

## ELISA RIEDO

PROFESSOR OF NANOSCIENCE AT CUNY ADVANCED SCIENCE RESEARCH CENTER  
DIRECTOR OF ASRC SURFACE SCIENCE FACILITY  
PROFESSOR OF PHYSICS AT THE CITY COLLEGE OF NEW YORK

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[www.picoForceLab.org](http://www.picoForceLab.org)

updated 1/1/17

### I. EARNED DEGREES

B.S., Physics, 1995, *Summa cum Laude*, University of Milano, Italy  
Ph.D., Physics, 2000, University of Milano, Italy

### II. EMPLOYMENT HISTORY

Sept 2015 – present: Professor of Nanoscience and Founding Member of the CUNY Advanced Science Research Center (ASRC), NYC (USA)  
Sept 2015 – present: Director of Surface Science Facility CUNY ASRC  
Sept 2015 – present: Tenured Full Professor, Physics, City College of New York (USA)  
2015: Tenured Full Professor, School of Physics, Georgia Tech (USA)  
2009 – 2015: Associate Professor (with tenure), School of Physics, Georgia Tech (USA)  
2006 – present: Adjunct Professor, School of Chemistry and Biochemistry, Georgia Tech (USA)  
2003 – 2009: Assistant Professor, School of Physics, Georgia Tech (USA)  
1999 – 2003: Post Doctoral Fellow, École Polytechnique Fédérale Lausanne (EPFL) (Switzerland)  
1998 – 1999: Research Assistant, European Synchrotron Research Facility (ESRF) (France)  
Feb – Jun 1998: Research Assistant, TASC – INFM labs, Trieste (Italy)  
June 1998: Visiting Research Assistant, Forschungszentrum of Jülich (Germany)  
1996 – 1998: Research Assistant, CoreCom (Politecnico of Milan and Pirelli) (Italy)  
1995: Research stage at CERN, Geneva, (Switzerland)

### III. REFEREED PUBLICATIONS

#### TEN MOST SIGNIFICANT PUBLICATIONS — \* INDICATES CONTACT AUTHOR

1. E. Albisetti, D. Petti, M. Pancaldi, M. Madami, S. Tacchi, J. Curtis, W.P. King, A. Papp, G. Csaba, W.Porod, P. Vavassori, E. Riedo\*, R. Bertacco, “Nanopatterning reconfigurable magnetic landscapes via thermally assisted scanning probe lithography” **Nature Nanotechnology**, 11, 545–551 (2016) (Cover article)
2. Y. Gao, S. Zhou, S. Kim, H.-C. Chiu, D. Nélias, C. Berger, W. de Heer, L. Polloni, R. Sordan, A. Bongiorno and E. Riedo\*, “Elastic coupling between layers in two-dimensional materials”, **Nature Materials** 14, 714–721 (2015)

3. Abdelghani Laraoui, Halley Aycock-Rizzo, Yang Gao, Xi Lu, Elisa Riedo\*, Carlos Meriles, "Imaging thermal conductivity with nanoscale resolution using a scanning spin probe" **Nature Communications** 6, 8954, (2015)
4. Ricardo Garcia, Armin Knoll, and Elisa Riedo\*, "Advanced Scanning Probe Lithography", **Nature Nanotechnology**, 9, 577 (2014). > 100 citations
5. H.-C. Chiu, K. D. Koh, M. Evich, A. Lesiak, M. W. Germann, A. Bongiorno, E. Riedo\* and F. Storici "How RNA intrusions change DNA structure and elastic properties", **Nanoscale** 6 (17), 10009 (2014)
6. D. Ortiz-Young, H. C. Chiu, S. Kim, K. Voitchovsky and E. Riedo\* "The interplay between apparent viscosity and wettability in nanoconfined water", **Nature Communications**, 4, 2482, (2013)
7. Suenne Kim, Si Zhou, Yike Hu, Muge Acik, Yves J. Chabal, Claire Berger, Walt de Heer, Angelo Bongiorno, and Elisa Riedo\* "Room Temperature Metastability of Multilayer Epitaxial Graphene Oxide", **Nature Materials**, 11, 544, (2012). > 200 citations
8. Z. Q. Wei, D. B. Wang, S. Kim, S. Y. Kim, Y. K. Hu, M. Yakes, A. R. Laracuate, Z. T. Dai, S. R. Marder, C. Berger, W. P. King, W. A. de Heer, P. E. Sheehan, and E. Riedo\*, "Nanoscale Tunable Reduction of Graphene Oxide for Graphene Electronics," **Science**, 328, 1373-1376, (2010). > 450 citations
9. M. Lucas, X. Zhang, I. Palaci, C. Klinke, E. Tosatti, and E. Riedo\* "Hindered rolling and friction anisotropy in supported carbon nanotubes" **Nature Materials** 8, 876 (2009).
10. J.H. Song and X.D. Wang and E. Riedo\* and Z.L. Wang, "Elastic Property of Vertically Aligned Nanowires/Nanotubes", **Nano Letters** 12, 1954 (2005). > 300 citations

#### COMPLETE LIST OF PUBLICATIONS

1. E. Albisetti, D. Petti, M. Pancaldi, M. Madami, S. Tacchi, J. Curtis, W.P. King, A. Papp, G. Csaba, W.Porod, P. Vavassori, E. Riedo, R. Bertacco, "Nanopatterning reconfigurable magnetic landscapes via thermally assisted scanning probe lithography" **Nature Nanotechnology**, 11, 545–551 (2016) doi:10.1038/nnano.2016.25 (Cover article) (Highlighted by News Media)
2. R. V. Ulijn and E. Riedo "Learning to think systems" **Nature Nanotechnology**, 11 (9), 824-824 (2016)
3. Alper Gurarlan, Shuping Jiao, Tai-De Li, Guoqing Li, Yiling Yu, Yang Gao, Elisa Riedo, Zhiping Xu, Linyou Cao, "Van der Waals Force Isolation of Monolayer MoS<sub>2</sub>" **Advanced Materials**, (2016) doi: 10.1002/adma.201601581
4. Carroll, Keith; Wolf, Heiko; Knoll, Armin; Curtis, Jennifer; Zhang, Yadong; Marder, Seth; Riedo, Elisa; Duerig, Urs "Understanding how Charged Nanoparticles Electrostatically Assemble and Distribute in 1-D" **Langmuir** (2016) doi: 10.1021/acs.langmuir.6b03471
5. Albisetti, Edoardo; Carroll, Keith; Xi, Lu; Curtis, Jennifer; Petti, Daniela; Bertacco, Riccardo; Riedo, Elisa, "Thermochemical scanning probe lithography of protein gradients at the nanoscale" **Nanotechnology**, 27 (31), 315302 (2016)
6. E. Albisetti, D. Petti, M. Madami, S. Tacchi, P. Vavassori, E. Riedo, R. Bertacco "Nanopatterning spin-textures: A route to reconfigurable magnonics" **AIP Advances**, (7), 5, 10.1063/1.4973387
7. Abdelghani Laraoui, Halley Aycock-Rizzo, Yang Gao, Xi Lu, Elisa Riedo, Carlos Meriles, "Imaging thermal conductivity with nanoscale resolution using a scanning spin probe" **Nature Communications** 6, 8954, (2015) doi:10.1038/ncomms9954
8. Yang Gao, Si Zhou, Suenne Kim, Hsian-Chih Chiu, Daniel Nélias, Claire Berger, Walt de Heer, Laura Polloni, Roman Sordan, Angelo Bongiorno and Elisa Riedo, "Elastic coupling between layers in two-dimensional materials", **Nature Materials** 14, 714–721 (2015), DOI: 10.1038/nmat4322
9. Ricardo Garcia, Armin Knoll, and Elisa Riedo "Advanced Scanning Probe Lithography", **Nature Nanotechnology**, 9, 577 (2014) DOI: 10.1038/NNANO.2014.157. > 100 citations
10. Robert Szoszkiewicz and Elisa Riedo "Sliding Charges" **News & Views, Nature Materials**, 13, 666–668 (2014) DOI: 10.1038/nmat4020.

11. Hsiang-Chih Chiu, Tai-De Li, Deborah Ortiz-Young, Elisa Riedo, "Nanorheology by atomic force microscopy", **Review of Scientific Instruments**, 85 (12), 123707 (2014)
12. Hsiang-Chih Chiu, Kyung Duk Koh, Marina Evich, Annie L. Lesiak, Markus W. Germann, Angelo Bongiorno, Elisa Riedo and Francesca Storici "How RNA intrusions change DNA structure and elastic properties", **Nanoscale** 6 (17), 10009-10017 (2014) DOI: 10.1039/C4NR01794C.
13. Keith M. Carroll, Maitri Desai, Anthony J. Giordano, Jan Scrimgeour, William P. King, Elisa Riedo, and Jennifer E. Curtis "Speed Dependence of Thermochemical Nanolithography for Gray-Scale Patterning", in press in **ChemPhysChem**, (2014) DOI: 10.1002/cphc.201402168.
14. Si Zhou, Suenne Kim, Emiliano Di Gennaro, Yike Hu, Cheng Gong, Chien-Yuan Chang, Xi Lu, Hsiang-Chih Chiu, Claire Berger, Walt de Heer, Elisa Riedo, Yves J. Chabal, Carmela Aruta, and Angelo Bongiorno "Film Structure of Epitaxial Graphene Oxide on SiC: Insight on the Relationship Between Interlayer Spacing, Water Content, and Intralayer Structure", **Advanced Materials Interfaces**, DOI: 10.1002/admi.201300106 (2014).
15. Keith M. Carroll, Xi Lu, Suenne Kim, Yang Gao, Hoe-Joon Kim, Suhas Somnath, Laura Polloni, Roman Sordan, William P. King, Jennifer E. Curtis, Elisa Riedo "Parallelization of Thermochemical Nanolithography", **Nanoscale** 6 (3), 1299 – 1304, (2014).
16. Deborah Ortiz-Young, Hsiang Chih Chiu, Suenne Kim, Kison Voitchovsky and Elisa Riedo "The interplay between apparent viscosity and wettability in nanoconfined water", **Nature Communications**, 4, 2482, (2013) DOI: 10.1038/ncomms3482.
17. K. M. Carroll, A. J. Giordano, D. Wang, V. K. Kodali, J. Scrimgeour, W. P. King, S. R. Marder, E. Riedo, and J. E. Curtis, "Fabricating nanoscale chemical gradients with thermochemical nanolithography," **Langmuir**, 29 (27), 8675–8682 (2013).
18. Suenne Kim, Si Zhou, Yike Hu, Muge Acik, Yves J. Chabal, Claire Berger, Walt de Heer, Angelo Bongiorno, and Elisa Riedo "Room Temperature Metastability of Multilayer Epitaxial Graphene Oxide", **Nature Materials**, 11, 544, (2012). > 200 citations
19. Hsiang-Chih Chiu, Sedat Dogan, Mirjam Volkmann, Christian Klinke, and Elisa Riedo "Adhesion and size dependent friction anisotropy in boron nitride nanotubes", **Nanotechnology**, 23, 455706 (2012).
20. H.-C. Chiu, S. Kim, C. Klinke, and E. Riedo, "Morphology dependence of radial elasticity in multiwalled boron nitride nanotubes", **Appl. Phys. Lett.** 101, 103109 (2012).
21. Marcel Lucas, and Elisa Riedo, Invited Review Article: "Combining scanning probe microscopy with optical spectroscopy for applications in biology and materials science", **Rev. Sci. Instrum.** 83, 061101 (2012) (Cover Article).
22. Hsian-Chih Chiu, Beate Ritz, Suenne Kim, Erio Tosatti, Christian Klinke, Elisa Riedo "Sliding on a Nanotube: Interplay of Friction, Deformations and Structure" **Adv. Mat.**, 24, 2879 (2012). (Cover Article)
23. Suenne Kim, Yaser Bastani, Haidong Lu, William P. King, Seth Marder, Kenneth H. Sandhage, Alexei Gruverman, Elisa Riedo, and Nazanin Bassiri-Gharb "Direct fabrication of arbitrary-shaped ferroelectric nanostructures on plastic, glass and silicon substrates", **Adv. Mat.**, 23, 3786–3790, (2011). (Cover Article)
24. Z. Q. Wei, D. B. Wang, S. Kim, S. Y. Kim, Y. K. Hu, M. K. Yakes, A. R. Laracuenta, Z. T. Dai, S. R. Marder, C. Berger, W. P. King, W. A. de Heer, P. E. Sheehan, and E. Riedo, "Nanoscale Tunable Reduction of Graphene Oxide for Graphene Electronics," **Science**, 328, 1373-1376, (2010). > 450 citations
25. Wen Chen, Gozde Guler, Elizabeth Kuruvilla, Gary B. Schuster, Hsiang-Chih Chiu, Elisa Riedo, "Development of Self-Organizing, Self-Directing Molecular Nanowires: Synthesis and Characterization of Conjoined DNA-2,5-Bis(2-thienyl)pyrrole Oligomers", **Macromolecules**, 43, 4032, (2010).

26. M. Lucas, Z. L. Wang, and E. Riedo, "Growth direction and morphology of ZnO nanobelts revealed by combining in situ atomic force microscopy and polarized Raman spectroscopy" **Phys. Rev. B** 81, 045415 (2010).
27. D. B. Wang, S. Kim, W. D. Underwood, Lee, W. P. King, R. Marder, E. Riedo, "Direct Writing and characterization of PPV nanostructures", **Appl. Phys. Lett.** 95, 233108 (2009).
28. Marcel Lucas, Xiaohua Zhang, Ismael Palaci, Christian Klinke, Erio Tosatti, and Elisa Riedo "Hindered rolling and friction anisotropy in supported carbon nanotubes" **Nature Materials** 8, 876 (2009). Featured in News & Views of Nature Materials.
29. D. Wang, V. Kodali, W. D. Underwood, J. E. Jarvholm, T. Odaka, S. C. Jones, M. Rumi, Z. Dai, W. P. King, S. R. Marder, J. E. Curtis, and E. Riedo "Thermochemical nanolithography of multi-functional templates for assembling nano-objects" **Adv. Funct. Mat.** 19, 3696 (2009) (Cover Article).
30. M. Lucas, Z.L. Wang, and E. Riedo, "Combined polarized Raman and atomic force microscopy: In situ study of point defects and mechanical properties in individual ZnO nanobelts" **Appl. Phys. Lett.** 95, 051904 (2009).
31. E. Gnecco, E. Riedo, W.P. King, S.R. Marder and R. Szoszkiewicz, "Linear ripples and traveling circular ripples produced on polymers by thermal AFM probes" **Phys. Rev. B** 79, 235421 (2009).
32. M. Lucas, K. Gall, and E. Riedo, "Tip size effects on AFM nanoindentation of a gold single crystal" **J. Appl. Phys.** 104, 113515 (2008).
33. M. Lucas, A. M. Leach, M. T. McDowell, S. E. Hunyadi, K. Gall, C. J. Murphy, and E. Riedo, "Plastic deformation of pentagonal silver nanowires: Comparison between AFM nanoindentation and atomistic simulations" **Phys. Rev. B** 77, 245420 (2008).
34. T.-D. Li, and E. Riedo "Nonlinear viscoelastic dynamics of nanoconfined wetting liquids", **Phys. Rev. Lett.** 100, 106102 (2008) (Highlighted by News Media).
35. D. B. Wang, M. Lucas, R. Szoszkiewicz, E. Riedo, T. Okada, S. C. Jones, S. R. Marder, Lee, W. P. King, "Local wettability modification by thermochemical nanolithography with write-read-overwrite capability", **Appl. Phys. Lett.** 91, 243104 (2007) (Highlighted by Virtual Journal of Nanoscale Science & Technology).
36. R. Szoszkiewicz, T. Okada, S. C. Jones, T.-D. Li, W. P. King, S. R. Marder and E. Riedo "High-speed, thermochemical nanolithography with sub-15 nm feature size", **Nano Letters** 7, 1064 (2007). (Highlighted by News Media). > 140 citations
37. M. Lucas, W. Mai, J.H. Song, Z.L. Wang and E. Riedo "Aspect ratio dependence of the elastic properties of ZnO nanobelts", **Nano Letters** 7, 1314 (2007). > 110 citations
38. T.-D. Li, J. Gao, R. Szoszkiewicz, U. Landman and E. Riedo "Structured and viscous water in subnanometer gaps", **Phys. Rev. B** 75, 115415 (2007). (Highlighted by News Media). > 220 citations
39. S. Yoo, W. J. Potscavage Jr., B. Domercq, S.-H. Han, T.-D. Li, S. C. Jones, R. Szoszkiewicz, D. Levi, E. Riedo, S. R. Marder, B. Kippelen, "Analysis of improved photovoltaic properties of pentacene/C60 organic solar cells: Effects of excitons blocking layer thickness and thermal annealing", **Solid-State Electronics** 51, 1367 (2007). > 110 citations
40. M. Lucas, W. Mai, J.H. Song, Z.L. Wang and E. Riedo "Size dependence of the mechanical properties of ZnO nanobelts", **Philos. Mag.** 87, 2135 (2007).
41. E. Gnecco, E. Riedo, R. Bennewitz, E. Meyer, H. Brune, "Thermally activated phenomena in nanoscopic sliding friction" **Tribotest** 12, 2169 (2006).
42. L. Sirghi, R. Szoszkiewicz and E. Riedo, "Volume of Nanoscopic Menisci", **Langmuir** 22, 1093 (2006). > 100 citations
43. R. Szoszkiewicz and E. Riedo, "Nucleation time of nanoscale water bridges", **Phys. Rev. Lett.** 85, 135502 (2005). ~100 citations
44. J.H. Song and X.D. Wang and E. Riedo and Z.L. Wang, "Elastic Property of Vertically Aligned Nanowires/Nanotubes", **Nano Letters** 12, 1954 (2005). > 300 citations

45. R. Szoszkiewicz and E. Riedo, "Friction forces as a local probe of Phase transitions", **App. Phys. Lett.** 87, 033105 (2005). (Highlighted by News Media).
46. J.H. Song and X.D. Wang and E. Riedo and Z.L. Wang, "Systematic study on experimental conditions for large-scale growth of aligned ZnO nanowires on nitrides", **J. Phys. Chem. B** 109, 9869 (2005). > [150 citations](#)
47. I. Palaci, S. Fedrigo, H. Brune, C. Klinke, M. Chen and E. Riedo, "Radial Elasticity of Multiwalled Carbon Nanotubes", **Phys. Rev. Lett.** 94, 175502, (2005). (Highlighted by News Media). > [160 citations](#)
48. E. Riedo, I. Palaci, C. Boragno, H. Brune, "2/3 power law dependence of Capillary Force in Nanoscopic Friction", **J. Phys. Chem. B** 108, 5324 (2004).
49. E. Riedo and E. Gnecco, "Thermally activated effects in Nanofriction", **Nanotechnology** 15 S288 (2004).
50. E. Riedo, H. Brune, "Nano-Friction and Young Modulus in Hard Coatings", **Appl. Phys. Lett.** 83, 1986 (2003).
51. E. Riedo, E. Gnecco, R. Bennewitz, E. Meyer, H. Brune, "Interaction Potential and Attempt Frequency Governing Sliding Friction", **Phys. Rev. Lett.** 91, 084502, (2003). (Highlighted by News Media). > [220 citations](#)
52. E. Riedo, F. Levy, H. Brune, "Kinetics of capillary condensation in nanoscopic sliding friction", **Phys. Rev. Lett.** 88, 185505-4, (2002). (Highlighted by News Media). > [230 citations](#)
53. R. Haerle, E. Riedo, A. Pasquarello, A. Baldereschi "sp<sup>2</sup>/sp<sup>3</sup> hybridization ratio in amorphous carbon from C1s core-level shifts: X-ray photoelectron spectroscopy and first-principles calculation", **Phys. Rev. B.** 65, 045101, (2002). > [250 citations](#)
54. S. Abbet, E. Riedo, H. Brune, U. Heiz, A. M. Ferrari, L. Giordano, G. Pacchioni, "Identification of defect sites on MgO(100) thin films by decoration with Pd atoms and studying CO adsorption properties", **J. Am. Chem. Soc.** 123(25), 6172, (2001). > [110 citations](#)
55. E. Riedo, J. Chevrier, F. Comin, H. Brune, "Nanotribology of carbon based thin films: the influence of film structure and surface morphology", **Surf. Sci.** 477/1, 25, (2001).
56. C. Aruta, J. Zegenhagen, B. Cowie, D. Luebbert, T. Baumbach, G. Pasquini, G. Balestrino, P. G. Medaglia, F. Ricci, E. Riedo, L. Ortega, "Structure of superconducting [BaCuO<sub>x</sub>]<sub>2</sub>/[CaCuO<sub>2</sub>]<sub>n</sub> superlattices on SrTiO<sub>3</sub>(0001) investigated by X-ray scattering", **Phys. Stat. Sol. (A)** 183, 353, (2001).
57. E. Riedo, F. Comin, J. Chevrier, A. M. Bonnot, "Composition and chemical bonding of pulsed laser deposited carbon nitride thin films", **J. Appl. Phys.** 88, 4365, (2000).
58. E. Riedo, F. Comin, J. Chevrier, F. Schmithusen, S. Decossas, M. Sancrotti, "Structural properties and surface morphology of amorphous Carbon and Carbon Nitride films," **Surf. Coat. Technol.** 125, 124, (2000). > [110 citations](#)
59. E. Riedo, E. Magnano, S. Rubini, M. Sancrotti, E. Barborini, P. Piseri, P. Milani, "EELS and XPS analysis of carbon films grown by cluster beam deposition with different nanostructures", **Solid State Comm.** 116, 287, (2000).
60. G. Ghislotti, E. Riedo, D. Ielmini, M. Martinelli, "Intersubband relaxation time for InGaAs/AlAs quantum wells with a large transition energy", **Appl. Phys. Lett.** 75, 3626 (1999).
61. G. Ghislotti, D. Ielmini, E. Riedo, M. Martinelli, "Picosecond time-resolved photoluminescence studies of recombination processes in CdTe", **Solid State Comm.** 111, 211, (1999).

#### PUBLISHED BOOKS, BOOK CHAPTERS, AND EDITED VOLUMES

62. Kyung Duk Koh, Hsiang-Chih Chiu, Elisa Riedo and Francesca Storici "Measuring the elasticity of ribonucleotide(s)-containing DNA molecules using AFM", book chapter in *Methods in Molecular Biology with the topic of RNA nanotechnology*, Springer Protocols, (2015)

63. D. Wang, V. Kodali, J. Curtis, E. Riedo, "Nanofabrication of Functional Nanostructures by Thermochemical Nanolithography" book chapter in *Tip Based Nanofabrication: Fundamentals and Applications*, Springer (2011).
64. D. Wang, R. Szoszkiewicz, V.K. Kodali, J.E. Curtis, S.R. Marder, E. Riedo, "A New-AFM Based Lithography Method: Thermochemical Nanolithography," *Applied Scanning Probe Methods, Volume 10: Biomimetics and Industrial Applications*, (2010).
65. M. Lucas, T.-D. Li, E. Riedo, "Nanomechanics: Fundamentals and NEMS," book chapter in *Nanoelectronics and Photonics, From Atoms to Materials, Devices, and Architectures*, in the Nanostructure Science and Technology series, Springer (2008).
66. R. Szoszkiewicz, E. Riedo, "New AFM Developments to Study Elasticity and Adhesion at the Nanoscale," book chapter in *Applied Scanning Probe Methods V*, in the NanoScience and Technology series, Springer (2007).
67. L. Merchan, R. Szoszkiewicz, E. Riedo, "NanoMechanics: Elasticity in Nano-Objects," book chapter in *Fundamentals of Friction and Wear on the nanoscale*, in the NanoScience and Technology series, Springer (2007).

#### **PATENTS AND COMMERCIALIZATION**

1. "Method and equipment for magnetic nanopatterning of substrates" patent filed in the name of Politecnico di Milano and Georgia Tech Research Corporation
2. United States Patent Application: "Thermochemical Nanolithography Components, Systems, And Methods", Serial No.: 12/791,466, Issue Date: 18 June 2013, US 8,468,611
3. "Thermochemical Nanolithography Components, Systems, And Methods" EP2435880, 11 September 2013
4. License for "Thermochemical Nanolithography (TCNL) Components, Systems, And Methods" ID 4720 (Leading Inventor: Riedo), to *Nanolnk* and at present under negotiation with *SwissLitho AG*. TCNL is a key-technology for the machine "NanoFrazor" commercialized by *SwissLitho AG*. Further developments for commercialization of TCNL with *SwissLitho AG* are under negotiation and one NanoFrazor was installed Nov 2016 in Riedo's lab. Riedo is also in the Technical Advisory Board of *SwissLitho AG*.

#### **IV. GRANTS AND CONTRACTS**

##### **SUBMITTED:**

LAST ROUND OF REVISION — NSF REVERSE SITE VISIT  
 NSF – Engineering Research Center, co-P.I. (**Thrust 1 Leader**)  
 "ERC: *Center for Biological Applications of Solid-State Systems.*"  
 03/2017 – 03/2021, \$17,000,000.

NSF – NRT-IGE: PhD-TD: *Trans-Disciplinary Doctoral Training Across Scales*  
 \$369,118

Air Force Research Lab/AFOSR: White Paper "*Mechanism of Adhesion of Gas Vesicles*"

NSF PIRE proposal — MILES (Materials Inspired by Living Emergent Systems)

#### FUNDED AND ACTIVE:

1. NSF – CMMI, P.I.  
*“MRI: Acquisition of NanoFrazor for nanofabrication of advanced nanomaterials with ultimate resolution and flexibility.”*  
08/2016 – 07/2019, \$910,000.
2. DOE-BES, Single P.I.  
*“Nanomechanics: elasticity and friction in nano-objects.”*  
08/2006 – 07/2019, (4 successful renewals). \$2,000,000.
3. NSF – CBET, P.I.  
*“Nanoscale investigations of water-solid interfaces for filtration applications.”*  
08/2016 – 07/2019, \$345,000.
4. Army Research Office, co-P.I. (2 Investigators)  
*“Chemical Sciences: Transient Nanopatterns by Biocatalytic Self-Assembly.”*  
08/2016-07/2020. \$ 595,848.
5. NSF – CMMI, P.I.  
*“Controlling the chemistry at the nanoscale: Parallelization, Robustness, and Registration.”*  
08/2014 – 07/2017, \$445,000.
7. New York Stem Cells Foundation Seed Grant, P.I. (\$10,000)  
*“Design and Screening of Material Surfaces Controlling Stem Cell Fate”*
8. New York Stem Cells Foundation Seed Grant, P.I. (\$10,000)  
*“In vitro human myelination of axonal-like conducting nanofibers mimicking the neuronal firing process”*
9. European Commission REA Marie Sklodowska-Curie COFUND Global Fellowship Program  
*“Patterning Spin-Wave reconfigurable Nanodevices for loGics and computing: SWING”*  
11/1/2016 – 11/1/2019, \$244,000 (Funding for a 2-year Post Doc in Riedo’s Lab)
10. NSF – DMR, Columbia and City College New York MRSEC, IRG 1, Seed Project  
*“MRSEC - Center for Precision Assembly of Superstratic And Superatomic Solids”*
11. ASRC-CUNY Seed Grant Co-P.I. (\$10,000)
12. ASRC-CUNY Seed Grant Co-P.I. (\$10,000)
13. Industry Grant, Swiss Litho AG (Single P.I.)  
*“Nanopatterning Materials for BioTech and Photonics Applications”*  
02/2017 – 02/2019, \$160,000.

#### FUNDED AND EXPIRED

1. NSF - Civil, Mechanical and Manufacturing Innovation.  
PI. 03/2011 – 12/2014. 3 years. \$350,000

2. Georgia Tech – IBSI “Physical detection and mechanical properties of ribonucleotides embedded in DNA” Multi-Investigators (2), co-PI. 1 year. \$30,000
3. NSF – MRSEC “The Georgia Tech Laboratory for New Electronic Materials”. co-PI. 12/2008 – 11/2014. 6 years. \$8,000,000.
4. DOE, Capital Equipment Supplement to “Nanomechanics: elasticity and friction in nano-objects”. Single Investigator, PI. 08/2011 – 07/2013. \$65,028
5. Renewal of NSF – STC “Materials and Devices for Information Technology Research”. co-PI. 08/2007 – 07/2013. 5 years. \$17,976,000.
6. NSF-NUE “NUE: The Nanotechnology Certificate Program at Georgia Tech”. co-PI. 09/2008 – 8/2010. 3 years. \$199,567.
7. President’s Undergraduate Research Award, Fall semester 2011. \$1,500
8. Renewal NSF-DMR, “Liquid dynamics in nano-confined geometries: Nano-hydrodynamics”. Single Investigator, PI. 09/2007 – 08/2010. 3 years. \$300,000.
9. GAAN Support, US Dept of Education, 08/2009 - 08/2013. \$6,763
10. College of Science Cutting Edge Research Award. Single Investigator, PI. 01/2006 – 06/2008. \$50,000.
11. NSF-STC International Research Experience Program, PI. 01/2006 – 03/2008. \$138,000.
12. Seed Project in NSF–STC “Materials and Devices for Information Technology Research”. Single Investigator, PI. 02/2005 – 08/2007. 2 years. \$158,700.
13. ACS Petroleum Research Foundation, Single Investigator, PI. 09/2004 – 08/2008. 2 Years (extended). \$80,000
14. NSF-DMR, “Interaction Forces in Water at the Nanoscale”. Single Investigator, PI. 06/2004 – 06/2007. \$151,000.
15. President’s Undergraduate Research Award, fall semester 2004. \$1,500
16. Swiss NSF grant, visiting researcher for 6 months.

## **V. PRESENTATIONS**

### **Invited Talks at International Conferences (Selected Ones):**

- Fall 2017 MRS Meeting Boston (upcoming)
- June 2017, ICTP-COST-MODPHYSFRICT Conference on “Trends in Nanotribology 2017, the Abdus Salam International Centre for Theoretical Physics (ICTP) in Trieste (upcoming)
- May 2017, STLE Tribology and Lubrication Engineering Society, Atlanta (upcoming)
- February 2017, TMS 2017 Annual Meeting & Exhibition (upcoming)



- November 2015. NanoFab in NYC Workshop
- October 2015, Tribology Frontiers Conference, Denver
- September 2015, Active and Adaptive Materials Workshop, NYC
- September 2015, Mechanical Behavior of Materials Workshop
- February 2015, Nanoscience NY Workshop, NYC
- June 2014, 13<sup>th</sup> International Ceramics Conference, CIMTEC
- January 2014 – Workshop on “Thermal Lithography”, IBM Zurich
- November 2013 - Conference on Frontiers of Condensed Matter Physics, ICTP, Trieste
- October 2013: AVS 60th International Symposium and Exhibition, “Novel 2D Materials”
- August 2012: "Dynamics and Jamming in Complex Environments," ACS National Meeting in Philadelphia, PA
- June 2012: SuperFOx, Como, (Italy)
- August 2012: MRS Joint Meeting, XXI International Materials Research Congress, Cancun
- April 2012: Lorentz Center Workshop “Fundamentals of Friction and Lubrication” (Netherlands)
- February 2012: NSF Site Visit of GT MRSEC – co-PI Seminar
- September 2011: Joint ICTP-FANAS Conference on Trends in Nanotribology, International Center of Theoretical Physics (ICTP)
- June 2011: International Conference on Mechanical Behavior of Materials, ICM11, Villa Erba
- May 2011: South east Soft Materials Workshop, Georgia Institute of Technology
- September 2010: DOE/BES Mechanical Behavior and Radiation Effects of Materials Contractors' Meeting, Washington DC, (USA).
- June 2010: 8<sup>th</sup> International Workshop on Epitaxial Semiconductors on Patterned Substrates and Novel Index Surfaces Como (Italy)
- October 2009: “NanoComposite 2009” Lake Louise, Canada.
- August 2009: “Gordon Conference: Chemistry and Physics of Liquids”, Holderness School, Plymouth NH (USA).
- October 2008: “Conference on the Physics, Chemistry, and Biology of Water 2007”, Vermont (USA).
- June 2008: “Physics of Micro- and NanoFluids”, Lorentz Center, Leiden (NL).
- April 2008: “Behavior of Defects in Materials - Contractors Meeting 2008”, Warrenton, VA (USA).
- October 2007: “Conference on the Physics, Chemistry, and Biology of Water 2007”, Vermont (USA).
- October 2006: Workshop on “Frontiers of Scanning Probe Microscopy,” Purdue University, West Lafayette, Indiana, (USA).
- September 2006: 5th ESF-Nanotribology Workshop, Antalya (Turkey).

- March 2006: ACS National Meeting in Atlanta, Georgia (USA).
- March 2004: Frontiers in Tribology 2004, Oak Ridge, Tennessee (USA).
- Fall 2004: GT Materials Council Nano-materials Forum, (USA).
- June 2005: 4rd ESF-Nanotribology Workshop, Porcherolles (France).
- September 2003: International Conference, "TNT03: Trends in NanoTechnology, 2003," Salamanca (Spain).
- February 2003: International Conference, "From elasticity to plastic flow in condensed media," Les Houches (France).

**Invited Seminars and Colloquia at Universities/Research Centers:**

- February 2017: New York University Tandon School of Engineering, (USA)
- November 2016: New York University, (USA)
- October 2016: CUNY Graduate Center (USA)
- Fall 2016: German Delegation Workshop, Columbia University (USA)
- April 2016: Yale University (USA)
- March 2016: City College New York (USA)
- February 2016: Air Force Research Lab, Dayton OH (USA)
- January 2016: Columbia University (USA)
- November 2015: New York University, (USA)
- October 2015: MRS Student Chapter
- February 2014: City College New York, (USA)
- June 2013: IBM, Zurich (CH)
- September 2012: New York University, (USA)
- June 2012: IBM, Zurich (CH).
- June 2010: Politecnico of Milan (Italy).
- March 2009: University of Miami (USA).
- November 2008: Agilent Workshop, Georgia Tech, (USA).
- September 2008: The Johns Hopkins University, (USA).
- April 2008: Colloid & Soft Matter Bag Lunch Seminar series, Georgia Tech, (USA).
- April 2007: University of South Florida (USA).
- July 2006: Solvay Workshop, Georgia Tech, (USA).
- June 2006: University of Maryland (USA).
- May 2006: School of Chemistry and Biochemistry, Georgia Tech, (USA).
- April 2006: University of South Florida (USA).

- January 2006: Emory University (USA).
- January 2006: University of Maryland (USA).
- September 2005: North Carolina State University (USA).
- Spring 2005: Invited lecture in MSE, Georgia Tech, (USA).
- Fall 2004: COPE seminar series, Georgia Tech, (USA).
- Summer 2004: School of Physics, REU seminar series, Georgia Tech, (USA).
- Spring 2004: Center for Process Systems Engineering series, Georgia Tech, (USA).
- January 2003: Georgia Institute of Technology (USA).
- November 2002: CNRS Grenoble (France).
- October 2002: University of Basel (Switzerland).
- September 2002: PCSM-ESPCI, Paris (France).
- May 2002: University of Paris VII (France).
- April 2002: University of Cambridge (England).
- September 2000: EPFL Lausanne (Switzerland).

## **VI. HONORS AND AWARDS**

- 2013: American Physical Society Elected Fellow, for *“For atomic force microscopy studies of nanoscale friction, liquid structure and nanotube elasticity, and the invention of thermochemical nanolithography”*.
- 2006: GT College of Science Cutting Edge Research Award
- 2005: Selected as *Highly Creative Researcher in Nanoscience and Nanotechnology* for the “Project on Creativity Capabilities and the Promotion of Highly Innovative Research” (CREA), a joint USA/European endeavor.
- 2002: Best Poster, Gordon International Conference Tribology 2002.
- 1999: Best ESRF Graduate Student Grant Award, ESRF, Grenoble.
- 1995: Physics Degree *Summa cum Laude*.

## **VII. Boards and Meeting Organization:**

1. Technical Advisory Board of *SwissLitho* AG.
2. Editorial Board Member for *Nature “Scientific Reports”* (2012-present)
3. Editorial Board Member for *“Review of Scientific Instruments”* (2008-2010).
4. Session Chair at the 2016 APS March Meeting Symposium on Nanoconfined water.
5. Co-Organizer of the workshop *NanoFab in NYC*, November 2015

6. Co-Organizer and Session Chair of the *Focus Topic* "Physics of Confined Liquids" at the 2015 APS March Meeting.
7. Member of the program committee for the 2014 AVS Symposium on Novel 2D Materials
8. Session Chair at the 2013 AVS Symposium on Novel 2D Materials.
9. Session Chair at the 2012 ACS Symposium on Dynamics and Jamming.
10. Co-Organizer of the *Focus Topic* "Tribophysics" at the 2010 APS March Meeting.
11. Founder and co-Organizer of the "Southeast Workshop Series on Soft Materials", GeorgiaTech Campus, yearly since 2008.
12. Co-Organizer of the Conference "Nano and Giga Challenges in Electronics, Photonics and Renewable Energy", Hamilton, Ontario, Canada, August 10-14, 2009.
13. Co-Organizer and Chair of the *Focus Topic* "Friction, Fracture, and Deformation" at the 2007 March Meeting of the American Physical Society (APS).
14. Co-chair of the symposium on "Nanotechnology and MEMS: Experiments and Modeling", 12<sup>th</sup> International Conference on Experimental Mechanics (ICEM12), 2004.

## **VIII. TEACHING**

### **A. COURSES TAUGHT (LAST 8 YEARS)**

#### **Georgia Tech**

Spring 2008	Phys 3141A	Thermodynamics	47
Fall 2008	Phys 4142A	Statistical Mechanics	37
Spring 2009	Phys 3141A	Thermodynamics	41
Fall 2009	Phys 2213B	Intro to Modern Physics	21
Spring 2010	Phys 4803N and Phys 8803A	Special Topics	15
Fall 2010	Phys 2213B	Intro to Modern Physics	26
Spring 2011	Phys 8803A and Phys 4803N	Special Topics	7
Fall 2011	Phys 2212N	Introductory Physics II	209
Spring 2012	Phys 8803A and Phys 4803N	Special Topics	7
Fall 2012	Phys 2212Q	Introductory Physics II	207
Spring 2013	Phys 4142A	Statistical Mechanics	31
Fall 2013	Phys 2213B	Intro to Modern Physics	30
Spring 2014	Phys 2213B	Intro to Modern Physics	15
Fall 2014	Phys 2213B	Intro to Modern Physics	30
Spring 2015	Phys 3141A	Thermodynamics	40

#### **CUNY**

Fall 2016	Phys22300	Physics I for Pre-Med	95
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#### **OTHER TEACHING ACTIVITIES**

1. New course development: *Nanoscale Properties and Characterization* (2011-2012)

## **IX. SERVICE**

### **Service on thesis and dissertation committees**

- The University of Western Australia, Ph.D. Thesis External Examiner (2014)
- GT School of Physics Ph.D. Thesis Committees (2007, 2008, 2010, 2013, 2016)
- GT School of Chemistry and Biochemistry OP-Ph.D. Thesis Committees (2006, 2008, 2014)
- GT Material Science Engineering Ph.D. Thesis Committee (2006 and 2007)
- GT Mechanical Engineering Ph.D. Thesis Committee (2007, 2015)

### **Review Activities:**

Reviewer for:

- The National Science Foundation (NSF) and NSF-Panel Reviewer
- The ACS Petroleum Foundation
- The Department of Energy (DOE)
- The Swedish National Science Foundation
- The European Science Foundation (ESF)
- The Swiss National Science Foundation
- Reviewer for the Following Journals:
- Nature, Nature Nanotechnology, Nature Materials, Nature Communications, ACS Nano, Physical Review Letters, Physical Review B, Journal of Physical Chemistry B, Journal of Chemical Physics, Tribology Letters, Applied Physics Letters, Review of Scientific Instruments, Advanced Materials, Applied Surface Science, Langmuir, Nano Letters.

### **Committees - Georgia Tech:**

- Reappointment, Promotion and Tenure Committee (2011-12-13-14)
- Condensed Matter faculty search committee (2013-2014)
- Colloquium committee (2011-12-13)
- Biophysics faculty search committee (2011)
- Materials Task Force member (2011)
- Globalization Task Force member (2011-2012)
- Physics Chair Faculty Search Committee (2010)
- Biophysics Search Committee, Physics (2007-08-09-10)
- Strategic Planning Committee: Physics (2007-08)
- Physics Faculty Advisory Committee (elected in 2007)
- Undergraduate physics major advisement (2004-2007)
- Physics Graduate Students Committee (2007)
- Physics Special Topics Seminar, Chair (2007)

- Physics Chair Faculty Search Committee (2005)
- Georgia Tech Sigma-Xi best PhD thesis Committee (2006)
- Physics Society of Physics advisor (2004-2005)
- Physics Undergraduate Committee (2005)
- Physics Colloquium Committee (2004, 2005)
- Physics Graduate Exam Committee (2004-2005)

#### **Committees – CUNY ASRC:**

- Nanoscience Professor Search Committee (2016)
- Physics Graduate Program Improvement (2016)

#### **X. SOCIETAL AND POLICY IMPACTS**

- CUNY Women in Science 2015: Breaking Barriers to Success forum ([YouTube](#))
- Presentation for the William E. Macaulay Honors College UG students (2016)
- Elementary School activities at the Atlanta International School (2010-2014)
- Graduate Students Recruitment and International Activities (Georgia Tech)
- May 2014, Women in Physics (WiP) at Georgia Tech, co-Founder, <http://www.wip.gatech.edu>
- April 2014, Public Lecture for Prospective Undergraduates at Georgia Tech
- November 2012, Lecture for "Inquiring Minds @ Tech" Public Lecture Series
- Lecture on *A Molecular Foundry @ GT* for the Physics Homecoming Event (Spring 2011)
- Presentation for a Career Panel at the 2008 NSF-STC retreat in Atlanta, Spring 2008.
- WIC (Women in Chemistry) & CMDITR - Georgia Tech Leadership Lunch "Female Faculty Work Life Balance", October 2008.
- Organization of the Women in Science Film Festival on Georgia Tech campus, March 2005.