Jakub Železný

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Education

2011 – 2016 **PhD in Physics of Nanostructures**
Faculty of Mathematics and Physics, Charles University in Prague
Supervisor: Prof. Tomáš Jungwirth

2006 – 2011 **Master's degree in Mathematical Physics**
Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague
Supervisor: David Krejčiřík, Ph.D.

Employment

2017 – present **Group leader**, Institute of Solid State Physics, Czech Academy of Sciences

2016 – 2017 **Postdoctoral researcher**, Max Planck Institute for Chemical Physics of Solids, Germany

2011-2016 **Research assistant**, Institute of Physics of the Czech Academy of Science, Czech Republic

2010-2011 **Research assistant**, Nuclear Physics Institute of the Czech Academy of Science, Czech Republic

Grants

2019 – 2022 Grant Agency of the Czech Republic, Junior grant, 5,469,000 CZK

2017 – 2022 Max Planck Partner Group, €100.000

Supervision of students and postdoctoral fellows

2021 – Vojtěch Pařízek, Bachelor's student

2019 – 2021 Srikrishna Ghosh, M.Sc., Ph.D. – Postdoctoral researcher at the Institute of Physics

2019 Yuta Yahagi, M.Sc. – Visiting PhD student

2018 – 2019 Bc. Carles Gomez Olivella – Research assistant, employed full time at the Institute of Physics

Publications

ResearcherId: G-5276-2014
ORCID: 0000-0001-9471-0078

Citation metrics
Articles in peer-reviewed journals: 33

Citations (WOS): 3371
h-index: 21

Selected publications

S. Ghosh, A. Manchon, and J. Železný, "Unconventional robust spin-transfer torque in noncollinear antiferromagnetic junctions", Phys. Rev. Lett. **128**, 097702 (2022).

F. Křízek, S. Reimers, Z. Kašpar, et al., "Atomically sharp domain walls in an antiferromagnet", Science Advances **8**, eabn3535 (2022).

R. González-Hernández, L. Šmejkal, K. Výborný, et al., "Efficient Electrical Spin Splitter Based on Nonrelativistic Collinear Antiferromagnetism", Phys. Rev. Lett. **126**, 127701 (2021).

A. Manchon, J. Železný, I. M. Miron, et al., "Current-induced spin-orbit torques in ferromagnetic and antiferromagnetic systems", Rev. Mod. Phys. **91**, 035004 (2019).

J. Železný, P. Wadley, K. Olejník, et al., "Spin-transport, spin-torque and memory in antiferromagnetic devices", Nature Phys. **14**, 220–228 (2018).

J. Železný, Y. Zhang, C. Felser, et al., "Spin-polarized current in noncollinear antiferromagnets", Phys. Rev. Lett. **119**, 187204 (2017).

J. Železný, H. Gao, A. Manchon, et al., "Spin-orbit torques in locally and globally noncentrosymmetric crystals: Antiferromagnets and ferromagnets", Phys. Rev. B **95**, 014403 (2017).

P. Wadley, B. Howells, J. Železný, et al., "Electrical switching of an antiferromagnet", Science **351**, 587–590 (2016).

J. Železný, H. Gao, K. Výborný, et al., "Relativistic Néel-order fields induced by electrical current in antiferromagnets", Phys. Rev. Lett. **113**, 157201 (2014).

Awards

2018 Otto Wichterle Award of the Czech Academy of Sciences for exceptional young researchers

2016 Václav Votruba Price for the best doctoral thesis in theoretical physics

Invited talks (selected)

2022 Materials for Humanity 22, Singapore

2022 Young Research Leaders Workshop (2022), Mainz, Germany

2019 SPIE, Spintronics XIII conference, San Diego, USA

2018 Workshop on Collective Spin Dynamics in Nanostructures, Beijing, China

2018 International Colloquium on Magnetic Films and Surfaces, Santa Cruz, USA (2018)

2018 Spins out of equilibrium: Manipulating and detecting quantum magnets, WE-Heraeus-Seminar, Germany

2017 CECAM workshop on ab-inito spinorbitronics, Italy

2017 Gordon Research Conference on Spin Dynamics in Nanostructures, Switzerland

Visiting positions

2015 Y. Mokrousov group, Forschungszentrum Jülich, Germany (2 months)

2013 Jairo Sinova group, Texas A&M University, College Station, USA (3 months)

Reviewing activities

88 referee reports for journals including Science, Nature, Nature Nanoelectronics, Nature Nanotechnology, Phys. Rev. Lett., Phys. Rev. X and Phys. Rev. B.

Peer review record: https://www.webofscience.com/wos/author/record/G-5276-2014