

CURRICULUM VITAE

Dr. Jairo Sinova

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Citizenship: USA and Spanish (dual)

Marital status: married

Birth date: May 1972

Last update: December 20th 2013



PROFESSIONAL APPOINTMENTS

Johannes Gutenberg Universität Mainz

Alexander von Humboldt Professor 2014 to Present

Texas A&M University Associate Head for Undergraduate Programs 2012 to 2014

Texas A&M University Professor of Physics 2010 to Present

Texas A&M University Associate Professor of Physics 2007 to 2010

Inst. of Physics of the Academy of Sciences of the Czech Republic

Independent Researcher 2007 to Present

Texas A&M University Assistant Professor of Physics 2003 to 2007

University of Texas at Austin Postdoctoral Research Fellow 2001 to 2003

University of Tennessee Postdoctoral Research Fellow 1999 to 2001

Indiana University Graduate Research Assistant 1995 to 1999

Indiana University Teaching assistant and Summer Researcher 1994 to 1995

Indiana University Cyclotron Facility Nuclear Summer Researcher 1993

Ohio University Instructor of Observational Astronomy Course 1992 to 1994

Michigan State University Astrophysics Summer Research Assistant 1992

EDUCATION

Indiana University Ph.D. Physics August 1999

Thesis Advisor: Professor Steven M. Girvin

Indiana University M.S. Physics August 1995

Ohio University B.S. Physics (Magna Cum Laude) June 1994

CURRENT RESEARCH TOPICS

- Semiconductor and metallic spintronics.
- Emergent phenomena in strongly correlated systems revealed in transport phenomena.
- Thermoelectric effects in topological insulator and ferromagnetic materials.
- Current driven magnetization-dynamics in ferromagnetic and strongly spin-orbit coupled systems.

RESEARCH HIGHLIGHTS (2000-2012)

- Over 99 publications in top peer-reviewed journals such as Science (1), Nature Physics (2), Nature Materials (2), Nature Communications (2), Physical Review Letters (27), Applied Physics Lett. (5), Review of Modern Physics (2), and Physical Review B or A (41).
- Over 6000 citations with an h-factor of 37 since 2000.
- Principal organizer of the international winter school and workshop NewSpin2 (December 2011) <http://newspin2.physics.tamu.edu/>.
- Research featured in Physics Today, Feb. 2005 (24 research items are featured per year over the whole of the physical sciences in this journal).
- Proposed the notion of intrinsic spin Hall effect (Phys. Rev. Lett. 2004) and formed part of one of the teams that discovered the Spin Hall effect (Phys. Rev. Lett. 2005).
- Part of the team that observed the Aharonov-Casher effect for the first time (Phys. Rev. Lett. 2006).
- Principal organizer of the first international conference on Spin Hall effect in South Korea (August 2005).

HONORS, AWARDS, AND RECOGNITIONS:

2014:	Alexander von Humboldt Professorship
2014:	Johannes Gutenberg Research Fellowship
2014:	ERC Synergy award
2011:	Fellow of the American Physical Society
2011:	Student Lead Award for Teaching Excellence
2011:	Distinguished Achievement University Wide Award in Research
2008:	Distinguished Achievement College Level Award in Teaching (Award donated to the Texas A&M University Physics Department)
2007:	Big XII Research Fellowship
2006:	NSF CAREER Award
2006:	Cottrell Scholar Award from the Research Corporation
2006:	Montague-Center for Teaching Excellence Scholar
1998:	Excellence in Teaching Award (Indiana University)
1992:	The Gresseli Award for Undergraduate Research
1991:	Distinguished Professor Scholarship (Ohio University)
1990:	Honors Tutorial Scholarship (Ohio University)

MEMBERSHIPS

- American Physical Society
- American Association of Physics Teachers

CURRICULUM VITAE ADDENDUM

RESEARCH FUNDING

Funding summary (German and European based): Total current active funding **€ 4.817.504**.

Title: "Alexander von Humboldt Award"

Agency: Alexander von Humboldt Foundation, single PI.

Amount and period: **€ 3.500.000, January 2014-December 2018**.

Title: "Spin-charge conversion and spin caloritronics at hybrid organic-inorganic interfaces"

Agency: European Research Council, Synergy Grants, four PIs.

Amount and period: **€ 1.317.504 (for Sinova; award total: € 9.651.489), March 2014-February 2020**.

Funding summary (US based): Total current active funding **\$1.413.611**. Total cumulative external funding \$2.591.479 for Sinova's group. \$1.698.979 in external funding as a single PI or PI (funded from 2006-2014) and \$892.500 external funding for Sinova's group as co-PI of larger projects. (Bold indicates active grants)

Title: "NRI Center: South West Academy for Nanoelectronics 2.0"

Agency: NERC, multiple PIs. Coordinator S. Banerjee from UT.

Amount and period: **\$350.000 (for Sinova), April 2013-December 2017**.

Title: "Topological effects and quantum pumping in complex systems with strong spin-orbit coupling"

Agency: Weizman-Texas A&M Research Program, PI (Finkelstein and Yuval Oreg co-PI).

Amount and period: **\$100.000 Sept 2012-August 2014**.

Title: "Spin-dependent transport and thermoelectric phenomena in multi-band systems"

Agency: National Science Foundation, Single PI.

Amount and period: **\$300.000 July 2011-June 2014**.

Title: "Realistic spin-FETs and efficient spin-logic architectures for low power logic computing"

Agency: Office of Naval Research, Single PI.

Amount and period: **\$266.001 May 2011-April 2014**.

Title: "Room temperature spin-field effect transistor for post-CMOS technologies"

Agency: Norman Hackerman Advanced Research Program, Texas, PI (Finkelstein co-PI)

Amount and period: **\$145.110, June 2010-May 2013**.

Title: "Towards Spin-Preserving, Heterogeneous Spin Networks"

Agency: National Science Foundation, co-PI, part of Ohio State-MRSEC

Amount and period: **\$252.500, May 2010-August 2014**.

Title: "Winter School and Workshop on spin physics and topological effects in cold atoms, condensed matter, and beyond"

Agency: National Science Foundation, Single PI.

Amount and period: \$7.000 December 2011-December 2012.

Title: "Winter School and Workshop on spin physics and topological effects in cold atoms, condensed matter, and beyond"

Agency: Office of Naval Research, Single PI.

Amount and period: \$10.000 July 2011-December 2012.

Title: "NRI Center: South West Academy for Nanoelectronics"

Agency: State of Texas and NERC, multiple PIs. Coordinator S. Banerjee from UT.
Amount and period: \$140.000 (for Sinova), January 2011-December 2012.

Title: "CAREER: Spin Dependent Phenomena in Semiconductors"

Agency: National Science Foundation, Single PI

Amount and period: \$400.000, July 2006-June 2011.

Title: "Spin-Hall effect in semiconductors and related phenomena in nano-spintronics" Agency:
Cottrell Scholar (Research Corporation for the Advancement of Science), Single PI
Amount and period: \$100.000, June 2006-June 2011.

Title: "NRI Center: South West Academy for Nanoelectronics"

Agency: State of Texas and NERC, multiple PIs. Coordinator S. Banerjee from UT

Amount and period: \$150.000 (for Sinova), September 2006-August 2010

Title: "Semiconductor nano-spintronics: spin-Hall effect and related phenomena"

Agency: Office of Naval Research, Single PI

Amount and period: \$245.118, January 2006-December 2009.

Title: "Paradigm of Physics Education Program", Agency: Texas A&M University, Montague-
Center for Teaching Excellence Scholar, Single PI

Amount and period: \$5.000, September 2006-September 2008.

Title: "Research in semiconductor nano-spintronics"

Agency: Texas A&M University, College of Science and Vice President for Research

Amount and period: \$96.000, January 2007-December 2009

Title: "Workshop on Semiconductor Nano-Spintronics: Spin-Hall Effect and Related Issues"

Agency: National Science Foundation, Single PI

Amount and period: \$24.750, August 2005.

COMMITTEES AND OTHER PROFESSIONAL ACTIVITIES

Other professional activities:

- Co-Organizer of the Newspin3 Winter School and Conference, April 2013
- Organizer of the Spintronics Tutorial session at the APS March Meeting, March 2013
- Principal Organizer of the Newspin2 Winter School and Conference, December 2011
- Co-Chair of the Cottrell Scholars Conference 2011
- Member of the Cottrell Scholar Advisory Group 2010-Present
- Member of the Editorial Advisory Panel for Nature Communications 2010-Present
- Member of the Research Corporation Advisory Board 2009-Present
- Organizer of the Condensed Matter Seminar Series at Texas A&M University, 2003-Present
- Onsite NSF reviewer 2009
- Reverse sight MRSEC-NSF panelist reviewer 2008, 2011
- Organizer of the international Workshop on Semiconductor Nano-Spintronics: Spin-Hall Effect and Related Issues, Korea, August 2005
- Local organizer and co-editor of the proceedings of the Conference for Strongly Correlated Systems in May of 2007 in Houston
- Proposal Reviewer and Panelist for NSF and DOE since 2003
- Physical Review, Applied Physics Letters, Science, and Nature referee
- Redesigned departmental webpage at Texas A&M University 2003-2004

Committees:

- Undergraduate Curriculum Committee (Chair) 2012-Present
- Undergraduate College Committee 2012-Present

- Advisory Committee 2011-Present
- Colloquium Committee 2011-Present
- Qualifying examination Committee 2008-Present
- Junior faculty mentor 2010-Present
- Budget Committee 2011
- Promotions, Tenure, and Appointments Committee 2010-2011
- Evaluation Committee 2010-2011 (Chair)
- Evaluation Committee 2009-2010 (Chair)
- Evaluation Committee 2008-2009 (Chair)
- Undergraduate Curriculum Committee 2007-2009
- Building Committee 2006-2009
- Nano Search Committee 2006-2007
- Condensed Matter Experimental Search Committee 2005 (Co-chair)
- Condensed Matter Theory Search Committee 2005 (Chair)
- Nano-science Search Committee (Co-chair)
- Phenomenology Search Committee
- Graduate and Undergraduate Student Recruitment

PUBLICATIONS

Summary: Science (1), Nature Physics (2), Nature Materials (2), Nature Communications (2), Physical Review Letters (27), Applied Physics Lett. (5), Review of Modern Physics (2), and Physical Review B or A (41). Other. Underlined number indicates Letter type article.

92. Xin Liu and Jairo Sinova, “*Reading charge transport from spin dynamics on the surface of topological insulators*”, Phys. Rev. Lett. **111**, 166801 (2013).
91. N. Tesarova, T. Ostatnický, V. Novak, K. Olejník, J. Subrt, C.T. Ellis, A. Mukherjee, J. Lee, G.M. Sipahi, J. Sinova, J. Hamrle, T. Jungwirth, P. Nemeč, J. Černe, K. Vyborný, “*Systematic study of magnetic linear dichroism and birefringence in (Ga,Mn)As*”, arXiv:1308.5907 (2013), submitted to Phys. Rev. B.
90. H. Kurebayashi, Jairo Sinova, D. Fang, A. C. Irvine, J. Wunderlich, V. Novak, R. P. Campion, B. L. Gallagher, E. K. Vehstedt, L. P. Zarbo, K. Vyborný, A. J. Ferguson, T. Jungwirth, “*Observation of a Berry phase anti-damping spin-orbit torque*”, arXiv:1306.1893; submitted to Nature Nanotechnology (2013).
89. V. P. Bhallamudi, C. S. Wolfe, V. P. Amin, D. E. Labanowski, A. J. Berger, D. Stroud, J. Sinova, P. C. Hammel, “*Experimental Demonstration Of Scanned Spin-Precession Microscopy*”, Phys. Rev. Lett. **111**, 117201 (2013).
88. Yong Pu, J. Beardsley, P. M. Odenthal, A. G. Swartz, R. K. Kawakami, P. C. Hammel, E. Johnston-Halperin, Jairo Sinova, and J. P. Pelz, “*Correlation of electrical spin injection and non-linear charge-transport in Fe/MgO/Si*”, Appl. Phys. Lett. **103**, 012402 (2013).
87. K. S. Tikhonov, J. Sinova, and A. M. Finkelstein, “*Spectral non-uniform temperature, non-local heat transfer, and the spin Seebeck effect*”, Nature Communications **4**, 2945 (2013).
86. P. Nemeč, V. Novak, N. Tesarova, E. Rozkotova, H. Reichlova, D. Butkovicova, F. Trojanek, K. Olejník, P. Maly, R. P. Campion, B. L. Gallagher, Jairo Sinova, T. Jungwirth, “*The essential role of carefully optimized synthesis for elucidating intrinsic material properties of (Ga,Mn)As*”, Nature Communications **4**, 1422 (2013).
85. Xin Liu and Jairo Sinova, “*Unified theory of spin-dynamics in two dimensional electron gases with arbitrary spin-orbit coupling strength at finite temperature*”, Phys. Rev. B. **86**, 174301 (2012).
84. Jairo Sinova and Igor Zutic, “*New moves of the spintronics tango*”, Nature Materials **11**, 368 (2012).
83. K. Olejník, J. Wunderlich, A. C. Irvine, R. P. Campion, V. Amin, Jairo Sinova, and T. Jungwirth, “*Detection of Electrically Modulated Inverse Spin Hall Effect in an Fe/GaAs Microdevice*”, Phys. Rev. Lett. **109**, 076601 (2012).
82. Oleg A. Tretiakov, Ar. Abanov, Jairo Sinova, “*Holey topological thermoelectrics*”, Appl. Phys. Lett. **99**, 113110 (2011).

81. Juergen Weischenberg, Frank Freimuth, Jairo Sinova, Stefan Blügel, and Yuriy Mokrousov, “*Ab Initio Theory of Scattering-Independent Anomalous Hall Effect*”, Phys. Rev. Lett. **107**, 106601 (2011).
80. Xin Liu, Xiong-Jun Liu, and Jairo Sinova, “*Spin dynamics in the strong spin-orbit coupling regime*”, Phys. Rev. B **84**, 035318 (2011).
79. Xiong-Jun Liu, Xin Liu, and Jairo Sinova, “*Scaling of the anomalous Hall effect in the insulating regime*”, Phys. Rev. B **84**, 165304 (2011) (Editor’s choice).
78. Amit Agarwal, Stefano Chesi, T. Jungwirth, Jairo Sinova, G. Vignale, Marco Polini, “*Plasmon mass and Drude weight in strongly spin-orbit-coupled 2D electron gases*”, Phys. Rev. B **83**, 115135 (2011).
77. J. Wunderlich, B. G. Park, A. C. Irvine, L. P. Zarbo, E. Rozkotova, P. Nemeč, V. Novak, Jairo Sinova, T. Jungwirth, “*Spin Hall effect transistor*”, Science **330**, 1801 (2010).
76. T. Jungwirth, P. Horodyska, N. Tesarova, P. Nemeč, J. Subrt, P. Maly, P. Kuzel, C. Kadlec, J. Masek, I. Nemeč, V. Novak, K. Olejnik, Z. Soban, P. Vasek, P. Svoboda, Jairo Sinova, “*Systematic study of Mn-doping trends in optical properties of (Ga,Mn)As*”, Phys. Rev. Lett. **105**, 227201 (2010).
75. Jairo Sinova, Viewpoint (invited): “*Spin Hall effect goes electrical*”, Physics **3**, 82 (2010).
74. Jairo Sinova, News and Views (invited): “*Spin Seebeck effect: thinks globally but acts locally*”, Nature Materials **9**, 880 (2010).
73. J. Masek, F. Maca, J. Kudrnovsky, O. Makarovskiy, L. Eaves, R. P. Campion, K. W. Edmonds, A. W. Rushforth, C. T. Foxon, B. L. Gallagher, V. Novak, Jairo Sinova, T. Jungwirth, “*Microscopic analysis of the valence band and impurity band theories of (Ga,Mn)As*”, Phys. Rev. Lett. **105**, 227202 (2010).
72. Liviu P. Zarbo, Jairo Sinova, Irena Knezevic, J. Wunderlich, T. Jungwirth, “*Modeling of diffusion of injected electron spins in spin-orbit coupled microchannels*”, Phys. Rev. B **82**, 205320 (2010).
71. O. A. Tretiakov, Ar. Abanov, S. Murakami, and Jairo Sinova, “*Large thermoelectric figure of merit for 3D topological Anderson insulators via line dislocation engineering*”, Appl. Phys. Lett. **97**, 073108 (2010).
70. A. A. Kovalev, Jairo Sinova, Y. Tserkovnyak, “*Anomalous Hall Effect in Disordered Multi-band Metals*”, Phys. Rev. Lett. **105**, 036601 (2010).
69. N. Nagaosa, Jairo Sinova, S. Onoda, A. H. MacDonald, and P. Ong, “*Anomalous Hall Effect*”, Rev. of Mod. Phys. **82**, 1539 (2010).
68. C. Bruene, A. Roth, E.G. Novik, M. Koenig, H. Buhmann, E.M. Hankiewicz, W. Hanke, J. Sinova, L. W. Molenkamp, “*Evidence of ballistic Intrinsic Spin Hall Effect in HgTe Nanostructures*”, Nature Physics **6**, 448 (2010).
67. Xiong-Jun Liu, Xin Liu, Congjun Wu, Jairo Sinova, “*Quantum anomalous Hall effect with cold atoms trapped in a square lattice*”, Phys. Rev. A **81**, 033622 (2010).
66. Xin Liu, M. F. Borunda, Xiong-Jun Liu, Jairo Sinova, “*Control of Josephson current by Aharonov-Casher Phase in a Rashba Ring*”, Phys. Rev. B **80**, 174524 (2009).
65. G. Acbas, M.-H. Kim, M. Cukr, V. Novak, M. A. Scarpulla, O. D. Dubon, T. Jungwirth, Jairo Sinova, J. Cerne, “*Electronic structure of ferromagnetic semiconductor Ga_{1-x}MnxAs probed by sub-gap magneto-optical spectroscopy*”, Phys. Rev. Lett. **103**, 137201 (2009).
64. Karel Vyborný, Jan Kucera, Jairo Sinova, A.W. Rushforth, B.L. Gallagher, and T. Jungwirth, “*Microscopic mechanism of the non-crystalline anisotropic magnetoresistance in (Ga,Mn)As*”, Phys. Rev. B **80**, 165204 (2009).
63. A. A. Kovalev, Y. Tserkovnyak, K. Vyborny, and Jairo Sinova, “*Transport theory for disordered multiple-band systems: Anomalous Hall effect and anisotropic magnetoresistance*”, Phys. Rev. B **79**, 195129 (2009).
62. Ion Garate, Jairo Sinova, T. Jungwirth, A.H. MacDonald, “*Theory of Weak Localization in Ferromagnetic (Ga,Mn)As*”, Phys. Rev. B **79**, 155207 (2009).
61. J. Wunderlich, A. C. Irvine, Jairo Sinova, B. G. Park, X. L. Xu, B. Kaestner, V. Novak, and T. Jungwirth, “*Spin-injection Hall effect in a planar photovoltaic cell*”, Nature Physics **5**, 675 (2009).
60. Karel Vyborny, Alexey A. Kovalev, Jairo Sinova, T. Jungwirth, “*Semiclassical framework for the calculation of transport anisotropies*”, Phys. Rev. B **79**, 045427 (2009).
59. Xiong-Jun Liu, Mario F. Borunda, Xin Liu, Jairo Sinova, “*Effect of Induced Spin-Orbit Coupling for Atoms via Laser Fields*”, Phys. Rev. Lett. **102**, 046402 (2009).

58. M. F. Borunda, Xin Liu, Alexey A. Kovalev, Xiong-Jun Liu, T. Jungwirth, Jairo Sinova, "Aharonov-Casher and spin Hall effects in two-dimensional mesoscopic ring structures with strong spin-orbit interaction", Phys. Rev. B **78**, 245315 (2008).
57. V. Novak, K. Olejnik, J. Wunderlich, M. Cukr, K. Vyborny, A. W. Rushforth, R. P. Campion, B. L. Gallagher, Jairo Sinova, T. Jungwirth, "Curie Point Singularity in the Temperature Derivative of Resistivity in (Ga,Mn)As", Phys. Rev. Lett. **101**, 077201 (2008).
56. Alexey A. Kovalev, Karel Vyborny, Jairo Sinova "Hybrid skew scattering regime of the anomalous Hall effect in Rashba systems: unifying Keldysh, Boltzmann, and Kubo formalisms", Phys. Rev. B Rapids **78**, 041305 (2008).
55. Alexey A. Kovalev, Liviu P. Zarbo, Y. Tserkovnyak, G. E. W. Bauer, Jairo Sinova "Piezospin Polarization of Currents in Nanostructures", Phys. Rev. Lett. **101**, 036401 (2008).
54. Wei-Cheng Lee, Jairo Sinova, A. A. Burkov, Yogesh Joglekar, A.H. MacDonald "Theory of reduced superfluid density in underdoped cuprate superconductors", Phys. Rev. B **77**, 214518 (2008).
53. T. Jungwirth, Jairo Sinova, A. H. MacDonald, B. L. Gallagher, V. Novak, K. W. Edmonds, A. W. Rushforth, R. P. Campion, C. T. Foxon, K. Olejnik, J. Masek, S.-R. Eric Yang, J. Wunderlich, C. Gould, L. W. Molenkamp, T. Dietl, and H. Ohno, "Character of states near the Fermi level in (Ga,Mn)As: impurity to valence band crossover", Phys. Rev. B **76**, 125206 (2007).
52. Tamara S. Nunner, N.A. Sinitsyn, Mario F. Borunda, A. A. Kovalev, Ar. Abanov, Carsten Timm, T. Jungwirth, Junichiro Inoue, A.H. MacDonald, Jairo Sinova, "Anomalous Hall effect in a two-dimensional electron gas", Phys. Rev. B **76**, 235312 (2007).
51. A. W. Rushforth, K. Vyborný, C. S. King, K. W. Edmonds, R. P. Campion, C. T. Foxon, J. Wunderlich, A. C. Irvine, P. Vašek, V. Novák, K. Olejnik, Jairo Sinova, T. Jungwirth, B. L. Gallagher, "Anisotropic magnetoresistance components in (Ga,Mn)As", Phys. Rev. Lett. **99**, 147207 (2007).
50. Mario F. Borunda, Tamara S. Nunner, Thomas Luck, N. A. Sinitsyn, Carsten Timm, J. Wunderlich, T. Jungwirth, A. H. MacDonald, and Jairo Sinova, "Absence of skew scattering in two-dimensional systems: Testing the origins of the anomalous Hall Effect", Phys. Rev. Lett. **99**, 066604 (2007).
49. R.A. Duine, A.S. Nunez, Jairo Sinova, and A.H. MacDonald, "Functional Keldysh Theory of Spin Torques", Phys. Rev. B **75**, 214420 (2007).
48. A. A. Kovalev, M. F. Borunda, T. Jungwirth, L. W. Molenkamp, J. Sinova, "Aharonov-Casher effect in a 2-D hole ring with spin-orbit interaction", Phys. Rev. B **76**, 125307 (2007).
47. J. Wunderlich, T. Jungwirth, A. C. Irvine, J. Zemen, A. W. Rushforth, E. De Ranieri, U. Rana, K. Vyborny, Jairo Sinova, C. T. Foxon, R. P. Campion, D. A. Williams, and B. L. Gallagher, "Local control of magnetocrystalline anisotropy in (Ga,Mn)As: application in spin-transfer-torque microdevices", Phys. Rev. B **76**, 054424 (2007).
46. J. Masek, J. Kudrnovsky, F. Maca, Jairo Sinova, A.H. MacDonald, R.P. Campion, B.L. Gallagher, and T. Jungwirth, "Mn-doped Ga(As,P) and (Al,Ga)As ferromagnetic semiconductors", Phys. Rev. B **75**, 045202 (2007).
45. N.A. Sinitsyn, A.H. MacDonald, T. Jungwirth, V. K. Dugaev, Jairo Sinova, "Anomalous Hall effect in 2D Dirac band: link between Kubo-Streda formula and semiclassical Boltzmann equation approach", Phys. Rev. B **75**, 045315 (2007).
44. N. A. Sinitsyn, J.E. Hill, Hongki Ming, Jairo Sinova, and A. H. MacDonald, "Charge and spin Hall conductivity in metallic graphene", Phys. Rev. Lett. **97**, 106804 (2006).
43. T. Jungwirth, Jairo Sinova, J. Masek, J. Kucera, and A. H. MacDonald, "Theory of ferromagnetic (III,Mn)V Semiconductors", Rev. of Mod. Phys. **78**, 809 (2006).
42. Jairo Sinova, Shuichi Murakami, S-Q. Shen, and Mahn-Soo Choi, "Spin-Hall effect: Back to the Beginning at a Higher Level", Solid State Comm. **138**, 214 (2006).
41. K. Nomura, J. Wunderlich, J. Sinova, B. Kaestner, A.H. MacDonald, T. Jungwirth, "Edge spin accumulation in semiconductor 2-D hole gases", Phys. Rev. B **72**, 245330 (2006).
40. M. Koenig, A. Tschetschetkin, E.M. Hankiewicz, Jairo Sinova, V. Hock, V. Daumer, M. Schaefer, C.R. Becker, H. Buhmann, and L.W. Molenkamp, "Direct observation of the Aharonov-Casher phase", Phys. Rev. Lett. **96**, 076804 (2006).
39. B. Kaestner, J. Wunderlich, Jairo Sinova, and T. Jungwirth, "Co-planar spin-polarized light emitting diode ", Appl. Phys. Lett. **88**, 091106 (2006).

38. T. Jungwirth, J. Masek, K.Y. Wang, K.W. Edmonds, M. Sawicki, M. Polini, Jairo Sinova, A.H. MacDonald, R.P. Campion, L.X. Zhao, N.R.S. Farley, T.K. Johal, G. van der Laan, C.T. Foxon, and B.L. Gallagher , " *Low temperature magnetization of (Ga,Mn)As semiconductors*", Phys. Rev. B **73**, 165205 (2006).
37. K. Nomura, Jairo Sinova, N.A. Sinitsyn, and A. H. MacDonald, "*Dependence of the intrinsic spin Hall effect on spin-orbit interaction character*", Phys. Rev. B **72**, 165316 (2005).
36. E. M. Hankiewicz, Jian Li, Tomas Jungwirth, Qian Niu, Shun-Qing Shen, and Jairo Sinova, "*Charge Hall effect driven by spin-chemical potential gradients and Onsager relations in mesoscopic systems*", Phys. Rev. B **72**, 155305 (2005).
35. E. Y. Sherman and J. Sinova, "*Physical limits of the ballistic and non-ballistic spin-field-effect transistor: Spin dynamics in remote-doped structures*", Phys. Rev. B **72**, 075318 (2005).
34. T. Jungwirth, K.Y. Wang, J. Masek, K.W. Edmonds, Jurgen Konig, Jairo Sinova, M. Polini, N.A. Goncharuk, A.H. MacDonald, M. Sawicki, R.P. Campion, L.X. Zhao, C.T. Foxon, and B.L. Gallagher , "*Prospects of high temperature ferromagnetism in (Ga,Mn)As semiconductors*", Phys. Rev. B **72**, 165204 (2005).
33. N.A. Sinitsyn, Qian Niu, Jairo Sinova, K. Nomura, "*Disorder effects in the AHE induced by Berry curvature*", Phys. Rev. B **72**, 045346 (2005).
32. Branislav K. Nikolic, Satofumi Souma, Liviu P. Zarbo, and Jairo Sinova, "*Non-Equilibrium Spin Accumulation due to the Spin Hall Effect in Mesoscopic Two-Probe Ballistic Spin-Orbit Coupled Semiconductor Structures*", Phys. Rev. Lett. **95**, 046601 (2005).
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30. K. Nomura, J. Sinova, T. Jungwirth, Q. Niu, and A. H. MacDonald, "*Non-vanishing spin Hall currents in disordered spin-orbit coupling systems*", Phys. Rev. B Rapids **71**, 041304 (2005).
29. A.D. Giddings, M.N. Khalid, J. Wunderlich, S. Yasin, R.P. Campion, K.W. Edmonds, Jairo Sinova, T. Jungwirth, K. Ito, K.Y. Wang, D. Williams, B.L. Gallagher, and C.T. Foxon, "*Large tunneling anisotropic magnetoresistance in (Ga,Mn)As nanoconstrictions*", Phys. Rev. Lett. **94**, 127202 (2005).
28. C. Ruster, C. Gould, T. Jungwirth, Jairo Sinova, G.M Schott, R. Giraud, K. Brunner, G. Schmidt, and L. W. Molenkamp, "*Super-giant Tunneling Anisotropic Magnetoresistance in a (Ga,Mn)As stack*", Phys. Rev. Lett. **94**, 027203 (2005).
27. E. M. Hankiewicz, L.W. Molenkamp, T. Jungwirth, and Jairo Sinova, "*Manifestation of the spin-Hall effect through transport measurements in the mesoscopic regime*", Phys. Rev. B Rapids **70**, 241301 (2004)
26. R. Aguado, M.P. López-Sancho, Jairo Sinova, L. Brey, "*Dielectric Function of Diluted Magnetic Semiconductors in the Infrared Regime*", Phys. Rev. B **70**, 1952001 (2004).
25. E. M. Hankiewicz, T. Jungwirth, T. Dietl, C. Timm, and Jairo Sinova, "*Optical properties of metallic (III,Mn)V ferromagnetic semiconductors in the infrared to visible range*", Phys. Rev. B **70**, 245211 (2004).
24. J. Sinova, T. Jungwirth, and J. Cerne, "*Magneto-transport and magneto-optical properties of ferromagnetic (III,Mn)V semiconductors*", Int. Jour. of Mod. Phys. B **18**, 1083 (2004).
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20. Jairo Sinova, T. Jungwirth, X. Liu, Y. Sasaki, J.K. Furdyna, W. A. Atkinson, and A.H. MacDonald, "*Magnetization relaxation in (Ga,Mn)As ferromagnetic semiconductors*", Phys. Rev. B **69**, 085209 (2004).
19. Jairo Sinova, Dimitrie Culcer, Q. Niu, N. A. Sinitsyn, T. Jungwirth, and A.H. MacDonald, "*Universal Intrinsic Spin-Hall Effect*", Phys. Rev. Lett. **92**, 126603 (2004).
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17. T. Jungwirth, Jairo Sinova, K.Y. Wang, K.W. Edmonds, R.P. Campion, B.L. Gallagher, C.T. Foxon, Qian Niu, and A.H. MacDonald , “DC-transport properties of ferromagnetic (Ga,Mn)As semiconductors”, Appl. Phys. Lett. **83**, 320 (2003).
16. Jairo Sinova, T. Jungwirth, J. Kucera, and A.H. MacDonald, “Infrared magneto-optical properties of (III,Mn)V ferromagnetic semiconductors”, Phys. Rev. B **67**, 235203 (2003).
15. T. Jungwirth, Jairo Sinova, J. Kucera, and A.H. MacDonald, “Theoretical models of ferromagnetic III-V semiconductors”, Current Applied Physics **3**, 461 (2003).
14. Jairo Sinova, C. B. Hanna, and A. H. MacDonald, “Measuring the condensate fraction of rapidly rotating trapped boson systems: off-diagonal order from the density”, Phys. Rev. Lett. **90** , 120401 (2003).
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10. J. Sinova, C. B. Hanna, and A. H. MacDonald , “Quantum Melting and Absence of Bose-Einstein Condensation in 2-D Vortex Matter”, Phys. Rev. Lett. **88**, 030403 (2002).
9. T. Jungwirth, J. König, Jairo Sinova, J. Kucera, and A.H. MacDonald , “Curie Temperature Trends in (III,Mn)V Ferromagnetic Semiconductors”, Phys. Rev. B **66**, 012402 (2002).
8. Jairo Sinova, J. Schliemann, Alvaro S. Nuñez, and A.H. MacDonald, “2D bands and electron-phonon interactions in polyacene plastic transistors”, Phys. Rev. Lett. **87**, 226802 (2001).
7. Jairo Sinova and Geoff Canright, “Nature and number of distinct phases in the random field Ising model”, Phys. Rev. B **64**, 094402 (2001).
6. Joel E. Moore, A. Zee, and Jairo Sinova, “The quantum Hall plateau transition at order $1/N$ ”, Phys. Rev. Lett. **87**, 046801 (2001).
5. Jairo Sinova, Geoff Canright, H. Castillo, and A.H. MacDonald, “Extensive eigenvalues in spin-spin correlations: a tool for counting pure states in Ising spin glasses”, Phys. Rev. B **63**, 104427 (2001).
4. J. Sinova, G. Canright, and A.H. MacDonald, “Nature of ergodicity breaking in Ising spin glasses as revealed by correlation function spectral properties”, Phys. Rev. Lett. **85**, 2609 (2000).
3. Jairo Sinova, A.H. MacDonald, and S.M. Girvin, “Disorder and interactions in Quantum Hall Ferromagnets near $\nu = 1$ ”, Phys. Rev. B **62**, 13579 (2000).
2. Jairo Sinova, V. Meden, and S.M. Girvin, “Liouvillian approach to the integer Quantum Hall effect transition”, Phys. Rev. B **62**, 2008 (2000).
1. Jairo Sinova, S.M. Girvin, T. Jungwirth, and K. Moon, “Skyrmion dynamics and NMR line shapes in Quantum Hall Ferromagnets”, Phys. Rev. B **61**, 2749 (2000).

REFEREED CONFERENCE PROCEEDINGS

12. O. A. Tretiakov, Ar. Abanov, Jairo Sinova, “Thermoelectric efficiency of topological insulators in a magnetic field”, J. Appl. Phys. **111**, 07E319 (2012).
11. Shuichi Murakami, Ryuji Takahashi, O. A. Tretiakov, Ar. Abanov, Jairo Sinova, “Thermoelectric transport of perfectly conducting channels in two- and three-dimensional topological insulators”, arXiv:1010.2304 (2010).
10. A.W. Rushforth, K. Výborný, C.S. King, K.W. Edmonds, R.P. Campion, C.T. Foxon, J. Wunderlich, A.C. Irvine, V. Novák, K. Olejník, A. A. Kovalev, Jairo Sinova, T. Jungwirth, B.L. Gallagher, “The Origin and Control of the Sources of AMR in (Ga,Mn)As Devices”, Journal of Magnetism and Magnetic Materials, **321**, 1001 (2009).
9. G. Acbas, J. Sinova, M.A. Scarpulla, O.D. Dubon, M. Cukr, V. Novak, and J. Cerne, “Comparison of the mid-infrared magneto-optical response of GaMnAs films grown by molecular beam epitaxy and ion implantation and pulsed laser melting”, Journal of Supercond. and Novel Magnetism, **20**, 457 (2007).
8. G. Acbas, J. Cerne, M. Cukr, V. Novak, and J. Sinova, “Infrared Magneto-Optical Studies in GaMnAs Films”, Physics of Semiconductors, AIP Conference Proceedings, **893**, 1217 (2007).
7. B. Kaestner, J. Wunderlich, Jairo Sinova, and T. Jungwirth, “Experimental observation of the spin-Hall effect in a spin-orbit coupled two-dimensional hole gas”, Physics E **34**, 47 (2006).

6. E. M. Hankiewicz, N. A. Sinitsyn, and J. Sinova, "Spin Currents and Intrinsic Spin-Hall effect in Low Dimensional Systems", *Journal of Superconductivity* **18**, 151 (2005).
5. E. M. Hankiewicz, T. Jungwirth, T. Dietl, C. Timm, and Jairo Sinova, "Ac Conductivity and Magneto-Optical Effects in the Metallic (III,Mn)V Ferromagnetic Semiconductors from the Infrared to the Visible Range", *Proceedings of American Institute of Physics (AIP)* (2004).
4. M. Polini, R. Fazio, M.P. Tosi, Jairo Sinova, and A. H. MacDonald, "Frustration of a Bose Gas inside an optical lattice", *Laser Physics* **14**, 603 (2004).
3. T. Jungwirth, Jairo Sinova, and A.H. MacDonald, "Magnetic and transport properties of (III,Mn)V ferromagnetic semiconductors", *Acta Physica Polonica A* **104**, 103 (2003).
2. Jairo Sinova, A.H. MacDonald, and S.M. Girvin, "Disorder and interactions in Quantum Hall Ferromagnets: effects of disorder in Skyrmion physics", *Physica E* **12**, 12 (2002).
1. Jairo Sinova, A. S. Nuñez, and J. Schliemann, "Electron-phonon interactions in polyacene organic transistors", *Physica status solidi b* **230**, 309 (2002).

CHAPTERS IN BOOKS

1. Jairo Sinova and Tomas Jungwirth, "Diluted Magnetic Semiconductors", in *Frontiers in Magnetic Materials*, Edited by A. V. Narlikar, Springer, New York, 2005.
2. Jairo Sinova and Allan H. MacDonald, "Theory of Spin-Orbit effects in Semiconductors", in *Spintronics* included in the series of *Semiconductors and Semimetals*, edited by T. Dietl, D. Awschalom, M. Kaminska, and H. Ohno, Elsevier, New York (2008).
3. Jairo Sinova, "Anomalous and Spin-injection Hall effects", in *Spin Transport and Magnetism in Electronic Systems*, edited by E. Tsybal and I. Zutic, Taylor & Francis, New York (2010).
4. Joerg Wunderlich, L. P. Zarbo, J. Sinova, and T. Jungwirth, "Spin-injection Hall Effect", in *Spin Current*, edited by S. Maekawa, S. O. Valenzuela, E. Saitoh, and T. Kimura, Oxford University Press, Oxford (2012).

INVITED TALKS

109. "Anti-damping intrinsic spin-orbit torque", Concepts in Spintronics- KITP Conference, Santa Barbara, October 2nd (2013).
108. "New twists in the spintronics: from anomalous Hall effect, to spin-helix transistor, to topological thermoelectrics", University of Texas, Austin, Texas, September 11th (2013).
107. "Berry phase intrinsic anti-damping spin-orbit torque", Spin Dynamics in Nanostructures- Gordon Conference, Hong Kong, August 20th (2013).
106. "Berry phase intrinsic anti-damping spin-orbit torque", 16th International Conference on Modulated Semiconductor Structures, Wroclaw, Poland, July 4th (2013).
105. "Berry phase intrinsic anti-damping spin-orbit torque", JGU Mainz, Mainz, Germany, July 1st (2013).
104. "New twists in the spintronics: from anomalous Hall effect, to spin-helix transistor, to topological thermoelectrics", Technical University Dresden, Dresden, Germany, June 12th (2013).
103. "Berry phase intrinsic anti-damping spin-orbit torque", Max Plank Institute, Dresden, June 11th (2013).
102. "Transverse Spin Seebeck Effect", Spin Caloritronics V, Columbus, Ohio, May 15th (2013).
101. "Spin-Orbit Effects", NewSpin3 conference, Mainz, Germany, April 8th (2013).
100. "Cottrell Scholars Collaborative: Integrating Research and Teaching", March Meeting 2013, Baltimore, March 22th (2013).
99. "New twists in the spintronics: from anomalous Hall effect, to spin-helix transistor, to topological thermoelectrics", University of Michigan, Ann Arbor, February 19th (2013).
98. "New twists in the spintronics: from anomalous Hall effect, to spin-helix transistor, to topological thermoelectrics", Temple University, Philadelphia, January 29th (2013).
97. "New twists in the spintronics: from anomalous Hall effect, to spin-helix transistor, to topological thermoelectrics", Syracuse University, New York, January 25th (2013).
96. "New twists and turns in the spintronics tango: from anomalous Hall effect, to spin-helix transistor, to topological thermoelectrics", University of Mainz, Mainz, December 6th (2012).
95. "Present and future challenges in Berry's phase induced Hall effects", Workshop on spin-orbit driven transverse transport phenomena, Bad Honnef, Germany, December 4th (2012).
94. "Theory of the anomalous Hall effect: from metallic to insulating hopping regime", SFB 689 Spintronics Workshop, Regensburg, Germany, September 19th (2012).

93. "But nobody told me this!", Graduate Student Mentoring colloquium, Texas A&M University, August 20th (2012).
92. "Expecting the unexpected in the spin Hall effect: from fundamental to practical!", International Workshop on Nanomagnetism & Superconductivity, Comaruga, Spain, July 1st (2012).
91. "Expecting the unexpected in the spin Hall effect: from fundamental to practical!", invited talk at the Frontiers in Materials: Spintronics workshop as part of the EMRS spring meeting, Strasbourg, May 13th (2012).
90. "New Twist in Spintronics", colloquium at University at Alabama, Tascaloosa, April 6th (2012).
89. "Theory of the anomalous Hall effect: from metallic to insulating regime", invited talk at the German Physical Society Meeting, Berlin, Germany, March 26th (2012).
88. "Topological thermoelectrics", RIKEN-APW-APCTP joint workshop "Recent trends in condensed matter physics", RINKEN-Saitama, Japan, January 14th (2012).
87. "Spin Hall effect transistors", 2nd ASRC International Workshop on "Magnetic Materials and Nanostructures", Tokai, Japan, January 10th (2012).
86. "Transport Theory and Simulation of Hybrid Structures", International Symposium High Performance Computing in Nano-Spintronics, Hamburg, Germany, November 30th (2011).
85. "New Twist in Spin Physics", colloquium at University at Buffalo SUNY, Buffalo, October 6th (2011).
84. "Spin-injection Hall effect: a new member of the spintronics Hall family and its implications in nano-spintronics", Hamburg, Germany, May 25th (2011).
83. "Topological thermoelectrics", MRS Spring Meeting, San Francisco, April 28th (2011).
82. "Spin Hall effect and devices: anomalous and spin Hall effect, spin-helix transistors, and beyond", APS March Meeting, Dallas, March 20th (2011).
81. "Echoes of special relativity in condensed matter physics: anomalous Hall effect, spin-helix transistors, and topological thermoelectrics", NORDITA, Stockholm, Sweden March 17th (2011).
80. "Spin Hall effect transistors and topological thermoelectrics", Autonoma University, Madrid, Spain, November 18th (2010).
79. "Echoes of special relativity in condensed matter physics: anomalous Hall effect, spin-helix transistors, and topological thermoelectrics", University of Cologne, Cologne, Germany, November 12th (2010).
78. "Echoes of special relativity in condensed matter physics: anomalous Hall effect, spin-helix transistors, and topological thermoelectrics", University of Utah, Salt Lake City, November 9th (2010).
77. "Making semiconductors magnetic: new materials properties, devices, and future", University of Utah, Salt Lake City, November 9th (2010).
76. "Spin-injection Hall effect: a new member of the spintronics Hall family and its implications in nano-spintronics", SPIE Spintronics-III International Conference, San Diego, August 1st (2010).
75. "Anomalous Hall effect in multiband disordered systems: from the metallic to the hopping regime", Fudan University, Shanghai, China June 17th (2010).
74. "Spin-dependent Hall effects and other thoughts on recent progress and future challenges in spintronics", KITPC, Beijing, China, June 7th (2010).
73. "New paradigms in spin-charge coupled physics", Free University Berlin, April 12th (2010).
72. "Exploiting the echoes of special relativity in condensed matter: new paradigms in spin-charge coupled physics", Ohio State University, February 9th (2010).
71. "Spin-injection Hall effect", UC San Diego, January 10th (2010).
70. "Spin-injection Hall effect: a new paradigm towards a room temperature Datta-Das type FET", Utrecht, The Netherlands, January 8th (2010).
69. "Spin-injection Hall effect: nanoelectronics, spintronics, and materials control in multiband complex systems", University of Texas, December 3rd (2009).
68. "A road to next generation technologies through basic research: Nanoelectronics, spintronics, and materials control in multiband complex systems", Jülich, Germany, November 11th (2009).

67. "Spin-injection Hall effect: a new member of the spintronics Hall family and its implications in nano-spintronics", Optical Spintronics Meeting, Cambridge, October 27th (2009).
66. "Spin-injection Hall effect: a new member of the spintronics Hall family and its implications in nano-spintronics", Symposium Spin Manipulation in Solid State Systems, Würzburg University, October 9th (2009).
65. "Spin-dependent Hall effects in strongly spin-orbit coupled systems", Ohio State University, October 5th (2009).
64. "Making Semiconductors Ferromagnetic", Ohio State University, October 2nd (2009).
63. "Spin-injection Hall effect: a new member of the spintronics Hall family and its implications in nano-spintronics", Ohio State University, October 1st (2009).
62. "Spin-injection Hall effect: a new member of the spintronics Hall family and its implications in nano-spintronics", Texas A&M University, September 29th (2009).
61. "New spintronic device concept using spin injection Hall effect: a new member of the spintronic Hall family", NRI-teleconference, Applied Research Associates, Vermont, August 4th (2009).
60. "Making Semiconductors Ferromagnetic", 125th ECS Meeting, Symposium on materials for post-CMOS, San Francisco, May 24th (2009).
59. "New developments in the Anomalous Hall Effect: phenomenological regimes, unified linear theories, and new members of the spintronic Hall family", SpinAps Spin Currents Conference, Lake Tahoe, April 19th (2009).
58. "Spin Injection Hall effect: a new member of the spintronic Hall family", Prairie View A&M, April 6th (2009).
57. "Spin Injection Hall effect: a new member of the spintronic Hall family", University of Maryland, March 12th (2009).
56. "New avenues in spin Hall caloritronic effects", Lorenz Center, Leiden University, Netherlands, February 10th (2009).
55. "Spin Injection Hall effect: a new member of the spintronic Hall family", Kavli Institute of Theoretical, Santa Barbara, December 18th (2008).
54. "Spin Injection Hall effect: a new member of the spintronic Hall family", Institute of Physics of the Academy of Science of the Czech Republic, Prague, November 18th (2008).
53. "Anomalous Hall effects in strongly spin-orbit coupled systems" (plenary talk), Spin Transport in Condensed Matter, 23rd Nishinomiya-Yukawa Memorial International Workshop, Kyoto, Japan, November 11th (2008).
52. "Computational Studies of the Spin and Anomalous Hall Effect", Computational Magnetism and Spintronics International Workshop, Dresden, Germany, November 4th (2008).
51. "Spin and anomalous Hall effects in semiconductors and metals", Summer School 'Nanomagnetism and Spintronics', Prague, Czech Republic, September 11th (2008).
50. "Theory of Hall effects and weak localization in strongly spin-orbit coupled systems: merging Keldysh, Kubo and Boltzmann theories", SPIE Spintronics International Conference, San Diego, August 12th (2008).
49. "Hall effects in strongly spin-orbit coupled systems: Merging Keldysh, Kubo, and Boltzmann approaches via the chiral basis", Spin Helicity and Chirality in Superconductors and Semiconductor Nanostructures, Karlsruhe, Germany, July 15th (2008).
48. "Making Semiconductors Ferromagnetic", NRI e-workshop, from Texas A&M University via teleconferencing, April 29th (2008).
47. "Challenges and Chemical Trends Dilute Magnetic Semiconductor", Rice University, April 28th (2008).
46. "Making Semiconductors Ferromagnetic: a physics tango in spintronics", New York University, New York, March 25th (2008).
45. "Spin-Hall effect: a new adventure in condensed-matter physics", Colloquium at New York University, New York, March 24th (2008).
44. "Spin-Hall effect: new challenges", International Workshop on Future Trends of Condensed Matter Physics, Aspen Colorado, February 8th (2008).

43. "Spin-Hall effect: a new adventure in condensed-matter physics", Colloquium at Sam Houston State University, Texas, January 22nd (2008).
42. "How to make semiconductors magnetic", International Workshop on Strongly Correlated Systems, Austin, Texas, October 23rd (2007).
41. "On the character of the Fermi energy in metallic diluted magnetic semiconductors", Los Alamos National Laboratory, Los Alamos, New Mexico, July 12th (2007).
40. "Anomalous and spin Hall effect in mesoscopic systems", International Conference of Nano-Magnetism, Istanbul, Turkey, June 25th (2007).
39. "Spin dependent transport and spin-current manipulation of magnetization", ONR Spintronics Review Workshop, Denver, Colorado, March 9th (2007).
38. "Anomalous transport: the convergence of sixty years of debate", Colloquium at Kansas University, Lawrence, Kansas, March 12th (2007)
37. "Challenges and Chemical Trends in Achieving a Room Temperature Dilute Magnetic Semiconductor: A Spintronics Tango Between Theory and Experiment", Frontiers in Chemical Physics, Univ. of Tennessee, Knoxville, Tennessee 22nd February (2007).
36. "Spin-Hall currents and spin accumulation in strong spin-orbit coupled regime", IFCAM International Workshop on Spin Currents, Sendai, Japan, 19th February (2007).
35. "Spin-Hall effect: a new twist on an old hat and other spintronics stories at TAMU", Texas A&M University, College Station, Texas, October 5th (2006).
34. "Spin Hall effect: where we were, where we are, and where we are going", Spin and Charge Effects at the Nanoscale, Scuola Normale Superiore at Pisa, Italy, July 2nd (2006).
33. "Do we understand (Ga,Mn)As? Prospects of high temperature magnetism in DMSs", KITP, Santa Barbara, May 25th (2006).
32. "Spin-Hall Effect in Mesoscopic Systems", Science and Application of Spin Electronics, Hong Kong University, Hong Kong, August 17th (2005).
31. "Anomalous transport and the spin Hall effect", Workshop on Semiconductor Nano Spintronics: Spin-Hall Effect and Related Issues", Pohang U., South Korea, August 8th (2005).
30. "Intrinsic Spin Hall effect", Spin-Tech III, Japan, August (2005).
29. "Spin-Hall Effect in the Mesoscopic Regime", International Workshop on the Anomalous Hall-Effect, Lyon, France July (2005).
28. "New physics in semiconductor spintronics", Houston Univ., April 25 (2005).
27. "Spin Hall effect: theory and experiment", Purdue University, April 8 (2005).
26. "Spin Hall effect: theory and experiment", Berkeley University, February 14 (2005).
25. "Novel magneto-resistance effects in diluted magnetic semiconductors", Stanford University, February 10 (2005).
24. "Experimental observation of the spin-Hall effect in two dimensional spin-orbit coupled systems", Yale University, January 13 (2005).
23. "Spin Hall effect: theory and experiment", University of Delaware, December 7 (2004).
22. "Magneto-optic effects and magnetization dynamics in metallic ferromagnetic semiconductors", 29th General Conference of the Condensed Matter Division of the European Physical Society, Prague, Czech Republic, July 20 (2004).
21. "Intrinsic Spin Hall Effect", invited talk at the March 2004 Meeting of the American Physical Society, Montreal, Canada, March (2004).
20. "Spin Hall Effect : the strange story of the anomalous Hall effect and its new trick in spintronics", University of Buffalo, October 29, (2003).
19. "Magneto-optical properties of metallic (III,Mn)V magnetic semiconductors", International Workshop in Diluted Magnetic Semiconductors, Lyon, France June 15 (2003)

18. "Spinning a Bose-Einstein condensate away: quantum fluctuations in 2D vortex matter", Autonoma University, Madrid, Spain, June 10 (2003).
17. "Magneto-optical and transport properties of metallic diluted ferromagnetic semiconductors: a spintronics tango", Ohio University, November 7 (2002).
16. "Magneto-optical properties of metallic diluted ferromagnetic semiconductors", International Conference of the Low Energy Electrodynamics in Solids, Long Island, October 13 (2002).
15. "Spinning a Bose-Einstein condensate away: quantum fluctuations in 2D vortex matter", Texas A&M University, September 19 (2002).
- 13-14. "Superconductivity in moth balls: surprises in organic transistors", University of Tennessee, April 9, 2002; California State University at Long Beach, April 2 (2002).
12. "Disorder and interactions in QH Ferromagnets near $\nu=1$ ", invited talk at the March 2002 Meeting of the American Physical Society (2002).
- 6-11. "Superconductivity in moth balls: surprises in organic transistors", Michigan State University, February 11, 2002; Rice University, January 28, 2002; Brandeis University, Yale University, and Brown University, November 14-16, 2001; University of Georgia, October 10 (2001).
5. "Surprises in organic transistors: superconductivity in moth balls and the future of plastic electronics", Seagate Technologies, Minneapolis, September (2001).
- 3-4. "Nature of the spin glass phase: to RSB or not to RSB", University of Texas, December 5, 2000; Indiana University, September (2000).
2. "Disorder and interactions in the Quantum Hall effect: How dirty are your samples?", Universidad Autonoma de Madrid, February (2000).
1. "NMR in the Quantum Hall effect and Skyrmion diffusion", Ohio University, September 22, (1999).

INTERNATIONAL CONFERENCES AND WORKSHOPS

1. International Workshop on Nanomagnetism & Superconductivity, Comaruga, Spain, July 1st (2012)
2. Frontiers in Materials: Spintronics workshop as part of the EMRS spring meeting, Strasbourg, May 13th (2012).
3. German American Physical Society March Meeting (Berlin, Germany), March (2012).
4. APS March Meeting (Boston, MA, February 2012).
5. RIKEN-APW-APCTP joint workshop "Recent trends in condensed matter physics", RINKEN-Saitama, Japan, January 14th (2012).
6. 2nd ASRC International Workshop on "Magnetic Materials and Nanostructures", Tokai, Japan, January 10th (2012).
7. International Symposium High Performance Computing in Nano-Spintronics (Hamburg, Germany, November 2011).
8. Spin Caloritronics II (Lorenz Center, Leiden, Netherlands, May 2011).
9. MRS Spring Meeting (San Francisco, CA, April 2011).
10. APS March Meeting (Dallas, TX, March 2011).
11. SPIE Spintronics-III International Conference (San Diego, CA, August 2010).
12. Shanghai Workshop on Spintronics and Low Dimensional Magnetism, (Shanghai, China June 2010)
13. Progress in Spintronics and Graphene Research, KITPC, (Beijing, China June 2010)
14. Spin manipulation in cold atoms and condensed matter, (Utrecht, The Netherlands January 2010).
15. Symposium Spin Manipulation in Solid State Systems, (Würzburg, Germany, October 2009).
16. Spintech V (Krakow, Poland, July 2009).
17. KITP Low Dimensional Electron System Workshop, (Santa Barbara, CA, May 2009).
18. SinAps Spin Currents 2009 Workshop, (Lake Tahoe, CA, April 2009).
19. Spin Caloritronics (Lorenz Center, Leiden, Netherlands, February, 2009).
20. KITP Rapid Response Workshop on the Quantum Spin Hall Effect and Topological Insulators, (Santa Barbara, CA, December, 2008).
21. Spin Transport in Condensed Matter, 23rd Nishinomiya-Yukawa Memorial International Workshop, (Kyoto, Japan, November, 2008).

22. International Conference on Computational Magnetism and Spintronics, (Dresden Max Planck Institute for Physics of Complex Systems during November, 2008).
23. Summer School on Nano-magnetism and Spintronics (Prague, Czech Republic, September, 2008).
24. Spintronics 2008, Spin sensing and devices, SPIE Optics & Photonics Symposium (San Diego, CA, August, 2008).
25. International Workshop on Spin Helicity and Chirality in Superconductor and Semiconductor Nanostructures (University of Karlsruhe, Germany, July, 2008).
26. 14th Annual Cottrell Scholar Conference, (Tucson, AZ, July 2008).
27. International Workshop on New Horizons in Condensed Matter Physics, (Aspen, CO, February 2008).
28. International Workshop on Strongly Correlated Systems, Austin, Texas, October 23rd (2007).
29. International Conference in Nano-Magnetism (IIT, Istanbul, Turkey 2007).
30. Frontiers in Chemical Physics (Univ. of Tennessee, Knoxville, February 2007).
31. IFCAM International Workshop on Spin Currents (Sendai, Japan, February 2007)
32. Spin and Charge Effects at the Nanoscale (Scuola Normale Superiore, Pisa, Italy, July 2006).
33. Spintronics conference at the KITP (Santa Barbara, California March 2006).
34. Workshop on Semiconductor Nano Spintronics: Spin-Hall Effect and Related Issues (Pohang University, South Korea, August 2005).
35. International Workshop on the Anomalous Hall-Effect (Lyon, France, July 2005).
36. Spintech III (Awai Island, Japan, June 2005).
37. General Conference of the Condensed Matter Division of the European Physical Society (Prague, Czech Republic, June 2004).
38. International Conference on the Physics of Semiconductors (Arizona, June 2004).
39. International Workshop in Diluted Magnetic Semiconductors (Lyon, France, June 2003).
40. International Conference on the Low Energy Electrodynamics in Solids (Long Island, New York, October, 2002).
41. Gordon Research Conference on Electronic Processes in Organic Matter (New Port, Rhode Island, July 2002).
42. International School of Solid State Physics 22nd Workshop: Quantum Phases at the Nanoscale, (Erice-Sicily, July 2002).
43. Electronic Properties of Two-dimensional Systems Conference (Prague, 2001).
44. Physics and Technology at the Nanometer Scale conference (Costa Rica, 2001).
45. Boulder Summer School on Superconductivity (Boulder, July 2000).
46. Les Houches Summer of Theoretical Physics on Topological Aspects of Low Dimensional Systems (France, July 1998).

TEACHING AND MENTORING

Texas A&M University physics department serves a large engineering department and as such faculty are expected to teach a large fraction of undergraduate physics courses. Our teaching load is two courses per academic year, which is the usual case in other research universities in the United States. When teaching larger courses we are given the choice of teaching one per semester or teaching two large lectures one semester in order to dedicate the other semester to graduate student advising and research. I have taken the double teaching option as the best way to balance teaching and research several times since my second year at Texas A&M.

Teaching experience:

Lectures:

- Graduate-level *Mesoscopic Transport in Multiband Systems*: created my own lecture notes on this specialty topics course focused on multiband mesoscopic transport and spintronics, quantum pumping, and spin pumping (Fall 2012).
- Graduate-level *Mesoscopic Physics*: created my own lecture notes on this specialty topics course focused on spintronics mesoscopic transport and current induced magnetic dynamics (Spring 2009).

- Undergraduate-senior-level: *Advance Mechanics*: besides textbook and prepared lecture notes I prepared numerical simulations, etc. available at the course's website http://appeal.physics.tamu.edu/P302_TAMU_APPEAL_website/index.html(Fall 2007).
- Undergraduate-junior-level *Thermal Physics, Waves, and Optics*: created this course completely new with new teaching methodologies. Course sponsored by several grants. The developed program is fully shown in the website <http://appeal.physics.tamu.edu/index.html>. I received the Distinguished Achievement College Level Award in Teaching on 2008 for this work and we have presented it at invited talks at several teaching conferences (Fall 2007).
- Undergraduate-junior-level *Introductory to Modern Physics*: course introduces modern physics to non-physics majors. We cover the fundamentals of quantum mechanics and 20th century physics and its foundations (Spring 2012).
- Undergraduate-freshman-level: *Introductory Mechanics*: taught two large lectures using the STEPS program. <http://faculty.physics.tamu.edu/sinova/courses/P218/> (double teaching Fall 2005; 100 students in each class; double taught Spring 2005, 80 students in each class; double teaching Spring 2010, 100 students in each class; double teaching Spring 2011, 100 students in each class; double teaching Spring 2012, 95 students in each class).
- Undergraduate-freshman-level: *Introductory to Electricity, Magnetism, and Waves*: taught two large lectures using the introductory book and my own lectures which I posted on the course's website. (Spring 2004 70 students).
- Graduate-level *Solid State Physics*: prepared my own notes which I made available on the website: <http://faculty.physics.tamu.edu/sinova/courses/oldcourses/P617/physics617.htm> (Fall 2003).
- Undergraduate-level: *Introductory level laboratory courses* (1994-1998)
- Undergraduate-level *Introductory observational astronomy*: designed and taught basic experimental observational astronomy (1992-1994).

Group Lectures:

Since some of the courses are not offered within our department I have performed several group courses to train my students in the particular techniques needed for their research, these include: Mesoscopic transport theory, Keldysh-non-equilibrium techniques, many-body theory of transport and equilibrium phenomena, magneto-optical effects and spin-charge dependent transport in ferromagnetic systems.

Educational workshops attended:

1. Research Corporation Cottrell Scholar Conference, Tucson, Arizona, July (2012)
2. Research Corporation Cottrell Scholar Conference, Tucson, Arizona, July (2011)
3. Research Corporation Cottrell Scholar Conference, Tucson, Arizona, July (2010)
4. Research Corporation Cottrell Scholar Conference, Tucson, Arizona, July (2008)
5. Research Corporation Cottrell Scholar Conference, Tucson, Arizona, July (2007)
6. Paradigms in Physics Workshop, Oregon State University, Corvallis, Oregon, June (2006)
7. Bridging the Vector Calculus Gap, Oregon State University, Corvallis, Oregon, June (2005)

Supervision of students and postdoctoral researchers:

- Graduate students:
 - Vivek Amin, Texas A&M University, September 20010-Present
 - Erin Veshtedt, Texas A&M University, September 2010-Present
 - Jacob Gyles, Texas A&M University, September 2011-Present
 - Huawai Gao, Texas A&M University, January 2011-Present
 - Shayan Hematian, Texas A&M University, May 2012-Present

- Xin Liu, Texas A&M University, September 2006-August 2012; Present: postdoctoral fellow at Penn State University.
- Xiong-Jun Liu, Texas A&M University, September 2007-August 2011; Present position: postdoctoral fellow at Hong Kong University.
- Mario Borunda, Texas A&M University, January 2004- December 2008; Present position: assistant professor at Oklahoma State University.
- Sergio Rodriguez, Texas A&M University, September 2004-2006
- Nikolai Sinitsyn, Texas A&M University, September 2003-June 2005 (Co-advised with Prof. Valery Pokrovsky); Present position: Staff member at Los Alamos National Laboratory.
- Hernesto Hernandez, Houston University, January 2004-May 2005
- Postdoctoral researchers:
 - Xingyuan Pan, Texas A&M University, January 2012- Present.
 - Ewelina Hankiewicz, Texas A&M University, August 2003-August 2005; Present position: Tenured Professor at the University of Würzburg.
 - Nikolai Sinitsyn, Texas A&M University, June 2006-August 2006; Present position: Permanent Staff member at Los Alamos National Laboratories.
 - Alexey Kovalev, Texas A&M University, September 2006-December 2008; Present position: postdoctoral fellow at UC Riverside.
 - Liviu Zarbo, Texas A&M University, July 2007-August 2009; Present position: Postdoctoral fellow at the Institute of Physics of the Academy of Sciences of the Czech Republic
- Undergraduates:
 - Cristian Cernov, Texas A&M University, May 2012 –Present.
 - David Darrow, Texas A&M University, September 2005-2007
 - Scott Adams, Texas A&M University, Fall 2004