CURRICULUM VITAE

Dr. Jairo Sinova

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Citizenship: Spanish and USA (dual)

Marital status: married

Last update: 1st of December 2021

PROFESSIONAL APPOINTMENTS

Johannes Gutenberg Universität Mainz
Alexander von Humboldt Professor 2014 to Present

Johannes Gutenberg Universität Mainz
Director of the Spin Phenomena Interdisciplinary Center (SPICE) 2014 to Present

Inst. of Physics of the Academy of Sciences of the Czech Republic
Independent Researcher 2007 to Present

Texas A&M University Adjunct 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 2014

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

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
Indiana University	M.S. Physics	August 1995
Ohio University	B.S. Physics (Magna Cum Laude)	June 1994

CURRENT RESEARCH TOPICS

- Antiferromagnetic Spintronics.
- Semiconductor and metallic spintronic; spin-orbitronics.
- 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 (2000-2020)

- Over 193 publications in top peer-reviewed journals such as Science (1), Science Advance (2), Nature Physics (5), Nature Materials (4), Nature Electronics (3), Nature Communications (8), Nature Nanotechnology (1), Nature Scientific Reports (1), Physical Review Letters (39), Applied Physics Lett. (9), Review of Modern Physics (4), and Physical Review B (78).
- Predicted the 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).
- Predicted the Néel Spin-Orbit Torque effect (Phys. Rev. Lett. 2014), which was observed in 2006 (Science 2016) and ignited the Antiferromagnetic Spintronics field.
- Over **16500** citations with an h-factor of **55** (Web of Science) – h-**64** and over **23260** citations in Google Scholar.
- Founder of the Spin Phenomena Interdisciplinary Center (SPICE) (http://www.spice.uni-mainz.de/) in 2014. Over 32 international workshops organized.
- Organizer of the Joint European Magnetic Symposia (JEMS), September 2018
- Organizer of the 1st international conference on Spin Hall effect (August 2005).

HONORS, AWARDS, AND RECOGNITIONS:

2021: Alexander von Humboldt Scout
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)

CURRICULUM VITAE ADDENDUM

MAJOR RESEARCH FUNDING

Funding summary (German and European based): **Total funding € 8.117.724**

Title: “TOPSTONE - Topological Solitons In Frustrated Magnets”
Agency: DFG (with Dr. Ricardo Zarzuela)
Amount and period for Sinova: **€ 208.850,00, September 2021 – September 2024**

Title: “Quench-switching of antiferromagnets explored with high spatial and temporal resolution”
Agency: DFG (with Czech Republic group)
Amount and period for Sinova: **€ 212.200,00, July 2021 – June 2024**

Title: “Ab-initio discovery of high-temperature topological magnetic materials”
Agency: DFG (with Chinese group)
Amount and period for Sinova: **€ 217.500,00, January 2021 – December 2023**

Title: “Magneto-Thermo-Electric Effects in Antiferromagnetic Spintronics”
Agency: DFG (with French group)
Amount and period for Sinova: **€ 214.450,00, January 2021 – December 2023**

Title: “EastoQmat SFB Center”
Agency: DFG, co-speaker, multiple PIs. (co-speaker)
Amount and period for Sinova: **€ 405.000, July 2020-June 2024**

Title: “Spin+X SFB Center”
Agency: DFG, multiple PIs.
Amount and period for Sinova: **€ 410.400, January 2020-December 2023**

Title: “Dynamical control of photocurrents, band structure topology, and topological transport via antiferromagnetic order manipulation”
Agency: Rheinland-Pfalz Excellence Innitiative-JGU.
Amount and period for Sinova: **€ 75.000, January 2020 – June 2021**

Title: “Controlled creation of topological magnetic texture in ferro- and antiferromagnets”
Agency: DFG, two PIs.
Amount and period: € 169.200, January 2019-February 2021

Title: “CHIME: Chiral Induced Dynamics in Magnetic Systems”
Agency: DFG, single PI.
Amount and period: **€ 185.000 February 2018-December 2021**

Title: “ASPIN: Antiferromagnetic Spintronics”
Agency: European Commission Future Emergent Technologies, co-PI.
Amount and period: **€ 397.020 October 2017-September 2022**

Title: “Spin-charge conversion and spin caloritronics at hybrid organic-inorganic interfaces”
Agency: European Research Council, Synergy Grants, four PIs.
Amount and period: € 1.509.504 for Sinova (award total: € 9.651.489), March 2014-June 2021

Title: “Alexander von Humboldt Award”
Agency: Alexander von Humboldt Foundation, single PI.
Amount and period: € 3.500.000, January 2014-December 2018 (extension to December 2020)

Title: “Theoretical studies of spin caloritronics”
Agency: DFG, single PI.
Amount and period: € 250.000, August 2014-September 2017

Title: “Spin+X SFB Center”
Agency: DFG, multiple PIs.
Amount and period for Sinova: € 363.600, January 2016-December 2019

Funding summary (US based): Total cumulative external US based 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-December 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 PROFFESIONAL ACTIVITIES

Other professional activities:

- Physical Review Letters Division Editor November 2020 – Present.
- Vice-chair/Chair of the Gordon Conference on Nanomagnetism, July 2019/2021
- Member of the Cottrell-Fulbright Selection Panel, 2015 – Present
- Member of the ERC Advance Panel Review, 2016 – Present
- Organizer of the Joint European Magnetic Symposia (JEMS), September 2018
- Co-organizer of the Tutorial session at the DPG meeting 2016
- 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 2010-2014
- Member of the Editorial Advisory Panel for Nature Communications 2010-2015
- Member of the Research Corporation Advisory Board 2009-2014
- 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:

- Steering Committee of Elasto-Q-Mat, 2020 – Present
- Gutenberg Forschung Kollegium, 2016 - Present
- Steering Committee of SFB-SPIN+X, 2015 – Present
- TopDyn Streering Committee Member, 2019 – Present
- Undergraduate Curriculum Committee (Chair) 2012-2013
- Undergraduate College Committee 2012-2013
- Advisory Committee 2011-2013
- Colloquium Committee 2011-2013
- Qualifying examination Committee 2008-2013
- Junior faculty mentor 2010-2013
- 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), Science Advance (2), Nature Physics (5), Nature Materials (4), Nature Electronics (3), Nature Communications (8), Nature Nanotechnology (1), Nature Scientific Reports (1), Physical Review Letters (39), Applied Physics Lett. (9), Review of Modern Physics (4), and Physical Review B (78). Underlined number indicates Letter type article.

180. S. P. Bommanaboyena, D. Backes, L. S. I. Veiga, S. S. Dhesi, Y. R. Niu, B. Sarpi, T. Denneulin, A. Kovács, T. Mashoff, O. Gomonay, J. Sinova, K. Everschor-Sitte, D. Schönke, R. M. Reeve, M. Kläui, H.-J. Elmers & M. Jourdan "Readout of an antiferromagnetic spintronics system by strong exchange coupling of Mn2Au and Permalloy", Nature Communications **12**, 6539 (2021)

180. A. Ross, R. Lebrun, O. Gomonay, J. Sinova, A. Kay, D.A. Grave, A. Rothschild and M. Kläui "Magnon transport in the presence of antisymmetric exchange in a weak antiferromagnet", Journal of Magnetism and Magnetic Materials **543**, 168631 (2022)

179. A. Barra, A. Ross, O. Gomonay, L. Baldrati, A. Chavez, R. Lebrun, J. D. Schneider, P. Shirazi1, Q. Wang, J. Sinova, G. P. Carman, and M. Kläui "Effective strain manipulation of the antiferromagnetic state of polycrystalline NiO", Appl. Phys. Lett. **118**, 172408 (2021)

178. Ricardo Zarzuela, Daniel Hill, Jairo Sinova, and Yaroslav Tserkovnyak "Dynamically stabilized spin superfluidity in frustrated magnets", Phys. Rev. B **103**, (2021).

177. Rafael González-Hernández, Libor Šmejkal, Karel Výborný, Yuta Yahagi, Jairo Sinova, Tomáš Jungwirth, and Jakub Železný "Efficient Electrical Spin Splitter Based on Nonrelativistic Collinear Antiferromagnetism", Phys. Rev. Lett. **126**, (2021).

176. Hendrik Meer, Felix Schreiber, Christin Schmitt, Rafael Ramos, Eiji Saitoh, Olena Gomonay, Jairo Sinova, Lorenzo Baldrati, and Mathias Kläui "Direct Imaging of Current-Induced Antiferromagnetic Switching Revealing a Pure Thermomagnetoelastic Switching Mechanism in NiO", NANO LETTERS **21**, (2021).

175. H. J. Elmers, S. V. Chernov, S. W. D'Souza, S. P. Bommanaboyena, S. Yu. Bodnar, K. Medjanik, S. Babenkov, O. Fedchenko, D. Vasilyev, S. Y. Agustsson, C. Schlueter, A. Gloskovskii, Yu. Matveyev, V. N. Strocov, Y. Skourski, L. Šmejkal, J. Sinova, J. Minár, M. Kläui, G. Schönhense, and M. Jourdan, "Néel Vector Induced Manipulation of Valence States in the Collinear Antiferromagnet Mn2Au", ACS NANO **14**, (2020).

174. A. Ross, R. Lebrun, L. Baldrati, A. Kamra, O. Gomonay, S.L. Ding, F. Schreiber, D. Backes, F. Maccherozzi, D.A. Grave, A. Rothschild, J. Sinova, M. Kläui, "An insulating doped antiferromagnet with low magnetic symmetry as a room temperature spin conduit", Appl. Phys. Lett. **117**, 242405 (2020).

173. R. Lebrun, A. Ross, O. Gomonay, V. Baltz, U. Ebels, A.L. Barra, A. Qaiumzadeh, A. Brataas, J. Sinova, M. Klaui, "Long-distance spin-transport across the Morin phase transition up to room temperature in ultra-low damping single crystals of the antiferromagnet alpha-Fe_2O_3", Nature Communications **11**, 6332 (2020).

172. F. Büttner, B. Pfau, M. Böttcher, M. Schneider, G. Mercurio, C. M. Günther, P. Hessing, C. Klose, A. Wittmann, K. Gerlinger, L.-M.Kern, C. Strüber, C. von Korff Schmising, J. Fuchs, D. Engel, A. Churikova, S. Huang, D. Suzuki, I. Lemesh, M. Huang, L. Caretta, D. Weder, J. H. Gaida, M. Möller, T. R. Harvey, S. Zayko, K. Bagschik, R. Carley, L. Mercadier, J. Schlappa, A. Yaroslavtsev, L. Le Guyarder, N. Gerasimova, A. Scherz, C. Deiter, R. Gort, D. Hickin, J. Zhu, M. Turcato, D. Lomidze, F. Erdinger, A. Castoldi, S. Maffessanti, M. Porro, A. Samartsev, J. Sinova, C. Ropers, J. H. Mentink, B. Dupé, G. S. D. Beach, S. Eisebitt "Observation of fluctuation-mediated picosecond nucleation of a topological phase", Nature Materials **20**, 30 (2021).

171. L. Baldrati, C. Schmitt, O. Gomonay, R. Lebrun, R. Ramos, E. Saitoh, J. Sinova, and M. Kläui "Efficient Spin Torques in Antiferromagnetic CoO/Pt Quantified by Comparing Field- and Current-Induced Switching", Phys. Rev. Lett. **125**, 077201 (2020).

170. S. Yu. Bodnar, Y. Skourski, O. Gomonay, J. Sinova, M. Kläui, and M. Jourdan "Magnetoresistance Effects in the Metallic Antiferromagnet Mn2Au", Phys. Rev. **14**, 014004 (2020).

169. Liang Liu, Jihang Yu, Rafael González-Hernández, Changjian Li, Jinyu Deng, Weinan Lin, Chenghang Zhou, Tiejun Zhou, Jing Zhou, Han Wang, Rui Guo, Herng Yau Yoong, Gan Moog Chow, Xiufeng Han, Bertrand Dupé, Jakub Železný, Jairo Sinova, and Jingsheng Chen "Electrical switching of perpendicular magnetization in a single ferromagnetic layer", Phys. Rev. B **101**, 220402 (2020).

168. Ricardo Zarzuela, Venkata Krishna Bharadwaj, Kyoung-Whan Kim, Jairo Sinova, and Karin Everschor-Sitte "Stability and dynamics of in-plane skyrmions in collinear ferromagnets", Phys. Rev. B **101**, 054405 (2020).

167. Mohammad M. Qaid, M.R. Mahani, J. Sinova, and G. Schmidt “Quantifying the inverse spin-Hall effect in highly doped PEDOT:PSS”, Phys. Rev. **2**, 013207 (2020).

166. J. P. Hanke, F. Freimuth, B. Dupe, J. Sinova, M. Klaui, Y. Mokrousov “Engineering the dynamics of topological spin textures by anisotropic spin-orbit torques”, Phys. Rev. B **101**, 014428 (2020).

165. A. Ross, R. Lebrun, O. Gomonay, D.A. Grave, A. Kay, L. Baldrati, S. Becker, A. Qaiumzadeh, C. Ulloa, G. Jakob, F. Kronast, J. Sinova, R. Duine, A. Brataas, A. Rothschild, M. Klaui “Propagation Length of Antiferromagnetic Magnons Governed by Domain Configurations”, Nano Letters **20**, 306-313 (2020).

164. L. Baldrati, O. Gomonay, A. Ross, M. Filianina, R. Lebrun, R. Ramos, C. Leveille, F. Fuhrmann, T.R. Forrest, F. Maccherozzi, S. Valencia, F. Kronast, E. Saitoh, J. Sinova, M. Klaui “Mechanism of Neel Order Switching in Antiferromagnetic Thin Films Revealed by Magnetotransport and Direct Imaging”, Phys. Rev. Lett. **123**, 177201 (2019).

163. J.H. Yu, R. Gonzalez-Hernandez, Liang Liu, J.Y. Deng, H.Y. Thong, Han Wang, Chen Lin, Hongxi Liu, F. Poh, J. Sinova, J.S. Chen “Thickness dependence of anomalous Hall conductivity in L1(0)-FePt thin film”, Journal of Physics D – Applied Physics **52**, 43LT02 (2019).

162. U. Chopra, S. Shambhawi, S. A. Egorov, J. Sinova, E.R. McNellis “Accurate and general formalism for spin-mixing parameter calculations”, Phys. Rev. B **100**, 134410 (2019).

161. A. Manchon, J. Zelezny, I.M. Miron, T. Jungwirth, J. Sinova, A. Thiaville, K. Garello, P. Gambardella “Current-induced spin-orbit torques in ferromagnetic and antiferromagnetic systems”, Review of Modern Physics **91**, 035004 (2019).

160. J. Kim, K.W. Kim, D. B. Shin, S.H. Lee, J. Sinova, N. Park, H. Jin “Prediction of ferroelectricity-driven Berry curvature enabling charge- and spin-controllable photocurrent in tin telluride monolayers”, Nature Communications **10**, 3965 (2019).

159. Y. Yamane, O. Gomonay, J. Sinova “Dynamics of noncollinear antiferromagnetic textures driven by spin current injection”, Phys. Rev. B **100**, 054415 (2019).

158. U. Chopra, S. A. Egorov, J. Sinova, E.R. McNellis, “Chemical and Structural Trends in the Spin-Admixture Parameter of Organic Semiconductor Molecules”, Journal of Physical Chemistry C **123**, 19112-19118 (2019).

157. S. Schott, U. Chopra, V. Lemaur, A. Melnyk, Y. Olivier, R. Di Pietro, I. Romanov, R.L. Carey, L. Remington, X.C. Jiao, C. Jellett, M. Little, A. Marks, C. R. McNeill, I. McCulloch, E.R. McNellis, D. Andrienko, D. Beljonne, J. Sinova, H. Sirringhaus “Polaron spin dynamics in high-mobility polymeric semiconductors”, Nature Physics **15**, 814-+ (2019).

156. D. Bossini, S. Dal Conte, G. Cerullo, O. Gomonay, R.V. Pisarev, M. Borovsak, D. Mihailovic, J. Sinova, J. H. Mentink, T. Rasing, A.V. Kimel “Laser-driven quantum magnonics and terahertz dynamics of the order parameter in antiferromagnets”, Phys. Rev. B **100**, 024428 (2019).

155. S.J. Wang, D. Venkateshvaran, M.R. Mahani, U. Chopra, E.R. McNellis, R. Di Pietro, S. Schott, A. Wittmann, G. Schweicher, M. Cubukcu, K. Kang, R. Carey, T.J. Wagner, J.N.M. Siebrecht, D.P.G.H. Wong, I.E. Jacobs, R.O. Aboljadayel, A. Ionescu, S.A. Egorov, S. Mueller, O. Zadvorna, P. Skalski, C. Jellett, M. Little, A. Marks, I. McCulloch, J. Wunderlich, J. Sinova, H. Sirringhaus “Long spin diffusion lengths in doped conjugated polymers due to enhanced exchange coupling (vol 2, pg 98, 2019)”, Nature Electronics **2**, 313-313 (2019).

154. R.M. Reeve, A. Loescher, H. Kazemi, B. Dupe, M.A. Mawass, T. Winkler, D. Schonke, J. Miao, K. Litzius, N. Sedlmayr, I. Schneider, J. Sinova, S. Eggert, M. Klaui “Scaling of intrinsic domain wall magnetoresistance with confinement in electromigrated nanocontacts”, Phys. Rev. B **99**, 214437 (2019).

153. B. Zimmermann, G. Bihlmayer, M. Bottcher, M. Bouhassoune, S. Lounis, J. Sinova, S. Heinze, S. Blugel, S, B. Dupe “Comparison of first-principles methods to extract magnetic parameters in ultrathin films: Co/Pt(111)”, Phys. Rev. B **99**, 214426 (2019).

152. D. Wagenknecht, L. Smejkal, Z. Kaspar, J. Sinova, T. Jungwirth, J. Kudrnovsky, K. Carva, I. Turek “Temperature-dependent resistivity and anomalous Hall effect in NiMnSb from first principles”, Phys. Rev. B **99**, 174433 (2019).

151. V.P. Kravchuk, O. Gomonay, D.D. Sheka, D.R. Rodrigues, K. Everschor-Sitte, J. Sinova, J. van den Brink, Y. Gaididei “Spin eigenexcitations of an antiferromagnetic skyrmion”, Phys. Rev. B **99**, 184429 (2019).

150. R. Lebrun, A. Ross, O. Gomonay, S.A. Bender, L. Baldrati, F. Kronast, A. Qaiumzadeh, J. Sinova, A. Brataas, R.A. Duine, M. Klaui “Anisotropies and magnetic phase transitions in insulating antiferromagnets determined by a Spin-Hall magnetoresistance probe”, Communications Physics **2**, 50 (2019).

149. S.J Wang, D. Venkateshvaran, M.R. Mahani, U. Chopra, E.R. McNellis, R. Di Pietro, S. Schott, A. Wittmann, G. Schweicher, M. Cubukcu, K. Kang, R. Carey, T.J. Wagner, J.N.M. Siebrecht, D.P.G.H. Wong, I.E. Jacobs,

R.O. Aboljadayel, A. Ionescus, S.A. Egorov, S. Mueller, O. Zadvorna, P. Skalski, C. Jellett, M. Little, A. Marks, I. McCulloch, J. Wunderlich, J. Sinova, H. Sirringhaus "Long spin diffusion lengths in doped conjugated polymers due to enhanced exchange coupling", Nature Electronics **2**, 98-107 (2019).

148. B.F. McKeever, D.R. Rodrigues, D. Pinna, A. Abanov, J. Sinova, K. Everschor-Sitte "Characterizing breathing dynamics of magnetic skyrmions and antiskyrmions within the Hamiltonian formalism", Phys. Rev. B **99**, 054430 (2019).

147. M. Dupe, S. Heinze, J. Sinova, B. Dupe "Stability and magnetic properties of Fe double layers on Ir (111)", Phys. Rev. B **98**, 224415 (2018).

146. M. Böttcher, S. Heinze, S. Egorov, J. Sinova, B. Dupé "B–T phase diagram of Pd/Fe/Ir(111) computed with parallel tempering Monte Carlo", New Journal of Physics **20**, 103014 (2018).

145. O. Gomonay, T. Jungwirth, J. Sinova "Narrow-band tunable terahertz detector in antiferromagnets via staggered-field and antidamping torques", Phys. Rev. B **98**, 104430 (2018).

144. O. Gomonay, K. Yamamoto, J. Sinova "Spin caloric effects in antiferromagnets assisted by an external spin current", Journal of Physics D: Applied Physics **51**, Number 26 (2018).

143. Ulrike Ritzmann, Stephan von Malottki, Joo-Von Kim, Stefan Heinze, Jairo Sinova, Bertrand Dupé "Trochoidal motion and pair generation in skyrmion and antiskyrmion dynamics under spin-orbit torques", Nature Electronics **1**, 451–457 (2018).

142. K. Yamamoto, O. Gomonay. J. Sinova, G. Schwiete "Spin transfer torques and spin-dependent transport in a metallic F/AF/N tunneling junction", Phys. Rev. B **98**, 014406 (2018).

141. L. Baldrati, A. Ross, T. Niizeki, C. Schneider, R. Ramos, J. Cramer, O. Gomonay, M. Filianina, T. Savchenko, D. Heinze, A. Kleibert, E. Saitoh, J. Sinova, and M. Kläui "Full angular dependence of the spin Hall and ordinary magnetoresistance in epitaxial antiferromagnetic NiO(001)/Pt thin films", Phys. Rev. B **98**, 024422 (2018).

140. E.R. McNellis, S. Schott, H. Sirringhaus, Jairo Sinova "Molecular tuning of the magnetic response in organic semiconductors", Phys. Rev. Materials **2**, 074405 (2018).

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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).
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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. Dielt, D. Awschalom, M. Kaminska, and H. Ohno, Elesvier, New York (2008).

3. Jairo Sinova, *"Anomalous and Spin-injection Hall effects",* in Spin Transport and Magnetism in Electronic Systems, edited by E. Tsymbal 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

186. "Direct Observation of Antiferromagnetic Parity Violation in the Electronic Structure of Mn2Au and …", Texas A&M University, 12th of November (2021).
185. "Emergent Antiferromagnetic Spintronics: from Dirac quasiparticles to non-relativistic novel magnetic classes", Computational materials discovery of unconventional magnetism EPFL, Lausanne, 27th of October (2021).
184. "Topological Antiferromagnetic Spintronics and the crystal Hall effects", Trends in Magnetism 2021 PETASPIN Conference, 6-10th of September 2021.
183. "Emergent Antiferromagnetic Spintronics: from Dirac quasiparticles to non-relativistic novel magnetic classes", W2S Seminar, 2nd of September (2021).
182. "Emergent Antiferromagnetic Spintronics: from Dirac quasiparticles to non-relativistic novel magnetic classes", Quantum Materials for Modern Magnetism and Spintronics (Q3MS), 14th of Juli (2021).
181. "Emergent Antiferromagnetic Spintronics: from Dirac quasiparticles to non-relativistic novel magnetic classes", Materials for Humanity 2021, 9th of Juli (2021).
180. "Why Spintronics: From Magnetic Cats to Artificial Intelligence: the Circular Technological Revolution of Spintronics", ESPIN RED School on Spintronics (on line), 17th of May (2021).
179. "Topological Antiferromagnetic Spintronics and the crystal Hall effects", CRIM, 9th of September (2020).
178. "Topological Antiferromagnetic Spintronics and the crystal Hall effects", APCTP-KIAS Quantum Materials Symposium 2020, South Korea, 13th of February (2020).
177. "Topological Antiferromagnetic Spintronics and the crystal Hall effects", New Perspectives in Spin Conversion Science 2020, University of Tokyo, Japan, 4th of February (2020).
176. "Topological Antiferromagnetic Spintronics and the crystal Hall effects", SMS 2019, Sendai, Japan, 27th of November (2019).
175. "From Magnetic Cats to Artificial Intelligence: the Circular Technological Revolution of Spintronics", Kavli Institute of Theoretical Physics, Santa Barbara, USA, 30th of October (2019).
174. "Topological Antiferromagnetic Spintronics and the crystal Hall effects", KITP, Santa Barbara, USA, 23rd of October (2019).
173. "Topological Antiferromagnetic Spintronics and the crystal Hall effects", Texas A&M University, College Station, USA, 17th of October (2019).
172. "Topological Antiferromagnetic Spintronics and the crystal Hall effects", MPI, Halle, Germany, 9th of August (2019).

171. “Topological Antiferromagnetic Spintronics and the crystal Hall effects”, Quantum Designer Physics, San Sebastian, Spain, 3rd of July (2019).
170. “Topological Antiferromagnetic Spintronics: from spin-orbit torques, to Neel spin-orbit torques to Dirac fermions”, International Symposium on Metallic Multilayers, Madrid, Spain, 19th of Juni (2019).
169. “A dormant giant awakens: the new era of antiferromagnetic spintronics”, Würzburg Universität, Germany, 30th of April (2019).
168. “A dormant giant awakens: the new era of antiferromagnetic spintronics”, Johannes Keppler Universität, Linz, Austria, 13th of March (2019).
167. “A dormant giant awakens: the new era of antiferromagnetic spintronics”, Freie Universität, Berlin, Germany, 18th of January (2019).
166. “Topological Antiferromagnetic Spintronics: from spin-orbit torques, to Neel spin-orbit torques to Dirac fermions”, EPFL, Lausanne, Switzerland, 19th of October (2018).
165. “Topological Antiferromagnetic Spintronics: from spin-orbit torques, to Neel spin-orbit torques to Dirac fermions”, Quantum Spintronics 2018, Trondheim, Norway, 5th of October (2018).
164. “Topological Antiferromagnetic Spintronics: from spin-orbit torques, to Neel spin-orbit torques to Dirac fermions”, NIST, Gaithersburg, Maryland, USA, 9th of August (2018).
163. “Topological Antiferromagnetic Spintronics: from spin-orbit torques, to Neel spin-orbit torques to Dirac fermions”, Quantum Designer Physics Conference, San Sebastian, Spain, 31st of May (2018).
162. “Topological Antiferromagnetic Spintronics: from spin Hall effect, to spin-orbit torques, to Neel spin-orbit torques, to tunable Dirac fermions”, Nanofront-mag-cm, Madrid, Spain, 12th of June (2018).
161. “Topological Antiferromagnetic Spintronics: from spin-orbit torques, to Neel spin-orbit torques to Dirac fermions”, Future Perspectives on Novel Magnetic Materials, Santorini, Greece, 31st of May (2018).
160. “Topological Antiferromagnetic Spintronics: from spin-orbit torques, to Neel spin-orbit torques to Dirac fermions”, Invited talk at the APS March Meeting, Los Angeles, USA, 5th of March (2018).
159. “Topological Antiferromagnetic Spintronics: a dormant giant awakens”, Köln Universität, Germany 26th of February (2018).
158. “A dormant giant awakens: the new era of antiferromagnetic spintronics”, ICN2 Severo Ochoa International Conference, Barcelona, 16th of February (2018).
157. “Topological Antiferromagnetic Spintronics: from spin-orbit torques, to Neel spin-orbit torques to Dirac fermions”, Gordon Research Conference, Switzerland, 17th of July (2017).
156. “Topological Antiferromagnetic Spintronics: from spin-orbit torques, to Neel spin-orbit torques to Dirac fermions”, SFB 668 International Symposium, Hamburg, Germany, 28th of June (2017).
155. “Topological Antiferromagnetic Spintronics: from Neel spin-orbit torques to Dirac fermions”, INTERMAG 2017, Dublin, Ireland, 28th of April (2017).
154. “Topological Antiferromagnetic Spintronics: from Neel spin-orbit torques to Dirac fermions”, Spin Mechanics 4, Fairmount Chateau Lake Louise, Alberta, Canada, 22nd of February (2017).
153. “A dormant giant awakens: the new era of antiferromagnetic spintronics”, Colloquium, Texas A&M University, 16th of February (2017).
152. “Can a ferromagnet behave like a cat? How the spin Hall effect and relativistic torques are opening new paths for information storage”, Colloquium, Geothe University am Frankfurt, Frankfurt, Germany, 30th of November (2016).
151. “Can a ferromagnet behave like a cat? How the spin Hall effect and relativistic torques are opening new paths for information storage”, Colloquium, Darmstadt University, Darmstadt, Germany, 25th of November (2016).
152. “Relativity shakes future technology: how the spin Hall effect and relativistic torques are opening new paths for information storage”, ECMoIS 2016, Bologna, Italy, 17th of November (2016).
151. “Can a ferromagnet behave like a cat? How the spin Hall effect and relativistic torques are opening new paths for information storage”, Colloquium, Monash University, Melbourne, Australia, 4th of November (2016).
150. “Antiferromagnetic spin-orbitronics”, Nanospin Conversion and Quantum Spin Dynamics Workshop, Tokyo, Japan, 13th of October (2016).
149. “Antiferromagnetic Spintronics”, Nanoscience and Quantum Transport, Kiev, Ukraine, 10th of October (2016).
148. “Spin-Torques and Spin Hall Effect in ferromagnets and antiferromagnets”, Nanoscience and Quantum Transport, Kiev, Ukraine, 9th of October (2016).
147. “Spin-orbitronics in ferromagnets, antiferromagnets and beyond”, Antiferromagnets Spintronics Workshop, Mainz, Germany, 27th of September (2016).
146. “Spin-orbit torques, Neel spin-orbit torques, and Weyl fermions in antiferromagnets”, International Spintronics and Spin Waves Workshop, San Sebastian, Spain, 19th of July (2016).

145. “Spin-orbit coupling effects and spin-orbit torques in ferromagnets and antiferromagnets”, Insulitronics 2016, Longyerbyen, Svalbard, 29th of May (2016).
144. “From SHE to SOT: can a ferromagnet behave like a cat?”, SPIN+X ITN Workshop, Technichal University Kaiserslautern, Kaiserslautern, Germany, 24th of May (2016).
143. “El Tango de la Fisica: investigacion espintronica a la Humboldt”, Catedra Europea, Universidad del Norte, Baranquilla, Colombia, 17th of March (2016).
142. Berry phase linked spin-orbit torques in FM and AFM systems”, Invited Talk, DPG Spring Meeting, Regensburg, Germany (2016).
141. “Relativistic spin-orbit torques in antiferromagnets and related effects: from 2D to 3D”, New Trends I 2D Systems, Madrid, Spain, 23th of February (2016)
140. “Can a ferromagnet behave like a cat? How the spin Hall effect and relativistic torques are opening new paths for information storage”, Colloquium, Karlsruhe Institute of Technology, Karlsruhe, Germany, 21st of January (2016).
139. “SHE and spin-orbit torques”, Spintronics with Antiferromagnetism, Sendai, Japa, 17th of November (2015).
138. “Relativistic spin-orbit torques”, SOC and Spin Mechanics Workshop, Mainz, Germany, 23rd of October (2015).
137. “Relativistic spin-orbit torques in ferromagnets and antiferromagnets: connecting spin Hall effect, spin galvanic effect and spin-orbit torques”, Psi-k 2015 Conference, San Sebastian, 8th of September (2015).
136. “Relativistic spin-orbit torques in ferromagnets and antiferromagnets”, Spin Mechanics 3 Workshop, München, Germany, 26th of June (2015).
135. “Relativity shakes future technology: how the spin Hall effect and relativistic torques are opening new paths for information storage”, Colloquium, University of Nijmegen, Nijmegen, The Netherlands, 29th of May (2015).
134. “Relativity shakes future technology: how the spin Hall effect and relativistic torques are opening new paths for information storage”, Colloquium, University of Duisburg, Duisburg, Germany, 8th of April (2015).
133. “Spin-Orbit Torques in ferromagnets and antiferromagnets, DMI, and other random thoughts”, Workshop of the group of Prof. Felser, Dresden, Germany, 26th of March (2015).
132. “Spintronics Research a la Humboldt: globally connecting nature, cultures, and people”, Humboldt Colloquium, Sao Paolo, Brazil, 26th of February (2015).
131. “Relativity shakes future technology: how the spin Hall effect and relativistic torques are opening new paths for information storage”, Colloquium at the University of Jyvaskylan, Jyvaskylan, Finland, 20th of February 2015.
130. “New twists and turns in the spin-orbitronics tango: from fundamental discoveries to practical applications”, Klosters, Siwtzerland, 9th of February (2015).
129. “Intrinsic current-driven spin-orbit torques and Neel spin-orbit fields in ferromagnetic and antiferromagnetic systems”, New Insights in the Physics of Magnetic Nanostructures Workshop, Tokai, Japa, 27th of January (2015)
128. “Relativity shakes future technology: how the spin Hall effect and relativistic torques are opening new paths for information storage”, IMR/AIMR Tohoku University, Sendai, Japan, 22nd of January (2015).
127. “Intrinsic current-driven spin-orbit torques and Neel spin-orbit fields in ferromagnetic and antiferromagnetic systems”, Zao Workshop, Japan, 18th of January (2015).
126. “Relativity shakes future technology: how the spin Hall effect and relativistic torques are opening new paths for information storage”, Colloquium, Konstanz Universität, Konstanz, Germany, 25th of November (2014).
125. “Spin-Orbit Torques and Spin-Transfer Torques”, SPICE Workshop on Modern Simulation Methods in Material Science, Schloß Waldhausen, Mainz, Germany, 20th of November (2014).
124. “Spintronics: a birds eye view”, SPICE Workshop on Modern Simulation Methods in Material Science, Schloß Waldhausen, Mainz, Germany, 18th of November (2014).
123. “Intrinsic current-driven spin-orbit torques and Néel spin-orbit fields in ferromagnetic and antiferromagnetic systems”, MMM, Honolulu, Hawaii, USA, 4th of November (2014).
122. “Relativity shakes future technology: how the spin Hall effect and relativistic torques are opening new paths for information storage”, Colloquium, Texas A&M University, College Station, Texas, USA, 30th of October (2014).
121. “Relativity shakes future technology: how the spin Hall effect and relativistic torques are opening new paths for information storage”, Colloquium, Regensburg Universität, Regensburg, Germany, 13th of October (2014).
120. “Spin Orbit-Torques”, SpinCat School, Bielefeld, Germany, 1st of October (2014).
119. “But Nobody Told Me This”, Marie Curie School on Spintronics, Paris, France, 17^{8h} of September (2014).

118. “Spin Orbit-Torques”, Marie Curie School on Spintronics, Paris, France, 17th of September (2014).
117. “Joining spin-dependent transport phenomena and magnetization dynamics for future MRAM technology”, SSPCM 2014, Rzeszow, Poland, 6th of September (2014).
116. “Spin Transport and Spin-Orbit Coupling: Organic Spin-Orbitronics”, Organic Spintronics Workshop, JGU, Mainz, Germany, 29th of August (2014).
115. “Large Tunneling Magneto-Seebeck Effect in a CoPt/MgO/Pt Tunneling Junction”, SpinCat VI, Irsee, Germany, 17th of July (2014).
114. “Spin-Orbit Torque in Ferromagnetic and Antiferromagnetic Systems”, Spin Mechanics 2, Sendai, Japan, 24th of June (2014).
113. “Relativity road to future technology: exploiting spin-orbit coupling to new possibilities for information storage”, Colloquium, Johannes Gutenberg Universität, Mainz, Germany, 17th of June (2014).
112. “Relativity road to future technology: exploiting spin-orbit coupling to new possibilities for information storage”, ICQ Workshop in spintronics, Beijing, 3rd of June (2014).
111. “Relativity road to future technology: exploiting spin-orbit coupling to new possibilities for information storage”, Colloquium, Würzburg Universität, Würzburg, Germany, May 12th (2014).
110. “Anti-damping intrinsic spin-orbit torque arising from Berry phases”, 14th REIMEI Workshop on Spin Currents and Related Phenomena, ILL, Grenoble, France, February 11th (2014).
109. “Anti-damping intrinsic spin-orbit torque arising from Berry phases”, Spin Transport Beyond Boltzmann, Bad Honnef, Germany, January 9th (2014).
110. “New twists in the spintronics: from anomalous Hall effect, to spin-helix transistor, to topological thermoelectrics“, Ohio University, Ohio, November 22nd (2013).
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 Dynamivs 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”, Fudam 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, Laurence, 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 ν=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).

TEACHING AND MENTORING

At Johannes Gutenberg University Mainz I am currently with no direct teaching duties as the director of the Spin Phenomena Interdisciplinary Center and as a Gutenberg Fellow. The team (via a substitute professor) teaches one course per semester. Most of these courses are specialized courses.

The 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. The 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. While at Texas A&M I took 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:

- Masters-level *Advance Solid State Theory* (Fall/Winter 2021/2022).
- Masters-level *Electrodynamics* (Spring/Sumer 2021).
- Masters-level *Solid State Theory* (Spring/Sumer 2021).
- Masters-level *Classical Mechanics* (Fall/Winter 2020/2021).
- Masters-level *Mathematical Methods for Physics* (Spring 2020).
- Graduate/Masters-level *Statistic Mechanics* (Spring 2018, Fall/Winter 2018/2019).
- Graduate *Spintronics* (Fall 2014)
- Graduate-level *Mesoscopic Transport in Multiband Systems II* (Fall 2013).
- 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:

    1. Steven Hendrik Schoenmaker, Johannes Gutenberg University Mainz, 2021-Present
    2. Tobias Wagner, Johannes Gutenberg University Mainz, 2021-Present
    3. Bennet Karetta, Johannes Gutenberg University Mainz, 2021-Present
    4. Gizem Özcan, Johannes Gutenberg University Mainz, 2020-Present
    5. Rodrigo Jaeschke, Johannes Gutenberg University Mainz, 2020-Present
    6. Nayra Alvarez, Johannes Gutenberg University Mainz, 2020-Present

7. Anna Birk Hellenes, Johannes Gutenberg University Mainz, 2019-Present
8. Marie Böttcher, Johannes Gutenberg University Mainz, 2016-2020
9. Uday Chopra, Johannes Gutenberg University Mainz, 2016-2020 (deceased 2021)
10. Diana Prychynenko, Johannes Gutenberg University Mainz, 2015-2019 (student in Berlin)
11. Libor Smejkal, Johannes Gutenberg University Mainz, 2015-2020 (student shared with Prof. Jungwirth in Prague)
12. Hristo Velkov, Johannes Gutenberg University Mainz, 2014-August 2017 Present Position: Consultant at d-fine company
13. Jacob Gyles, Texas A&M University, September 2011-December 2016, Present position: Assistant Professor of Physics at University of South Florida.
14. Vivek Amin, Texas A&M University, September 20010-August 2014; Present position: Assistand Professor at Indiana University Indianapolis.
15. Erin Veshtedt, Texas A&M University, September 2010-May 2013
16. Huawai Gao, Texas A&M University, January 2011-August 2015
17. Shayan Hematian, Texas A&M University, May 2012-Agusut 2016
18. Xin Liu, Texas A&M University, September 2006-August 2012; Present position: Professor in China.
19. Xiong-Jun Liu, Texas A&M University, September 2007-August 2011; Present position: Professor in China.
20. Mario Borunda, Texas A&M University, January 2004- December 2008; Present position: Associate professor at Oklahoma State University.
21. Sergio Rodriguez, Texas A&M University, September 2004-2006
22. 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.
23. Hernesto Hernandez, Houston University, January 2004-May 2005; Present position: Professor in Mexico.

- Postdoctoral researchers:
    1. Ricardo Zarzuela; Johannes Gutenberg University, 2019 - Present
    2. Libor Smejkal, Johannes Gutenberg University Mainz, 2020 - Present
    3. Olena Gomonay, Johannes Gutenberg University, 2015 – Present
    4. Uday Chopra, Johannes Gutenberg University Mainz, 2020-2021(deceased 2021)
    5. Karin Everschore-Sitte; Johannes Gutenberg University, 2015- 2016 (from 2017 to 2021 she led her own Emmy Noether Group in Mainz in coordination/cooperation with my group; Present position: W3 Professor in Duisburg)
    6. Erik McNellis; Johannes Gutenberg University, 2014 – 2021
    7. Reza Mahani; Johannes Gutenberg University, 2016 – 2021
    8. Bertrand Dupe; Johannes Gutenberg University, 2016 - 2019
    9. Melanie Dupe: Johannes Gutenberg University, 2016 - 2019
    10. Kyoung-Wahn Kim, Johannes Gutenberg University, 2016- 2018; Present position: Professor in South Korea.
    11. Matthias Sitte; Johannes Gutenberg University, 2015- 2017
    12. Ulirke Ritzmann, Johannes Gutenberg University, 2016- 2017
    13. Yuta Yamane, Johannes Gutenberg University, 2014- 2017
    14. Amaury de Melo Souza, Johannes Gutenberg University, 2015- 2017
    15. Georg Schwiete, Johannes Gutenberg University, 2014-2016; Present position: Professor at University of Alabama.
    16. Zhe Yuan, Johannes Gutenberg University, 2014-2015; Present position: Professor in China (Beijing).
    17. Peng Yan, Johannes Gutenberg University, 2015; Present position: Professor in China.
    18. Xingyuan Pan, Texas A&M University, January 2012- December 2013.

19. Ewelina Hankiewicz, Texas A&M University, August 2003-August 2005; Present position: Tenured Professor at the University of Würzburg.
20. Nikolai Sinitsyn, Texas A&M University, June 2006-August 2006; Present position: Permanent Staff member at Los Alamos National Laboratories.
21. Alexey Kovalev, Texas A&M University, September 2006-December 2008; Present position: Assistant Professor in Nebraska.
22. 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:
    - Bennet Karetta, Johannes Gutenberg University, 2020- 2021
    - Tobias Wagner, Johannes Gutenberg University, 2020- 2021
    - Sebastian Müller, Johannes Gutenberg University, 2015- 2019
    - Ilja Müller, Johannes Gutenberg University, 2015- 2018
    - Cristian Cernov, Texas A&M University, May 2012 –2019.
    - David Darrow, Texas A&M University, September 2005-2007
    - Scott Adams, Texas A&M University, Fall 2004