Nicholas Sedlmayr
Curriculum Vitae

Personal Details

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Assistant Professor
Department of Physics and Medical Engineering
Rzeszów University of Technology
35-959 Rzeszów, Poland

Education

2006 — Ph.D., Theoretical Condensed Matter Physics with Igor Lerner
The University of Birmingham, UK
Thesis: "The Coulomb Blockade in Quantum Dots and a Metamagnetic Quantum Critical Point"

2002 — MSci. First Class (Honours)
Theoretical Physics and Applied Mathematics
The University of Birmingham, UK
Awards: Moreton Prize

Previous Academic Employment

2015 - 2017 — Research Associate Postdoctoral Fellow
Institute for Mathematical and Theoretical Physics
Department of Physics, Michigan State University
East Lansing, U.S.A.

2013 - 2015 — Postdoctoral Researcher
Institute of Theoretical Physics, CEA Saclay
Saclay, France

2010 - 2013 — Postdoctoral Researcher and Teaching Assistant
Department of Physics, University of Kaiserslautern
Kaiserslautern, Germany

2007 - 2009 — Postdoctoral Researcher
Institute of Physics, Martin-Luther-University
Halle (Saale), Germany

2006 - 2007 — Postdoctoral Researcher
Max-Planck Institute for Microstructure Physics
Halle (Saale), Germany

Publications

Journal Articles

1. N. Sedlmayr, P. Jäger, M. Maiti, and J. Sirker
   Bulk-boundary correspondence for dynamical phase transitions in one-dimensional topological insulators and superconductors
   Phys. Rev. B, 97, 064304 (2018)
2. N. Sedlmayr, M. Fleischhauer, and J. Sirker
   Fate of dynamical phase transitions at finite temperatures and in open systems
   Phys. Rev. B, 97, 45147 (2018)
3. N. Sedlmayr, V. Kaladzhyan, C. Dutreix, and C. Bena
   Bulk boundary correspondence and the existence of Majorana bound states on the edges of 2D topological superconductors
   Phys. Rev. B, 96, 184516 (2017)
4. D. Morath, N. Sedlmayr, J. Sirker, and S. Eggert
   Conductance in inhomogeneous quantum wires: Luttinger liquid predictions and quantum Monte Carlo results
   Phys. Rev. B, 94, 115162 (2016)
5. M. Guigou, N. Sedlmayr, J.M. Aguiar-Hualde, and C. Bena
   Signature of a topological phase transition in long SN junctions in the spin-polarized density of states
   Europhys. Lett., 115, 47005 (2016)
6. E. König, A. Levchenko, and N. Sedlmayr
   Universal fidelity near quantum and topological phase transitions in finite 1D systems
   Phys. Rev. B, 93, 235160 (2016)
7. I.M. Dayton, N. Sedlmayr, V. Ramirez, T. Chasapis, R. Loloee, M. Kanatzidis, A. Levchenko, and S. Tessmer
   Scanning tunneling microscopy of superconducting topological surface states in Bi2Se3
   Phys. Rev. B (Rapid Comm.) 93, 220506(R) (2016)
8. N. Sedlmayr, J.M. Aguiar-Hualde, and C. Bena
   Majorana bound states in open quasi-1D and 2D systems with transverse Rashba coupling
   Phys. Rev. B, 93, 155425 (2016)
9. N. Sedlmayr, M. Guigou, P. Simon, and C. Bena
   Majoranas with and without a 'character': hybridization, braiding and Majorana number
   Journal of Physics: Condensed Matter, 27, 455601 (2015)
10. N. Sedlmayr, and C. Bena
    Visualising Majorana bound states in 1D and 2D using the generalized Majorana polarization
    Phys. Rev. B, 92, 115115 (2015)

11. N. Sedlmayr, J.M. Aguiar-Hualde, and C. Bena
Flat Majorana bands in 2-d lattices with inhomogeneous magnetic fields: topology and stability
Phys. Rev. B, 91, 115415 (2015)
12. J. Sirker, M. Maiti, N.P. Konstantinidis, and N. Sedlmayr
Boundary fidelity and entanglement in the symmetry protected topological phase of the SSH model
Journal of Statistical Mechanics: Theory and Experiment, P10032 (2014)
13. J. Sirker, N.P. Konstantinidis, F. Andraschko, and N. Sedlmayr
Locality and thermalization in closed quantum systems
Phys. Rev. A, 89, 042104 (2014)
14. N. Sedlmayr, D. Morath, J. Sirker, S. Eggert, and I. Affleck
Conducting fixed points for inhomogeneous quantum wires: a conformally invariant boundary theory
Phys. Rev. B, 89, 045133 (2014)
15. N. Sedlmayr, V.K. Dugaev, and J. Berakdar
Dynamics of the polarization of a pinned domain wall in a magnetic nanowire
Physica Status Solidi (b), 251, 231 (2014)
16. N. Sedlmayr, P. Korell, and J. Sirker
Two-band Luttinger liquid with spin-orbit coupling: Applications to monatomic chains on surfaces
Phys. Rev. B., 88, 195113 (2013)
17. N. Sedlmayr, J. Ren, F. Gebhard, and J. Sirker
Closed and open system dynamics in a fermionic chain with a microscopically specified bath: Relaxation and thermalization
Phys. Rev. Lett. 110, 100406 (2013)
18. N. Sedlmayr, P. Adam, and J. Sirker
Theory of the conductance of interacting quantum wires with good contacts and applications to carbon nanotubes
Phys. Rev. B., 87, 035439 (2013)
19. N. Sedlmayr, J. Ohst, I. Affleck, J. Sirker, and S. Eggert
Transport and scattering in inhomogeneous quantum wires
Phys. Rev. B (Rapid Comm.) 86, 121302(R) (2012)
20. N. Sedlmayr and J. Berakdar
Negative differential magnetoresistance in ferromagnetic wires with domain walls
Phys. Rev. B, 86, 024409 (2012)
21. F. Gebhard, K. zu Münster, J. Ren, N. Sedlmayr, J. Sirker, and B. Ziebarth
Particle injection into a chain: decoherence versus relaxation for Hermitian and non-Hermitian dynamics
Annalen der Physik, 524, 286 (2012)
22. N. Sedlmayr, V.K. Dugaev, M. Inglot, and J. Berakdar
Indirect interaction of domain walls
Physica Status Solidi RRL, 5, 450 (2011)

23. N. Sedlmayr, S. Eggert, and J. Sirker
Electron scattering from domain walls in ferromagnetic Luttinger liquids
Phys. Rev. B, 84, 024424 (2011)

24. N. Sedlmayr, V.K. Dugaev, and J. Berakdar
Spin density waves and domain wall interactions in nanowires
Phys. Rev. B, 83, 174447 (2011)

25. N. Sedlmayr, V.K. Dugaev, and J. Berakdar
Role of non-collinear magnetization: from ferromagnetic nanowires to rings
Physica Status Solidi (b), 247, 2603 (2010)

26. N. Sedlmayr, V.K. Dugaev, and J. Berakdar
Current-induced interactions of multiple domain walls in magnetic quantum wires
Phys. Rev. B, 79, 174422 (2009)

27. N. Sedlmayr and J. Berakdar
Transport properties of an interacting quantum dot in a non-uniform magnetization
Europhys. Lett., 83, 57003 (2008)

28. N. Sedlmayr, I.V. Yurkevich, and I.V. Lerner
Tunnelling density of states at Coulomb blockade peaks
Europhys. Lett., 76, 109 (2006)

Conference Proceedings

1. N. Sedlmayr, S. Eggert, and J. Sirker
Non-collinear ferromagnetic Luttinger liquids
J. Phys.: Conf. Ser., 303, 012107 (2011)

2. N. Sedlmayr, V.K. Dugaev, J. Berakdar, V.R. Vieira, M.A.N. Araújo, and J. Barnaś
Spin and charge transport through non-collinear magnetic nanowires
J. Magn. Magn. Mater., 322, 1419 (2010)

On-line book chapters

1. N. Sedlmayr, J. Berakdar, M.A.N. Araújo, V.K. Dugaev, and J. Barnaś
Charge and spin transport in magnetic nanowires
Nanowires – Fundamental Research (Intech, Croatia) (2011)

Invited talks

2017 IPhT, CEA Saclay, France, 25th September
2016 University of Wisconsin-Madison, Madison, USA, 15th November
2016 University of Manitoba, Winnipeg, Canada, 25th November
2014 Technical University of Kaiserslautern, Germany, 6th November
2013 *SFB/TRR 49,* Bensheim, Germany, 19th-20th September
2012 Marburg University, Germany, 8th November
2011 *SFB/TRR 49,* Alzey, Germany, 15th-16th September
2011 Max Planck Institute for Solid State Research, Stuttgart, Germany, 6th July
2011 Martin-Luther University, Halle, Germany, 2nd May

Contributed talks

2018 *Symposium on the Physics of Majorana Bound States*, Warsaw, 5th January
2017 *APS March Meeting*, New Orleans, USA 13th-17th March
2016 *APS March Meeting*, Baltimore, USA 14th-18th March
2013 *APS March Meeting*, Baltimore, USA 18th-22 March
2012 *CMD24-CMMP12*, Edinburgh, Scotland, 3rd-7th September
2012 *DPG Spring Meeting*, Berlin, Germany, 26th-30th March
2012 *APS March Meeting*, Boston, USA, 27th February-3 March
2011 *CMMP11*, Manchester, England, 13th-15th December
2011 *APS March Meeting*, Dallas, USA, 21st-25th March
2010 *Joint European Magnetic Symposia*, Krakow, Poland, 23rd-28th August
2009 *DPG Spring Meeting*, Dresden, Germany, 22nd-27th March

Teaching Experience

Rzeszów University of Technology, Poland

2017	Higher Mathematics in English II	Lecture course
2017	Physics II	Exercise classes
2017	Linear Algebra	Lecture course
2017	Mechanics	Laboratory

Michigan State University, USA

2017	Calculus	Lecture course
2016	Linear Algebra	Lecture course

University of Kaiserslautern, Germany

2012	Condensed matter field theory	Exercise classes and exams
2011	Advanced quantum mechanics	Exercise classes and exams
2011	Many-body theory	Exercise classes and exams
2010	Quantum mechanics	Exercise classes and exams

Martin-Luther-University, Halle (Saale), Germany

2009	Quantum field theory	Exercise classes

University of Birmingham, UK

2002-2006	Mathematics for physicists	Exercise classes
2004	C++	Laboratory

Additional Information

Societies Associate member of the Institute of Physics (UK)

Referee PRL, PRB, Annals of Physics, JMMM, New Journal of Physics, Canadian Journal of Physics

Languages English (native speaker), German (advanced), Polish (beginner), French (beginner)