

CURRICULUM VITAE

Wolfgang Losert

Notarization: I have read the following and certify that these *curriculum vitae* are a current and accurate statement of my professional record.

Signature _____ Date _____

I. Personal Information

I.A. UID, Last Name, First Name, Middle Name, Contact Information

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University of Maryland
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I.B. Academic Appointments at UMD

Professor, University of Maryland College Park Department of Physics (65%) Institute for Physical Science and Technology (35%) Institute for Research in Electronics and Applied Physics Department of Bioengineering (Affiliate) Program in Oncology, University of MD Cancer Center	7/2014-present
Associate Professor, University of Maryland College Park	7/2006-6/2014
Assistant Professor, University of Maryland College Park	8/2000-6/2006

I.C Administrative Appointments at UMD

Interim Associate Dean for Research, CMNS	7/2014-present
Director, UMD-NCI Partnership for Cancer Technology	6/2010-present
Director, Biophysics Graduate Program	7/2011-6/2014

I.D. Other Employment

Visiting Assistant Professor, Haverford College, Dept. of Physics	7/1999-7/2000
Research Associate, Haverford College, Dept. of Physics	2/1998-7/2000

I.E. Educational Background

Ph.D. Physics, City College of the City University of New York	1998
Diplom (~MS) <i>summa cum laude</i> Applied Physics, Technical Univ. Munich	1995

II. Research, Scholarly, and Creative Activities

II.B. Chapters

II.B.1. Books

1. W. Losert, "Pattern Formation" in *Encyclopedia of Nonlinear Science*, ed. Alwyn Scott. New York and London: Routledge, 690-693, (2004).
2. W. Losert, "Granular Matter" in *Encyclopedia of Nonlinear Science*, ed. Alwyn Scott. New York and London: Routledge, 381-383, (2004).
3. C. Poole and W. Losert, "Laser Tweezer Deformation of Giant Unilamellar Vesicles," in "Methods to Study Membrane Lipids," Methods in Molecular Biology Book Series, (Humana Press, Totowa, NJ, 2007).
4. K. Nordstrom and W. Losert, "Refractive Index Matching: Microstructure Evolution during Impact using Refractive Index Matched Granular Matter" *Rapid Penetration into Granular Media*, M. Iskander (Ed.) (Elsevier, 2015).
5. J. Candia, J.R. Banavar, and W. Losert, "Uncovering Phenotypes with Supercells: Applications to Single-Cell Sequencing" X. Wang (ed.), *Single Cell Sequencing and Systems Immunology*, Translational Bioinformatics (Springer, 2015).

II.C. Articles in Refereed Journals

* *undergraduate student (advised or co-advised)*

graduate student (advised or co-advised)

^ *postdoctoral researcher (advised or co-advised)*

authors with intellectual leadership are listed in bold

1. J.W. Kim, J.Y. Vaishnav, E. Ott, S.C. Venkataramani, and **W. Losert**, "Front Propagation of Spatio-temporal Chaos," *Physical Review E* **64**, 016215 (5 pages) (2001).
2. **W. Losert** and G. Kwon*, "Transient and steady state dynamics of granular shear flows," *Advances in Complex Systems* **4**, 369 -377 (2001).
3. **S.J. Friedmann**, G. Kwon*, and **W. Losert**, "Granular memory and its effect on the triggering and distribution of rock-avalanche events," *J. Geophys. Res.* **108**, No. B8, 2380-2391 (2003).
4. J. Stambaugh[#], D.P. Lathrop, E. Ott, and **W. Losert**, "Pattern Formation in a Monolayer of Magnetic Spheres," *Physical Review E* **68**, 026207 (5 pages) (2003).
5. **N. Taberlet**[#], P. Richard, A. Valance, R. Delannay, W. Losert, J-M. Pasini, and J.T. Jenkins, "Super Stable Heap in a thin channel," *Physical Review Letters* **91**, 264301 (4 pages) (2003).
6. M. Newey[#], S. Van der Meer[#], J. Ozik, E. Ott, **W. Losert**, "Band-in-band segregation of multidisperse granular mixtures," *Europhys. Lett.* **66**, 205-211 (2004).
7. K. Lee[#] and **W. Losert**, "Local control of the dendritic microstructure through perturbations," *Journal of Crystal Growth* **269**, 592-598 (2004).
8. J. Stambaugh[#], Z. Smith*, E. Ott, and **W. Losert**, "Segregation in a monolayer of magnetic spheres," *Physical Review E* **70**, 031304 (6 pages) (2004).
9. M. Toiya[#], J. Stambaugh[#], and **W. Losert**, "Transient and oscillatory granular shear flow," *Physical Review Letters* **83**, 088001 (4 pages) (2004).

10. N. Taberlet[#], P. Richard, and **W. Losert**, “Understanding the dynamics of segregation bands of simulated granular material in a rotating drum,” *Europhys. Lett.* **68**, 522-528 (2004).
11. L.-Q. Wu, K. Lee[#], X. Wang, D.S. English, W. Losert, and **G.F. Payne** “Chitosan-mediated and spatially selective electrodeposition of nano-scale particles,” *Langmuir* **21**, 3641-3646 (2005).
12. K. Lee[#] and **W. Losert**, “Controlled dynamics of grain boundaries in binary alloys,” *Acta Materialia* **53**, 3503-3510 (2005).
13. A. Pomerance[#], J. Matthews, M. Ferguson[#], J.S. Urbach, and **W. Losert**, “Actin polymerization in a thermal gradient,” *Macromolecular Symposia* **227**, 231-242 (2005).
14. R. Skupsky[#], W. Losert, and **R. Nossal**, “Distinguishing modes of Eucaryotic Gradient Sensing,” *Biophysical Journal* **89**, 2806-2823 (2005).
15. J. Stambaugh[#], K. Van Workum, J. Douglas, and **W. Losert**, “Polymerization Transitions in Two-Dimensional Systems of Dipolar Spheres,” *Physical Review E* **72** 031301 (2005).
16. P. Ribiere, P. Richard, M. Toiya[#], W. Losert, R. Delannay and **D. Bideau** “Effect of rare events on out of equilibrium relaxation,” *Physical Review Letters* **95**, 268001 (2005).
17. **S.J. Friedmann**, N. Taberlet[#], **W. Losert** “Rock avalanche dynamics: Insights from granular physics experiments,” *International Journal of Earth Sciences* **95**, Issue 5, pp.911-919 (2006).
18. S. Akamatsu, K. Lee[#], and **W. Losert**, “Control of eutectic solidification microstructures through laser spot perturbations,” *Journal of Crystal Growth* **289**, 331 (2006).
19. J. Galanis, D. Harris, D. Sackett, W. Losert, and **R. Nossal**, “Spontaneous patterning of confined granular rods,” *Physical Review Letters* **96**, 028002 (2006).
20. N. Taberlet[#], M. Newey[#], P. Richard and **W. Losert** "On axial segregation in a tumbler: an experimental and numerical study," *J Stat. Mech.* P07013 (2006).
21. R. Skupsky[#], C. McCann[#], R. Nossal, and **W. Losert** “Bias in the Gradient Sensing Response of Chemotactic Cells,” *Journal of Theoretical Biology* **247**, 242-258 (2007).
22. Luo R, Ahvazi B, Amarei D, Shroder D, Burrola B[#], Losert W, **Randazzo PA**. “Kinetic analysis of GTP hydrolysis catalyzed by the Arf1.GTP.ASAP1 complex,” *Biochem J.* **402**, 439–447 (2007).
23. M. Toiya[#], J. Hettinga^{*}, and **W. Losert**, "3D Imaging of Particle Motion During Penetrometer Testing," *Granular Matter* **9**, 323-329 (2007).
24. A. J. Pons, A. Karma, S. Akamatsu, M. Newey[#], A. Pomerance[#], H. Singer, and **W. Losert**, “Feedback control of unstable cellular solidification fronts,” *Physical Review E* **75**, 021602 (2007).
25. S. Slotterback[#], M. Toiya[#], L. Goff^{*}, J. Douglas, **W. Losert**, “Particle motion during the compaction of granular matter,” *Phys. Rev. Lett* **101**, 258001 (2008).
26. S. Han[#]; D.J. McBride; W. Losert, and **S. Leikin**, “Segregation of type I collagen homo- and heterotrimers in fibrils,” *J. Mol. Biol.* **383**(1), 122-132. (2008).
27. L. Li, M. Driscoll[#], G. Kumi, R. Hernandez, K. J. Gaskell, W. Losert, and **J.T. Fourkas**, “Binary and Gray-Scale Patterning of Chemical Functionality on Polymer Films,” *J. Amer. Chem. Soc.* **130**, 13512-13513 (2008).

28. A. Pomerance[#], **E. Ott**, **M. Girvan** and **W. Losert**, “The Effect of Network Topology on the Stability of Discrete State Models of Genetic Control,” *PNAS* **106**, 8209-8214 (2009).
29. M. Driscoll[#], R. Kopace*, L. Li, C. McCann, J. Watts*, J.T. Fourkas, and **W. Losert**, “The Adventures of Dicty the Dictyostelium Cell,” *Chaos*, **19**, 041110, (2009).
30. A.G. Banerjee[#], A. Pomerance[#], W. Losert, and **S.K. Gupta**, “Developing a Stochastic Dynamic Programming Framework for Optical Tweezer based Automated Particle Transport Operations,” *IEEE Transactions on Automation Science and Engineering* **7**, 218-227 (2010).
31. S. Han[#], E. Makareeva, N.V. Kuznetsova, A.M. DeRidder, M.B. Sutter, W. Losert, C.L. Phillips, R. Visse, H. Nagase, and **S. Leikin**, "Molecular Mechanism of Type I Collagen Homotrimer Resistance to Mammalian Collagenases," *Journal of Biological Chemistry* **285**, 22276-22281 (2010).
32. C. P. McCann[#], P. W. Kriebel, C. A. Parent, **W. Losert** “Cell Speeds, Persistence, and Information Transmission during Signal Relay and Collective Migration,” *Journal of Cell Science* **123**, 1724-1731 (2010).
33. C.R. Berardi*, K. Barros, J.F. Douglas, and **W. Losert**, “Direct observation of string-like collective motion in a two-dimensional driven granular fluid,” *Physical Review E* **81**, 041301 (2010).
34. L. Liu, S. Das, W. Losert, and **C.A. Parent** “mTORC2-mediated AC9 activation is required for chemoattractant induced cAMP production and chemotaxis in neutrophils,” **19**, 845-857 *Developmental Cell* (2010). Previewed in *Developmental Cell* **19**, 795 (2010), Editors Choice *Science Signaling* **3**, 387 (2010).
35. J. Galanis, R. Nossal, W. Losert, and **D. Harries** “Nematic order in small systems: Measuring the elastic and wall anchoring constants in vibrofluidized granular rods,” *Phys. Rev. Lett.* **105**, 168001 (2010).
36. J.A. Dijksman[#], E. Wandersman, S. Slotterback[#], C. Berardi*, W.D. Updegraff*, M. van Hecke, **W. Losert**, “From Frictional to Newtonian Flows: Three Dimensional Imaging and Rheology of Gravitational Suspensions,” *Physical Review E* **82**, 060301 (2010).
37. H. Zhou, B. Burrola Gabilondo[#], W. Losert, and **W.van de Water**, “Stretching and relaxation of vesicles,” *Physical Review E* **83** 011905 (2011).
38. B. Koss, S. Chowdhury[#], T. Aabo, SK Gupta, and **W. Losert**, “Indirect Optical Gripping with Triplet Traps,” *Journal of the Optical Society of America B* **28**, 982-985 (2011).
39. A. G. Banerjee[#], S. Chowdhury[#], **W. Losert**, and **S.K. Gupta**, “Survey on Indirect Optical Manipulation of Cells, Nucleic Acids, and Motor Proteins” *Journal of Biomedical Optics* **16**, 051302 (2011).
40. M. Herrera[#], S. McCarthy, S. Slotterback[#], E. Cephas*, W. Losert, and **M. Girvan** “The path to fracture: dynamics of contact networks in granular flows,” *Physical Review E* **83**, 061303 (2011).
41. M.K. Driscoll[#], J.T. Fourkas, and **W. Losert**, “Local and global measures of shape dynamics,” *Physical Biology* **8**, 055001 (2011).
42. **L. Kondic**, X. Fang, W. Losert, C.S. O’Hern, and R.P. Behringer, “Microstructure evolution during impact on granular matter,” *Physical Review E* **85**, 011305 (2012).
43. M.K. Driscoll[#], C.P. McCann[#], R. Kopace*, T. Homan*, J.T. Fourkas, C.A. Parent, **W. Losert** “Cell Shape Dynamics: From Waves to Migration,” *PLOS Computational Biology* **8**(3): e1002392 (2012).

44. A. G. Banerjee, S. Chowdhury[#], W. Losert, and **S.K. Gupta**, "Real-Time Path Planning for Coordinated Transport of Multiple Particles using Optical Tweezers" *IEEE Transactions on Automation Science and Engineering*, **9**(4),669-678 (2012).
45. K. Glass[#], E. Ott; W. Losert; **M. Girvan**, "Implications of Functional Similarity for Gene Regulatory Interactions," *Journal of the Royal Society Interface* **9** 1625 (2012).
46. J.A. Dijkstra[#], F. Rietz, K.A. Loerincz, M. van Hecke, **W. Losert**, "Invited Article: Refractive Index Matched Scanning of Dense Granular Materials" *Review of Scientific Instruments* **83**, 011301 (2012).
47. P.V. Afonso, M. Janka-Junttila, Y.J. Lee, C.P. McCann[#], C.M. Oliver, K.A. Amer, W. Losert, M.T. Cicerone, and **C.A. Parent**, "LTB₄ is a Signal Relay Molecule for neutrophil chemotaxis," *Developmental Cell* **22**, 1079 (2012).
48. S. Slotterback[#], K.Ronaszegi[#], M. Mailman[^], W. D. Updegraff*, M.v. Hecke, M. Girvan, and **W. Losert**, "Onset of Irreversibility in Cyclic Shear of Granular Packings," *Physical Review E* **85**, 021309 (2012).
49. M.K. Driscoll[#], J. Albanese, Z-M Xiong, M. Mailman[^], **W. Losert**, and **K. Cao**, "A novel automated image analysis of nuclear shape: What can we learn from a prematurely aged cell?" *Aging* **4**, 119-132 (2012).
50. N. Murdoch[#], P.Michel, **D.C. Richardson**, C.R. Berardi*, S.F. Green, and **W. Losert** "Numerical simulations of granular dynamics II. Particle dynamics in a shaken granular material," *Icarus* **219** 321–335 (2012).
51. S. Chowdhury, P. Svec, C. Wang[#], K.T. Seale, **J.P. Wikswo**, **W. Losert**, and **S.K. Gupta**, "Automated Cell Transport in Optical Tweezers-Assisted Microfluidic Chamber," *IEEE Transactions on Automation Science and Engineering*, **267** (2012).
52. N. Murdoch[#], B. Rozitis, K.N. Nordstrom[^], S.F. Green, P. Michel, T-L. de Lophem, and **W. Losert**, "Granular Convection in Microgravity," *Physical Review Letters* **110**, 018307 (2013). Highlighted on physics.aps.org website.
53. T. R. Kiebling, M. Herrera[#], K. D. Nnetu, E. Balzer, M. Girvan, A. Fritsch, S. Martin, **J. Kaes** and **W. Losert**, "Analysis of multiple physical parameters for mechanical phenotyping of living cells," *European Biophysics Journal* **42**, 383-394 (2013).
54. N. Murdoch[#], B. Rozitis, S.F. Green, P. Michel, T-L. de Lophem, and **W. Losert**, "Granular Shear Flow in Varying Gravitational Environments," *Granular Matter* **15**, 129-137 (2013).
55. R.M. Lee[#], D.H. Kelley, K.N. Nordstrom[^], N.T. Ouellette, **W. Losert**, "Quantifying stretching and rearrangement in epithelial sheet migration," *New Journal of Physics* **15**(2), 025036 (2013).
56. M.C. Weiger, V. Vedham, C.H. Stuelten, K. Shou, M. Herrera[#], M. Sato, **W. Losert**, and **C.A. Parent**, "Real-Time Motion Analysis Reveals Cell Directionality as an Indicator of Breast Cancer Progression," *PLOS ONE*, **8**(3), e58859 (2013).
57. C. Guven[#], E. Rericha[^], **E. Ott**, and **W. Losert**, "Modeling and Measuring Signal Relay in Noisy Directed Migration of Cell Groups," *PLOS Computational Biology* **9**(5), e1003041 (2013).
58. C. Wang[#], S. Chowdhury[#], S.K. Gupta, **W. Losert**, "Optical Micromanipulation of active cells with minimal perturbations: direct and indirect pushing," *Journal of Biomedical Optics* **18**(4), 045001-045001 (2013).
59. **N. Murdoch**[#], B. Rozitis, S.F. Green, P. Michel, T-L. de Lophem, and **W. Losert**, "Simulating regoliths in microgravity," *Mon. Not. R. Astron. Soc.* (2013) to appear.

60. J. Parker[#], E. Sherman, M. van de Raa[#], D. van der Meer, L. Samelson, and **W. Losert**, “Automatic sorting of point pattern sets using Minkowski Functionals,” *Physical Review E*, **88**, 022720 (2013).
61. J. Candia[^], R. Maunu[#], M.K. Driscoll[#], W. Lai, A. Maritan, K. Cao, R. Nussenblatt, **J.R. Banavar**, and **W. Losert** “From Cellular Characteristics to Disease Diagnosis: Uncovering Phenotypes with Supercells,” *PLOS Computational Biology*, 9 (9), e1003215 (2013).
62. M. Harrington[#], J. Weijs[#], and **W. Losert**, “Suppression and emergence of granular segregation under cyclic shear,” *Physical Review Letters*, **111**, 078001 (2013).
63. K.W. Desmond, U. Villa, M. Newey[#], **W. Losert**, “Characterizing the Rheology of Fluidized Granular Matter,” *Physical Review E* **88**, 032202 (2013).
64. R. Moosavi, M.R. Shaebani, M. Maleki, J. Toeroek, **D.E. Wolf**, and **W. Losert**, “Coexistence and Transition between Shear Zones in Slow Granular Flow,” *Physical Review Letters* **111**, 148301 (2013).
65. M. Harrington[#], M. Lin^{*}, K.N. Nordstrom[^], and **W. Losert**, “Experimental Measurements of Orientation and Rotation of Dense 3D Packings of Spheres,” *Granular Matter* **16**, 185 (2014).
66. K. Moore[#], J. Giannini[#] and **W. Losert**, “Toward Better Physics Labs for Future Biologists,” *American Journal of Physics* **82** (5), 387-393 (2014).
67. J. Candia[^], **J. Banavar**, and **W. Losert**, “Understanding Health and Disease with Multidimensional Single-Cell Methods”, *Journal of Physics: Condensed Matter* (Topical Review) **26** (7), 073102 (2014).
68. **E.F. Redish**, C. Bauer, **K.L. Carleton**, **T.J. Cooke**, M. Cooper, **C.H. Crouch**, B.W. Dreyfus, B. Geller, J. Giannini[#], J. Svoboda Gouvea, M.W. Klymkowsky, **W. Losert**, K. Moore[#], **J. Presson**, V. Sawtelle, C. Turpen, and **K. Thompson**, “NEXUS/Physics: An interdisciplinary repurposing of physics for biologists,” *American Journal of Physics*, **82** (5), 368-377 (2014).
69. C.P. McCann[#], E.C. Rericha[^], C. Wang[#], **W. Losert**, and **C.A. Parent**, “Dictyostelium Cells Migrate Similarly on Surfaces of Varying Chemical Composition”, *PLOS One*, **9** (2), e87981 (2014).
70. M. Driscoll[#], X. Sun[#], C. Guven[#], **JT Fourkas**, and **W. Losert**, “Cellular contact guidance through dynamic sensing of nanotopography,” *ACS Nano* **8** (4), 3546-3555 (2014).
71. S. Chowdhury[#], A. Thakur, C. Wang[#], P. Svec, W. Losert, and **S. K. Gupta**. “Automated Manipulation of Biological Cells Using Gripper Formations Controlled by Optical Tweezers.” *IEEE Transactions on Automation Science and Engineering*, 11(2):338-347, (2014).
72. A Thakur, S Chowdhury[#], P Švec, C Wang[#], W Losert, and **SK Gupta** “Indirect pushing based automated micromanipulation of biological cells using optical tweezers” *The International Journal of Robotics Research*, 0278364914523690 (2014).
73. M. Mailman[^], M. Harrington[#], M. Girvan, and **W. Losert** “Consequences of Anomalous Diffusion in Disordered Systems Under Cyclic Forcing” *Physical Review Letters* **112** (22), 228001 (2014).
74. K. Nordstrom[^], E. Lim^{*}, M. Harrington[#], and **W. Losert**, “Granular Dynamics During Impact” *Physical Review Letters* **112** (22), 228002 (2014).

75. C. Wang[#], S. Chowdhury[#], M. Driscoll[#], C.A. Parent, S.K. Gupta, **W. Losert** “The Interplay of cell-cell and cell-substrate adhesion in collective cell migration” *Journal of The Royal Society Interface* 11 (100), 20140684 (2014).
76. O. Nagel, C. Guven[#], M. Theves, M. Driscoll[#], **W. Losert**, **C. Beta**, “Geometry-Driven Polarity in Motile Amoeboid Cells”, *PLOS One* 9 (12), e113382 (2014).
77. S. Sarkar, B.A. Baker, D. Chen[#], P.S. Pine, J. H. McDaniel, M.L. Salit, W. Losert, **C.G. Simon Jr.**, and **J. Dunkers**, “Synergistic Effects of Nanofiber Scaffold Structure and Chemistry on Human Bone Marrow Stromal Cell Response,” submitted to *Biomaterials* (2015).
78. S. Das, J.M. Parker, P.W. Kriebel, C. Guven, W. Losert, **D.R. Larson**, and **C.A. Parent** “Adenylyl cyclase mRNA localizes to the back of polarized Dictyostelium cells during chemotaxis” submitted to *Current Biology* (2015).
79. M.K. Driscoll, W. Losert, K. Jacobson, and **M. Kapustina** ”Spatiotemporal relationships between the cell shape and the actomyosin cortex of periodically protruding cells,” submitted to *Cytoskeleton* (2015).
80. S. Dolatabadi, J. Candia, N. Akrap, C. Vannas, T. Tomic, W. Losert, G. Landberg, P. Åman, and A. Ståhlberg, “Cell cycle and cell size dependent gene expression at single-cell level reveal cell type specific subpopulations” to be submitted.

***Work carried out as Graduate Student and Postdoctoral Researcher
(Lead junior researcher listed in bold)***

81. **L.M. Williams**, M. Muschol, X. Qian, W. Losert, and H.Z. Cummins, "Dendritic sidebranching with periodic localized perturbations: Directional solidification of pivalic acid-coumarin152 mixtures" *Phys. Rev. E* **48**, 489-499; erratum: *E* **48**, 4862 (1993).
82. **W. Losert**, B.Q. Shi, H.Z. Cummins, and J.A. Warren, “Spatial period-doubling instability of dendritic arrays in directional solidification,” *Phys. Rev. Lett.* **77**, 889-891 (1996).
83. **W. Losert**, O.N. Mesquita, J.M.A. Figueiredo, and H.Z. Cummins, “Direct Measurement of Dendritic Array Stability,” *Phys. Rev. Lett.* **81**, 409-412 (1998).
84. **W. Losert**, D.A. Stillman*, H.Z. Cummins, P. Kopzcynski, W.-J Rappel and A. Karma, “Selection of doublet cellular patterns in directional solidification through spatially periodic perturbations,” *Phys. Rev. E* **58**, 7492-7506 (1998).
85. **W. Losert**, B.Q. Shi and H.Z. Cummins, “Evolution of dendritic patterns during alloy solidification: Onset of the initial instability,” *Proc. Nat. Acad. Sci. USA* **95**, 431-438 (1998).
86. **W. Losert**, B.Q. Shi and H.Z. Cummins, "Evolution of dendritic patterns during alloy solidification: From the initial instability to the steady state," *Proc. Nat. Acad. Sci. USA* **95**, 439-442 (1998).
87. H.Z. Cummins, Y.H. Hwang, G. Li, W.M. Du, W. Losert, and **G.Q. Shen**, "Relaxation dynamics in orthoterphenyl: Comparing bk from extended mode-coupling theory and phenomenological analyses," *J. Non-Cryst. Solids* **235-237**, 254 (1998).
88. **J.-C. Geminard**, W. Losert, and J.P. Gollub, "Frictional Mechanics of Wet Granular Material," *Phys. Rev. E* **59**, 5881-5890 (1999).

89. **W. Losert**, D.G.W. Cooper*, and J.P. Gollub, "Propagating front in an excited granular layer," *Phys. Rev. E* **59**, 5855-5861 (1999).
90. **W. Losert**, D.G.W. Cooper*, J. Delour, A. Kudrolli, and J.P. Gollub, "Velocity statistics in vibrated granular media," *Chaos* **9**, 682-690 (1999).
91. **W. Losert**, **L. Bocquet**, T.C. Lubensky, and J.P. Gollub, "Particle dynamics in sheared granular matter," *Phys. Rev. Lett.* **85**, 1428 (4 pages) (2000).
92. **W. Losert**, J.-C. Geminard, S. Nasuno, and J.P. Gollub, "Mechanisms for slow strengthening in granular materials," *Phys. Rev. E*, **61** 4060-4068 (2000).
93. **L. Bocquet**, **W. Losert**, T.C. Lubensky, and J.P. Gollub, "Granular Shear dynamics and forces: Experiments and continuum theory," *Phys. Rev. E* **65**, 011307 (19 pages) (2002).
94. **J.-C. Tsai**, W. Losert, G.A. Voth, J.P. Gollub, "Two-dimensional granular Poiseuille flow on an incline: multiple dynamical regimes," *Phys. Rev. E* **65**, 011306 (13 pages) (2002).
95. **G.A. Voth**, B. Bigger*, M.R. Buckley*, W. Losert, M.P. Brenner, H.A. Stone, and J.P. Gollub, "Ordered clusters and dynamical states of particles in a vibrated fluid," *Phys. Rev. Lett.* **88**, 234301 (4 pages) (2002).
96. **J.-C. Geminard** and **W. Losert**, "Frictional Properties of bidisperse granular matter," *Phys. Rev. E* **65**, 041301 (5 pages) (2002).

II.D. Published Conference Proceedings

II.D.1. Refereed conference proceedings

1. M. Toiya[#] and **W. Losert**, "3D imaging of rod penetration through a Granular Pile," Proceedings of the Powders and Grains conference (Stuttgart, 2005).
2. M. Newey[#], N. Taberlet, P. Richard, and **W. Losert**, "Segregation Transients in a Tumbler Flow," Proceedings of the Powders and Grains conference (Stuttgart, 2005).
3. N. Taberlet, W. Losert, and **P. Richard**, "Axial segregation of dry grains in a rotating drum: a numerical study," *Proceedings of the Powders and Grains conference* (Stuttgart, 2005).
4. **W. Losert**, K. Ronaszegi[#], J. Weijs[#], J. Dijkstra[#], and S. Slotterback[#], "Three Dimensional Particle Rearrangements During Slow Granular Shear Flow In A Split Bottom Geometry," *Proceedings of the Powders and Grains Conference* (Golden, CO, 2009).
5. S. Slotterback[#], L. Goff*, M. Toiya[#], J. Douglas, M.v. Hecke, **W. Losert** "Microscopic rearrangements in a granular column during compaction by thermal cycling," Proceedings of the Powders and Grains conference (Golden, CO, 2009).
6. A.G. Banerjee, W. Losert, **S.K. Gupta**, "A decoupled and prioritized stochastic dynamic programming approach for automated transport of multiple particles using optical tweezers," *ASME 3rd International Conference on Micro and Nanosystems*, San Diego, CA (2009).
7. S. Chowdhury[#], P. Svec, C. Wang[#], W. Losert, and **S.K. Gupta**, "Gripper Synthesis for Indirect Manipulation of Cells using Holographic Optical Tweezers," *IEEE International Conference on Robotics and Automation (ICRA '12)*, St. Paul, Minnesota, May 14-18, (2012).

8. A. Thakur, S. Chowdhury[#], C. Wang[#], P. Svec, W. Losert, and **S. K. Gupta**, "Automated Indirect Optical Micromanipulation Of Biological Cells Using Indirect Pushing To Minimize Photo-Damage," *ASME 2012 International Design Engineering Technical Conferences (IDETC) & Computers and Information in Engineering Conference (CIE)*, (2012).
9. S. Chowdhury[#], A. Thakur, C. Wang[#], P. Svec, W. Losert, and **S. K. Gupta**, "Automated Indirect Transport of Biological Cells Using Planar Gripper Formations," *IEEE International Conference on Automation Science and Engineering (CASE'12)*, Seoul, Korea.

II.E. Conferences, Workshops, and Talks

II.E.2. Invited Talks

1. APS Centennial Meeting (3/21/99)
2. NYS - APS Meeting (10/22/99)
3. CECAM, ENS-Lyon (7/25/00)
4. CCCNLS, Irvine (2/3/01)
5. Dynamics Days Europe (6/8/01)
6. ICTP, Trieste (8/8/01)
7. American Association for Crystal Growth meeting, *In situ analysis and control of dendritic arrays in binary alloy directional solidification*, Seattle (8/7/2002)
8. Structures in Granular Matter Conference in Leiden, Holland *Non-steady state granular shear flows* (8/20/2002)
9. Gordon Conference on Physics Research and Education - Classical Mechanics and Nonlinear Dynamics "*Granular dynamics experiments: Visual demonstrations of non-equilibrium statistical mechanics*" (6/16/2004).
10. Dynamics Days 2005, Long Beach, CA "*Dynamics of Cell Motion*" (1/11/2005)
11. KITP Workshop in Granular Matter, UC Santa Barbara, "*The start of granular flow: Memory effects and instabilities*" (6/23/2005)
12. Workshop in Biological Physics, Kroegerup Hojskole, Denmark (8/24/2005)
13. APS March Meeting, Baltimore, MD (3/13/2006).
14. European Science Foundation Workshop on Optical Micromanipulation, Obergurgl, Austria (2/5/2007).
15. TMS Meeting, Frontiers in Solidification Science (Orlando, FL, 2/27/2007) *declined invitations due to scheduling conflicts to speak at STATPHYS satellite meeting in Italy on granular matter, and at International Solidification symposium in China*
16. Polymers Gordon Conference *Forced and Confined Actin networks* (7/2007)
17. Symposium in Honor of Walter Goldburg's 80th birthday, *Forced and Confined Actin networks* Univ. of Pittsburgh (9/29/2007).
18. National Academy of Sciences Frontiers of Science Symposium, Beijing China, invited participation and poster presentation. (10/28/2007)
19. American Society for Cell Biology Minisymposium Organizer and Introductory Speaker (Postdoc E. Rericha gave invited talk) (12/2007)
20. Aspen Center for Physics, Workshop on Quantitative Biology (1/9/2008)
21. Workshop on Jamming at Lorentz Center Leiden *Slow rearrangements of granular matter in three dimensions* (2/19/2008)
22. IMA Workshop on Cell migration *Cell migration with competing signals* (5/28/2008).

23. Symposium in Honor of Herman Cummin's 80th Birthday, *Decision Making and Group Behavior of Dictyostelium Discoideum* (12/16/2008).
24. Workshop on Numerical Modeling of Asteroid Granular Materials *Segregation* (1/14/2010).
25. Trends in Optical Micromanipulation workshop, Obergurgl, Austria (4/12/2010).
26. Particulate Materials in Extreme Environments, Livermore, CA (9/21/2010).
27. Dynamics Days 2011, *The Path to Fracture: Dynamics of Broken Link Networks in Granular Flows*, North Carolina (1/5/2011).
28. Fluid Dynamics in the 21st Century Workshop *Physics of Cell Migration – from Waves to Migration*, Haverford (5/19/2011).
29. Fluctuations and Response in Active Materials, Leiden, Holland (6/21/2011).
30. Developmental Biology Annual Meeting Satellite Symposium, *Cell Shape Dynamics: From Waves to Migration* Chicago (7/2011).
31. Physics of Cancer Symposium *From waves to motion: Physics approaches to characterize and control individual and collective cell migration* Leipzig, Germany (10/14/2011).
32. National Energy Technology Laboratory, Multiphase Flow Workshop “*Dense granular flows 3D imaging of collective motion*” (5/23/2012).
33. European Solid Mechanics Conference, Graz (7/10/2012).
34. APS March Meeting Tutorial on Opportunities in Biological Physics, *Physics of Cancer*, Baltimore MD (3/2013).
35. Aspen Center for Physics, Workshop on Physics of Functional Biological Assemblies, *Cell Shape Dynamics: From Actin Waves to Cell Migration*, Aspen, CO (6/24/2013).
36. AAPT Annual Meeting, *Reinventing the Introductory Physics Laboratories for Future Biologists* Portland OR (7/16/2013).
37. Single Cell Analysis Meeting London, UK (11/2013).
38. Mid Atlantic Soft Matter Meeting, Philadelphia, PA (1/17/2014).
39. Drug Discovery Summit, Boston, MA (5/2014)
40. Gordon Conference on Education at the Interface of Physics and Biology (June 2014).
41. Federation of Translational Immunologists Centers of Excellence meeting (June 24, 2014).
42. SIAM conference on the Life Sciences in Session “Convergence of Applied Mathematics and Oncology.” (8/2014).
43. Banff Workshop (Sept 9, 2014)
44. Gordon Conference on Directed Cell Migration (1/2015)
45. Photonics West (2/2015)
46. APS March Meeting Focus Session Physics of Cancer (3/2015)
47. Granular Matter in Microgravity workshop in Erlangen (Germany) (3/2015)

II.E.13 Colloquia

1. Physics Department Colloquium, Emory University, *Granular shear flow: Memory in Sand* (11/15/2002).
2. Cosmos Club, Washington DC *The Physics of Flowing Sand* (4/24/2003).
3. Geology Department Colloquium, University of Maryland *Physics of Granular Flow* (10/10/2003)

4. Physics Colloquium, Georgia Tech, *Dynamics of Cell Motion* (10/5/2004)
5. Applied Math Colloquium, New Jersey Institute of Technology, *Memory in a Sandpile*, (11/5/2004)
6. Physics Colloquium, UC Irvine, *Dynamics of Cell Motion*, (2/10/2005)
7. Physics Colloquium, Univ. of Maryland, *Dynamics of complex materials: From flowing sand to motile cells* (9/13/05)
8. Physics Colloquium, Univ of Buffalo, *Cell migration: Biochemical signals & cell motion* (10/11/2007)
9. Physics Colloquium, Georgetown University *Cell Dance: Decision Making and Group Behavior of Cells* (11/11/2008)
10. Physics Colloquium, Emory University *Decision Making and Group Behavior of Cells* (11/06/09).
11. Physics Colloquium, Oakland University (4/1/2010).
12. Physics Colloquium and Distinguished Lecturer Series: Force in Molecules, Cells and Tissues, Washington University *Cell migration: From waves to motion* (11/10/2010).
13. Physics Colloquium, Brandeis University *Cell migration: From waves to motion* (11/16/2010).
14. Physics Colloquium, GW University (1/21/2012)
15. Mechanical Engineering Colloquium, Rutgers University, *From Waves to Cell Migration* (March 2012)
16. Physics Colloquium, University of Maryland (October 2013)

II.E.15 Other

Seminars

1. National Institute of Standards and Technology, Metallurgy Seminar (4/93)
2. Dickinson College, Physics Seminar (04/19/99)
3. Columbia Univ., Earth Observatory Seminar (08/02/99)
4. Syracuse University, Physics Seminar (11/05/99)
5. Duke University, Physics Seminar (12/07/99)
6. City College New York (12/15/1999)
7. University of Chicago (2/7/00)
8. UC San Diego (2/10/00)
9. University of Maryland (2/23/00)
10. Georgia Tech (2/14/00)
11. Georgetown University (3/9/00)
12. University of Toronto (3/28/00)
13. Univ. of Stuttgart, Institute for Computer Applications (6/11/01)
14. Universite de Paris, Granular Group Seminar (6/14/01)
15. Johns Hopkins Univ., Condensed Matter Seminar (10/11/01)
16. University of Maryland College Park, Applied Math Seminar, Mathematics Department, *Control of binary alloy crystal growth patterns* (3/14/2002)
17. Northwestern University, Complex Systems Seminar, Center for Complex Systems, *Control of binary alloy crystal growth patterns* (4/5/2002)
18. NIH, Biophysics Seminar, *Understanding and controlling pattern formation on the microscale*, (6/5/2002)

19. University of Maryland, College Park, Chemical Physics Seminar, *Understanding and controlling pattern formation on the microscale* (10/9/2002).
20. Yale University, Mechanical Engineering Seminar, *Granular shear flow: Memory in Sand*, (10/15/2002).
21. Georgia Tech, Center for Nonlinear Science Seminar, *Understanding and controlling pattern formation on the microscale* (11/14/2002).
22. NIH, Laboratory for Integrative and Medical Biophysics Seminar, *Materials driven far from equilibrium* (5/29/2003).
23. George Mason University Seminar, *Laser imaging and micromanipulation of biomaterials* (6/11/2003).
24. University of Rennes, France, Condensed Matter Physics Seminar, *The start of granular shear flow: Memory and aging effects* (1/15/2004).
25. National Institute of Standards and Technology, Metallurgy Division Group Seminar, *Grain boundary dynamics in thermal gradients in 2D and 3D*, (2/26/2004).
26. Cornell University, LASSP Seminar, *Granular Shear flow: Transients and Segregation Dynamics* (4/9/2004).
27. NIH, Dictyostelium Interest Group Seminar, *Manipulation of Dictyostelium with Laser Tweezers*, (5/14/2004).
28. Georgia Tech, Center for Nonlinear Science, *Dynamics of cell motion* (7/28/2004).
29. University of Maryland, Informal Statistical Physics Seminar, *Memory in a Sandpile* (10/19/2004).
30. National Institute of Standards and Technology, Physics Seminar, *Dynamics of Cell Motion*, (12/15/2004).
31. Penn State University, Applied Math Seminar, *Dynamics of Cell Motion* (1/31/2005).
32. Univ. of Chicago, Computations in Science Seminar, (10/5/05).
33. Penn State University, Condensed Matter Physics Seminar, *Dense granular flows* (10/25/05).
34. Northeastern Univ., Nonlinear Science, *Physics of cell motility* (11/8/05).
35. Harvard University, Applied Math, DEAS, *Physics of cell motility* (11/9/05).
36. University of Delaware, Solid State Physics, *Physics of cell motility* (12/6/05).
37. George Mason University, Physics, *Dense granular flows* (3/3/06).
38. Univ. of Maryland, Fluid Dynamics Reviews, *Dense granular flows* (5/12/06).
39. Laboratory for Physical Sciences Seminar *Physics of cell motility* (10/4/06).
40. University of Pittsburgh, Condensed Matter Physics Seminar, *Physics of cell motility* (10/19/06).
41. NIST Polymers Division Seminar, *Decision making during cell migration* (1/22/2008).
42. AMOLF Amsterdam, Holland, *Decision making during cell migration* (2/18/2008).
43. Syracuse University, Biophysics Seminar, *Decision making during cell migration* (4/10/2008).
44. Cornell University, Machines and Organisms Seminar, *Decision making during cell migration* (4/10/2008).
45. Johns Hopkins University, Condensed Matter Physics Seminar, *Decision making during cell migration* (4/17/2008).
46. University of Maryland, Electrophysics Seminar, *Micromanipulation with Holographic Optical Tweezers* (4/19/2008).
47. University of Chicago, James Franck Institute Seminar *A look inside granular matter close to jamming* (5/13/2008).

48. UC Irvine, Beckman Laser Institute LAMMP Seminar, *Decision Making and group behavior of Dictyostelium discoideum* (11/12/2008).
49. Brown University, Mechanical Engineering Seminar, *The inside of a sandpile: 3D imaging of particle motion in dense granular flows* (4/26/2009).
50. University of Maryland, Applied Dynamics Seminar, *The inside of a sandpile: 3D imaging of particle motion in dense granular flows* (5/2009).
51. University of Twente, Holland, *The inside of a sandpile: 3D imaging of particle motion in dense granular flows* (5/25/2009).
52. Leiden University, Holland, *The inside of a sandpile: 3D imaging of particle motion in dense granular flows* (5/27/2009).
53. Rutgers University, *Decision Making in Group Migration* (10/14/09).
54. Emory University, *The inside of a sandpile: 3D imaging of particle motion in dense granular flows*, (11/05/09).
55. AMOLF Seminar, Amsterdam, Holland, *Cell Migration* (11/30/09).
56. NIST, Polymers Division Seminar, *Decision Making in Group Migration*, (12/16/09).
57. Institut des Nanosciences de Paris, France, *Cell Dynamics* (1/12/2010).
58. UCLA, Biomath Seminar, *Individual and Collective Cell Dynamics*, (4/29/2010).
59. UCSD, Biophysics Seminar, *Individual and Collective Cell Dynamics*, (4/30/2010).
60. ESPCI, Paris, Physics Seminar, *Cell migration: From waves to motion*, (6/2/2010).
61. University of Leipzig, Soft Matter Physics Colloquium, *Cell migration: From waves to motion*, (6/4/2010).
62. Seminar, UC Berkeley *Cell Migration: From Waves to Motion* (9/20/2010).
63. Cummins Memorial Symposium, City College New York *Cell Migration: From Waves to Motion* (10/15/2010).
64. University of Marburg Institute for Synthetic Biology, *Cell migration: From waves to motion* (10/27/2010).
65. University of Maryland Statistical Physics Seminar, *Physics of Cell Migration*, (4/2011).
66. NIST, Shape Metrology Seminar, *Physics of Cell Migration*, (5/15/2011).
67. SFB Seminar, University of Goettingen, Germany, *Waves to Cell Migration* (4/24/2012).
68. Stowers Institute Seminar, *From Movies to Phenotypes: Multiparameter Cell Shape Analysis* (1/15/2013).
69. Dictyostelium Interest Group Meeting, Johns Hopkins University (5/24/2013).
70. NIH, Complex Systems Neuroscience Seminar, *Cell Shape Dynamics: From Actin Waves to Cell Migration* (5/28/2013).
71. NIH, Light Microscopy Seminar, *Cell Shape Dynamics: From Actin Waves to Cell Migration* (6/3/2013).
72. Los Alamos National Lab, Center for Nonlinear Science Seminar, *Collective Dynamics of Granular materials* (6/17/2013).
73. Los Alamos National Lab, Center for Nonlinear Science Colloquium, *Physics of Cancer* (6/18/2013).
74. Microbiology and Immunology Seminar, USUHS *Physics of Cancer* (February 10, 2014).
75. Systems Biology Seminar, Duke University *Physics of Cancer* (February 25, 2014).
76. Biophysics Seminar, University of North Carolina (February 26, 2014).
77. Food and Drug Administration, Nanotechnology Seminar (March 20, 2014).
78. DOE Webinar, *Physics of Granular Media* (March 2014).

79. Rutgers University (May 1, 2014).
80. SFB Seminar, LMU Munich (July 21, 2014)
81. Arizona State University, Biophysics Seminar (October 15, 2014)

II.H. Completed Creative Works

II.H.4 Demonstrations

“Physics of Sandpiles” Demonstrations for University of Maryland College Park Maryland Days (2001-2014). Postdocs, graduate, and undergraduate students provided demonstrations of jamming and granular flows. Demonstrations included a spontaneous separation of sand by size and an interactive demonstration showing the strength of jammed sand.

II.H.5. Inventions

1. WE Bentley, R Ghodssi, GF Payne, GW Rubloff, LQ Wu, H Yi, W Losert, DS English “Spatially selective deposition of polysaccharide layer onto patterned template.” US Patent 7,790,010
2. With J. Fourkas and R. Duraiswami, Invention Disclosure Title “Method for spooling individual polymer strands.”
3. With J. Fourkas and R. Duraiswami, Invention Disclosure Title “Method for controlled polymer disentanglement.”
4. With Julian Candia and Jayanth Banavar, Invention Disclosure Title “Quantitative Multiparameter Phenotyping through Combined Cell Averaging and Machine Learning Single-Cell Data Analysis,” (3/2013).
5. With J. Fourkas et al, Invention Disclosure Title “Nanotopographic Cell Rectifier,” (12/2013).
6. With D. Chen and J. Candia, Invention Disclosure Title “Analysis of Robustness in Multidimensional Single Cell Datasets” (12/2014).

II.H.10. Exhibitions and Installations

“Cells in Motion” Biophysics Exhibit for University of Maryland College Park Maryland Days (2013-2014). Collaboration with Dorothy Beckett, the Houston Science Museum, and Baylor College of Medicine to produce and project a short video (via a portable IMAX projection system) highlighting one of the strengths of the Biophysics Program at Maryland. The Houston Science Museum is interested in a revised version of the video for broader usage.

II.H.27 Other

“Physics of Cancer” Public lecture presentations for University of Maryland College Park Maryland Days (2010-2011).

II.J. Sponsored Research

II.J.1. Grants

Equipment Grants

1. DURIP equipment grant (04/01/01-03/31/02) “*Nonlinear Dynamics and Noise under the Microscope: Three dimensional*”. **W. Losert, P.I.**, R. Roy (Physics), Co-PI.
2. NSF-MRI Research Instrumentation Grant “*MRI: Acquisition of a holographic laser tweezer array*” **W. Losert, PI**, D. English, S. Lower, and R. Roy Co-PIs.

Research Grants

1. NASA Microgravity Fluid Physics Grant (01/01/02–12/31/05) “*Granular flow instabilities: Transients, aging, and segregation dynamics,*” **W. Losert, P.I.**, J. Friedman (Geology), Co-PI.
2. NASA microgravity materials research (12/1/2003-11/30/2007) “*Adaptive control of alloy microstructures,*” A. Karma (Northeastern Univ) PI, **W. Losert Co-I**
3. NIH Technology Development for Biomedical Applications Grant (7/1/2003-6/30/2006) “*Dynamic Control and Analysis of biopolymer networks,*” **W. Losert P.I.**, J. Urbach (Georgetown University), Co-I.
4. NIST Cooperative Agreement (10/2003 – 9/2006) “*Control of crystal growth processes through curvature enhancers and suppressors,*” **W. Losert PI.**
5. MRSEC seed funding (9/1/2003-8/30/2005) “*Dynamics of biomaterials studied through optical micromanipulation,*” **W. Losert PI**; D. English, Co-I.
6. NIST Cooperative Agreement (6/2005-5/2006) “*FiPy based simulations of chemotaxis*” **W. Losert, PI.**
7. UMD-NIST Nanomanufacturing grant (9/2005 – 8/2007) “*Nanotube-vesicle bioreactor networks self-assembled and self-powered through directed actin polymerization,*” W. Losert **PI**, K. Helmersen (NIST) Co-PI.
8. NSF-CTS grant (9/1/05 – 8/31/06) “*Collaborative Research: Studies of Aging and Memory in Granular Materials,*” **W. Losert, PI**, C.S. O’Hern (Yale Univ) Co-PI
9. ARO (\$25,000), ONR (\$20,000), NSF (7,500) Funding for Dynamics Days 2006.
10. NIST Cooperative Agreement (6/2006-5/2008) “*FiPy based simulations of chemotaxis,*” **W. Losert, PI.**
11. NSF-CTS grant (9/1/06 – 8/31/09) “*Aging and Memory in Granular Materials,*” **W. Losert, PI**, C.S. O’Hern (Yale Univ) Co-PI
12. NSF-CBET International Supplement
13. NSF-PHY grant (7/15/2008-6/30/2011) “*Integration of topographical, mechanical and biochemical signals in cell motility,*” PI with J. Fourkas Co-I
14. NSF-DMR grant (8/2009-7/2012) “*RECOVERY: Dynamic Contact Networks in Granular Systems: New Insights Into Fracture and Segregation,*” PI with M. Girvan Co-I

15. **NSF-CPS** grant (9/2009-8/2013) “*CPS:Small:Image Guided Autonomous Optical Manipulation of Cell Groups,*” **Co-I** with S.K. Gupta
16. **MRSEC Seed grant** (11/2009-10/2011) “*Assembly and Immobilization of Functional Nanomaterials for Device Applications,*” **Co-I** with Fourkas, Waks, Shapiro.
17. **NIST** Cooperative Agreement (9/2009-8/2012) “*Developing Computational Tools for NIST’s effort in third generation photovoltaics,*” **PI**
18. **DTRA** Subcontract from Duke University (4/2010-3/2014) “*Microstructure, fluidization, and control of penetrator trajectories in granular media,*” **Co-I** with Behringer, O’Hern, Kondic
19. **NIST** Cooperative Agreement (9/2012-8/2014) “*Multiparameter Cell analysis,*” **PI**
20. **NIH R01 Nanotechnology Grant** (7/2010-6/2015) “*Using controlled 2D and 3D nanotopography to unravel tactile senses of motile cells,*” **PI** with J. Fourkas Co-PI
21. **DOD Era of Hope Scholar – Breast Cancer Research Grant** (4/2011-4/2016) **Co-I** with S. Martin PI
22. **NSF-PHY, Physics of Living Systems** grant (9/2012-9/2015) “*Collective Cell Migration,*” **PI** with J. Fourkas Co-I
23. **NIH U01** Subcontract from USUHS (7/2014-6/2019) “*Elucidating TCR signaling mechanisms via quantitative pattern analysis*” Co-I with B. Schaefer.
24. **NIST** Cooperative Agreement (9/2014-8/2016) “*Characterizing Complex Biological Systems by Multi-Parametric Classification and Heterogeneity Analysis,*” **PI**
25. **NIH U01** (9/2015-9/2018) “*Crowd coding in the brain: 3D imaging and control of collective neuronal dynamics,*” **Co-PI** with Kanold PI
26. **NSF-DMR** grant (5/2015-4/2018) “*Collective Rotation Networks in Dense Granular Flow Experiments: Connecting Rotation and Translation Across Scales*” **PI**
27. **AFOSR-MURI** grant (7/2015-7/2020) “*Understanding and Controlling the Coupled Electrical, Chemical, & Mechanical Excitable Networks of Living Systems*” **PI**

II.J.3. Other

1. Applied Materials Corporation agreement (5/2004-12/2004) W. Losert PI
2. Research Corporation Research Innovation Award (5/15/02 – 5/14/05) “*Adaptive control of crystal microstructures using variable laser patterns,*”
3. National Academies Keck Futures Initiative Seed Grant “*Biology on Demand: External Control of a Complex Cellular System, S. Cerevisiae,*” **Co-I** with Nemenman (Emory), Wikswo (Vanderbilt), and 2 others

II.K. Fellowships, Gifts, and Other Funded Research

II.K.1 Fellowships

Fellowship of the German National Merit Foundation (Studienstiftung). The foundation supports the top 0.2% of students in Germany, based on academic merit (grades and faculty recommendation) (1992-1995).

II.K.3 Other

Research Corporation Research Innovation Award (2001)

University of Maryland Graduate Research Board Semester Research Award (2002)

Richard A. Ferrell Distinguished Faculty Fellowship, Department of Physics, University of Maryland (2006)

III. Teaching Mentoring and Advising

III.A. Courses Taught

Semester, course prefix, number, and title, (enrollment number)

Spr 2010	PHYS 818	Physics of Cancer (7)
Spr 2011	PHYS 828M	Cancer Bio-Physics (15)
Fall 2007	PHYS 161	Introduction to Physics I (170)
Fall 2008	PHYS 161	Introduction to Physics I (100)
Fall 2010	PHYS 374	Mathematical Methods in Physics (30)
Fall 2011	PHYS 374	Mathematical Methods in Physics (52)
Fall 2012	PHYS 131	Physics for Biologists I (9)
Spr 2013	PHYS 132	Physics for Biologists II (11)
Fall 2013	PHYS 131	Physics for Biologists I (118)

III.B. Teaching Innovations

III.B.1. Major Programs Established

Helped initiate and lead a new research and Graduate Partnership Program (GPP) on Cancer Technology with the National Institutes of Health (NIH) National Cancer Institute. More than 20 graduate students with >20 UMD mentors and > 20 NIH co-mentors are benefiting from this Partnership which enables them to carry out part of their thesis project in collaboration with NIH laboratories.

III.B.3. Software, Applications, Online Education, etc.

Co-Developer of all materials for new course sequence Physics131/132. Contributed to most reading materials developed for Phys131/132, homework and quizzes. The Materials are organized as a [wiki page](#).

Developed student and instructor laboratory manuals for PHYS 131/132 with assistance from graduate students Kim Moore (Physics Education) and John Giannini (Biophysics).

III.B.4. Instructional Workshops and Seminars Established

Initiated weekly Biophysics seminar series
Initiated summer week-long MatLab training workshop
Initiated annual UMD-NCI partnership symposia

III.B.5. Course or Curriculum Development

PHYS 828M Cancer Bio-Physics (3 credit course). The course combines outside talks by cancer cell biologists and doctors with lectures and class projects. The course has been taught twice in 2010 (as PHYS 818) and 2011.

PHYS 131/132: Co-Leader with E.F. Redish in the development of the new Interdisciplinary Physics Course Sequence and Laboratory for Life Sciences Students. The course development is supported in part through the Howard Hughes Medical Institute (8/2010-current).

PHYS 131/132 LABS: Developed 22 weeks of new laboratory exercises to accompany this course sequence with assistance from graduate students, Kim Moore from the Physics Education Research Group (PERG) and John Giannini from Biophysics. We developed all course material with feedback from the Phys131/132 course development team. The labs were very highly rated by the mostly pre-med undergraduate students, and deemed valuable for their learning and for their future careers. (1/2012-current)

III.C. Advising: Research or Clinical

III.C.1. Undergraduate

1. Ava Omidvar (6/2014 – current) actin and focal adhesion dynamics
2. Zeshan Tariq (1/2012-current)
3. Rob Tully (6/2014 – 1/2015) actin and focal adhesion dynamics
4. Michael Lin (2/2010-2014) rods and rotations in granular materials
5. Shola Wylie (6/2014-8/2014 – TREND 2014) impact dynamics
6. Sima Kolaei (6/2013-8/2014)
7. Jacquelyn Weisz (8/2013-1/2014) neutrophil migration
8. Zeynep Karakas (6/2013-1/2014)
9. Joshua Aldridge (1/2013-12/2013)
10. Allyson Rice (TREND REU - Summer 2013)
11. Ryan Shute (1/2013-1/2014)
12. Emily Lin, Duke Univ (Summer 2012, TREND student) impact into granular materials
13. Bobby Vinson (1/2012-8/2012)
14. Cristopher Bennett (6/2011-9/2011) optical tweezer force calibration
15. Brian Slusher (TREND REU - Summer 2011)
16. Sam Engel (TREND REU – Summer 2011)
17. Peter Kordell (6/2010-1/2012) analysis of wound healing assays
18. Eric Kim (6/2010-12/2011) electric guidance of cells

19. Anthony Coburger (6/2010-6/2011) cell shape dynamics of neutrophils
20. Jon Balajthy (9/2009 – 5/2010) analysis of vesicle dynamics
21. William Derek Updegraff (2/2009-12/2010) digging into granular matter
22. Simon Freedman (TREND-REU – Summer 2009) shape dynamics for cell migration
23. Nicholas Prior (5/2009-9/2009) research on robotic clam
24. John Watts (6/2008-9/2009) Cell migration on ridges
25. Ilya Zhitomirskiy (6/2008-12/2008) shape deformations of membranes and cells
26. Alex Steinkamp (TREND REU – Summer 2008) membrane shapes
27. Scott Robertson (2/2008-6/2008) – Effects of nanoparticles on mammalian cells
28. Stephen Hung (2/2008-12/2008) – Deformations of vesicles in ternary mixtures
29. Khalid Ismail (2/2008-12/2008) –Roboclam – imaging granular flow in three dimensions
30. Rael Kopace (6/2007-8/2008) – Cell motility at the edge of a cliff
31. Laura Beachy (9/2007-1/2008) – cell motility on patterned surfaces
32. Humza Kazmi (9/2007-1/2008) – Nanoparticle effect on cell motility
33. Becca Taft (Physics, Yale Univ, TREND REU - Summer 2007) –granular simulations
34. Abby Goldman (Physics, Mt Holyoke, REU student - Summer 2007) – cell motion
35. Avner May (Physics, Harvard Univ, Summer 2007) – Avalanches in granular matter
36. Emmanuel Cephias (1/2007 – 10/2007) – Network theory applied to granular flow
37. Len Goff (6/2006 – 1/2007)
38. Chris Berardi (9/2005-2008) – The physics of jamming
39. Matt Wilkinson (1/2006-8/2006)
40. Debra Friedman (1/2006-8/2006)
41. Elisheva Bresler (9/2005-8/2006)
42. Justin Senseny (9/2005-12/2005)
43. Kenneth Desmond (RPI, TREND-REU Summer 2005)
44. Joe Meszaroz (1/2005 – 12/2006)
45. Kumar Saleh (1/2005 – 9/2006) Banneker/Key Scholar – Chemistry Major
46. Jacqueline Owens (12/2004 – 12/2005)
47. Matt Kelley (5/2003 – 12/2004 – BS) High School teacher
48. Andrew Porter (5/2004 – 12/2004)
49. Dave Jones (11/2003-8/2004)
50. Ricardo Pizarro (Monroe Martin Prize 5/2002-12/2003 and 9/2004 – 12/2004.)
51. Ryan Smith (Physics, Illinois Wesleyan Univ., TREND REU Summer 2004)
52. Katherine Newhall (RPI. TREND-REU Summer 2004)
53. Calli Vance (MRSEC-REU Summer 2004)
54. Zachary Smith (Physics, Colorado School of Mines) TREND-REU Summer 2003
55. Andrew Pomerance – (Physics) Spring 2003, physics graduate student since F 2003
56. Nicole Harrison (Materials Science) MRSEC-REU Summer 2003
57. Paul Freese (Materials Science) TREND-REU Summer 2003
58. Rachel Headley (5/2003-12/2003, B.S., honors, graduate school geophysics at Berkeley)
59. Dominic Britti (Summer 2004), graduate school in Materials Science

60. Sulima Elemam (1/2002-8/2002)
61. Lucy Karpen (1/2002/6/2002)
62. Elisabeth Schemm, (Summer 2001, Harvard Univ), graduate student Stanford Univ.
63. Gene Kwon (8/2000 – 5/2002)

III.C.2. Master's

1. Peter Bradford (M.S. 6/2004, Law School), Patent Lawyer.
2. Cory Poole (5/2004 – 12/2006), High School Teacher of AP Physics in CA.

III.C.3. Doctoral

1. Justin Stambaugh (5/2001-12/2004, Ph.D., Staff Scientist Lincoln Labs, MIT)
2. Kyuyong Lee (12/2000 - 12/2004, Ph.D., Postdoc, Pusan Univ. Korea)
3. Ron Skupsky (advised 2002 – 8/2005, Ph.D. Postdoc Maine)
4. Masahiro Toiya (5/2002 – 8/2006, Ph.D. Postdoc, Brandeis Univ., Waltham, MA)
5. Mike Newey (5/2002 – 12/2006, Ph.D, Staff Engineer, Lincoln Labs, MIT)
6. Matt Ferguson (11/2000 – 3/2007, Ph.D. Assistant Professor Boise State Univ)
7. Andrew Pomerance (8/2003-8/2009, Ph.D. Research Scientist, DOD Contractor)
8. Sejin Han (1/2004 – 9/2009, Ph.D., Postdoc Hong Kong University)
9. Kimberly Glass (w/Ott and Girvan) (2/2010, Ph.D., Postdoc Harvard Medical School)
10. Beatriz Burrola Gabilondo (8/2010, Preceptor, Harvard University, Purdue University)
11. Brooke Hester (10/2010, Assistant Professor, Appalachian State University)
12. Colin McCann (6/2011) Research Scientist, Industry
13. Steven Slotterback (8/2012) Industry
14. Meghan Driscoll (12/2012) Postdoctoral Researcher w/Gaudenz Danuser (UT Dallas)
15. Can Guven (2/2010-8/2014)- Intel Staff Scientist
16. Matt Harrington (6/2011-5/2015)- Postdoc Losert
17. Joshua Parker (1/2011-5/2015) DOD Smart Fellow – Staff position
18. Xiaoyu Sun (2/2010-6/2015) – Fourkas main advisor - Postdoc Fourkas/Losert
19. Leonard Campanello (6/2014-current)
20. John Giannini (6/2013-current) – joint with H. Shroff
21. Desu Chen (6/2012 – current) – joint project with NIST
22. Yang Shen (6/2012 – current)
23. Deborah Hemmingway (6/2012-current) – joint project with EF Redish
24. Rachel Lee (6/2011-current) – joint project with C.A. Parent (NCI)
25. Chenlu Wang (9/2010 – current) – joint project with SK Gupta and C.A. Parent (NCI)
26. Eleanor Ory (6/2010-current)
27. Samira Aghayee (1/2015-current) – joint project with Kanold
28. Song (5/2015-current) – joint project with Parent

III.C.4. Post-doctoral

1. Julian Candia (UM Cancer Center Training Grant Postdoctoral Awardee, 11/2011-8/2014) – Staff Scientist, NIH

2. Kerstin Nordstrom (PhD, University of Pennsylvania 2011, 7/2011-6/2014) Won AAAS Media Fellowship. Assistant Professor at Mt. Holyoke College
3. Erin Rericha (Ph.D. Univ of Texas, Austin 8/2004 – 7/2011) Won Burroughs Wellcome Fellowship. Assistant Professor Vanderbilt University
4. Jennifer Galanis, Co-advised Postdoctoral Researcher in Dr. Nossal's group at NIH Senior Researcher, Ben Gurion University
5. Mitch Mailman (Ph.D. Brandeis University 1/2011-8/2012). FTI-NET
6. Co-advising of Daniel Wheeler, Assistant Research Scientist at NIST (with Dr. Warren at NIST 2007-2012). Staff Scientist, NIST
7. Satarupa Das (PhD, 9/2013-current)

III.C.5. Other Research Directions (K-12 Interactions)

Year-long lab research internship for three African American high school students: Kandice Fields (2004/2005) - started at the University of Maryland in the Fall 2005 semester; Joi Logan (2006/2007); Kevin Smith (2007/2008).

III.E. Advising: Other than Research Direction

III.E.1. Undergraduate

Advising undergraduate physics majors interested in biophysics

III.E.2. Master's

Organized semester-long research projects by international students

1. Sander Van der Meer (2/2002 – 5/2002) Masters student from Univ. of Twente, Holland.
2. Sascha Pfisterer (2/2005-8/2005) Masters student from FH Mannheim, Germany.
3. Jacco Hettinga (4/2005 – 7/2005) Masters student from the Univ. of Twente, Holland.
4. Martin Weber (8/2005-2/2006) Masters student from FH Mannheim, Germany.

III.E.3. Doctoral

Organized semester-long research projects by international students

1. Nicolas Taberlet (5/2002-7/2005; two visits to UMD for 8 months total) Ph.D. Student of the University of Rennes, jointly advised with R. Delannay, Univ. of Rennes, France. Since 1/2007 Staff Scientist/Lecturer at Ecole Normale Supérieure, Lyon
2. Justine Malafosse (5/2005– 7/2005) Ecole Nationale Supérieure de Techniques Avancées, Paris, France
3. Silvie Grossmann (4/2006-8/2006) University of Heidelberg, Germany
4. Dominik Wildanger (4/2006-8/2006) University of Heidelberg, Germany
5. Krisztian Ronaszegi (2/2007-2/2008) Budapest University, Hungary
6. Joshua Dijkstra (2/2008-4/2008) Leiden University, Holland, *Velocity dependence of 3D granular shear flow*
7. Joost Weijs (9/2008-1/2009) University of Twente, Holland (supported by Burgers program), *Separation of particles by shape in 3D granular flows*

8. Tess Homan (9/2008-1/2009) University of Twente, Holland, *Quantifying cell migration*
9. Thomas Aabo (1/20/2009-4/30/2009) Danish Technical University, *Cell-cell signaling in yeast investigated with holographic optical tweezers*
10. Hernan Zhou (9/2009-1/2010) University of Eindhoven, *Cell membrane deformations*
11. Ludovic Jacob (2/2010-9/2010) University of Rennes, *Robotic digging in sand*
12. Matthias van de Raa (7/2010-10/2010) Univ. of Twente, *Patterns of peptide localization*
13. Mathijs Vermeulen (9/2011-12/2011) Univ. of Eindhoven, *Cell shape fluctuations*
14. Tong Shen (2/2012-7/2012), Shanghai Univ, *Models of nuclear shapes*
15. Miguel Pinto (9/2013-11/2013) Univ. Autonoma de Madrid, *anisotropic granular flows*

III.E.5. Other Advising Activities

Graduate Program Director of Biophysics Program (7/2011-7/2014)

Incoming Physics graduate students: F2004 (4), F2005 (4), F2007 (5), F2008 (4)

Thesis defense committees

- 2008: Jianwei Liu (Biochemistry)
 M. Sebastian Pauletti (Mathematics)
 William Grimes (Chemical Physics, NIH).
- 2009: Joshua Dijkstra (Physics, Leiden University)
- 2010: Tanay Desai (Biochemistry)
 Yuxiang Liu (Mechanical Engineering)
 Min Tang (Statistics)
 Bora Sul
 Christian Tomasetti (Mathematics)
 Melanie Freed (Bioengineering)
 Quiang Liu (Chemical Physics)
- 2011: Ashley Hardin (Chemical Physics)
 Hongdian Yang (Biophysics)
- 2012: Ashutosh Gupta (Physics)
 Katayoon Sadin (Chemical Physics)
 Hana Hwang (Physics)
- 2013: John Platig (Physics)
 Jen-Chien Chang (Physics)
 Mark Herrera (Physics)
 Sagar Chowdhury (Mechanical Engineering)
- 2014: Josh Ballew (Mathematics)
 Armstrong Mbi (Physics, Georgetown University)
 Ben Geller (Physics)
 Ben Dreyfus (Physics)
 Abhi Sing (University of Twente)
- 2015: Kaustav Nandy (CS)
 Jim Greene (AMSC)
 Mike Azatov (Physics)

IV. Service and Outreach

IV.A. Editorships, Editorial Boards, and Reviewing Activities

IV.A.2 Editorial Boards

Physical Biology (5/2013-present)

IV.A.3 Reviewing Activities for Journals and Presses

Physical Review Letters, Proceedings of the Royal Society, Physical Review B, Physical Review E, Physica D, Physics of Fluids, Journal of Fluid Mechanics, American Journal of Physics, ChemPhysChem, Journal of Geophysical Research, European Biophysics Journal, Journal of Molecular Biology, Systems Biology Reviews, Physical Biology, Journal of Physical Chemistry, PLOS Computational Biology, PNAS. (~10-20 article reviews per year)

IV.A.4 Reviewing Activities for Agencies and Foundations

Reviewed proposals for Research Corporation, National Science Foundation (NSF), Royal Society, Marsden Fund, Dutch Science Foundation, Swiss Science Foundation, NASA, NSERC, ISTAR, NIH, and DOE
Served on DOE, NSF, NIH, and NASA review panels
Served on Argonne National Lab Site Visit Panel for the Materials Division
Served on NSF Physics Frontiers Center Review Panel

IV.B. Committees, Professional & Campus Service

IV.B.1. Campus Service - Department

Physics APT Committee (2010-2012)
Physics Salary Committee (2002, 2005, 2006, 2008)
Physics Qualifier exam questions/grading (2002, 2004, 2010, 2012, 2013)
IPST Burgers Board (2009-2014)
IPST Salary Committee (2008)
Organizer of the Applied Dynamics seminar (2001-2008)

IV.B.2. Campus Service – College

Associate Dean for Research (7/2014-present)
Life Sciences Committee (Fall 2013)
Director, Biophysics Graduate Program (7/2011-7/2014)
Director, Partnership for Cancer Technology with the National Cancer Institute (2010-present)

IV.B.3. Campus Service – University

Chair, Educational Affairs Committee of the University Senate (8/2012-7/2014)

Reviewer, Massive Open Online Courses – MOOC with recommendations adopted by
University Senate (4/2013) and University President (6/2013)
University Senator, (5/2006-5/2009 and 5/2011-5/2014)
University Senate Committee on Committees, (5/2006-5/2008 and 5/2011-5/2012)
Judge, Graduate Research Interaction Day – GRID (2002, 2003, and 2007)

IV.C. External Service and Consulting

IV.C.1. Community Engagements, Local, State, National, International

Lab tours for Flowers High School (5/2004) ~80 high school students
Lab tours for the Physics Department Summer Girls Program (2001, 2004)
Job shadowing for high school students (2003, 2005, 2006, 2011, 2013, and 2015)
Summer high school internships (2 students in 2008, 1 in 2010, 1 in 2013, 2 in 2014)
Year-long lab research internship for three African-American high school students:
Kandice Fields (2004/2005) - started at the University of Maryland in the Fall
2005 semester; Joi Logan (2006/2007); Kevin Smith (2007/2008).
Invited Lecture “Science on Saturday” at Princeton Plasma Physics Laboratory (1/2014)

IV.C.2. International Activities

Co-Organizer of Dynamics Days 2002 (~250 attendees)
Organizer of Dynamics Days 2006 (~250 attendees)
Co-Organizer of Dynamics Days 2012 (~300 attendees)

IV.C.3. Corporate and Other Board Memberships

Board of Directors, German School Washington (private school, pre-K-12) (2010-2014)

IV.C.7. Other

Vice Chair, Chair Elect, Chair, and Past Chair: APS Division of Biological Physics
(2012-2016)
Executive Committee: APS Group in Statistical and Nonlinear Physics (2008-2011)
Program Committee: APS Division of Fluid Dynamics (2006-2008)
Nominations Committee: APS Group in Statistical and Nonlinear Physics (2003)
Session Arranger/Abstract Sorter: APS March meetings (2002-2010 and 2012-present)
Volunteer Researcher: NIH (2003-present)
Guest Researcher: NIST (2006-2009)

V. Awards, Honors and Recognition

V.1. Research Fellowships, Prizes and Awards

Research Corporation Research Innovation Award (2001)
University of Maryland Graduate Research Board Semester Research Award (2002)

Richard A. Ferrell Distinguished Faculty Fellowship, Department of Physics, University of Maryland (2006)

V.4 Recognition in Media

Interview for the Discovery Channel Online Edition (2008) (also on MSNBC and other online news) <http://www.msnbc.msn.com/id/28018543/>

Interview in major Danish newspaper (Politiken – Mar 13, 2005) on new collaborative project with J. Glueckstaed, Riso National Labs

V.5 Other Special Recognition

Director: Research and Graduate Partnership Program in Cancer Technology with the National Cancer Institute. This partnership started as a Systems Biology Interaction between Physics Department and the National Cancer Institute. Six Physics graduate students were involved in initial projects that started through this initiative. Since its official start in 2010, the partnership has supported collaborative projects for 21 graduate students from 8 PhD Programs mentored jointly by NIH investigators and faculty from the University of Maryland.

Chair: March Meeting program committee for the Division of Biological Physics, APS, as Vice-Chair of the Division (for 2014 March meeting).

Organizer: Dynamics Days 2012 with M. Girvan Baltimore (January 2012), ~300 attendees; ~100,000\$ budget.

Organizer: Summer school on Granular Materials: From Simulations to Astrophysical Applications (College Park, June 2011)

Co-Organizer: Fluids 2011 Conference in honor of Jerry Gollub (Haveford, May 2011)

Organizer: Dynamics Days 2006, Bethesda, MD (www.chaos.umd.edu/DDays2006). The conference drew ~250 attendees. It was held near NIH and fostered interactions between theoretical nonlinear dynamics and experimental biological research.

Member: Organizing Committee, 2004 Gordon Conference on Granular and Granular Fluid Flows.

Speaker: QEM (Quality Education for Minorities) seminar on how to successfully apply for NSF-MRI funding in Fall 2003.

Co-Organizer: Dynamics Days 2002, Baltimore, MD. A four day meeting of over 200 researchers covering a wide range of topics in nonlinear dynamics (see <http://www.chaos.umd.edu/Ddays2002>).

VI. Other Information

Current External Collaborators

R.P. Behringer, PhD, Duke University– *High speed penetration into granular materials.*

C. Beta, PhD, University of Potsdam – *Directed cell migration in channels.*

A. Carlsson, PhD, Washington Univ. – *Simulations of actin polymerization waves.*

M. Cicerone, PhD, NIST and IPST – *BCARS imaging*

C. Civin, MD, UM Medical School – *Emergent properties of cancer stem cells.*

K. Jacobson, PhD, University of North Carolina Chapel Hill – *Shape dynamics of cells.*

S. Martin, PhD, UM Medical School – *Breast cancer cell dynamics.*

V. Mili, PhD, NCI, NIH – *Spatial patterning of mRNA.*

T. Misteli, PhD, NCI – *Systematic analysis of nuclear shapes.*
 A. Morozov PhD, Rutgers University – *Network analysis of Cell groups*
 R. Nussenblatt, MD, NEI, NIH – *Emergent properties of ocular disease.*
 C. Parent, PhD, National Cancer Institute, NIH – *Individual and collective cell dynamics.*
 L. Samelson, PhD NCI, NIH – *Nanoscale patterning of immune signals.*
 S. Sarkar, PhD, NIST – *Shape phenotyping during cell differentiation.*
 B. Schaefer, PhD, USUHS – *Spatial patterning of immune signals.*
 H. Shroff, NIBIB – *Imaging of actin wave dynamics.*
 A. Winter, PhD, MIT *Robotic digging in sand.*

Current University of Maryland College Park Collaborators

J. Banavar, Physics – *Analysis of emergent properties in health and disease.*
 K. Cao, Biology – *Nuclear shape analysis in premature aging.*
 J. Fourkas, Chemistry and IPST – *Cell migration on nanotopography.*
 M. Girvan, Physics and IPST – *Network analysis of granular flows.*
 S.K. Gupta, Mechanical Engineering – *Robotics with Holographic Tweezers.*
 P. Kanold, Biology – *Crowd coding of the Brain*
 E. Ott, Physics and Electrical Engineering – *Models of self- aggregation.*
 E.F. Redish – *NEXUS: reforming the Introductory Physics for Biologists Course.*

Past Collaborators

P. Abshire (UMD), S. Akamatsu and G. Faivre (University of Paris, France), B. Bentley (UMD), W. Briels (University of Twente), M. Cicerone (NIST), AJ Chitnis (NICHD, NIH), C. Crouch (Swathmore), R. Delanney (Univ Rennes), J.F. Douglas (Polymers Division, National Institute of Standards and Technology), J. Galanis (NIH), M. van Hecke (Leiden University), K. Helmerson (NIST and Joint Quantum Institute, UMD), J. Glueckstaed (Riso National Laboratory, Denmark), A. Karma (Department of Physics, Northeastern University), J. Kaes (Leipzig), S. Leikin (Laboratory of Physical and Structural Biology, NIH), A. Maritan (Univ. Padua), P. Michel (Planetology, CNRS, Niece, France), L. Kondic (NJIT), R. Nossal (NIH), C.S. O’Hern (Yale), D. Sackett (NIH), G. Payne (UMD), S. Raghavan (UMD), P. Randazzo, (NCI, NIH), L. Staudt (NCI, NIH), K. Tanner (NCI), J. Urbach (Department of Physics, Georgetown University), J.A. Warren (Director, CTCMS, NIST), W. van de Water (TU Enschede, Holland).

Student awards (major awards listed in bold)

1. **Cosmos Club Fellowship** (2003: Mike Newey).
2. **Cosmos Club Fellowship** (2003: Masahiro Toiya).
3. Undergraduate Research Fellowship in IREAP (2003: Dominic Britti).
4. Thomas Mason Fellowship for Interdisciplinary Research (2003: Andrew Pomerance).
5. Best Graduate Student Presentation Award, IREAP (2003: Masahiro Toiya).
6. **Student Research Achievement Award, Biophysical Society** (2004: Justin Stambaugh).
7. 2nd place poster competition, Graduate Student Research Interaction Day, University of Maryland (2004: Justin Stambaugh).
8. Thomas Mason Fellowship for Interdisciplinary Research (2004: Cory Poole).

9. Undergraduate Presentation Award TREND REU Program (2004: Katherine Newhall).
10. Undergraduate Research Fellowship in IREAP (2004, Andrew Porter).
11. Student Poster Award, Burgers Symposium (2004: Masahiro Toiya).
12. **Student Research Achievement Award at the Biophysical Society** (2005: Sejin Han).
13. Thomas Mason Fellowship for Interdisciplinary Research (2005: Beatriz Burrola).
14. IPST - Monroe Martin Prize for Undergraduate Research (2005: Ricardo Pizarro).
15. Undergraduate Presentation Award TREND REU Program (2005: Kenneth Desmond).
16. Korean Embassy Scholarship (2005: Sejin Han).
17. Student Poster Award, Burgers Symposium (2005: Matt Ferguson).
18. CMPS Senior Summer Scholarship (2006: Chris Berardi).
19. Selection to participate in Woods Hole Physiology Course (2006: Erin Rericha).
20. Korea-U.S. Science Cooperation Center/KSEA Scholarship (2006: Sejin Han).
21. Best Graduate Student Presentation Award, IREAP, (2006: Masahiro Toiya).
22. Thomas Mason Fellowship for Interdisciplinary Research (2006: Colin McCann).
23. **Mexican Government Fellowship (2006: Beatriz Burrola).**
24. **Burroughs-Wellcome Fund Interfaces in Sciences Award (\$500,000 total for 5 years, two of them as Postdoc in my group, three faculty years) (2007: Erin Rericha).**
25. APS-Division of Biological Physics Travel Award (2007: Sejin Han).
26. Thomas Mason Fellowship for Interdisciplinary Research (2008: Meghan Driscoll).
27. Undergraduate Research Fellowship in IREAP (2008: Rael Kopace).
28. Undergraduate Student Presentation Award TREND (2008: Alex Steinkamp).
29. Student Poster Award, Burgers Symposium (2008: Joost Weijs).
30. Undergraduate Presentation Award TREND REU Program (2009: Simon Freedman).
31. The Ralph Myers Award for Exceptional Teaching (2009: Mark Herrera).
32. **The George A. Snow Memorial Award** (2009: Beatriz Burrola-Gabilondo, for her role in successfully starting and running the Maryland Women in Physics Group).
33. Student Poster Award, Burgers Symposium (2009: Hernan Zhou).
34. **DOD Graduate Student Fellowship (2010: Mark Herrera).**
35. Student Poster Award, Burgers Symposium (2010: Meghan Driscoll).
36. Thomas Mason Fellowship for Interdisciplinary Research (2012: Joshua Parker).
37. **DOD-SMART Fellowship (2012-2015: Joshua Parker).**
38. **AAAS Media Fellowship (2012: Kerstin Nordstrom).**
39. **Chateaubriand Fellowship (2012: Matt Harrington).**
40. Fellowship from the City of Rennes (France) **(2012: Matt Harrington).**
41. The Ralph Myers Award for Exceptional Teaching (2012: Steve Slotterback).
42. **ARCS fellowship (2013, 2014, 2015: Rachel Lee).**
43. Thomas Mason Fellowship for Interdisciplinary Research (2013: Can Guven).

44. GRID Presentation Award (2013: Deborah Hemmingway).
45. Finalist in the MTech Business Model Challenge (2013: Deborah Hemmingway).
46. Sagar Chowdhury, Engineering Dean's Doctoral Student Research Award, 2013, Primary Advisor: SK Gupta.
47. Matt Harrington, Burgers Symposium Poster Award, Fall 2013.
48. Rachel Lee, Biosciences Poster Award -- Biochemistry/Biophysics, Fall 2013.
49. Kim Moore, Ralph Meyers and Friends Teaching Award, 2013, primary advisor EF Redish.
50. Thomas Mason Fellowship for Interdisciplinary Research (2014: Matt Harrington).
51. Zeshan Tariq, HHMI Undergraduate Research Fellowship, 2014.
52. Satarupa Das, American Society for Cell Biology, Women in Cell Biology Travel Award, 2014.
53. Rachel Lee, SIAM Student Travel Award and Invited Talk, 2015.