RAGHUVEER PARTHASARATHY

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PROFESSIONAL PREPARATION

Postdoctoral Institution	**Area**	**Dates**
University of California, Berkeley	Chemistry / Biophysics	2002-2006
Graduate Institution	**Major/Area**	**Degree & Year**
University of Chicago	Physics / Condensed Matter	Ph.D. (2002)
Undergraduate Institution	**Major**	**Degree & Year**
University of California, Berkeley	Physics	A.B. (1997)

APPOINTMENTS

Aug. 2019-present	• Associate Member, Knight Campus for Accelerating Scientific Impact
Sept. 2017-present	• Professor, Department of Physics, University of Oregon
Sept. 2016-present	• Alec and Kay Keith Professor, The University of Oregon
June 2016-present	• Co-director, University of Oregon Science Literacy Program
Sept. 2011-present	• Associate Professor, Department of Physics, University of Oregon
May 2008-present	• Associate Member, Institute of Molecular Biology, University of Oregon
June 2006-present	• Member, Materials Science Institute, University of Oregon
June 2006-Aug. 2011	• Assistant Professor, Department of Physics, University of Oregon
2002-2006	• Miller Research Fellow / Postdoctoral Fellow, University of California, Berkeley, Department of Chemistry
1997-2002	• Graduate research fellow, University of Chicago, Department of Physics. Advisors: Heinrich M. Jaeger and Thomas F. Rosenbaum

AWARDS

2016	Alec and Kay Keith Professorship, The University of Oregon
2008	National Science Foundation CAREER Award
2007-2009	Alfred P. Sloan Research Fellowship
2002-2005	Miller Research Fellowship, University of California, Berkeley
2001-2002	Grainger Graduate Fellowship, Department of Physics, University of Chicago
1997-2000	NSF Graduate Research Fellowship
1997-2000	McCormick Fellowship, Department of Physics, University of Chicago
1997-1998	Sachs Fellowship, Department of Physics, University of Chicago
1997	Departmental Citation, Department of Physics, University of California, Berkeley
1995	Educational Initiatives Award, University of California, Berkeley

PUBLICATIONS

- [Preprint] T. J. Wiles, B. H. Schlomann, E. S. Wall, K. Guillemin, R. Parthasarathy, "Swimming motility and chemotaxis control the spatial organization, persistence, and inflammatory activity of a model intestinal pathobiont." *bioRxiv* 779983 (2019). [https://www.biorxiv.org/content/10.1101/779983v1]
- Philip E. Jahl, Raghuveer Parthasarathy, "Lipid Bilayer Hydrodynamic Drag." *Phys. Rev. Research* **2**, 013132 (2020). [https://journals.aps.org/prresearch/abstract/10.1103/PhysRevResearch.2.013132]

- Brandon H Schlomann and Raghuveer Parthasarathy, "Timescales of gut microbiome dynamics." *Current Opinion in Microbiology,* **50:** 56-63 (2019). [https://www.sciencedirect.com/science/article/abs/pii/S1369527419300463]
- B. H. Schlomann, T. J. Wiles, E. S. Wall, K. Guillemin, R. Parthasarathy, "Sublethal antibiotics collapse gut bacterial populations by enhancing aggregation and expulsion." *PNAS,* **116:** 21392-21400 (2019). [https://doi.org/10.1073/pnas.1907567116]
- Catherine D. Robinson, Helena S. Klein, Kyleah D. Murphy, Raghuveer Parthasarathy, Karen Guillemin, Brendan J. M. Bohannan, "Experimental bacterial adaptation to the zebrafish gut reveals a primary role for immigration." *PLoS Biology* **16**: e2006893 (2018). [https://doi.org/10.1371/journal.pbio.2006893]
- E. A. Hay and R. Parthasarathy, "Performance of convolutional neural networks for identification of bacteria in 3D microscopy datasets." *PLOS Computational Biology* **14**: e1006628 (2018). https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1006628
- Brandon H Schlomann, Travis J Wiles, Elena S Wall, Karen Guillemin, Raghuveer Parthasarathy, "Bacterial cohesion predicts spatial distribution in the larval zebrafish intestine." *Biophysical Journal* **115:** 1-7 (2018). https://doi.org/10.1016/j.bpj.2018.10.017
- Savannah L Logan, Christopher Dudley, Ryan P Baker, Michael J Taormina, Edouard A Hay, Raghuveer Parthasarathy, "Automated High-Throughput Light-Sheet Fluorescence Microscopy of Larval Zebrafish," *PLOS ONE* **13:** e0198705 (2018). https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0198705
- S. L. Logan, J. Thomas, J. Yan, R. P. Baker, D. S. Shields, J. B. Xavier, B. K. Hammer, R. Parthasarathy, "The *Vibrio cholerae* Type VI Secretion System Can Modulate Host Intestinal Mechanics to Displace Commensal Gut Bacteria." *Proc. Natl. Acad. Sci.* **115:** E3779-E3787 (2018). https://doi.org/10.1073/pnas.1720133115
- [Single-author paper from one of my students] Brandon Schlomann, "Stationary moments, diffusion limits, and extinction times for logistic growth with random catastrophes." *Journal of Theoretical Biology* **454:** 154-163 (2018). [*https://doi.org/10.1016/j.jtbi.2018.06.007*]
- T. J. Wiles, E. S. Wall, B. H. Schlomann, E. A. Hay, R. Parthasarathy, K. Guillemin, "Modernized tools for streamlined genetic manipulation of wild and diverse symbiotic bacteria." *mBio*, 9: e01877-18 (2018). https://mbio.asm.org/content/9/5/e01877-18
- J. Ganz, R. P. Baker, M. K. Hamilton, E. Melancon, P. Diba, J. S. Eisen, R. Parthasarathy, "Image velocimetry and spectral analysis enable quantitative characterization of larval zebrafish gut motility." *Neurogastroenterology and Motility*, **30:** e13351 (2018).
- R. Parthasarathy, "Monitoring microbial communities using light sheet fluorescence microscopy." *Curr. Opin. Microbiol.* **43**, 31–37 (2018). [https://doi.org/10.1016/j.mib.2017.11.008]
- V. L. Thoms, T. T. Hormel, M. A. Reyer, R. Parthasarathy, "Tension Independence of Lipid Diffusion and Membrane Viscosity." *Langmuir* **33**, 12510–12515 (2017). [PMID 28984459] [http://pubs.acs.org/doi/full/10.1021/acs.langmuir.7b02917]
- M. J. Taormina, E. A. Hay, R. Parthasarathy, "Passive and Active Microrheology of the Intestinal Fluid of the Larval Zebrafish." *Biophysical Journal* **113**, 957–965 (2017). [PMID 28834731] [http://www.cell.com/biophysj/fulltext/S0006-3495(17)30797-X]
- Travis J. Wiles, Matthew L. Jemielita, Ryan P. Baker, Brandon H. Schlomann, Savannah L. Logan, Julia Ganz, Ellie Melancon, Judith S. Eisen, Karen Guillemin, Raghuveer Parthasarathy , "Host Gut Motility Promotes Competitive Exclusion within a Model Intestinal Microbiota." *PLoS Biol.* **14**: e1002517 (2016). [PMID 27458727] [http://journals.plos.org/plosbiology/article?id=info:doi/10.1371/journal.pbio.1002517] Writeup in *phys.org*: [http://phys.org/news/2016-07-real-time-imaging-fish-gut-ties.html]
- J. T. Nichols, B. Blanco-Sánchez, E. P. Brooks, R. Parthasarathy, J. Dowd, A. Subramanian, G. Nachtrab, K. D. Poss, T. F. Schilling, C. B. Kimmel, Ligament versus bone cell identity in the

zebrafish hyoid skeleton is regulated by mef2ca. *Development* **143**, 4430–4440 (2016). [PMID 27789622] [http://dev.biologists.org/content/143/23/4430.long]

- A. S. Rolig, R. Parthasarathy, A. R. Burns, B. J. M. Bohannan, K. Guillemin, "Individual Members of the Microbiota Disproportionately Modulate Host Innate Immune Responses." *Cell Host Microbe*. **18**, 613–620 (2015). [PMID 26567512] [http://www.sciencedirect.com/science/article/pii/S1931312815004199]
- W. Z. Stephens, T. J. Wiles, E. S. Martinez, M. Jemielita, A. R. Burns, R. Parthasarathy, B. J. M. Bohannan, K. Guillemin, "Identification of Population Bottlenecks and Colonization Factors during Assembly of Bacterial Communities within the Zebrafish Intestine." *mBio*. **6** (2015). [PMID 26507229] [http://mbio.asm.org/content/6/6/e01163-15]
- Tristan T. Hormel, Matthew A. Reyer, Raghuveer Parthasarathy, "Two-Point Microrheology of Phase-Separated Domains in Lipid Bilayers." *Biophys. J.* **109:** 732-726 (2015). [PMID 26287625] [http://www.cell.com/biophysj/abstract/S0006-3495%2815%2900723-7]
- M. D. Hammers, M. J. Taormina, M. M. Cerda, L. A. Montoya, D. T. Seidenkranz, R. Parthasarathy, M. D. Pluth, "A Bright Fluorescent Probe for H_2S Enables Analyte-Responsive, 3D Imaging in Live Zebrafish Using Light Sheet Fluorescence Microscopy." *J. Am. Chem. Soc.* **137:** 10216-10223 (2015), [PMID 26061541] [http://pubs.acs.org/doi/abs/10.1021/jacs.5b04196]
- Raghuveer Parthasarathy, "The Physics of Life: an undergraduate general education biophysics course," *Phys. Educ.* **50:** 358-366 (2015). DOI: 10.1088/0031-9120/50/3/358 http://iopscience.iop.org/0031-9120/50/3/358/
- Ryan Baker, Michael J. Taormina, Matthew Jemielita, and Raghuveer Parthasarathy, "A combined light sheet fluorescence and differential interference contrast microscope for live imaging of multicellular specimens," *J. Microscopy* **258:**105-112 (2015). DOI: 10.1111/jmi.12220 [*http://onlinelibrary.wiley.com/doi/10.1111/jmi.12220/abstract*] [PMID 25611324]
- Matthew Jemielita, Michael J. Taormina, Adam R. Burns, Jennifer S. Hampton, Annah S. Rolig, Karen Guillemin, and Raghuveer Parthasarathy, "Spatial and temporal features of the growth of a bacterial species colonizing the zebrafish gut," *mBio* **5:** e01751-14 (2014). [*http://mbio.asm.org/content/5/6/e01751-14.abstract*] [PMID 25516613]
- Tristan T. Hormel, Sarah Q. Kurihara, M. Kathleen Brennan, Matthew C. Wozniak, and Raghuveer Parthasarathy, "Measuring Lipid Membrane Viscosity Using Rotational and Translational Probe Diffusion," *Phys. Rev. Lett.* **112**, 188101 (2014). [PMID 24856725] [*http://journals.aps.org/prl/abstract/10.1103/PhysRevLett.112.188101*]
- Kyle J. Welch, Isaac Hastings-Hauss, Raghuveer Parthasarathy, and Eric I. Corwin, "Ballistic and diffusive dynamics in a two-dimensional ideal gas of macroscopic chaotic Faraday waves," *Phys. Rev. E* **89:** 042143 (2014). [*http://journals.aps.org/pre/abstract/10.1103/PhysRevE.89.042143*]
- Alexander R. Small and Raghuveer Parthasarathy, "Superresolution Localization Methods," *Annual Reviews of Physical Chemistry* **65:** 107-125 (2014). [*http://www.annualreviews.org/doi/abs/10.1146/annurev-physchem-040513-103735*]
- Andrew F. Loftus, Sigrid Noreng, Vivian L. Hsieh, and Raghuveer Parthasarathy, "Robust Measurement of Membrane Bending Moduli Using Light Sheet Fluorescence Imaging of Vesicle Fluctuations," *Langmuir* **29:** 14588–14594 (2013). [*http://pubs.acs.org/doi/abs/10.1021/la403837d*]
- Matthew Jemielita*, Michael J. Taormina*, April DeLaurier, Charles B. Kimmel, and Raghuveer Parthasarathy, "Comparing phototoxicity during the development of a zebrafish craniofacial bone using confocal and light sheet fluorescence microscopy techniques," *J. Biophotonics* **6:** 920-928 (2013) [* = equal contributors] [*http://onlinelibrary.wiley.com/doi/10.1002/jbio.201200144/abstract*].
- Andrew F. Loftus, Vivian Hsieh, and Raghuveer Parthasarathy, "Modulation of membrane rigidity by the human vesicle trafficking proteins Sar1A and Sar1B," *Biophys. Biochem. Res. Comm.* **426:** 585-589 (2012). [*http://dx.doi.org/10.1016/j.bbrc.2012.08.131*]

- Raghuveer Parthasarathy, "Cars and Kinetic Energy – Some Simple Physics with Real-World Relevance," *The Physics Teacher* **50:** 395-397 (2012). [*https://aapt.scitation.org/doi/10.1119/1.4752039*]
- Michael J. Taormina*, Matthew Jemielita*, W. Zac Stephens, Adam R. Burns, Joshua V. Troll, Raghuveer Parthasarathy, and Karen Guillemin, "Investigating Bacterial-Animal Symbioses with Light Sheet Microscopy," *Biol. Bulletin* **223:** 7-20 (2012). [* = equal contributors] (Part of a special issue on "Discoveries in Animal Symbiosis in the 'omics' Age.")
- Raghuveer Parthasarathy, "Rapid, accurate particle tracking by calculation of radial symmetry centers," *Nature Methods* **9:** 724-726 (2012). [PMID 22688415] [*http://www.nature.com/nmeth/journal/vaop/ncurrent/abs/nmeth.2071.html*]
- Emily Goers Sweeney, J. Nathan Henderson, John Goers, Christopher Wreden, Kevin G. Hicks, Jeneva K. Foster, Raghuveer Parthasarathy, S. James Remington, and Karen Guillemin, "Structure and Proposed Mechanism for the pH-Sensing Helicobacter pylori Chemoreceptor TlpB," *Structure* **20:** 1177-1188 (2012). (Featured on the journal cover; *http://www.cell.com/structure/issue?pii=S0969-2126%2812%29X0007-8*) [*http://www.sciencedirect.com/science/article/pii/S0969212612001815*]
- *[Book Chapter]* Raghuveer Parthasarathy, "Optics: Basic Physics," in *Handbook of Biomedical Optics,* ed. D.A. Boas, C. Pitris, N. Ramanujam (CRC Press, 2011).
- Edward I. Settles*, Andrew F. Loftus*, Alesia N. McKeown, and Raghuveer Parthasarathy, "The vesicle trafficking protein Sar1 lowers lipid membrane rigidity," *Biophys. J.* **99:** 1539-1545 (2010). [* = equal contributors] [*http://www.cell.com/biophysj/abstract/S0006-3495%2810%2900803-9*]
- Yupeng Kong and Raghuveer Parthasarathy, "Different modulation mechanisms of attractive colloidal interactions by lipid and protein functionalization," *Langmuir* **26:** 10541-10545 (2010) [*http://pubs.acs.org/doi/abs/10.1021/la1005538*].
- *[Preview / Commentary paper; not a peer-reviewed article]* Anica M. Wandler, Raghuveer Parthasarathy, and Karen Guillemin, "A greasy foothold for *Helicobacter pylori*," *Cell Host & Microbe* **7:** 338-339 (2010) [*http://www.cell.com/cell-host-microbe/fulltext/S1931-3128(10)00142-3*].
- Kamil Godula, K., Marissa L. Umbel, David Rabuka, Zsofia Botyanszki, Carolyn R. Bertozzi, and Raghuveer Parthasarathy. Control of the molecular orientation of membrane-anchored biomimetic glycopolymers. *J. Am. Chem. Soc.* **131**, 10263-10268 (2009) [*http://pubs.acs.org/doi/abs/10.1021/ja903114g*].
- Yupeng Kong and Raghuveer Parthasarathy, "Modulation of attractive colloidal interactions by lipid membrane functionalization," *Soft Matter*, **5**, 2027-2029 (2009) [*http://xlink.rsc.org/?doi=B821441G*].
- Christopher W. Harland*, Zsofia Botyanszki*, David Rabuka, Carolyn R. Bertozzi, and Raghuveer Parthasarathy, "Synthetic trehalose glycolipids confer desiccation resistance to supported lipid monolayers," *Langmuir* **25**: 5193-5198, (2009) [*http://dx.doi.org/10.1021/la804007a*]. [*These authors contributed equally to this work]
- Gregory T. Tietjen, Yupeng Kong, and Raghuveer Parthasarathy**,** "An efficient method for the creation of tunable optical line traps via control of gradient and scattering forces," *Opt. Express* **16:** 10341-10348 (2008). [*http://www.opticsexpress.org/abstract.cfm?uri=oe-16-14-10341*]
- Christopher W. Harland, David Rabuka, Carolyn R. Bertozzi, and Raghuveer Parthasarathy, "The *M. tuberculosis* virulence factor trehalose dimycolate imparts desiccation resistance to model mycobacterial membranes." *Biophys. J.* **94:** 4718-4724 (2008). [*http://www.biophysj.org/cgi/content/abstract/94/12/4718*]
- Jay T. Groves, Raghuveer Parthasarathy, and Martin B. Forstner. Fluorescence Imaging of Membrane Dynamics. *Ann. Rev. Biomed. Engin.* **10:** 311-338, (2008). [*http://arjournals.annualreviews.org/doi/pdf/10.1146/annurev.bioeng.10.061807.160431*]
- Raghuveer Parthasarathy, David Rabuka, Carolyn R. Bertozzi, and Jay T. Groves. Molecular Orientation of Membrane-Anchored Mucin Glycoprotein Mimics. *J. Phys. Chem. B* **111:** 12133-12135 (2007).

- David Rabuka, Raghuveer Parthasarathy**,** Goo Soo Lee, Xing Chen, Jay T. Groves, and Carolyn Bertozzi, "Hierarchical Assembly of Model Cell Surfaces: Synthesis of Mucin Mimetic Polymers and Their Display on Supported Bilayers," *J. Amer. Chem. Soc.*, **129:** 5462-5471 (2007).
- Raghuveer Parthasarathy and Jay T. Groves, "Curvature and spatial organization in biological membranes," *Soft Matter*, **3:** 24-33 (2007).
- H. M. Rønnow, J. Jensen, R. Parthasarathy**,** G. Aeppli, T. F. Rosenbaum, D. F. McMorrow, and C. Kraemer, "Magnetic excitations near the quantum phase transition in the Ising ferromagnet $LiHoF_4$, *Phys. Rev. B*, **75:** 054426 (2007). [http://dx.doi.org/10.1103/PhysRevB.75.054426]
- Raghuveer Parthasarathy*, Cheng-han Yu*, and Jay T. Groves, "Curvature modulated phase separation in lipid bilayer membranes," *Langmuir*, **22:** 5095-5099 (2006). [*These authors contributed equally to this work]
- Raghuveer Parthasarathy and Jay T. Groves, "Coupled membrane fluctuations and protein mobility in supported intermembrane junctions," *J. Phys. Chem. B*, **110:** 8513-8516 (2006).
- Raghuveer Parthasarathy, Paul A. Cripe, and Jay T. Groves, "Electrostatically Driven Spatial Patterns in Lipid Membrane Composition," *Phys. Rev. Lett.* **95:** 048101 (2005).
- H. M. Rønnow, R. Parthasarathy, J. Jensen, G. Aeppli, T. F. Rosenbaum, and D. F. McMorrow, "Quantum phase transition of a magnet in a spin bath," *Science* **308:** 389-392 (2005).
- Raghuveer Parthasarathy and Jay T. Groves, "Protein Patterns at Lipid Bilayer Junctions," *Proc. Natl. Acad. Sci.* **101:** 12798-12803 (2004).
- Raghuveer Parthasarathy and Jay T. Groves, "Optical techniques for imaging membrane topography," *Cell Biochem. Biophys.* **41:** 391-414 (2004).
- Raghuveer Parthasarathy, Bryan L. Jackson, Thomas J. Lowery, Amy P. Wong, and Jay T. Groves, "Nonequilibrium Adhesion Patterns at Lipid Bilayer Junctions," *J. Phys. Chem. B* **108**: 649-657 (2004). [DOI: 10.1021/jp035543k]
- Raghuveer Parthasarathy, Xiao-Min Lin, Klara Elteto, T. F. Rosenbaum, and Heinrich M. Jaeger, "Percolating through Networks of Random Thresholds: Finite Temperature Electron Tunneling in Metal Nanocrystal Arrays," *Phys. Rev. Lett.* **92:** 076801 (2004).
- Xiao-Min Lin, Raghuveer Parthasarathy, and Heinrich M. Jaeger, "Nanocrystal Arrays: Self-assembly and physical properties," in the *Dekker Encochyopedia of Nanoscience and Nanotechnology*, ed. J.A. Schwarz, C.I. Contescu, K. Putyera (Dekker, 2004).
- Thomas Scheibel, Raghuveer Parthasarathy, George Sawicki, Xiao-Min Lin, Heinrich Jaeger, and Susan L. Lindquist, "Conducting nanowires built by controlled self-assembly of amyloid fibers and selective metal deposition," *Proc. Natl. Acad. Sci.* **100:** 4527-4532 (2003).
- Raghuveer Parthasarathy, Xiao-Min Lin, and Heinrich M. Jaeger, "Electronic transport in metal nanocrystal arrays: the effect of structural disorder on scaling behavior," *Phys. Rev. Lett.* **87:** 186807 (2001). [http://dx.doi.org/10.1103/PhysRevLett.87.186807]
- Xiao-Min Lin, Raghuveer Parthasarathy, and Heinrich M. Jaeger, "Direct patterning of self-assembled nanocrystal monolayers by electron beams," *Appl. Phys. Lett.* **78:** 1915-1917 (2001). [http://dx.doi.org/10.1063/1.1358363]
- Sayantani Ghosh, Raghuveer Parthasarathy, Thomas F. Rosenbaum, and Gabriel Aeppli, "Coherent spin oscillations in a disordered magnet," *Science* **296:** 2195-2198 (2002).
- S. Anders, R. Parthasarathy, H. M. Jaeger, P. Guptasarma, D. G. Hinks, and R. van Veen, "Dynamics of the second peak in the magnetization of Bi2Sr2CaCu2O8 crystals," *Phys. Rev. B* **58:** 6639-6644 (1998).
- D. H. Cobden, G. Pilling, R. Parthasarathy, P. L. McEuen, I. M. Castleton, E. H. Linfield, D. A. Ritchie, and G. A. C. Jones, "Current flow past an etched barrier: field emission from a two-dimensional electron gas," *Europhys. Lett.* **41:** 327-332 (1998).

- R. Parthasarathy, C. Franck, R. Treffers, D. Cudaback, C. Heiles, C. Hancox, and R. Millan, "A rooftop radio observatory: an undergraduate telescope system at the University of California at Berkeley," *Am. J. Phys.* **66:** 768-771 (1998).