



Martin Gmitra

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● RESEARCH PROFILE

Research Interest

Expert in Density Functional Theory calculations of electronic properties of solids, spin-orbit coupling, magnetism, optics and transport. Research interests are focused on a search of novel two-dimensional materials and detailed study of their van der Waals hybrids in order to propose new functional materials utilizing proximity effects.

Main Achievements

- current induced spin dynamics in spin valves (DOI: [10.1103/PhysRevLett.96.207205](https://doi.org/10.1103/PhysRevLett.96.207205))
- fundamentals of spin-orbit coupling in graphene (DOI: [10.1103/PhysRevB.80.235431](https://doi.org/10.1103/PhysRevB.80.235431))
- graphene spintronics (DOI: [10.1038/nnano.2014.214](https://doi.org/10.1038/nnano.2014.214))
- proximity effects in van der Waals heterostructures (DOI: [10.1103/PhysRevLett.119.146401](https://doi.org/10.1103/PhysRevLett.119.146401))

Personal Credo

- bridge theoretical and experimental research
- transfer knowledge to students and young researchers

● WORK EXPERIENCE

1 FEB 2018 – CURRENT – Slovakia

UNIVERSITY RESEARCH ASSISTANT – PAVOL JOZEF ŠAFÁRIK UNIVERSITY IN KOŠICE

Research activities within projects as principal investigator:

- "*Theoretical study of multifunctional quantum low-dimensional magnetic materials*" VEGA 1/0105/20
- "*Implementations of methods for electronic structure calculations of quantum materials*" MŠVVaŠ SR, 90/CVTISR/2018
- "*Exploitation of spin-orbit and magnetic proximity effects in design of new functional materials* IPPH2020 VVGS-2018-887, VVGS-2019-1277

Košice, Slovakia

1 FEB 2007 – 31 JAN 2018 – Germany

UNIVERSITY RESEARCH ASSISTANT – UNIVERSITY OF REGENSBURG

Researcher within the projects:

- "*Emergent relativistic effects in condensed matter*" DFG SFB 1277
- "*Spin in reduced dimensions*" DFG SFB 689
- "*Ultrasmooth*" EU MRTN-CT-2003-504462

Regensburg, Germany

1 JUN 2006 – 31 JAN 2007 – Slovakia

UNIVERSITY RESEARCH ASSISTANT – PAVOL JOZEF ŠAFÁRIK UNIVERSITY IN KOŠICE

Independent scientific position and research in the field of spin dynamics. Coordinator of bilateral grant "*Current induced magnetization reversal and magnetization dynamics in hybrid nanosystems*" MVTs POL/SR/UPJS07.

Košice, Slovakia

1 FEB 2004 – 31 MAY 2006 – Poland

Researcher within EU project Marie-Curie Training Network "*Spintronics*" HPRN-CT-2002-00302.

Poznań, Poland

● EDUCATION AND TRAINING

1 OCT 2001 – 30 JUN 2004 – Košice, Slovakia

PHD. "PHILOSOPHIAE DOCTOR" IN THE FIELD OF PHYSICS OF CONDENSED MATTER AND ACOUSTICS – Pavol Jozef Šafárik University in Košice

1 OCT 2001 – 4 JUL 2003 – Košice, Slovakia

RNDR. "RERUM NATURALIUM DOCTOR" IN THE FIELD OF PHYSICS – Pavol Jozef Šafárik University in Košice

20 SEP 1996 – 29 MAY 2001 – Košice, Slovakia

MGR. MASTER IN THE FIELD OF PHYSICS – Pavol Jozef Šafárik University in Košice

● SCIENTIFIC RECORDS

Publication records

Number of Publications: 104 in current content journals

Number of citations: about 3300 without self citations

h-index: 25

Researcher ID: [J-3214-2016](#)

ORCID: [0000-0003-1118-3028](#)

Scopus Author ID: [56024364000](#)

● INVITED TALKS

Selected list

- **Proximity effects in van der Waals heterostructures**, 2Dtronics kickoff meeting, March 11 - 12, 2021, Adam Mickiewicz University in Poznań, Poland
- **Proximity effects in heterostructures of graphene and 2D materials**, CoMET Computational Materials and Education and Training, April 14, 2020, Pennsylvania State University, United States of America
- **Emergent proximity effects in heterostructures of graphene and 2D materials**, Science Days JARA-FIT, October 11 - 12, 2019, Jülich Aachen Research Alliance, Schleiden Germany
- **Proximity effects in graphene, bilayer graphene and carbon nanotubes**, NTTI2018 and NGS18, July 16 - 19, 2018, University of Luxembourg, Luxembourg
- **Theory of spin-orbit coupling proximity effects in graphene based heterostructures**, Optoelectronics on 2D materials, Summer school, August 20 - 25, 2018, Davos, Switzerland
- **Spin-orbit fields at semiconductor interfaces**, APS March Meeting 2016, March 14 - 18, 2016 Baltimore, Maryland, United States of America
- **Spin-orbit coupling effects in semiconducting nanowires**, Microsoft Numerics Meeting, Station Q, October 3 - 4, 2016 TU Delft, Netherlands
- **Proximity spin-orbit effects in graphene on transition-metal dichalcogenides**, International Workshop "Emergent Relativistic Effects in Condensed Matter", September 27 - 29, 2016, Thon-Dittmer-Palais, Regensburg, Germany
- **Proximity spin-orbit physics of graphene on transition-metal dichalcogenides**, The Twelfth International School on Theoretical Physics Symmetry and Structural Properties of Condensed Matter, September 5 - 10, 2016, Rzeszów, Poland