

APARNA BASKARAN

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Personal Information:

Date of Birth: 12 May 1979.
Country of Citizenship: India.

Education:

Pondicherry University	Physics, M.Sc. 2001
University of Florida	Physics, Ph.D. 2006
Syracuse University	Physics, Postdoctoral 2006-2010

Employment:

1. Teaching Assistant, Department of Physics, University of Florida, August 2001-December 2001.
2. Research Assistant, Department of Physics, University of Florida, January 2002-April 2006.
3. Post doctoral research associate, Department of Physics, University of Florida, May 2006-August 2006.
4. Post doctoral research associate, Physics Department, Syracuse University, August 2006-July 2010.
5. Assistant Professor, Department of Physics, Brandeis University, July 2010 – Present.

Publications:

1. "Gaussian Kinetic Model for Granular Gases", J. W. Dufty, A. Baskaran, and L. Zogaib, *Phys. Rev. E* **69**, 051301; [cond-mat/0312113](#).
2. "Hydrodynamics for a Granular Gas from Exactly Solvable Kinetic Models", A. Baskaran and J. W. Dufty, in *Modeling and Numerics of Kinetic Dissipative Systems*, editors L. Pareschi, G. Russo, G. Toscani, (Nova Science, NY, 2006); [cond-mat/0410084](#).
3. "Hard Sphere Dynamics for Normal and Granular Fluids", J. W. Dufty and A. Baskaran, in *Nonlinear Dynamics in Astronomy and Physics*, S. Gottesman ed., *Annals of the New York Academy of Sciences* **1045** (2005); [cond-mat/0503180](#).
4. "Linear Response for a Granular Fluid", J. W. Dufty, A. Baskaran, J. J. Brey, *J. Stat. Mech.* (2006) L08002; [cond-mat/0507609](#).
5. "Linear Response and hydrodynamics for a granular fluid", A. Baskaran, J. W. Dufty, J. J. Brey, *Phys. Rev. E* **77**, 031310 (2008); [cond-mat/0612408](#)

6. “Transport Coefficients of a hard sphere granular fluid”, A. Baskaran, J. W. Dufty, J. J. Brey Phys. Rev. E **77**, 031311 (2008); [cond-mat/0612409](#)
7. “Kinetic theory of response functions of the hard sphere granular fluid” A. Baskaran, J. W. Dufty, J. J. Brey, J. Stat. Mech. (2007) P12002; [arXiv:0708.0678](#).
8. “Hydrodynamics of self propelled hard rods”, A. Baskaran and M. C. Marchetti Phys. Rev. E **77**, 011920 (2008); [arXiv:0708.2401](#)
9. “Isotropic Cholesteric transition of a weakly chiral elastomer cylinder”, X. Xing and A. Baskaran, Phys. Rev. E., **78**, 021709 (2008); [arXiv:0801.3661](#)
10. “Enhanced Diffusion and Ordering of Self-propelled Rods”, A. Baskaran and M. C. Marchetti, Phys. Rev. Lett., **101**, 268101 (2008); [arXiv: 0806.4559](#) .
11. “Granular Hydrodynamics from Kinetic Theory – Fundamental Considerations”, James W. Dufty and Aparna Baskaran, invited chapter in *Computational Gas Solid Flows – Theory, Methods and Practice*, eds. Pannala, Syamlal, O’Brien, IGI-Global (submitted, to appear).
12. “Statistical Mechanics and Hydrodynamics of Bacterial Suspensions”, Aparna Baskaran and M. C. Marchetti, PNAS **106** 15567 (2009).
13. “Nonequilibrium statistical mechanics of self propelled hard rods”, A. Baskaran and M. C. Marchetti, J. Stat. Mech. P04019 (2010).
14. “Fluctuations and Pattern Formation in Self-propelled Particles”, S. Mishra, A. Baskaran and M. C. Marchetti, Phys. Rev. E **81**, 061916 (2010).
15. “Collective properties of low Reynolds number rotors”, Y. Fily, A. Baskaran and M. C. Marchetti (In preparation, August 2010).
16. “Velocity correlations in a low density granular fluid at weak dissipation”, A. Baskaran and J. W. Dufty (In preparation, August 2010).

Seminars and Invited Talks:

1. “A New Kinetic Model for Granular Gases”, seminar, University of Seville, Spain, September 2003.
2. “An Improved kinetic model for granular gases”, Florida – Paris Workshop on Granular Fluids, Paris, France, November 2003.
3. “Application of the methods of non equilibrium statistical mechanics to granular fluids”, DuftyFest, Department of Physics, University of Florida, September 2005.
4. “Statistical Mechanics and hydrodynamics of a granular fluid”, Department of Physics, Syracuse University, February 2006,
5. “Statistical Mechanics and hydrodynamics of a granular fluid”, Department of Physics and Astronomy, University of British Columbia, Vancouver, Canada, March 2006.
6. “Understanding the hydrodynamics of dense granular fluids”, *Granular fluids: A proving ground for Nonequilibrium Statistical Mechanics*, Sevilla, Spain September 2007.
7. “Applying nonequilibrium statistical mechanics to understand emergent behavior in self-propelled systems”, Institute of Mathematical Sciences, Chennai October 2007.
8. “Self-propelled particles”, ‘Random Interactions’, Tata Institute of Fundamental Research, October 2007.
9. “Nonequilibrium statistical mechanics of nontraditional fluid systems : Illustrations”, Indian Institute of Science, Bangalore, October 2007.

10. “Hydrodynamics of self-propelled particles”, 6th New York Complex Matter Workshop, Rochester Institute of Technology, Rochester, June 2008.
11. “Bacteria as fluids and a cell as an elastomer- Applying the material physics paradigm to biology”, Theoretical Physics Colloquium, Tata Institute of Fundamental Research, February 2009.
12. “Bacteria as fluids and a cell as an elastomer- Applying the material physics paradigm to biology”, Physics Colloquium Brandeis University, February 2009.
13. “Self-propelled particles: From Microdynamics to Hydrodynamics”, Invited Presentation, APS March meeting, March 2009.
14. Invited speaker, I2CAM workshop on Soft Active Materials, Syracuse University, May 2009.
15. “Self-propelled particles: From Microdynamics to Hydrodynamics”, Soft Condensed Matter Seminar, Department of Physics, University of Pennsylvania, Philadelphia PA, September 2009.
16. Invited Speaker, New England Complex Fluids Workshop, Brandeis University, Waltham MA, September 2009.
17. “Self-propelled particles: From Microdynamics to Hydrodynamics”, Department of Physics and Astronomy Colloquium, Rochester Institute of Technology, Rochester, NY, November 2009.

Contributed Talks:

1. “Hydrodynamics for a Granular Gas from Exactly Solvable Kinetic Models”, Workshop on Modeling and Numerics of Kinetic Dissipative Systems, Lipari, Italy, May 2004.
2. “Fluctuations and Response for a Granular Fluid”, StatPhys **22**, Bangalore, India, July 2004.
3. “Green-Kubo Expressions for Transport in a Granular Fluid”, SESAPS meeting, November 2004.
4. “Approximate evaluation of the Green-Kubo expression of the shear viscosity of a granular fluid”, SESAPS meeting, November 2005.
5. “Hydrodynamics of Self propelled hard particles”, APS March meeting, Denver, CO, 2007.
6. “Effect of Fluctuations on the elasticity of nematic elastomers”, APS March meeting, Denver, CO, 2007.
7. “Kinetic theory of hydrodynamic response functions”, APS March meeting, Denver CO, 2007.
8. “Elasticity of a chiral elastomer”, APS March meeting New Orleans, LA, 2008
9. “Hydrodynamic of vibrated granular rods”, Gordon Research Conference on Granular and Granular-fluid flow, June 2008.
10. “Swimming with a crowd”, selected as best poster and invited to present, Gordon Conference on Soft Condensed Matter, August 2009.
11. “Fluctuation and pattern formation in self-propelled particles”, APS March meeting Portland OR, 2010.

Poster Presentations:

1. "Radiative and Transport Properties of Ions in a Complex Environment", A. Baskaran, J. Wrighton, and J. Dufty, International Conference on Strongly Coupled Coulomb Systems, Santa Fe, NM, September 2002.
2. "A Practical Kinetic Theory for granular gases", A. Baskaran, J. Dufty, and L. Zogaib, American Physical Society meeting, Montreal, Canada, March 2004.
3. "Linear response and hydrodynamics for a granular fluid", A. Baskaran, J. Dufty, J. J. Brey, Gordon Research Conference on Nonlinear Science, June 2005.
4. "Hydrodynamics of Self-propelled particles", A. Baskaran and M. C. Marchetti, CNLS conference on Complexity of Biological and Soft Materials, Santa Fe, NM, May 2007.
5. "On the Elasticity of a Chiral Elastomer", A. Baskaran and X. Xing, Gordon Research Conference on Nonlinear Science, June 2007.
6. "Swimming with a crowd", A. Baskaran and M. C. Marchetti, Gordon Research Conference on Soft Condensed Matter, August 2009.

Other Professional Activity:

- Member, American Physical Society.
- Member, American Association for the Advancement of Science.
- Visiting Student Research Associate, Tata Institute of Fundamental Research, Bombay, India. Summer 2000
- Visiting Research Associate, University of Seville, Spain Fall 2003. Worked on thesis related topics with J. J. Brey and his group.
- Co-organizer of Workshop on Granular Gases, Paris, France (20 participants from six countries, two days of seminars).
- Invited Participant in the *Granular Physics* program at the Kavli Institute, Santa Barbara, May and June, 2005.
- Organizer, Graduate Student Seminar Forum, Department of Physics, University of Florida, Fall 2005.
- Co-organizer of "Duftyfest" - A symposium to celebrate Jim Dufty's 65th birthday (30 participants from 5 countries).
- Graduate Student Mentor, Female Physics Forum, University of Florida, Fall 2005 and Spring 2006.
- Participant in The Boulder School on condensed matter and material physics, June 2006.
- Participant in APS' Professional Skills Development Workshop for Women Physicists, New Orleans, March 2008.
- Series Director, Condensed Matter and Biological Physics Seminar, Physics Department, Syracuse University, Fall 2007-Present.
- Co-organizer, I2CAM conference on Soft Active Materials, Syracuse University, May 2009.
- Co-chair, Gordon Research Seminar associated with the Gordon Research conference on Soft Condensed Matter, August 2011.

Awards:

- Gold Medalist, Class of 2001, Integrated M. Sc. Program, Pondicherry University.

- Outstanding Academic Achievement by an International Student, CLAS, University of Florida, Year of 2004 (4 awards in the College).
- NSF Travel Award for participation at StatPhys22, April 2004 (20 awards nationally).
- College of Liberal Arts and Sciences, University of Florida, travel awards, Fall 2003, Fall 2004.
- Winner of McGinty Dissertation Fellowship, College of Liberal Arts and Sciences, University of Florida, Spring 2006.
- Institute of Fundamental Theory, University of Florida, J. Michael Harris Award, Spring 2006.
- Charles Hooper Memorial Award for excellence in teaching and research, Department of Physics, University of Florida, Spring 2006.
- Recipient of the Alec Courtelis Award for the year 2006, University of Florida, for academic excellence and service to the university community.
- Travel award, Los Alamos National Laboratory, for participation in the CNLS workshop on Biological and Soft Materials, May 2007.
- Chair's discretionary funding, Gordon Research Conference on Nonlinear Science, June 2007.
- Chair's discretionary funding, Granular Gordon Conference, June 2008.
- Chair's discretionary funding, Gordon Research Conference on Soft Condensed Matter, August 2010.