

SHUBHO BANERJEE

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EDUCATION

Ph.D. Physics August 2000, Carnegie Mellon University, Pittsburgh, PA

Thesis: "A study of morphological and thermodynamic properties of dipolar fluids"

M.S. Physics May 1995, Carnegie Mellon University, Pittsburgh, PA

5 Year Integrated M.S. Physics May 1993, Indian Inst. of Tech., Kanpur, India

EXPERIENCE

Associate Professor, Rhodes College, Memphis TN, Aug. 2012 - present

Assistant Professor, Rhodes College, Memphis TN, Aug. 2004 - 2010

Visiting Professor, Rhodes College, Memphis TN, Aug. 2002 - Aug. 2004

Postdoctoral Associate, Univ. of Maryland, College Park, Sep. 2000 - Aug. 2002

Graduate Student, Carnegie Mellon Univ., Pittsburgh, PA, Aug. 1993 - Aug. 2000

HONORS

Recipient: Outstanding Faculty Award, Rhodes Student Government - 2010

Recipient: Outstanding Faculty Award, Rhodes Student Government - 2004

Recipient: Faculty Member of the Month, Residence Council of students - 2002

Recipient: Mellon College of Science, Graduate Teaching Award - 1998

Honorable Mention: Carnegie Mellon University, Graduate Teaching Award - 1998

PROFESSIONAL AFFILIATIONS/POSITIONS

Technical Program Chair for Electrostatics Society of America 2017 meeting

Editorial Board for The Journal of Electrostatics November 2016 - present

Referee for The Journal of Royal Society Proceedings A, January 2012 - present

Referee for The Journal of Electrostatics April 2011 - present

Referee for The Physics Teacher April 2009 - present

Referee for American Journal of Physics August 2006 - present

Adjunct Faculty Dept. of Mech. Engg., Univ. of Memphis March 2004 - 2007

Member of Sigma Pi Sigma April 2003 - present

PUBLICATIONS

- “Exact and approximate capacitance and force expressions for the electrostatic interaction between two equal-sized charged conducting spheres”, S. Banerjee, M. Levy, M. Davis, and B. Wilkerson, *IEEE Trans. Ind. Appl.* (2017). [link](#)
- “Asymptotic expansions of Lambert series and related q-series”, S. Banerjee and B. Wilkerson, *Int. J. Number Theory* (2017). [link](#)
- “Electrostatic force between two equal-sized charged conducting spheres”, S. Banerjee, M. Levy, M. Davis, and B. Wilkerson, *Proc. ESA Annu. Meet. Electrostatics Paper B4* (2016)*. [link](#)
- “Exact closed-form solution for the electrostatic interaction of two equal-sized charged conducting spheres”, *J. Phys. Conf. Ser.* **646** 012016 (2015). [link](#)
- “Exact and approximate expressions for the force between a charged conducting sphere and infinite grounded plane”, S. Banerjee, S. J. McArty, E. F. Nelsen, *Proc. ESA Annu. Meet. Electrostatics Paper C4* (2015)*. [link](#)
- “Approximate capacitance expressions for two equal sized conducting spheres”, S. Banerjee and M. Levy, *Proc. ESA Annu. Meet. Electrostatics Paper G4* (2014)*. [link](#)
- “Electrostatic charging of an uncharged sphere through contact with a charged sphere at constant voltage”, S. Banerjee, B. K. Hoffmeister, J. J. Svejkosky, and C. S. Badger, *J. Electrostat.* **69** (6), 601-603 (2011). [link](#)
- “On the stability of electrostatic orbits”, S. Banerjee, B. Taylor, and A. Banerjee, *Am. J. Phys.* **77**, 396-400 (2009). [link](#)
- “Orbital motion of electrically charged spheres in microgravity”, S. Banerjee, K. W. Andring, D. L. Campbell, J. A. Janeski, D. A. Keedy, S. P. Quinn, and B. K. Hoffmeister, *Phys. Teach.* **46**, 460-464 (2008). [link](#)
- “Effect of electrically insulating materials on magnetically induced electrical currents in a tissue-like medium”, B. K. Hoffmeister, A. R. Shores, S. Banerjee, and R. A. Malkin, *Am. J. of Phys.* **74**, 260 (2006). [link](#)
- “Criticality in hard-sphere charge-asymmetric ionic fluids”, Jean-Noel Aqua, S. Banerjee, and M. E. Fisher, *Phys. Rev. E* **72**, 041501 (2005). [link](#)
- “How multivalency controls ionic criticality”, M. E. Fisher, Jean-Noel Aqua, and S. Banerjee, *Phys. Rev. Lett.* **95**, 135701 (2005). [link](#)
- “Shapes and textures of ferromagnetic liquid droplets”, S. Banerjee and M. Widom, *Braz. J. Phys.* **31**, 360-365 (2001). [link](#)
- “Thermodynamic limit of polydisperse fluids”, S. Banerjee, R. B. Griffiths and M. Widom, *J. Stat. Phys.* **104**, 725-751 (2001). [link](#)

“Ferromagnetic liquid thin films under applied field”, S. Banerjee and M. Widom, *Phys. Rev. E* **61**, 4171-4176 (2000). [link](#)

“Elongation of confined ferrofluid droplets under applied fields”, S. Banerjee, M. Fasnacht, S. Garoff and M. Widom, *Phys. Rev. E* **60**, 4272-4279 (1999). [link](#)

“Thermodynamic limit for dipolar media”, S. Banerjee, R. B. Griffiths and M. Widom, *J. Stat. Phys.*, **93**, 109-141 (1998). [link](#)

* Non-peer-reviewed publication

INVITED TALKS, SEMINARS

Electrostatics of charged conducting spheres, Physics Colloquium, Rhodes College, August 2012

Electrostatics of charged conducting spheres, Physics Colloquium, University of Memphis, April 2012

Creating electrostatic orbits in weightlessness, Undergraduate Physics Colloquium, Carnegie Mellon University, October 2009

What is the shape of a ferromagnetic liquid droplet?, Physics Seminar, Indiana University Purdue University at Indianapolis, November 2008

Phase transitions in ionic systems: effect of charge asymmetry on critical parameters, Physics Seminar, Rhodes College, November 2006

Wonders of weightlessness, Joint Physics Seminar (with B. K. Hoffmeister and students), Rhodes College, September 2006

Apples, Donuts, and Eggs: breakfast food or shapes of liquid magnets?, Physics Seminar, Rhodes College, January 2004

Liquid magnetism, Flow Research Center, University of Memphis, January 2004

Ferrofluids: Liquids that obey magnetic commands!, Physics Colloquium, University of Memphis, November 2002

Phase coexistence and criticality in ionic systems, Statistical Physics Seminar, University of Maryland, October 2001

Liquid ferromagnets, Statistical Physics Seminar, University of Maryland, November 2000

Ferrofluids!, Physics Undergraduate Colloquium, Carnegie Mellon University, October 1999

Shape and magnetization texture of a ferromagnetic liquid droplet, Senior Graduate Student Seminar Series, Cornell University, July 1999

CONFERENCE PRESENTATIONS

- Electrostatic force between two conducting equal-sized charged spheres*, Electrostatics Society of America Meeting, Purdue University, June 2016
- Exact and approximate expressions for the force between a charged conducting sphere and infinite grounded plane*, Electrostatics Society of America Meeting, Pomona, June 2015
- Exact closed-form solution for the electrostatic interaction of two equal-sized charged conducting spheres*, Electrostatics Conference 2015, Southampton UK, March 2015
- Approximate Capacitance Expressions for Two Equal Sized Conducting Spheres*, Electrostatics Society of America Meeting, Notre Dame, June 2014
- Charging of a conducting using another charged conducting sphere*, Electrostatics Conference 2011, Bangor Wales, March 2011
- A shape phase diagram for a ferromagnetic liquid droplet*, American Physical Society Meeting, Pittsburgh, March 2009
- Understanding criticality and phase coexistence in $z:1$ electrolytes*, Statistical Mechanics Conference, Rutgers University, December 2001
- Ferromagnetic liquid thin films in applied field*, American Physical Society Meeting, Minneapolis, March 2000
- Thermodynamic limit of polydisperse colloids*, Statistical Mechanics Conference, Rutgers University, May 1999
- Ferrofluid thin films under applied fields*, American Physical Society Meeting, Saint Louis, March 1996
- Thermodynamic limit for dipolar systems*, Statistical Mechanics Conference, Rutgers University, May 1995

CONFERENCE PRESENTATIONS BY COAUTHORS

- Lambert series and Jacobi theta functions near $q=1$* , poster presentation by Blake Wilkerson at Joint Mathematics Meeting, Seattle WA, January 2016
- Electrostatic force between a charged sphere and a grounded plane*, poster presentation by Stefan McCarty at Sigma Pi Sigma Quadrennial Congress, Orlando FL, October 2012
- Unusual shapes of magnetic liquids*, poster presentation by Travis Rasor at Sigma Pi Sigma Quadrennial Congress, Fermi Lab, October 2008
- Demonstration of electrostatic orbits in weightlessness*, talk by John Janeski at Joint Meeting of the American Association of Physics Teachers and the American Astronomical Society, Seattle, January 2007

Experimental and theoretical challenges of creating electrostatic orbits in weightlessness, poster presentation by Kevin Andring at Joint Meeting of the American Association of Physics Teachers and the American Astronomical Society, Seattle, January 2007

Magnetically induced electric currents in the human body: MRI scans and medical implants, invited talk by Brent Hoffmeister at 2006 Gordon Research Conference on Physics Research and Education, Mount Holyoke College, June 2006

The effect of valence on Coulombic criticality: field theory errs; simulation answers; but how to understand?, invited talk by Michael Fisher at Statistical Mechanics Conference, Rutgers University, December 2004

Solving “tough” integrals using the Monte Carlo technique, poster presentation by Paul Sinclair at Sigma Pi Sigma Quadrennial Congress, Albuquerque, October 2004

An analytical and numerical approach to predicting the effects of plastic implants on magnetically induced currents in the body, poster presentation by Andrew Shores at Sigma Pi Sigma Quadrennial Congress, Albuquerque, October 2004

GRANTS/AWARDS

National Aeronautics and Space Administration. “Orbital Dynamics of Electrically Charged Spheres.” Award: Flight time aboard NASA C-9 aircraft for microgravity experiments in August 2006

COMMITTEE WORK

Foundations curriculum committee [fall 2014-present, chair spring 2015-fall 2016]

Health professions advising committee [fall 2012-present]

Parking appeals committee [AY 2015-16]

Faculty professional interest committee [fall 2011-spring 2014, chair AY 2012-13]

LIST OF COURSES TAUGHT AT RHODES COLLEGE

Astronomy Lab

Fundamentals of Physics - I

Fundamentals of Physics - I Lab

Fundamentals of Physics - II

Fundamentals of Physics - II Lab

Memphysics

Modern Physics - II

Mathematical Methods in Physics

Thermal Physics

Electromagnetic Theory

Quantum Physics

Engineering Physics*

Medical Physics*

Fluid Mechanics*

Statics and Mechanics of Materials*

*New course introduced to the curriculum