

# Prof. Dr. Jairo Sinova - Curriculum Vitae

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**Date of birth:** 15. May 1972      **Nationality:** Spain and USA  
**Place of birth:** Valladolid (Spain)      **Marital status:** Married

## Professional Life and Work Experience

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**Johannes Gutenberg Universität Mainz**  
Alexander von Humboldt Professor (W3) 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** 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** Summer Researcher 1993

## Education

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**Indiana University** Ph.D. Physics August 1999  
**Indiana University** M.S. Physics August 1995  
**Ohio University** B.S. Physics (Magna Cum Laude) June 1994

## Major Honors and Awards

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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

# Professional Activities and Services to the Community

## Scientific Focus:

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

## Professional Activities, Research and Mentoring highlights:

- **Publications:** >140 reviewed publications (over 9050 citations and h-factor 43)
  - 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 Neél Spin-Orbit Torque effect (Phys. Rev. Lett. 2014), which was observed in 206 (Science 2016) starting the Antiferromagnetic Spintronics field.
- **Conferences:** >157 invited presentations at universities and conference presentations; founder of the SPICE: Spin Phenomena Interdisciplinary Center.
- **Mentoring:** Supervision of >34 Postdocs, PhD and Master students and interns. 7 former group members have become faculty members at leading institutions. Within the SPICE center he promotes the concept of Young Research Leaders Workshops – an invitation only top junior researchers conference.
- **Funding:** >5.5 Mio. € third party funding in the last 3 years.
- **Services to the Community:**
  - founder of the **Spin Phenomena Interdisciplinary Center (SPICE) in 2015**, with over 24 international conferences already organized (<https://www.spice.uni-mainz.de/>)

## SPICE website (screen shot)

The screenshot shows the SPICE website homepage. At the top left is the logo for Johannes Gutenberg University Mainz. The main navigation bar includes links for HOME, ABOUT SPICE, NEWS AND POSTS, WORKSHOPS, WORKSHOP PROPOSALS, VISITOR PROGRAM, VISITOR INFORMATION, and SPICE STAFF. The 'Recent and Upcoming Workshops' section features three featured workshops: 'TOPOLOGY MATTERS' (July 25-28, 2017, Mainz, Germany), 'YOUNG RESEARCH LEADERS GROUP WORKSHOP' (July 31-Aug. 4, 2017, Mainz, Germany), and 'EXOTIC NEW STATES IN SUPERCONDUCTING DEVICES' (Sept. 25-28, 2017, Mainz, Germany). Below this, there are sections for 'Programs' (Workshops 2017, Workshops 2014-16, Visitor Program, Propose a Workshop), 'SPICE Workshops Talks' (YouTube channel, Watch the workshop talks and lectures at the SPICE YouTube Channel), and 'Visitor Information' (How to reach SPICE, Workshop venues, Prepare your visit, Accommodations, Facilities on Campus). The 'Follow Us' section includes links to YouTube, Facebook, and SPICE news. The 'Collaborating Centers' section lists mtp, INSP/RE, SPIN-X, and METRAN SCIENCE. A large photo shows a group of people at a SPICE Workshop: Spin Dynamics in the Dirac Systems.

- Co-Organizer of the Newspin3 Winter School and Conference, April 2013
- Vice-chair of the Gordon Conference on Nanomagnetism, July 2019
- Organizer of the Joint European Magnetic Symposia (JEMS), September 2018
- Organizer of the Spintronics Tutorial session at the APS March Meeting, March 2013 and at the DFG Spring Meeting 2016 (with Karin Everschor-Sitte).
- Member of the ERC Advance Panel Review, 2016 - Present
- Co-organizer of the first German-USA Fulbright-Cottrell workshop in Germany on innovative teaching and junior researcher's leadership.
- Reviewer for various journals (Nature Physics, Nature Materials, PRL)
- Reviewer for project and laboratories (NSF, ANR, AERES, etc.)

## Ten Selected Publications

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1. *Room-temperature spin-orbit torque in NiMnSb*  
C. Ciccarelli, L. Anderson, V. Tshitoyan, A. J. Ferguson, F. Gerhard, C. Gould, L. W. Molenkamp, J. Gayles, J. Zelezny, L. Smejkal, Z. Yuan, J. Sinova, F. Freimuth, T. Jungwirth  
Nature Phys. 12, 855-860 (2016)
2. *Electric control of the spin Hall effect by intervalley transitions*  
N. Okamoto, H. Kurebayashi, T. Trypiniotis, I. Farrer, D. A. Ritchie, E. Saitoh, J. Sinova, J. Masek, T. Jungwirth, Cr. Barnes  
Nature Mat. 13, 932 (2014)
3. *An antidamping spin-orbit torque originating from the Berry curvature*  
H. Kurebayashi, Jairo Sinova, D. Fang, A. C. Irvine, T. D. Skinner, J. Wunderlich, V. Novák, R. P. Campion, B. L. Gallagher, E. K. Vehstedt, L. P. Žárbo, K. Výborný, A. J. Ferguson, T. Jungwirth  
Nature Nanotechn. 9, 211 (2014)
4. *Spectral non-uniform temperature, non-local heat transfer, and the spin Seebeck effect*  
K. S. Tikhonov, J. Sinova, A. M. Finkelstein  
Nature Commun. 4, 2945 (2013)
5. *The essential role of carefully optimized synthesis for elucidating intrinsic material properties of (Ga,Mn)As*  
P. Nemeč, V. Novak, N. Tesarova, E. Rozkotova, H. Reichlova, D. Butkovicova, F. Trojanek, K. Olejnik, P. Maly, R. P. Campion, B. L. Gallagher, Jairo Sinova, T. Jungwirth  
Nature Commun. 4, 1422 (2013)
6. *Spin Hall effect transistor*  
J. Wunderlich, B. G. Park, A. C. Irvine, L. P. Zarbo, E. Rozkotova, P. Nemeč, V. Novak, J. Sinova, T. Jungwirth  
Science 330, 1801 (2010)
7. *Evidence of ballistic Intrinsic Spin Hall Effect in HgTe Nanostructures*  
C. Bruene, A. Roth, E.G. Novik, M. Koenig, H. Buhmann, E.M. Hankiewicz, W. Hanke, J. Sinova, L. W. Molenkamp  
Nature Phys. 6, 448 (2010)
8. *Spin-injection Hall effect in a planar photovoltaic cell*  
J. Wunderlich, A. C. Irvine, Jairo Sinova, B. G. Park, X. L. Xu, B. Kaestner, V. Novak, T. Jungwirth  
Nature Phys. 5, 675 (2009)
9. *Experimental observation of the spin-Hall effect in a two-dimensional spin-orbit coupled semiconductor system*  
J. Wunderlich, B. Kaestner, J. Sinova, T. Jungwirth  
Phys. Rev. Lett. 94, 047204 (2005)
10. *Universal Intrinsic Spin-Hall Effect*  
J. Sinova, D. Culcer, Q. Niu, N. A. Sinitsyn, T. Jungwirth, A.H. MacDonald  
Phys. Rev. Lett. 92, 126603 (2004)