

Dissertation: Dynamics and Assembly of Colloidal Particles

Advisor: Erik Luijten

M.S. Physics, University of Illinois, 2009

B.S. Physics and B. S. Mathematics, *Summa Cum Laude*, Kansas State University, 2005, 4.00 GPA.

### Research Experience

- Postdoctoral Research Associate 2011–present  
Professor Juan J. de Pablo University of Wisconsin  
Developing coarse-grained models for the simulation of DNA dynamics in flow for use in DNA-coded self-assembly studies and simulations of DNA sequencing via flow extension and confinement. Performing Molecular Dynamics simulations of Liquid-Crystal–Nanoparticle composites.
- Graduate Research Assistant 2006–2011  
Professor Erik Luijten University of Illinois  
Examined assembly and hydrodynamic effects in colloidal suspensions using molecular dynamics simulation. Developed a hybrid Molecular Dynamics/Multiparticle Collision Dynamics code to simulate hydrodynamic effects. Collaborated extensively with experimentalists examining self-assembly of patchy colloids.
- Undergraduate Research Assistant 2005  
Professor Amit Chakrabarti Kansas State University  
Developed Monte-Carlo codes for the simulation of the Ising Model and colloid–polymer mixtures.
- Undergraduate Research Assistant 2002–2005  
Professor Bruce Law Kansas State University  
Studied surface adsorption in binary liquid mixtures using ellipsometry.
- Undergraduate Research Assistant 2002  
Professor Alexey Bezryadin University of Illinois  
Performed fabrication and analysis of thermal and magnetic properties of thin-film Molybdenum–Germanium superconductors.

### Honors and Awards

- Genomic Sciences Training Program, University of Wisconsin, 2011
- List of Teachers Ranked as Excellent by their Students, University of Illinois, 2005–2006, 2011
- Materials Computation Center Travel Award, 2010
- Boulder School for Condensed Matter and Materials Physics, 2009
- Meritorious Participant, Mathematical Contest in Modeling, 2004–2005
- Barry M. Goldwater Scholarship in Science and Engineering, 2003

## Teaching Experience

- University of Illinois Urbana, Illinois  
Teaching Assistant 2005–2006, 2011  
Taught discussion and laboratory sections and conducted help sessions for physics courses in Mechanics, Thermal Physics and Quantum Physics.
- Kansas State University Manhattan, Kansas  
Tutor/Grader 2002, 2004–2005  
Tutored students in upper-level undergraduate and introductory graduate courses in Mathematics, including Abstract Algebra, Real and Complex Analysis, and Topology. Graded sections of Applied Matrix Theory, Introductory Number Theory and Introductory Group Theory, as well as sophomore–level Analytic Geometry and Calculus.

## Publications

1. “Influence of Hydrodynamics on Cluster Formation in Colloid–Polymer Mixtures,” J. K. Whitmer and E. Luijten. *J. Phys. Chem. B* **115**, 7294–7300 (2011).
2. “Triblock Colloidal Spheres for Directed Self-Assembly,” Q. Chen, E. Diesel, J. K. Whitmer, S. C. Bae, E. Luijten and S. Granick. *J. Am. Chem. Soc.* **133**, 7725–7727 (2011).
3. “Supracolloidal Isomers and Helices from Janus Spheres,” Q. Chen, J. K. Whitmer, S. Jiang, S. C. Bae, E. Luijten and S. Granick. *Science* **331**, 199 (2011).
4. “Sedimentation of Aggregating Colloids,” J. K. Whitmer and E. Luijten. *J. Chem. Phys.* **134**, 034510 (2011).
5. “Fluid–Solid Boundary Conditions for Multiparticle Collision Dynamics,” J. K. Whitmer and E. Luijten. *J. Phys.: Cond. Mat.* **22**, 104106 (2010).
6. “Adsorption at the liquid-vapor surface of a binary liquid mixture,” J. K. Whitmer, S. B. Kiselev, and B. M. Law. *J. Chem. Phys.* **123**, 204720 (2005).

## Selected Presentations

1. J. K. Whitmer, Q. Chen, S. Jiang, S. C. Bae, S. Granick and E. Luijten. “Helical Assembly of Janus Particles,” APS March Meeting, Dallas, TX, March 2011.
2. J. K. Whitmer and E. Luijten. “Hydrodynamics of Janus Particle Clusters,” Poster presentation, CECAM Workshop on Mesoscale Hydrodynamic Methods, Lausanne, Switzerland, July 2010.
3. J. K. Whitmer and E. Luijten. “Self-Assembly of Amphiphilic Janus Colloids,” Soft Materials Seminar, University of Illinois, April 2010.
4. J. K. Whitmer and E. Luijten. “Clusters of Janus Particles in Stokes Flow,” APS March Meeting, Portland, OR, March 2010
5. J. K. Whitmer and E. Luijten. “Dynamics of Janus Particles,” Poster presentation, Boulder School for Condensed Matter and Materials Physics, Boulder, CO, July 2009
6. J. K. Whitmer and E. Luijten. “Colloids with Arbitrary Slip Boundary Conditions,” APS March Meeting, Pittsburgh, PA, March 2009
7. J. K. Whitmer and E. Luijten. “Sedimentation of Aggregating Colloidal Suspensions,” Soft Materials Seminar, University of Illinois, October 2008
8. J. K. Whitmer and E. Luijten. “Simulating Collective Dynamics of Confined Colloids,” APS March Meeting, New Orleans, LA, March 2008
9. J. K. Whitmer and E. Luijten. “Hydrodynamic Interactions in Colloidal Matter,” Soft Materials Seminar, University of Illinois, February 2008