

Curriculum Vitae

Xinsheng Sean Ling (凌新生)

1. Home Address:

105 River Farm Drive, East Greenwich, RI 02818 USA

2. Education

1984 B.S. (Physics), Wuhan University

1987 M.S. (Metal Physics), Institute of Metal Research, Chinese Academy of Sciences

1992 Ph.D. (Physics), University of Connecticut

3. Professional Experience

1992-94 Postdoctoral Research Associate, Yale University

1994-96 Visiting Scientist (postdoc), NEC Research Institute, Princeton, NJ

1996-02 Assistant Professor of Physics, Brown University

2002-08 Associate Professor of Physics (with tenure), Brown University

2008- Professor of Physics (with tenure), Brown University

2002-03 Visiting Professor, Delft University of Technology, the Netherlands

2015-18 Visiting Professor (1000-People Plan 千人计划), Southeast University, Nanjing, China

2018-2020 Visiting Professor, Soochow University, Suzhou, China

4. Academic Honors

1998 Alfred P. Sloan Fellow

1999 Research Innovation Awards, Research Corporation

2002 John Simon Guggenheim Fellow

2005 Fellow, American Physical Society

2012 China National 1000-People Plan, 中国国家千人计划第九批入选者

5. Refereed Publications and Book Chapters

[Citations 6779 (Google Scholar) 1/18/2023]

[54] Huaguang Wang, Zexin Zhang, Xinsheng Sean Ling. "2D phase behaviors of colloidal ellipsoids and rods." *Frontiers in Physics*, **10**, 1043983 (2022).

[53] Dan Zhou, Hansong Zeng, Rujun Tang, Zhi H. Hang, Zhiwei Hu, Zixi Pei, X. S. Ling, "On the Origin of the Anomalous Sign Reversal in the Hall Effect in Nb Thin Films", *Chinese Physics B* **31**, 037403 (2022). <https://doi.org/10.1088/1674-1056/ac3ba8>

[52] Hansong Zeng, Dan Zhou, Guoqing Liang, Rujun Tang, Zhi H. Hang, Zhiwei Hu, Zixi Pei, X. S. Ling, "Kondo effect and superconductivity in niobium with iron impurities", *Scientific Reports* **11**, 14256 (2021). DOI: 10.1038/s41598-021-93731-6

[51] Ya Chen, Xinlan Tan, Huaguang Wang, Zexin Zhang, J. M. Kosterlitz, X. S. Ling, "2D Colloidal Crystals with Anisotropic Impurities", *Phys. Rev. Lett.* **127**, 018004 (2021).

[50] Xinlan Tan, Ya Chen, Huaguang Wang, Zexin Zhang, and Xinsheng Sean Ling, "2D isotropic-nematic transition in colloidal suspensions of ellipsoids", *Soft Matter* **17**, 6001–6005 (2021). DOI: 10.1039/d1sm00367d.

[49] Xinzhuo Liu, Huaguang Wang, Zexin Zhang, J.M. Kosterlitz, and X.S. Ling, "Nature of the glass transition in 2D colloidal suspensions of short rods", *New J. Phys.* **22**, 103066 (2020).

[48] Sung-Cheol Kim, Lichao Yu, Alexandros Pertsinidis, and Xinsheng Sean Ling. "Dynamical processes of interstitial diffusion in a two-dimensional colloidal crystal." *Proc. Natl Acad. Sci. USA*, **117**, 13220 (2020).

[47] X.S. Ling, "DNA Sequencing using Nanopores and Kinetic Proofreading", *Quantitative Biology* **2020**, 8(3): 187–194 (2020).

[46] Xia, Deying, Huynh, Chuong, McVey, Shawn, Kobler, Aaron, Stern, Lewis, Yuan, Zhishan, Ling, Xinsheng Sean, "Rapid fabrication of solid-state nanopores with high reproducibility over a large area using helium ion microscope". *Nanoscale* **10**: 5198-5204 (2018).

[45] X. Luo, V. Stanev, B. Shen, L. Fang, X.S. Ling, S. Rosenkranz, T.M. Benseman, R. Divan, W.-K. Kwok, and U. Welp, "Antiferromagnetic and nematic phase transitions in $\text{BaFe}_2(\text{As}_{1-x}\text{P}_x)_2$ studied by ac microcalorimetry and SQUID magnetometry", *Phys. Rev. B* **91**, 094512 (2015).

[44] Daniel Y. Ling and Xinsheng Sean Ling, "On the distribution of DNA translocation times in solid-state nanopores: an analysis using Schrödinger's first-passage-time theory", *J. Phys.: Condens. Matter* **25**, 375102 (2013). (Highlight: <http://iopscience.iop.org/0953-8984/page/Highlights-of-2013>)

[43] Sungcheol Kim, Lichao Yu, Stephanie Huang, Alexandros Pertsinidis, and Xinsheng Sean Ling, "Optical Tweezers as a Micromechanical Tool for Studying Defects in 2D Colloidal Crystals (Invited Paper)", *Proc. of SPIE Vol.8097*, 80970X-1(2011).

[42] Helen A. Hanson, Xi Wang, I.K. Dimitrov, J. Shi, X.S. Ling, B.B. Maranville, C.F. Majkrzak, M. Laver, U. Keiderling, M. Russina, "Structural evidence for an edge-contaminated vortex phase in a Nb crystal using neutron diffraction" *Phys. Rev. B* **84**, 014506 (2011).

[41] Xinsheng Sean Ling, "Fabrication and Integration of Solid-State Nanopores, and Applications in Molecular Biophysics" (A review chapter), to be published in "Nanopores" (edited by Rashid Bashir, Samir Iqbal), (Springer, 2011).

[40] Xi Wang, Helen A. Hanson, Xinsheng Sean Ling, Charles F. Majkrzak, Brian B. Maranville, "3D Spatially Resolved Neutron Diffraction from a Disordered Vortex Lattice" (arXiv:1102.4776), *J. App. Cryst.* **44**, 414 (2011).

[39] Venkat S.K. Balagurusamy, Paul Weinger, & Xinsheng Sean Ling, "Detection of DNA hybridizations using solid-state nanopores", *Nanotechnology* **21**, 335102 (2010).

- [38] Hongbo Peng and X. S. Ling, "Reverse DNA translocation through a solid-state nanopore by magnetic tweezers", *Nanotechnology*, 20, 185101 (2009).
- [37] D. Branton, D. Deamer, A. Marziali, H. Bayley, S.A. Benner, T. Butler, M. Di Ventra, S. Garaj, A. Hibbs, X. Huang, S. B. Jovanovich, P. S. Krstic, S. Lindsay, X. S. Ling, C. H. Mastrangelo, A. Meller, J. S. Oliver, Y. V. Pershin, J. M. Ramsey, R. Riehn, G. V. Soni, V. Tabard-Cossa, M. Wanunu, M. Wiggin & J. A. Schloss, "Review: The potential and challenges of nanopore sequencing", *Nature Biotechnology* 26, 1146 - 1153 (2008).
- [36] A. Pertsinidis and X.S. Ling, "Statics and Dynamics of 2D Colloidal Crystals in a Random Pinning Potential", *Physical Review Letters*, 100, 028303 (2008).
- [35] N. D. Daniilidis, S. R. Park, I. K. Dimitrov, J. W. Lynn, X. S. Ling, "Emergence of Quasi-Long-Range Order below the Bragg Glass Transition", *Physical Review Letters*, 99, 147007 (2007).
- [34] N. Daniilidis, I. Dimitrov and X. S. Ling, "Ewald construction and resolution function for rocking-curve Small Angle Neutron Scattering experiments", *Journal of Applied Crystallography*, 40, 959-963 (2007).
- [33] I. K. Dimitrov, N. D. Daniilidis, C. Elbaum, J. W. Lynn, X. S. Ling, "Peak Effect in Polycrystalline Vortex Matter", *Physical Review Letters* 99, 047001 (2007).
- [32] N. D. Daniilidis, I. K. Dimitrov, V. F. Mitrovic, C. Elbaum, X. S. Ling, "Magnetocaloric Studies of the Peak Effect in Nb", *Physical Review B* 75, 174519 (2007).
- [31] S.R. Park, H. Peng, and X.S. Ling, "Fabrication of Nanopores in Silicon Chips Using Feedback Chemical Etching", *SMALL* 3, 116 (2007).
- [30] S. Wu, S.R. Park, and X.S. Ling, "Lithography-Free Formation of Nanopores in Plastic Membranes using Laser Heating", *Nano Letters* 6, 2571(2006).
- [29] A.J. Storm, J.H. Chen, X.S. Ling, H. Zandbergen, and C. Dekker, "Electron-Beam-Induced Deformations of SiO₂ Nanostructures", *Journal of Applied Physics* 98, 014307 (2005).
- [28] X.S. Ling, "Scars on a colloidal crystal ball", *News & Views, Nature Materials*, 4, 360 (2005).
- [27] A. Pertsinidis and X.S. Ling, "Video microscopy and micromechanics studies of one- and two-dimensional colloidal crystals" (Invited Paper), *Focus Issue on **Brownian Motion and Diffusion in the 21st Century*** (Institute of Physics and Deutsche Physikalische Gesellschaft), *New Journal of Physics*, 7, 33 (2005).
- [26] S.R. Park, S.M. Choi, D.C. Dender, J.W. Lynn, and X.S. Ling, "Fate of the Peak Effect in a Type-II Superconductor: Multicriticality of the Bragg-Glass Transition", *Physical Review Letters*, 91, 167003 (2003).
- [25] A.J. Storm, J.H. Chen, X.S. Ling, H. Zandbergen, and C. Dekker, "Fabrication of Solid-State Nanopores with Single Nanometer Precision", *Nature Materials*, 2, 537 (2003).
- [24] X.S. Ling, S.R. Park, B.A. McClain, S.M. Choi, D.C. Dender, and J.W. Lynn, *Physical Review Letters*, 89, 259702 (2002), "Ling *et al.* Reply".
- [23] A. Pertsinidis and X.S. Ling, "Diffusion of Point Defects in Two-Dimensional Colloidal Crystals", *Nature*, 413, 147 (2001).
- [22] A. Pertsinidis and X.S. Ling, "Equilibrium Configurations and Energetics of Point Defects in Two-Dimensional Colloidal Crystals", *Physical Review Letters*, 87, 098303 (2001).
- [21] X.S. Ling, S.R. Park, B.A. McClain, S.M. Choi, D.C. Dender, and J.W. Lynn, "Superheating and Supercooling of Vortex Matter in a Nb Single Crystal: Direct Evidence for a Phase Transition at the Peak Effect from Neutron Diffraction", *Physical Review Letters*, 86, 712 (2001) (a PR Focus story, 1/19/01).

- [20] H. H. Wen, S. L. Li, G. H. Chen, and X. S. Ling, "Vortex-slush state in $\text{YBa}_2\text{Cu}_3\text{O}_{7-d}$ thin films", *Physical Review*, B **64**, 054507 (2001).
- [19] J. Shi, X. S. Ling, R. Liang, D.A. Bonn, W.N. Hardy, *Physical Review*, B Rapid Communications, **60**, R12593 (1999), "Giant Peak Effect Observed in an Ultra-pure $\text{YBa}_2\text{Cu}_3\text{O}_7$ Crystal".
- [18] X.S. Ling, S.J. Smullin, J.E. Berger, W.L. Karlin, D.E. Prober, R. Liang, "Equilibrium and Driven Vortex Phases in the Anomalous Peak Effect", *Philosophical Magazine Letters*, **79**, 399 (1999).
- [17] J. Shi, J.E. Berger, and X.S. Ling, *Physica C*, **301**, 215 (1998), "Growth of $\text{YBa}_2\text{Cu}_3\text{O}_7$ Crystals with BaZrO_3 -Coated Alumina Crucibles".
- [16] X.S. Ling, J.E. Berger, and D. E. Prober, *Physical Review*, B Rapid Communications, **57**, R3249 (1998), "Nature of Vortex Lattice Disorder at the Onset of the Peak Effect".
- [15] X.S. Ling, J.I. Budnick, and B.W. Veal, *Physica C*, **282**, 2191 (1997), "Peak Effect and Its Disappearance in Superconducting YBCO Crystals".
- [14] J.D. McCambridge, N. Rizzo, S. Hess, J. Wang, X.S. Ling, and D.E. Prober, *IEEE Transactions on Applied Superconductivity*, **7**, 1134 (1997), "Pinning and Vortex Lattice Structure in NbTi Alloy Multilayers".
- [13] X.S. Ling, H.J. Lezec, M.J. Higgins, J.S. Tsai, J. Fujita, Y. Nakamura, Chao Tang, P.M. Chaikin, and S. Bhattacharya, *Physical Review Letters*, **76**, 2989 (1996), "Nature of Phase Transitions of Superconducting Wire Networks in a Magnetic Field".
- [12] C. Tang, X.S. Ling, S. Bhattacharya, and P.M. Chaikin, *Europhysics Letters*, **35**, 597 (1996), "Peak Effect in Superconductors: Melting of Larkin Domains".
- [11] S. Field, J. Witt, F. Nori, and X.S. Ling, *Physical Review Letters*, **74**, 1206 (1995), "Superconducting Vortex Avalanches".
- [10] X.S. Ling, J.D. McCambridge, N.D. Rizzo, J.W. Sleight, D.E. Prober, L.R. Motowidlo, and B.A. Zeitlin, *Physical Review Letters*, **74**, 805 (1995), "Fluctuation Effects on a Strongly Pinned Vortex Lattice in a Thin Type-II Superconducting Wire".
- [9] J.D. McCambridge, N.D. Rizzo, X.S. Ling, J. Wang, D.E. Prober, L. Motowidlo, and B.A. Zeitlin, *IEEE Transactions on Applied Superconductivity*, **5**, 1697 (1995), "Flux Pinning in NbTi/Nb Multilayer".
- [8] X.S. Ling, J.D. McCambridge, N.D. Rizzo, J.W. Sleight, D.E. Prober, L.R. Motowidlo, and B.A. Zeitlin, *Physica B*, **194-196**, 1867 (1994), "Flux Dynamics in Submicron Superconducting NbTi Wires".
- [7] L. Motowidlo, B. Zeitlin, J. McCambridge, N. Rizzo, X.S. Ling, and D.E. Prober, *IEEE Transactions on Applied Superconductivity*, **3**, 1366 (1993), "Multifilamentary NbTi with Artificial Pinning Centers".
- [6] H. Liu, E. Gregory, N.D. Rizzo, J.D. McCambridge, X.S. Ling, and D.E. Prober, *IEEE Transactions on Applied Superconductivity*, **3**, 1350 (1993), "Experimental Results on Nb-Ta-Ti Superconducting Wires".
- [5] X.S. Ling, D. Shi, and J.I. Budnick, *Physica C*, **185**, 2181 (1991), "Self-Organized Critical State in HTSC".
- [4] D. Shi, X.S. Ling, M. Xu, M. Fang, S. Luo, J.I. Budnick, B. Dabrowski, D. Hinks, and Y. Zheng, *Physical Review B*, **43**, 3684 (1991), "Irreversibility in BaKBiO_3 ".
- [3] X.S. Ling and J.I. Budnick, "AC Magnetic Susceptibility Studies of Type-II Superconductors: Vortex Dynamics", in *Magnetic Susceptibility of Superconductors and Other Spin Systems*, Edited by R.A. Hein, T.L. Francavilla, & D.H. Liebenberg, (Plenum, New York, 1991), p.377.
- [2] X. S. Ling, M.E. Filipkowski, E. Heller, J.I. Budnick, *Materials Research Society Symposium Proceedings* **169**, 947 (1990), "AC Susceptibility Studies of High- T_c Superconductors: Dissipative Effects in LaSrCuO and YBaCuO Systems".

[1] M.S. thesis (in Chinese): “热点”中局域声子的动力学过程(Dynamic processes of localized phonons in the “hot spot”) (Institute of Metal Research, CAS, 1987), Xincheng Ling (the main results were published in 高英俊, 周本濂, 凌新生; “热点”中局域声子的动力学过程, 广西科学; 1996年03期, 1-3.)

6. Patents and Inventions

[1] Ling, X.S., "Addressable nanopores and micropores including methods for making and using same", US Patent No. 7,678,562 (issued in 2010.)

[2] Ling, X.S., Bready, B, etc. “Use of longitudinally displaced nanoscale electrodes for voltage sensing of biomolecules and other analytes in fluidic channels”, US Patent No. 8,882,980 (issued in 2014).

[3] Ling, X.S., Bready, B.; Pertsinidis, A. “Hybridization Assisted Nanopore Sequencing”, WO2007041621A3, International Application No.: PCT/US2006/038748.

[4] Ling, X.S. “Methods of sequencing nucleic acids using nanopores and active kinetic proofreading”, WO/2013/119784, International Application No.: PCT/US2013/025106.

7. Ph.D. Theses and M.S. students Supervised

(1) Alexandros Pertsinidis, Ph.D.'03, “Experimental Studies of Two-Dimensional Colloidal Crystals: Defects, Pinning, and Driven Dynamics” (Position after graduation: postdoc at Stanford. Present position: Associate Professor, Sloan-Kettering Institute)

(2) Sang Ryul Park, Ph.D.'04, “Neutron Scattering and AC Susceptibility Studies of Vortex Matter in Type-II Superconductors” (Position after graduation: scientist at startup NABsys, Inc. Present position: Staff scientist, Illumina)

(3) Ivo Dimitrov, Ph.D.'07, “Ultrasonic Attenuation, AC Susceptibility and Small Angle Neutron Scattering Studies of Nb and V-Ti Alloys” (Position after graduation: postdoc at Rutgers. Present position: intelligence/national security, confidential)

(4) Nikolaos Daniilidis, Ph.D.'08, “Experimental Studies of Bragg Glass Transition”. (Position after graduation: postdoc at UC Berkeley)

(5) Hongbo Peng, Ph.D.'08, “Towards hybridization-assisted nanopore sequencing”. Position after graduation: member of technical staff, IBM T.J. Watson Research Center, NY)

(6) Shanshan Wu, Ph.D.'09, “Fabrication of nanopore systems and their application to DNA manipulation”. (Position after graduation: Consultant, McKinsey & Company, Shanghai, China)

(7) Helen Hanson, Ph.D.'12, “The Crystallography of Vortex Matter in a Niobium Crystal”. (Position after graduation: staff engineer, Intel Corporation, Portland, Oregon)

(8) Xi Wang, Ph.D.'12, “3D Neutron Diffraction Studies on the Vortex Lattice” (Position after graduation: postdoc in Harvard Physics)

(9) Sungcheol Kim, Ph.D.'13, “Transport of charged colloids and DNA in microchannels” (Position after graduation: IBM Watson).

(10) Lichao Yu, Ph.D.'15, “Defects in Two Dimensional Colloidal Crystals” (Position after graduation: Associate at Galatea Associates, Boston).

(11) Xu Luo, Ph.D.'15, “Thermodynamic Studies of Phase Transitions and Emerging Orders in Unconventional Superconductors” (Position after graduation: Engineer, Micron Tech.).

(12) Wang Miao, Ph.D.'15, “Nonlinear Transport in Solid-State Nanopores” (Position after graduation: Analyst, J.P. Morgan, New York City).

- (13) Ankun Dong (Ph.D.'17, "Single-molecule nanoscopy of RNA polymerase II transcription at a single gene in live cells", joint supervision with Dr. A. Pertsinidis, Sloan-Kettering Institute)
(14) Sizhe Cheng (M.S. 2021)
(15) Xinhao Wang (M.S. 2022)
(16) Xiaoyang Liu (M.S. 2022)

8. Current Students under Supervision

- Jonah Eick (Sc.B. 2023)
Abdulai Gassama (M.S. 2024)
Owen Tower (Ph.D. student, 2nd year)
Lihy Buchbinder (Ph.D. student, 1st year)

9. Undergraduate Senior Theses Supervised

- Sylvia J. Smullin, Sc.B.'98
David Bagdadi, Sc.B.'99
Mark Henle, Sc.B.'00
Rachel Pepper, Sc.B.'02)
Bridget McClain Sc.B.'04
Adam Politzer, Sc.B.'05
Angus McMullen, Sc.B.'08
Greg Hebert, Sc.B.'08
Barbara Stekas, Sc.B.'10
Benjamin Mossbarger, Sc.B.'10
Mark Nagy, Sc.B.'12
Jonathan Hess, Sc.B.'20 (Sc.B.'20)

10. Visitors and Postdoctoral Associates:

- Prof. Jing Shi (1998-2000) (present position: professor of physics, Wuhan University, China)
Dr. Cong Ren (2000-2001) (present position: associate professor, Institute of Physics, Beijing)
Dr. Sang Ryul Park (2004-2006) (present affiliation: Illumina)
Dr. Ivo Dimitrov (2.2008-2.2009) (present affiliation: US Government intelligence)
Dr. Venkat Balagurusamy (2007-2010) (present affiliation: IBM)
Liping Liu (visiting student from Southeast University, Nanjing, sponsor: MOE, China, 2014)
Hongwen Wu (visiting student from Southeast University, Nanjing, sponsor: MOE, China, 2016)

11. Invited Talks, Seminars, and Colloquia

- [93] Soft Matter and Biophysics Seminar: "2D Colloidal Crystals with Anisotropic Impurities", Syracuse University, Feb.4, 2022.
[92] Invited talk (by recorded virtual presentation) "DNA sequencing using nanopores and kinetic proofreading", 6th Annual Next Generation Sequencing Congress USA & 6th Annual Single Cell Analysis Congress USA, December 3, 2020.
[91] Soochow University Summer School lecture: "The Physics of 2D Superconducting Wire Networks", Aug. 2, 2019.

- [90] Physics Colloquium, “Search for quantum entanglement in Kitaev System using low-f susceptibility”, Wuhan University, Wuhan, China, May 23, 2019.
- [89] Physics Colloquium, “Nanopore DNA Sequencing”, McGill University, Montreal, Canada, Oct.5, 2018.
- [88] Invited talk, APS March Meeting: March 15, 2017, “Nanopore kinetic proofreading of DNA sequences”, New Orleans, LA.
- [87] “Nanopore DNA Physical Sequencing: the Dream and the Challenge”, The Eminent Scholar Lecture Series, Hubei University of Technology, Wuhan, China, October 27, 2016.
- [86] “Kosterlitz-Thouless transition and topological order”, The Eminent Scholar Lecture Series, Hubei University of Technology, Wuhan, China, October 26, 2016.
- [85] “The Nanopore DNA Sequencing Problem and the Second Law”, Southern University of Science and Technology, Shenzhen, China, January 8, 2016.
- [84] Physics Colloquium, Dec. 14, 2015, “Nanopore DNA Sequencing and Schrodinger’s other equation”, Shanghai Jiaotong University.
- [83] Physics Colloquium, May 25, 2015 Physics Department, Northwest University, Xi’ An, China.
- [82] Invited talk: “Nanopore DNA Sequencing using Kinetic Proofreading”, NIH DNA Sequencing meeting, San Diego, CA, May 10, 2015.
- [81] Invited Talk, April 11, 2015, NGS meeting, Beijing, China.
- [80] Seminar, “Nanopore DNA Sequencing and the Second Law”, Beijing University of Technology, April 10, 2015, Beijing
- [79] Invited talk, Workshop on soft matter: “Nanopore DNA Sequencing and the Second Law”, Shanghai Jiaotong University, Jan. 22, 2015.
- [78] Brown Chemistry Colloquium: “Nanopore DNA Sequencing: Is it ‘Physically’Possible?”, 11/1/2013.
- [77] Hunter College, Chemistry Colloquium: : “Nanopore DNA Sequencing: Is it ‘Physically’Possible?”, 10/11/2013.
- [76] UC Berkeley Nanoscience and Nanoengineering Institute Seminar: “Nanopore DNA Sequencing: Is it ‘Physically’Possible?”, 9/6/2013.
- [75] 2013 APS March Meeting, invited talk: “Nonlinear transport of fd virus particles through a solid-state nanopore”, 3/19/2013, Baltimore.
- [74] Institute of Physics-Chinese Academy of Sciences (colloquium 10/10/2012) (Beijing). “Resistive-pulse sensing of filamentous *fd* virus using solid-state nanopores”.
- [73] The 19th International Symposium on Electro- and Liquid Phase Separation Techniques (ITP 2012), Baltimore (10/3/2012) "Nanopore DNA Sequencing: Making a Solid-State "Nanoporase" for Active Kinetic Proofreading"
- [72] University of Delaware (Physics colloquium 3/21/2012): "Nanopore DNA Sequencing: Making a Solid-State "Nanoporase" for Active Kinetic Proofreading"
- [71] Brandeis University (MRSEC seminar, 2/9/2012): "Nanopore DNA Sequencing: Making a Solid-State ‘Nanoporase’ for Active Kinetic Proofreading"

- [70] Invited Speaker: “Solid-State Nanopore DNA Sequencing Technology: Physics of Feasibility Issues” in “International Symposium: Next Generation Sequencing”, Southeast University, Nanjing, December 28, 2011.
- [69] Invited speaker: “Nanopore DNA sequencing: is it really possible?” Symposium on Quantum Science & Quantum Biology, Sept. 26-27, 2011, Cambridge, MA.
- [68] Invited speaker: “Optical tweezers as a micromechanical tool for 2D colloidal defect studies”, OTOM '11: Optical Trapping & Optical Micromanipulation Conference co-sponsored by SPIE, 21-25 August, 2011, San Diego, CA.
- [67] Invited speaker: “Solid-state nanopores for DNA analysis”, International Symposium on “Biochips and Biosensors based Molecular Diagnostics” June 18-20, 2011, Shanghai, China.
- [66] Condensed Matter Seminar: “Study Hard Condensed Matter Physics in Soft Colloidal Crystals”, Boston University, November 19, 2010.
- [65] Physics Colloquium: “Nanopore Biophysics”, University of Texas at San Antonio, October 29, 2010.
- [64] Physics Colloquium: “Nanopore Biophysics”, University of Rhode Island, Kingston, RI, October 8, 2010.
- [63] Physics Colloquium: “Nanopore Biophysics”, University of Kentucky, Lexington, KY, September 3, 2010.
- [62] Condensed Matter Seminar: “Neutron Scattering Studies of Vortex Matter in Type-II Superconductors”, School of Physics, Peking University, Beijing, August 26, 2010.
- [61] Biophysics Seminar: “Nanopore Biophysics”, School of Physics, Fudan University, Shanghai, August 13, 2010.
- [60] Seminar: “Single-Molecule Biophysics using Solid-State Nanopores”, IBM Thomas J. Watson Research Center, Yorktown Heights, NY, April 14, 2010.
- [59] Yale Physics Club (Physics Department Colloquium): “Single-Molecule Biophysics using Solid-State Nanopores”, Yale University, Nov. 9, 2009.
- [58] Physical Chemistry Seminar: “Nanopore DNA Sequencing”, Brown Chemistry, Sept. 24, 2009.
- [57] Physics Seminar: “Nanopore DNA Sequencing”, Wuhan University, July 1, 2009.
- [56] Invited Lectures (2), “International Workshop on Soft Matter and Biophysics”, Taipei, May 20-24, 2007.
- [55] Invited Talk: “Towards DNA Sequencing using Solid-State Nanopores”, APS March Meeting, Denver, March 7, 2007.
- [54] Physics Colloquium: “Towards Nanopore DNA Sequencing”, Rice University, Oct. 11, 2006.
- [53] Seminar “Towards Nanopore DNA Sequencing”, National Bionanotechnology Center, Cornell University, September 12, 2006.
- [52] Condensed Matter Seminar: “Bring Nanopore Technology to the Masses: Towards Nanopore DNA Sequencing”, Princeton University, Oct.3, 2005.
- [51] Argonne National Lab, Materials Science Colloquium: “Developing Nanotechnology for Molecular Biophysics: Towards Nanopore DNA Sequencing”, Argonne, IL, September 22, 2005.
- [50] Invited Talk: “Addressable Nanopore Array Devices: Nanofabrication and DNA Translocation”, Second Focused Workshop on Electronic Recognition of Bio-molecules, University of Illinois, Urbana, IL, Sept.7-9, 2005.
- [49] Invited Talk: “Developing Nanotechnology for Molecular Biophysics: Towards Nanopore DNA Sequencing”, APS March Meeting, Los Angeles, March 24, 2005.
- [48] Invited Talk: “Developing Nanotechnology for Molecular Biophysics: Towards Nanopore DNA Sequencing”, MIT Complex Fluids Workshop, March 18, 2005.

- [47] Invited Speaker: “Neutron scattering studies of vortex matter”, NIST Center for Neutron Science, Gaithersburg, MD, NSF-NIST Review Workshop, January 5, 2005.
- [46] Invited talk: "Abrikosov Bragg Glass Melting: Origin of the Peak Effect", Sixth Annual Greater Boston Area Statistical Mechanics Meeting, Brandeis University, October 16, 2004.
- [45] Physics Colloquium: “Developing Nanotechnology for Molecular Biophysics: Towards Nanopore DNA Sequencing”, Clark University, April 1, 2004.
- [44] LANL Center for Nonlinear Science Colloquium: “Developing Nanotechnology for Molecular Biophysics: Towards Nanopore DNA Sequencing”, Los Alamos National Lab, March 28, 2004.
- [43] Condensed Matter Seminar: “Towards Nanopore DNA Sequencing”, Syracuse University, Oct.25, 2003.
- [42] Physics Colloquium: “Colloid Physics”, Syracuse University, Oct.24, 2003.
- [41] Condensed Matter Seminar: “Towards Nanopore DNA Sequencing”, UMass-Amherst, Oct.16, 2003.
- [40] Physics Colloquium: “Towards Nanopore DNA Sequencing”, Brown University, Sept.29, 2003.
- [39] Physics Colloquium: “Playing Soft Balls in Flatland and Watch Two-Dimensional Colloidal Crystals”, Leiden University, the Netherlands, April 4, 2003.
- [38] NanoScience Seminar: “Playing Soft Balls in Flatland and Watch Two-Dimensional Colloidal Crystals”, Delft University of Technology, the Netherlands, April, 2003.
- [37] Physics Colloquium: “Playing Soft Balls in Flatland and Watch Two-Dimensional Colloidal Crystals”, Utrecht University, the Netherlands, April 2, 2003.
- [36] Aspen Workshop on Single Molecule Biophysics, Talk: “Towards Nanopore DNA Sequencing”, Aspen, Colorado, January 6-11, 2003.
- [35] Invited talk: “Neutron Scattering Studies of Bragg-Glass Superconductivity”, the First American Conference on Neutron Scattering, Knoxville, TN, June 23-27, 2002.
- [34] Seminar "Neutron Scattering Studies of Bragg-Glass Superconductivity", IRC for Superconductivity, University of Cambridge, UK, June 7, 2002.
- [33] Condensed Matter Seminar "Defects in 2D Colloidal Crystals", University of Konstanz, Germany, June 5, 2002.
- [32] Colloquium "Neutron Scattering Studies of Bragg-Glass Superconductivity", Hahn-Meitner-Institute, Berlin, Germany, June 3, 2002.
- [31] Physics Colloquium "Bragg-Glass Superconductivity", Brandeis University, April 12, 2002.
- [30] Invited talk: "Bragg-Glass Superconductivity", Symposium on vortex matter, the Annual Meeting of the American Association for the Advancement of Science, Boston, Feb.15, 2002.
- [29] Invited talk:"SANS Studies of Vortex Matter Phase Transition and Peak Effect", International Workshop on Vortex Physics, Bariloche, Argentina, Nov.28-Dec.2, 2001.
- [28] Seminar: “Probing Vortex Matter using Cold Neutrons”, Institut Laue Langevin, Grenoble, France, April 9, 2001.
- [27] Physics Colloquium, “Peak Effect and Phase Transition in Vortex Matter: Recent Experiments using *in-situ* Neutron Diffraction and Magnetization”, University of Connecticut, March 2, 2001.
- [26] Condensed Matter Seminar: “Peak Effect and Phase Transition in Vortex Matter: Recent Experiments using *in-situ* Neutron Diffraction and Magnetization”, Yale University, February 28, 2001.
- [25] Invited talk:"Real-Time Video Microscopy Studies of Defects in Colloidal Crystals", Workshop on Complex Fluids, University of Massachusetts Amherst, June 15, 2000.
- [24] Invited talk: “Colloid Physics at Brown”, Inaugural Workshop on Complex Fluids, Harvard University, December 18, 1999.

- [23] Condensed Matter Seminar: "Giant Peak Effect: New Physics at Weak-Disorder Limit", Rutgers University, November 23, 1999.
- [22] Physics Department Colloquium: "Vortex Physics in Type-II Superconductors", WPI, September 13, 1999.
- [21] International Workshop on Vortex Physics in High- T_c Superconductors, Invited talk: "Giant Peak Effect at the Vortex Solid-Liquid Transition: Does Size Matter?" Stanford University, June 22-25, 1999.
- [20] Condensed Matter Seminar: "Giant Peak Effect Observed in an Ultrapure YBCO Crystal", Princeton University, May 13, 1999.
- [19] Winter Conf. on High- T_c Superconductivity, invited talk: "Giant Peak Effect Observed in YBCO". Univ. of Miami, Miami, Florida, January 7-13, 1999.
- [18] Condensed Matter Seminar: "Peak Effect in Disordered Superconductors", Northwestern University, May 21, 1998.
- [17] Condensed Matter Seminar: "Peak Effect in Disordered Superconductors", University of Chicago, May 20, 1998.
- [16] Condensed Matter Seminar: "Peak Effect in Disordered Superconductors", Indiana University, April 24, 1998.
- [15] Condensed Matter Seminar: "Peak Effect and Driven Vortex Phases in Disordered Superconductors", University of Massachusetts at Amherst, Oct. 9, 1997.
- [14] Condensed matter seminar: "Sidekick on a Sliding Vortex Lattice", Physics Department and Center for Complex Systems, Northeastern University, May 13, 1997.
- [13] Special Seminar: "Phase Transitions in Superconducting Networks", University of Pennsylvania, April 1996.
- [12] Special Seminar: "Phase Transitions in Superconducting Networks". University of Delaware, April 1996,
- [11] Physics Department Colloquium: "Phase Transitions in Superconducting Networks", Clark University, April 1, 1996.
- [10] Special Seminar: "Phase Transitions in Superconducting Networks". Brown University, March 1996.
- [9] Invited Symposium Talk: "Peak Effect in High- T_c Superconductors", APS March Meeting, March 1996.
- [8] Physics Colloquium: "Peak Effect in High- T_c Superconductors". Kent State University, Jan. 1996,
- [7] Special Seminar: "Peak Effect in High- T_c Superconductors". University of Illinois at Urbana-Champaign, Jan. 1996,
- [6] Physics Colloquium: "Peak Effect in High- T_c Superconductors". University of Illinois at Chicago, Jan. 1996,
- [5] Special Seminar: "Peak Effect in High- T_c Superconductors", James Frank Institute, University of Chicago, Jan. 1996.
- [4] NEC Research Institute, Princeton, NJ, Oct. 1995, "Phase Transitions in Superconducting Wire Networks".
- [3] Invited Talk, DOE Workshop on Low-Temperature Superconductors, Wisconsin, Feb. 1994, "Fluctuation and Dissipation in Superconducting Thin Wires".
- [2] Yale University, Solid State Seminar, Oct. 1993, "Are Superconductors Really Superconducting?"
- [1] Argonne National Lab, Materials Science Division Seminars, March, 1992, "Peak Effect in High- T_c Superconductors".

12. External Grants (as PI, total \$4.64M, excluding subcontracts)

16. NSF-DMR-2203380:Condensed Matter Physics:"Thermally Activated Dynamics in 2D Colloidal Glasses and Crystals" (August 1, 2022-July 31, 2025), \$651,108.
15. May Yang and George Lu Family Funds, \$50,000, (2013-)
14. NSF-DMR:Condensed Matter Physics"Statics and Dynamics of 1D and 2D Colloidal Lattices with Random Pinning" (July 15, 2010-June 30, 2013), \$360,000.
13. NIH National Human Genome Research Institute: R21 "Hybridization-Assisted Nanopore DNA Sequencing" (Aug.1, 2007-July 31, 2010) \$820,000.
12. DOE Basic Energy Sciences:"Neutron scattering studies of vortex matter" (Aug.1, 2007-July 31, 2010), \$600,685.
11. National Science Foundation Grant, "NIRT: DNA Sequencing and Translocation Studies using Electrically-Addressable Nanopore Arrays", (07/04-06/08) \$1,550,000 (Brown \$900,000, Harvard \$650,000) (PI: Ling (Brown), Co-PIs: A. Meller (Harvard), D.R. Nelson (Harvard), and J. Oliver (Brown)).
10. National Science Foundation Grant, DMR: "Investigation of Vortex Matter Phase Transitions in Type-II Superconductors using Small Angle Neutron Scattering and Complementary Techniques", (07/04-06/07), \$330,000.
9. National Science Foundation Grant, "NER: DNA Sequence Detection using Novel Solid-State and Soft Nanopores", (09/03-08/04), \$100,000.
8. National Science Foundation Grant, MRI: "Acquisition of a Scanning Probe Microscope for Studies of Biomolecules and Nanoscale Materials and Devices", (07/03-06/04), \$133,000 (PI: J. Tang, co-PIs: Ling, Valles and Xiao).
7. National Science Foundation Grant, MRI: "Acquisition of a Workhorse Electron Beam Lithography System for Microstructured Materials and Devices Research", (07/01-06/02), \$151,200.
6. National Science Foundation Grant, DMR: "Novel Studies of Vortex Matter and Peak Effect using In-Situ Neutron Scattering and AC Magnetization", (07/01-06/02), \$277,000.
5. National Science Foundation Grant, SGER: "In-Situ Measurements of Small Angle Neutron Scattering and AC Magnetic Susceptibility of Vortex Matter", (07/00-06/01), \$59,949.
4. National Science Foundation Grant, DMR: "Novel Studies of Two-Dimensional Colloidal Crystals in Pinning Potentials", (07/98-06/02), \$240,000.
3. A. P. Sloan Fellowship, (07/98-06/01), \$35,000.
2. Research Corporation, "Experimental Studies of Topological Defects and Order in 2D Colloidal Crystals", (07/98-06/00), \$35,000.
1. Petroleum Research Fund Grant, "Novel Studies of Two-Dimensional Colloidal Crystals in Pinning Potentials", (07/98-06/99), \$35,000.

13. Classes Taught at Brown

Teaching assignments (see department record).

14. Service to the Department & University

Committee assignments (see department record).

15. Service to Professional Community

Regular Referee for journals: Soft Matter, Nanotechnology, Nature Communications, Nature Nanotechnology, Nature Materials, Nature Physics, Nano Letters, Phys. Rev. Lett., Phys. Rev. B, Phys. Rev. E., Journal of Physics and Chemistry of Solids, Journal of Applied Physics, Applied Physics Letters, Journal of Physics: Condensed Matter, Biophysical Journal.

Regular Proposal reviewer for: National Science Foundation, Petroleum Research Fund.
Co-Chair of 7th New England Workshop on Complex Fluids (July 2001).
External reviewer (1998-1999) for Hong Kong University of Science and Singapore National University, Canadian Institute for Advanced Research (CIAR) and Idaho Board of Education.
Reviewer for NIST-NCNR (neutron beam-time allocation) (2003-present).
Nominator for MacArthur Fellows, the MacArthur Foundation (2002) (successfully nominated Xiaowei Zhuang 庄小威).
NSF-DMR review panel (Jan. 2005); NSF Biotechnology review panel (March 2006)
Executive Committee, Members at Large (2005-2007), APS New England Section.
Grant reviewer, office of Natural Sciences and Engineering Research, Academy of Finland, Helsinki, Finland
Chair, Symposium on “Nanopore Biophysics”, APS March Meeting, 2006.
Advisory Breakout Group: “Hard Condensed Matter: Structure”, for NIST NCNR expansion, 7/17-19, 2006.
NSF Review Panel for Career Awards in Biomaterials program (Oct.30, 2006)
Proposal review for U.S. Civilian Research & Development Foundation (1, in March 2007)
External referee for tenure reviews of Prof. Amit Meller (Boston University) and Prof. Jiali Li (Arkansas) (2007).
NIH-NHGRI grant review panel (study section: next generation sequencing technology), March 3-4, 2008, San Francisco, CA.
NIH-NHGRI grant review panel (study section: next generation sequencing technology), March 18, 2009, Washington DC.
Judge, 2013 Rhode Island Science and Engineering Fair (RISEF), March, 2013.
NIH Young scholars program review panel, March 2014.
Chair, NSF MRSEC Final Review Panel on soft matter physics (June, 2014)
External reviewer for full professorship for Prof. Jiali Li (Arkansas) (2015), Prof. Liviu Movileanu (Syracuse) (2015) and Prof. Yujie Wang (SJTU) (2015).
Member-at-large, APS New England Section (2015)
Proposal review for Israel Ministry of Science, Technology and Space, 1, December, 2015.
Proposal reviews (20) for China 1000-Talent program (2017).
Paper reviews for PNAS (2, 2017)
Paper reviews for PNAS and Nanotechnology (2017-2020, 1-2 per year)
NSF MRSEC proposal review (soft condensed matter) (2020).

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