

## Maxim Tsoi

### Office

Department of Physics  
University of Texas at Austin  
Austin, TX 78712-1199  
phone: 512-232-7962  
fax: 512-471-9637

### Residence

6429 York Bridge Circle  
Austin, Texas, 78749  
phone: 512-351-9150  
website: <http://www.ph.utexas.edu/~tsoi/>  
e-mail address: [tsoi@physics.utexas.edu](mailto:tsoi@physics.utexas.edu)

### Education

**Ph. D.** (summa cum laude), Physics, Konstanz University, Germany, 1998

**M. S.**, Physics, Moscow Institute of Physics and Technology, 1995

**B. S.**, Physics, Moscow Institute of Physics and Technology, 1993

### Professional Experience

Member of the Center for Complex Quantum Systems (CQS)

Member of the Texas Materials Institute (TMI)

Member of the Center for Nano & Molecular Science & Technology (CNM)

2009-present	Associate Professor of Physics, University of Texas at Austin, TX
2003-2009	Assistant Professor of Physics, University of Texas at Austin, TX
2001-2003	Research Associate, IBM Research Division, Almaden Research Center, San Jose, CA
2000-2001	Research Associate, Department of Physics, Michigan State University, East Lansing, MI
1998-2000	Postdoctoral Fellow, Grenoble High Magnetic Field Laboratory, Max-Planck-Institut für Festkörperforschung and Centre National de la Recherche Scientifique, Grenoble, France
1995-1998	Research Assistant, Grenoble High Magnetic Field Laboratory, Max-Planck-Institut für Festkörperforschung and Centre National de la Recherche Scientifique, Grenoble, France
1993-1995	Research Assistant, Institute of Solid State Physics RAS, Chernogolovka, Russia

### Title of Dissertation

Conduction Electrons, Surfaces & Interfaces

### Dissertation Advisor

Prof. Peter Wyder (Grenoble High Magnetic Field Laboratory, Max-Planck-Institut für Festkörperforschung and Centre National de la Recherche Scientifique, Grenoble, France)

## **Postdoctoral Research Topics**

Magnetic domain wall motion triggered by an electric current (IBM Research Division, Almaden Research Center, San Jose, CA)

Current-perpendicular-to-plane magnetoresistance of magnetic multilayers (Department of Physics, Michigan State University, East Lansing, MI)

Generation and detection of phase-coherent current-driven magnons in magnetic multilayers (Grenoble High Magnetic Field Laboratory, Max-Planck-Institut für Festkörperforschung and Centre National de la Recherche Scientifique, Grenoble, France)

## **Postdoctoral Advisors**

Dr. S. S. P. Parkin (IBM Research Division, Almaden Research Center, San Jose, CA)

Prof. Jack Bass (Department of Physics, Michigan State University, East Lansing, MI)

Prof. Peter Wyder (Grenoble High Magnetic Field Laboratory, Max-Planck-Institut für Festkörperforschung and Centre National de la Recherche Scientifique, Grenoble, France)

## **Current Research Interests**

Condensed matter experiment, nanostructures, spintronics; special interest in spin-transfer torque (STT) phenomenon, spin-dependent scattering of conduction electrons, interactions between transport currents and (ferro-, antiferro-) magnetic materials, giant magnetoresistance, STT-driven ferromagnetic resonance (FMR), exchange bias.

Applications range from magnetic memories, including magnetic random access memory (MRAM) and STTRAM, to microwave on-chip technologies. In addition, I am interested in conduction-electron ballistics, in particular application of electron focusing techniques for studying electron relaxation and scattering.

## **Professional Societies**

American Physical Society (APS), Member of the Division of Condensed Matter Physics (DCMP) and the Topical Group on Magnetism and its Applications (GMAG).

## **Grants**

Previous Funding

PI

National Science Foundation; CAREER: Topics in Nanomagnetism and Magnetoelectronics; \$493,260; 02/15/07 - 01/31/13

## Co-PI

National Science Foundation; NIRT - Spin Distributions and Dynamics in Magnetic Nanostructures Materials; PI: J. Erskine; Co-PIs: A. de Lozanne, Q. Niu, M. Tsoi, R. Walser; \$1,400,000; 07/15/04 - 06/30/09

Air Force Office of Scientific Research; Instrumentation for Characterization of Spintronic Materials and Devices; PI: X. Li; Co-PI: M. Tsoi; \$323,007; 09/15/08 - 09/14/09

National Science Foundation; MRI: Development of a Spin-polarized Scanning Tunneling Microscope for Nanomagnetism Studies; PI: A. De Lozanne; Co-PIs: A. H. MacDonald, G. B. Goodenough, C.-K. Shih, M. Tsoi; \$483,000; 10/01/09 - 09/30/13

## Current Funding PI

National Science Foundation; Current-Driven Magnetodynamics in Metallic Heterostructures; \$ 336,307; 08/01/12 - 07/30/16

STARnet program, a Semiconductor Research Corporation program sponsored by MARCO and DARPA; Center for Spintronic Materials, Interfaces, and Novel Architectures; \$ 600,000; 11/01/13 - 10/31/17

## Co-PI

None

## Pending Funding PI

King Abdullah University for Science and Technology (SA); Antiferromagnetic Spin-Orbitronics; \$ 300,002; 04/01/16 - 03/31/19

## Co-PI

DOD - Defense Threat Reduction Agency; Modification of Nanoscale Magnetic Films and Devices by Species- and Energy-Tunable Ionizing Radiation Phase II; PI: B. M. Hegelich; Co-PIs: M. Downer, E. Li, M. Tsoi; \$ 1,700,000; 01/01/16 - 12/31/20

## Publications

### *Publications while in rank of Associate Professor*

58. <sup>1</sup> H. Seinige, C. Wang, and M. Tsoi, «Current-driven non-linear magnetodynamics in exchange-biased spin valves», J. Appl. Phys. 117, 17C507 (2015).

Please note these article types as indicated:

<sup>1</sup> *Refereed articles*

<sup>2</sup> *Invited articles*

<sup>3</sup> *Book chapters*

57. <sup>1</sup> C. Wang, H. Seinige, G. Cao, J.-S. Zhou, J. B. Goodenough, and M. Tsoi, «Temperature dependence of anisotropic magnetoresistance in antiferromagnetic Sr<sub>2</sub>IrO<sub>4</sub>», J. Appl. Phys. 117, 17A310 (2015).
56. <sup>1</sup> C. Wang, H. Seinige, G. Cao, J.-S. Zhou, J. B. Goodenough, and M. Tsoi, «Anisotropic magnetoresistance in antiferromagnetic Sr<sub>2</sub>IrO<sub>4</sub>», Phys. Rev. X 4, 041034 (2014).
55. <sup>1</sup> M. Choi, A. B. Posadas, C. O. Rodriguez, A. O'Hara, H. Seinige, A. J. Kellock, M. M. Frank, M. Tsoi, S. Zollner, V. Narayanan, and A. A. Demkov, «Structural, optical and electrical properties of strained La-doped SrTiO<sub>3</sub> films», J. Appl. Phys. 116, 043705 (2014).
54. <sup>1</sup> H. Seinige, C. Wang, and M. Tsoi, «Ferromagnetic resonance: Electrical detection vs conventional absorption measurements», J. Appl. Phys. 115, 17D116 (2014).
53. <sup>1</sup> T. Pramanik, U. Roy, M. Tsoi, L. F. Register, and S. K. Banerjee, «Micromagnetic simulations of spin-wave normal modes and the spin-transfer-torque driven magnetization dynamics of a ferromagnetic cross», J. Appl. Phys. 115, 17D123 (2014).
52. <sup>1</sup> H. Seinige, C. Wang, and M. Tsoi, «Ferromagnetic resonance detection by a point-contact bolometer», Proc. SPIE, Vol. 8813, 88131K (2013).
51. <sup>1</sup> C. Wang, H. Seinige, and M. Tsoi, «Current-driven parametric resonance in magnetic multilayers», J. Phys. D: Appl. Phys. 46, 285001 (2013).
50. <sup>1</sup> L. Schlipf, A. Slepko, A. Posadas, H. Seinige, A. Dhamdhere, M. Tsoi, D. Smith, and A. A. Demkov, «Epitaxial Zintl aluminide SrAl<sub>4</sub> on a LaAlO<sub>3</sub> substrate», Phys. Rev. B 88, 045314 (2013).
49. <sup>1</sup> U. Roy, T. Pramanik, M. Tsoi, L. F. Register, and S. K. Banerjee, «Micromagnetic study of spin-transfer-torque switching of a ferromagnetic cross towards multi-state spin-transfer-torque based random access memory», J. Appl. Phys. 113, 223904 (2013).
48. <sup>1</sup> A. B. Posadas, C. Mitra, C. Lin, A. Dhamdhere, D. J. Smith, M. Tsoi, and A. A. Demkov, «Oxygen vacancy-mediated room-temperature ferromagnetism in insulating cobalt-substituted SrTiO<sub>3</sub> epitaxially integrated with silicon», Phys. Rev. B 87, 144422 (2013).

47. <sup>1</sup> D. R. Birt, K. An, A. Weathers, L. Shi, M. Tsoi, and X. Li,  
«Brillouin light scattering spectra as local temperature sensors for thermal magnons and acoustic phonons»,  
Appl. Phys. Lett. 102, 082401 (2013).
46. <sup>1</sup> M. Tsoi and V. Tsoi,  
«Low-frequency resonance increase in the resistance of a microcontact between ferromagnetic and nonmagnetic metals»,  
JETP 116 (2), 293-322 (2013).
45. <sup>1</sup> C. Wang, H. Seinige, and M. Tsoi,  
«Ferromagnetic resonance driven by an ac current: a brief review»,  
Low Temp. Phys. 39 (3), 247–251 (2013).
44. <sup>1</sup> D. R. Birt, K. An, M. Tsoi, S. Tamaru, D. Ricketts, K. L. Wong, P. K. Amiri, K. L. Wang, and X. Li,  
«Deviation from Exponential Decay for Spin Waves Excited with a Coplanar Waveguide Antenna»,  
Appl. Phys. Lett. 101, 252409 (2012).
43. <sup>1</sup> U. Roy, H. Seinige, F. Ferdousi, J. Mantey, M. Tsoi, and S. K. Banerjee,  
«Spin-transfer-torque switching in spin valve structures with perpendicular, canted, and in-plane magnetic anisotropies»,  
J. Appl. Phys. 111, 07C913 (2012).
42. <sup>1</sup> T. Staudacher and M. Tsoi,  
«Ferromagnetic resonance driven by spin transfer torque»,  
Thin Solid Films 519, 8260-8262 (2011).
41. <sup>1</sup> A. H. MacDonald and M. Tsoi,  
«Antiferromagnetic metal spintronics»,  
Phil. Trans. R. Soc. A 369, 3098-3114 (2011).
40. <sup>1</sup> T. Staudacher and M. Tsoi,  
«Spin-torque-driven ferromagnetic resonance in point contacts»,  
J. Appl. Phys. 109, 07C912 (2011).
39. <sup>1</sup> S. A. Yang, G. S. D. Beach, C. Knutson, D. Xiao, Z. Zhang, M. Tsoi, Q. Niu, A. H. MacDonald, and J. L. Erskine,  
«Topological electromotive force from domain-wall dynamics in a ferromagnet»,  
Phys. Rev. B 82, 054410 (2010).
38. <sup>1</sup> J. Basset, Z. Wei, and M. Tsoi,  
«Current-induced reorientation of exchange bias on a nanoscale»,  
IEEE Trans. Mag. 46, 1770 (2010).

37. <sup>1</sup> Z. Wei and M. Tsoi,  
«Probing wavenumbers of current-induced excitations in point-contact experiments»,  
Nanotechnology, Science and Applications 3, 17 (2010).
36. <sup>1</sup> B. O’Gorman and M. Tsoi,  
«Fabrication of point contacts by FIB patterning»,  
Eur. Phys. J. Appl. Phys. 49, 10801 (2010).
35. <sup>1</sup> D. R. Birt, B. O’Gorman, M. Tsoi, X. Li, V. E. Demidov, and S. O. Demokritov,  
«Diffraction of spin waves from a submicrometer-size defect in a microwaveguide»,  
Appl. Phys. Lett. 95, 122510 (2009).
34. <sup>1</sup> V. E. Demidov, S. O. Demokritov, D. Birt, B. O’Gorman, M. Tsoi, and X. Li,  
«Radiation of spin waves from the open end of a microscopic magnetic-film waveguide»,  
Phys. Rev. B 80, 014429 (2009).
33. <sup>1</sup> S. A. Yang, G. S. D. Beach, C. Knutson, D. Xiao, Q. Niu, M. Tsoi, and J. L. Erskine,  
«Universal electromotive force induced by domain wall motion»,  
Phys. Rev. Lett. 102, 067201 (2009).
32. <sup>1</sup> Z. Wei, A. Sharma, J. Bass, and M. Tsoi,  
«Point-contact search for antiferromagnetic giant magnetoresistance»,  
J. Appl. Phys. 105, 07D113 (2009).
31. <sup>1</sup> B. O’Gorman, S. Dietze, and M. Tsoi,  
«Current-sweep-rate dependence of spin-torque driven dynamics in magnetic nanopillars»,  
J. Appl. Phys. 105, 07D111 (2009).
30. <sup>1</sup> Z. Wei, J. Basset, A. Sharma, J. Bass, and M. Tsoi,  
«Spin-transfer interactions in exchange-biased spin valves»,  
J. Appl. Phys. 105, 07D108 (2009).

***Publications while in rank of Assistant Professor***

29. <sup>1</sup> J. Basset, A. Sharma, Z. Wei, J. Bass, and M. Tsoi,  
«Towards antiferromagnetic metal spintronics»,  
Proc. SPIE, Vol. 7036, 703605 (2008).
28. <sup>2</sup> G. S. D. Beach, M. Tsoi, and J. L. Erskine,  
«Current-induced domain wall motion»,  
J. Magn. Magn. Mat. 320, 1272-1281 (2008).
27. <sup>2</sup> J. Bass, A. Sharma, Z. Wei, and M. Tsoi,  
«Studies of Effects of Current on Exchange-Bias: A Brief Review»,  
J. of Magnetism 13 (1), 1 (2008).

26. <sup>2</sup> M. Tsoi,  
«Spin-torque measured up» (news & views),  
Nature Physics 4, 17 (2008).
25. <sup>1</sup> Z. Wei, A. Sharma, A. S. Nunez, P. M. Haney, R. A. Duine, J. Bass, A. H. MacDonald,  
and M. Tsoi,  
«Changing exchange bias in spin valves with an electric current»,  
Phys. Rev. Lett. 98, 116603 (2007).
24. <sup>1</sup> G. S. D. Beach, C. Knutson, M. Tsoi, and J. L. Erskine,  
«Field- and current-driven domain wall dynamics: an experimental picture»,  
J. Magn. Magn. Mat. 310, 2038-2040 (2007).
23. <sup>1</sup> G. S. D. Beach, C. Knutson, C. Nistor, M. Tsoi, and J. L. Erskine,  
«Nonlinear domain-wall velocity enhancement by spin-polarized electric current»,  
Phys. Rev. Lett. 97, 057203 (2006).
22. <sup>1</sup> Di Xiao, M. Tsoi, and Qian Niu,  
«Minimal field requirement in precessional magnetization switching»,  
J. Appl. Phys. 99, 013903 (2006).
21. <sup>1</sup> G. S. D. Beach, C. Nistor, C. Knutson, M. Tsoi, and J. L. Erskine,  
«Dynamics of field-driven domain wall propagation in ferromagnetic nanowires»,  
Nature Mater. 4, 741–744 (2005).
20. <sup>1</sup> J. Z. Sun, B. Özyilmaz, W. Chen, M. Tsoi, and A. D. Kent,  
«Spin-transfer-induced magnetic excitation: The role of spin-pumping induced damping»,  
J. Appl. Phys. 97, 10C714 (2005).
19. <sup>1</sup> M. Tsoi, J. Z. Sun, and S. S. P. Parkin,  
«Current-driven excitations in symmetric magnetic nanopillars»,  
Phys. Rev. Lett. 93, 36602 (2004).
18. <sup>1</sup> M. Tsoi, V. S. Tsoi, and P. Wyder,  
«Generation of current-driven magnons in Co/Cu multilayers with antiferromagnetic  
alignment of adjacent Co layers»,  
Phys. Rev. B 70, 12405 (2004).

***Publications as postdoctoral fellow***

17. <sup>1</sup> M. Tsoi, J. Z. Sun, M. J. Rooks, R. H. Koch, and S. S. P. Parkin,  
«Current-driven excitations in magnetic multilayer nanopillars from 4.2 to 300 K»,  
Phys. Rev. B 69, 100406(R) (2004).

16. <sup>1</sup> M. Tsoi, R. E. Fontana, and S. S. P. Parkin,  
«Magnetic domain wall motion triggered by an electric current»,  
Appl. Phys. Lett. 83, 2617 (2003).
15. <sup>1</sup> M. Tsoi, V. Tsoi, J. Bass, A. G. M. Jansen, and P. Wyder,  
«Current-driven resonances in magnetic multilayers»,  
Phys. Rev. Lett. 89, 246803 (2002).
14. <sup>2</sup> M. Tsoi,  
«Electromagnetic wave radiation by current-driven magnons in magnetic multilayers»,  
J. Appl. Phys. 91, 6801 (2002).
13. <sup>2</sup> M. Tsoi,  
«Phase-coherent current-driven magnons in magnetic multilayers»,  
J. Magn. Magn. Mat. 240, 103 (2002).
12. <sup>1</sup> K. Eid, D. Portner, J. A. Borchers, R. Loloee, M. Al-Haj Darwish, M. Tsoi, R. D. Slater,  
K. V. O'Donovan, H. Kurt, W. P. Pratt, Jr., and J. Bass,  
«Absence of mean-free-path effects in the current-perpendicular-to-plane magnetoresistance  
of magnetic multilayers»,  
Phys. Rev. B 65, 054424 (2002).
11. <sup>1</sup> K. Eid, M. Tsoi, D. Portner, R. Loloee, W. P. Pratt, Jr., and J. Bass,  
«Further evidence against mean-free-path effects in the CPP-MR»,  
J. Magn. Magn. Mat. 240, 171 (2002).
10. <sup>1</sup> M. Tsoi and V. Tsoi,  
«Fluctuation model of current-driven magnon excitation»,  
JETP Lett. 73, 98 (2001).
9. <sup>1</sup> M. Tsoi, A. G. M. Jansen, J. Bass, W.-C. Chiang, V. Tsoi, and P. Wyder,  
«Generation and detection of phase-coherent current-driven magnons in magnetic  
multilayers»,  
Nature 406, 46 (2000).

***Publications as graduate student***

8. <sup>1</sup> M. Tsoi, A. G. M. Jansen, J. Bass, W.-C. Chiang, M. Seck, V. Tsoi, and P. Wyder,  
«Excitation of a magnetic multilayer by an electric current»,  
Phys. Rev. Lett. 80, 4281 (1998).
7. <sup>1</sup> M. Tsoi, A. Böhm, M. Primke, V. Tsoi, and P. Wyder,  
«Direct observation of conduction electron beam transmission through a Bi intercrystalline  
boundary»,  
Phys. Rev. B 56, R15581 (1997).



6. <sup>1</sup> M. Tsoi, A. G. M. Jansen, and J. Bass,  
«Search for point-contact giant magnetoresistance in Co/Cu multilayers»,  
J. Appl. Phys. 81, 5530 (1997).
5. <sup>1</sup> M. Tsoi, V. Tsoi, and P. Wyder,  
«Anomalous energy dependence of the electron relaxation time in Bismuth»,  
JETP Lett. 64, 891 (1996).
4. M. Tsoi and V. Tsoi,  
«System of tip contacts with micron intercontact distances»,  
Instrum. Exp. Tech. 39, 608 (1996) [Prib. Tekh. Eksp. 39, 147 (1996)].
3. <sup>1</sup> V. Tsoi, M. D. Jaeger, B. Golding, M. Tsoi, and J. Bass,  
«Transverse electron focusing, quantum electron kinetics, and the Hall effect in Bi»,  
Physica B 218, 22 (1996).
2. <sup>1</sup> M. Tsoi and V. Tsoi,  
«Drift electron focusing in Bismuth»,  
Physica B 218, 14 (1996).
1. <sup>1</sup> M. Tsoi and V. Tsoi,  
«Angular dependence of the probability of specular reflection of conduction electrons  
from the surface of a Bi sample»,  
JETP Lett. 62, 237 (1995).

#### Papers in Press

None

#### Papers Submitted for Publication

1. <sup>1</sup> C. Wang, H. Seinige, G. Cao, J.-S. Zhou, J. B. Goodenough, and M. Tsoi,  
«Electrically Tunable Transport in Antiferromagnetic Mott Insulator Sr<sub>2</sub>IrO<sub>4</sub>»,  
submitted to Phys. Rev. B on 07-10-2015.

#### Papers in Preparation

1. H. Seinige, C. Wang, and M. Tsoi,  
«Electrical detection of ferromagnetic and parametric resonances: towards faster current-  
driven dynamics in magnetic nanodevices»,  
tentative submission date: October 2015.
2. T. Zhou, H. Seinige, C. Liu, L. Jin, Y. Liao, M. C. Williamson, L. Jia, Z. Zhong, H. Zhang,  
and M. Tsoi,  
«Crossover from positive to negative magnetoresistance in a LiZn/YIG ferrite composite»,  
tentative submission date: December 2015.

## Publications Edited

None

## Books

1. <sup>3</sup> M. Tsoi, «Introduction to Spintronics», World Scientific Publishing, in preparation (tentative submission date: December 2015).

## Surveys, Editorials, and Reviews

None

## Chapters in Books

1. <sup>3</sup> M. Tsoi, «Spin Torque Effects in Magnetic Systems: Experiment», Ch. 7 in “Handbook of Spin Transport and Magnetism”, Eds.: E. Y. Tsybal, I. Žutić (Chapman and Hall/CRC, 2012).

## Articles in Conference Proceedings

None

## Articles in Workshop Proceedings

None

## Technical Reports

None

## Patents Issued

M. Tsoi, A. H. MacDonald, «Method for controlling magnetic exchange bias in magnetic sensors within a data storage device», Provisional Application #60/915,705

## Awards and Honors

National Science Foundation CAREER Award (2006)

Ragnar Holm Plaque, Royal Institute of Technology (KTH), Stockholm, Sweden (2002)

## Service

Departmental

Graduate Recruitment Committee (2004-present)

Budget Council Advisory Committee (2014-present)

College

Tsoi was instrumental in establishing interactions between UT Austin and Université Joseph Fourier (UJF) de Grenoble, France; as a result several graduate and undergraduate French students were awarded internships at UT Austin and UT students are now being selected to study at UJF for a semester. In 2005 Tsoi gave a technology presentation at

the Presidential Advisory Committee Meeting of the Center for Nano and Molecular Science and Technology.

#### University

Member of the UT "Outstanding Thesis/Report Award 2014 - 2015" review and selection committee for the STEM disciplines.

Tsoi contributes to diversity and equal opportunity at UT by teaching, advising, and mentoring students who are under-represented or under-served in science. In particular his teaching and research activities involve women and under-represented minorities: he currently supervises one female graduate student (since 2012) and co-supervised another female graduate student (Summer 2015). Two other female students have completed Master theses in his laboratory and graduated in 2010 and 2011, respectively; two Ph.D. candidates from Universidad Técnica Federico Santa Maria (Chile) have been pursuing research projects in his laboratory for three months in 2010 and six months in 2014, respectively; one Ph.D. candidate from China is pursuing a research project in his laboratory now.

#### Community

In 2004 Tsoi spoke at the Saturday Physics Workshop for high-school physics teachers and their students. In 2008 and 2014 Tsoi gave lectures to high-school students at the LBJ Science Academy. In 2010 Tsoi gave a lecture to high-school students and teachers at the Summer Nanoscience Academy. Tsoi contributes lectures and laboratory tours to the annual "Alice in Wonderland" (UT Physics) program aiming to attract women to science.

#### Seminars/Lectures

125 presentations at Conferences, Colloquia, and at other institutions (64 invited talks and 61 contributed presentations).

#### Invited talks

125. "Interconnections between magnetic state and transport currents in antiferromagnetic  $\text{Sr}_2\text{IrO}_4$ ", the 2016 Joint MMM-Intermag Conference, San Diego, 2016
124. "Spintronics with antiferromagnetic  $\text{Sr}_2\text{IrO}_4$ ", International Workshop on Spintronics with Antiferromagnets, Tohoku Forum for Creativity, Tohoku, Japan, 2016
123. "Antiferromagnetic Spintronics", Physics Colloquium, University of Texas at Austin, 2015
122. "Anti-FM Spintronics: Voltage Switching", STARnet 2015 Meeting, Intel Oregon, 2015
121. "Antiferromagnetic spintronics: progress, challenges and perspectives", STARnet ACCEL e-Workshop Series, 2015

120. "Spintronics with ferromagnets and antiferromagnets", MSE Seminar Series, King Abdullah University of Science & Technology (KAUST), Saudi Arabia, 2015
119. "Antiferromagnetic spintronics with  $\text{Sr}_2\text{IrO}_4$ ", European Materials Research Society (E-MRS) 2014 Fall Meeting, Warsaw, Poland, 2014
118. "Spintronics with ferromagnets and antiferromagnets", Physics Colloquium, University of Texas at Austin, 2014
117. "From electronics to spintronics", the LBJ Science Academy, University of Texas at Austin, 2014
116. "Probing current-driven magnetodynamics on the nano-scale", CQS Workshop "Quantum Physics in the Flatland", UT Austin, TX, 2014
115. "Ferromagnetic resonance on the nano-scale", Physics Colloquium, Sejong University, Seoul, Korea, 2013
114. "Probing current-driven magnetodynamics on the nano-scale", ICAMD 2013, Jeju, Korea, 2013
113. "Magnetic resonances driven by an ac current", SPIE Optics+Photonics 2013, Spintronics VI, San Diego, 2013
112. "Applications of spin-transfer-torque in spintronics", Florida International University, Miami, 2013
111. "From point contacts to spin-transfer torque", Buckley Prize Session, the March 2013 Meeting of the American Physical Society, Baltimore, 2013
110. "Magnetic Resonances Driven by Spin Transfer Torque", National Institute of Standards and Technology, Gaithersburg, 2012
109. "Manifestations of Spin Transfer Torque in Spintronics", Physics Colloquium, Baylor University, 2012
108. "Spin transfer torque memory", NSF NNIN Workshop, MRC Austin, 2012
107. "Applications of spin-transfer-torque in spintronics", Tamura symposium, Osaka, Japan, 2011
106. "Spin-torque excitations in magnetic nanostructures", Complex Quantum Systems Seminar, UT Austin, 2011
105. "Spin transfer torque in magnetic nanostructures", Purdue University, 2011

104. "Ferromagnetic resonance driven by spin transfer torque", University of Texas at Austin, 2011
103. "Spin transfer torque (STT)", Physics Colloquium, Sejong University, Seoul, Korea, 2010
102. "Spin-torque-driven excitations in magnetic nanostructures", International Conference of the Asian Union of Magnetism Societies, Jeju Island, Korea, 2010
101. "Spintronics – electronics for the future", Summer Nanoscience Academy, University of Texas at Austin, 2010
100. "Spin-transfer-torque effects in ferromagnets and antiferromagnets", Texas A&M University, 2010
99. "Spintronics: from ferromagnets to antiferromagnets", FINAL ESF FoNE (Fundamentals in NanoElectronics) EUROCORES Conference, Madrid, Spain, 2009
98. "Electromotive force induced by a moving magnetic domain wall", Spin Currents Workshop, Stanford Sierra Conference Center, South Lake Tahoe, 2009
97. "Spintronics: from ferromagnets to antiferromagnets", Physics & Astronomy Colloquium, California State University, Northridge, 2009
96. "Spin-transfer-torques at a ferromagnet/antiferromagnet interface", the March 2009 Meeting of the American Physical Society, Pittsburgh, 2009
95. "Spintronics: from ferromagnets to antiferromagnets", Physics Colloquium, University of Texas at Austin, 2008
94. "Towards antiferromagnetic metal spintronics", IEEE Nano, Arlington, 2008
93. "Towards antiferromagnetic metal spintronics", SPIE Optics+Photonics 2008, Spintronics Symposium, San Diego, 2008
92. "Length and time scales in magnetic domain wall dynamics", SPIE Optics+Photonics 2008, Spintronics Symposium, San Diego, 2008
91. "Transverse electron focusing as a way of studying electron transport", Complex Quantum Systems Seminar, UT Austin, 2008
90. "Spintronics: from ferromagnets to antiferromagnets", UT Austin- UJF Grenoble Workshop on Nanomaterials and Nanostructures, 2007

89. "Spintronics: from ferromagnets to antiferromagnets", Center for Nanomagnetic Systems Colloquium & Houston Chapter of the IEEE Magnetic Society, University of Houston, 2007
88. "Spintronics: from ferromagnets to antiferromagnets", IBM T. J. Watson Research Center, 2007
87. "Spintronics: from ferromagnets to antiferromagnets", University of Delaware, 2007
86. "Tuning the exchange bias in spin valves by an electric current", the March 2007 Meeting of the American Physical Society, Denver, 2007
85. "Spintronics: from ferromagnets to antiferromagnets", Physics Colloquium, University of Nebraska-Lincoln, 2007
84. "Spin transfer in antiferromagnets", the 10th Joint MMM/Intermag Conference, Baltimore, 2007
83. "Spintronics: from ferromagnets to antiferromagnets", Complex Quantum Systems Seminar, UT Austin, 2006
82. "Spin transfer in ferromagnets and antiferromagnets", Nanomaterials Conference, UT Austin, 2006
81. "Spintronics: from ferromagnets to antiferromagnets", Stanford University, 2006
80. "Spintronics: from ferromagnets to antiferromagnets", IBM Almaden Research Center, San Jose, 2006
79. "Spin transfer in ferromagnets and antiferromagnets", French-US Workshop on Spintronics, Saint Pierre de Chartreuse, France, 2006
78. "Spin transfer in magnetic nanostructures", Nanotechnology and Materials Science Seminar Series, UT Austin, 2006
77. "Spin-transfer phenomena in magnetic nanostructures", Texas A&M University, 2004
76. "Excitation of spin waves by an electric current", Symposium Latsis EPFL, Lausanne, Switzerland, 2002
75. "Excitation of spin waves by an electric current", Swedish summer school on magnetism, Backagården, Sweden, 2002
74. "Point contact spectroscopy", Royal Institute of Technology (KTH), Stockholm, Sweden, 2002

73. "Current-driven spin waves in magnetic multilayers", University of Texas at Austin, 2002
72. "Excitation of spin waves by an electric current", National Institute of Standards and Technology, Boulder, 2002
71. "Spin injection in point-contact magnetic multilayers", the Fall 2001 Meeting of the Materials Research Society, Boston, 2001
70. "Electromagnetic wave radiation by current-driven magnons in magnetic multilayers", the 46th Conference on Magnetism & Magnetic Materials, Seattle, 2001
69. "Point contact spectroscopy in magnetic fields", IUVSTA 15th International Congress, AVS 48th International Symposium, 11th International Conference on Solid Surfaces, San Francisco, 2001
68. "Current-driven magnons in magnetic multilayers", Physical Phenomena at High Magnetic Fields IV, Santa Fe, 2001
67. "Phase-coherent current-driven magnons in magnetic multilayers", the 4<sup>th</sup> International Symposium on Metallic Multilayers, Aachen, Germany, 2001
66. "Current-driven magnons in magnetic multilayers", Data Storage Systems Center, Carnegie Mellon University, Pittsburgh, 2001
65. "Generation and detection of current-driven magnons in magnetic multilayers", New York University, New York, 2000
64. "Generation and detection of current-driven magnons in magnetic multilayers", IBM Almaden Research Center, San Jose, 2000
63. "Spin-current injection and spin-wave excitation in magnetic multilayers", the March 2000 Meeting of the American Physical Society, Minneapolis, 2000
62. "Current-driven excitation of magnetic multilayers", Meeting of CNRS GDR P.O.M.M.E.S. (magnetic nanostructures), Gif-sur-Yvette, France, 1998

#### Contributed presentations

61. "Current-Driven Magnetodynamics in MTJs", C-SPIN Midterm Review, Minneapolis, 2015
60. "Antiferromagnetic spintronics with Sr<sub>2</sub>IrO<sub>4</sub>", Nano Night 2015, UT Austin, 2015
59. "Electrically tunable transport in antiferromagnetic Sr<sub>2</sub>IrO<sub>4</sub>", the March 2015 Meeting of the American Physical Society, San Antonio, 2015

58. "Temperature and bias dependence of anisotropic magnetoresistance in antiferromagnetic  $\text{Sr}_2\text{IrO}_4$ ", the March 2015 Meeting of the American Physical Society, San Antonio, 2015
57. "Antiferromagnetic spintronics with  $\text{Sr}_2\text{IrO}_4$ ", Graduate Recruitment Open House 2015, UT Austin, 2015
56. "Current-driven non-linear magnetodynamics in exchange biased spin valves", C-SPIN Mini-Workshop, University of Minnesota, November 2014
55. "Anisotropic magnetoresistance in antiferromagnetic  $\text{Sr}_2\text{IrO}_4$ ", the 59th Magnetism and Magnetic Materials Conference, Honolulu, 2014
54. "Current-driven non-linear magnetodynamics in exchange-biased spin valves", the 59th Magnetism and Magnetic Materials Conference, Honolulu, 2014
53. "Antiferromagnetic spintronics with  $\text{Sr}_2\text{IrO}_4$ ", the 8th International Conference on Physics and Applications of Spin Phenomena in Solids (PASPS VIII), Washington DC, 2014
52. "Anisotropic magnetoresistance in antiferromagnetic semiconductor  $\text{Sr}_2\text{IrO}_4$ ", the 32nd International Conference on the Physics of Semiconductors (ICPS), Austin, 2014
51. "Antiferromagnetic spintronics and current-driven magnetodynamics", C-SPIN Midterm Review, Minneapolis, 2014
50. "Anisotropic magnetoresistance in  $\text{Sr}_2\text{IrO}_4$ ", C-SPIN Mini-Workshop, University of Minnesota, 2014
49. "Ferromagnetic resonance: electrical detection vs conventional absorption measurements", Nano Night 2014, UT Austin, 2014
48. "Ferromagnetic resonance: electrical detection vs conventional absorption measurements", Graduate Recruitment Open House 2014, UT Austin, 2014
47. "Antiferromagnetic spintronics: point-contact study of anisotropic magnetoresistance in  $\text{Sr}_2\text{IrO}_4$ ", C-SPIN Theme 4 Monthly Call, University of Minnesota, 2014
46. "Anisotropic magnetoresistance in  $\text{Sr}_2\text{IrO}_4$ ", the March 2014 Meeting of the American Physical Society, Denver, 2014
45. "Structural and electrical properties of strained La-doped  $\text{SrTiO}_3$  films", the March 2014 Meeting of the American Physical Society, Denver, 2014



44. "Ferromagnetic resonance: electrical detection vs conventional absorption measurements", the 58th Magnetism and Magnetic Materials Conference, Denver, 2013
43. "Micromagnetic simulations of spin-wave normal modes and the spin-transfer-torque driven magnetization dynamics of a ferromagnetic cross", the 58th Magnetism and Magnetic Materials Conference, Denver, 2013
42. "Micromagnetic study of spin-transfer-torque switching of a ferromagnetic cross towards multi-state spin-transfer-torque based random access memory", TECHCON 2013, Austin, 2013
41. "Point-contact study of soft magnetic CoSiBFeNb amorphous alloys", the March 2013 Meeting of the American Physical Society, Baltimore, 2013
40. "Insulating room temperature ferromagnetic SrTiO<sub>3</sub>", the March 2013 Meeting of the American Physical Society, Baltimore, 2013
39. "Magnetic resonances excited by spin-transfer-torque", Graduate Recruitment Open House 2013, UT Austin, 2013
38. "Spin-transfer-driven parametric resonance in magnetic nanodomains", the March 2012 Meeting of the American Physical Society, Boston, 2012
37. "Spin-transfer-driven parametric resonance in magnetic multilayers", the 56th Magnetism and Magnetic Materials Conference, Scottsdale, 2011
36. "Spin-transfer-torque switching in spin-valve structures with perpendicular, canted, and in-plane magnetic anisotropies", the 56th Magnetism and Magnetic Materials Conference, Scottsdale, 2011
35. "Spin torque switching of a tilted spin valve structure with Co/Pt/Co/Ni multilayer", TECHCON 2011, Austin, 2011
34. "Magnetic resonances excited by spin-transfer-torque", Nano Night 2011, UT Austin, 2011
33. "Spin-torque-driven excitations in magnetic thin films", the March 2011 Meeting of the American Physical Society, Dallas, 2011
32. "Spin-torque-driven ferromagnetic resonance in point contacts", the 55th Magnetism and Magnetic Materials Conference, Atlanta, 2010
31. "Current-induced reorientation of exchange bias on a nanoscale", the 11th Joint MMM/Intermag Conference, Washington, 2010

30. "Radiation of spin waves from the open end of a microscopic magnetic-film waveguide", the 11th Joint MMM/Intermag Conference, Washington, 2010
29. "Diffraction of spin waves from a submicrometer-size defect in a micro-waveguide", the 11th Joint MMM/Intermag Conference, Washington, 2010
28. "Detection of electromotive force induced by domain wall motion", the 11th Joint MMM/Intermag Conference, Washington, 2010
27. "Detection of EMF induced by domain wall motion", the March 2009 Meeting of the American Physical Society, Pittsburgh, 2009
26. "Universal Electromotive Force Induced by Domain Wall Motion", the March 2009 Meeting of the American Physical Society, Pittsburgh, 2009
25. "Spin-transfer interactions in exchange-biased spin valves", the 53rd Magnetism and Magnetic Materials Conference, Austin, 2008
24. "Point-contact search for antiferromagnetic giant magnetoresistance", the 53rd Magnetism and Magnetic Materials Conference, Austin, 2008
23. "Current-sweep-rate dependence of spin-torque driven dynamics in magnetic nanopillars", the 53rd Magnetism and Magnetic Materials Conference, Austin, 2008
22. "Magnetic domain wall velocity surge above Walker breakdown", the 53rd Magnetism and Magnetic Materials Conference, Austin, 2008
21. "Current-Induced Magnetoresistance in Antiferromagnetic Spin Valves", the March 2008 Meeting of the American Physical Society, New Orleans, 2008
20. "Fabrication of point contacts by FIB patterning", the March 2008 Meeting of American Physical Society, New Orleans, 2008
19. "The dynamics of field and current-driven magnetic domain wall depinning", the March 2008 Meeting of American Physical Society, New Orleans, 2008
18. "Magnetoresistive Effects in Antiferromagnetic Spin Valves", the 52nd Magnetism and Magnetic Materials Conference, Tampa, 2007
17. "Injection and Propagation of Magnetic Domain Walls in Thin Film Nanowires", the March 2007 Meeting of American Physical Society, Denver, 2007
16. "Effects of domain wall width on current- and field-driven wall motion", the March 2007 Meeting of American Physical Society, Denver, 2007

15. "Effects of spin-polarized current on multilayers containing antiferromagnetic layers", 1st WUN International Conference on Spintronic Materials and Technology, York, UK, 2007
14. "Probing wavenumbers of current-induced excitations in point-contact experiments", the March 2006 Meeting of the American Physical Society, Baltimore, 2006
13. "Spin transfer in an antiferromagnet", Emerging Themes in Physics Workshop, UT-Austin, 2006
12. "Current-driven excitations in symmetric magnetic nanopillars", the March 2005 Meeting of the American Physical Society, Los Angeles, 2005
11. "Mobility of field and current-driven domain walls in magnetic nanowires", the March 2005 Meeting of the American Physical Society, Los Angeles, 2005
10. "Current-driven excitations in magnetic multilayers", 5<sup>th</sup> International Symposium on Metallic Multilayers, Boulder, Colorado, 2004
9. "Mean-Free-Path Effects in CPP-MR?", the March 2001 Meeting of the American Physical Society, Seattle, 2001
8. "Generation and detection of phase-coherent current-driven magnons in magnetic multilayers", 15<sup>th</sup> annual CFMR symposium, East Lansing, 2001
7. "Excitation of high-frequency magnons by an electric current", Symposium on Spin-Electronics, Halle, Germany, 2000
6. "Generation and detection of current-driven magnons in magnetic multilayers", the 18<sup>th</sup> General Conference of the Condensed Matter Division of the European Physical Society, Montreux, Switzerland, 2000
5. "Excitation of a magnetic multilayer by an electric current", the 17<sup>th</sup> General Conference of the Condensed Matter Division of the European Physical Society, Grenoble, France, 1998
4. "Search for point-contact giant magnetoresistance in Co/Cu multilayers", the March 1997 Meeting of the American Physical Society, Kansas City, 1997
3. "Search for point-contact giant magnetoresistance in Co/Cu multilayers", 41st Conference on Magnetism and Magnetic Materials, Atlanta, 1996
2. "Drift electron focusing in bismuth", the 2<sup>nd</sup> International Conference on Point-Contact Spectroscopy, Nijmegen, The Netherlands, 1995

1. “Needle-point-contact system for a micron contact separation”, the 2<sup>nd</sup> International Conference on Point-Contact Spectroscopy, Nijmegen, The Netherlands, 1995

## **Professional Services**

### Journal Editing and Editorial Boards

Editorial Board of Nanotechnology, Science and Applications (ISSN: 1177-8903).

### Conference Chair Positions

Chaired Session D41: Cooperative Phenomena: Magnetic Properties and Spin Dynamics at the APS 2005 March Meeting, Los Angeles, 2005.

Chaired Session HA: Spin Torque: Metallic Systems at the 10th Joint MMM/Intermag Conference, Baltimore, 2007.

Chaired Session AS: Spin Torque and Other Excitations in Magnetic Nanostructures at the 53rd Magnetism and Magnetic Materials Conference, Austin, 2008.

Chaired Session ED: Magnetization Dynamics and Damping I at the 59th Magnetism and Magnetic Materials Conference, Honolulu, 2014.

### Major Conference Program Committees

Program Committee Member, 53rd Magnetism and Magnetic Materials Conference, Austin, 2008.

March Meeting 2008 Sorter. Co-organizer of the focused sessions 06.11.4+ 16.12.11 Spin Transport & Magnetization Dynamics in Metal Based Systems at the APS March Meeting, New Orleans, 2008.

Program Committee Member, Representative of the Sub-Committee on Magnetization Dynamics and Damping/Ultrafast Switching/Magnonics, 59th Magnetism and Magnetic Materials Conference, Honolulu, 2014.

### Workshops and Specialized Conference Program Committees

None

### Journal, Conference, and Book Reviewing

Review papers for Science, Nature Physics, Nature Materials, Nature Nanotechnology, Nature Communications, Scientific Reports, Physical Review Letters, Physical Review A, Physical Review B, Europhysics Letters, Applied Physics Letters, Journal of Applied Physics, Journal of Physics D, Journal of Magnetism and Magnetic Materials, Proceedings of the Royal Society A, The Journal of Physical Chemistry, IEEE Transactions on Magnetics, IEEE Transactions on Nanotechnology, Nanotechnology, Carbon, Journal of Nanoscience and Nanotechnology.

### Grant Proposal Reviewing

Panel Member, National Science Foundation (NSF). Review proposals for NSF, Department of Energy (DOE), Department of Defense (DoD), and Natural Sciences and Engineering Research Council (NSERC).

## **Other Service**

None