

Nicholas Sedlmayr

Curriculum Vitae

Personal Details

ndsedlmayr@gmail.com
<http://nick.sedlmayr.co.uk>

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, 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)
2. 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)
3. 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)
4. 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)
5. 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)
6. 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)
7. 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)
8. N. Sedlmayr, and C. Bena
Visualising Majorana bound states in 1D and 2D using the generalized Majorana polarization
Phys. Rev. B, 92, 115115 (2015)
9. 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)
10. 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)

11. J. Sirker, N.P. Konstantinidis, F. Andraschko, and N. Sedlmayr
Locality and thermalization in closed quantum systems
Phys. Rev. A, 89, 042104 (2014)
12. 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)
13. 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)
14. 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)
15. 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)
16. 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)
17. 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)
18. N. Sedlmayr and J. Berakdar
Negative differential magnetoresistance in ferromagnetic wires with domain walls
Phys. Rev. B, 86, 024409 (2012)
19. 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)
20. N. Sedlmayr, V.K. Dugaev, M. Inglot, and J. Berakdar
Indirect interaction of domain walls
Physica Status Solidi RRL, 5, 450 (2011)
21. N. Sedlmayr, S. Eggert, and J. Sirker
Electron scattering from domain walls in ferromagnetic Luttinger liquids
Phys. Rev. B, 84, 024424 (2011)
22. N. Sedlmayr, V.K. Dugaev, and J. Berakdar
Spin density waves and domain wall interactions in nanowires
Phys. Rev. B, 83, 174447 (2011)
23. 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)

24. 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)
25. N. Sedlmayr and J. Berakdar
Transport properties of an interacting quantum dot in a non-uniform magnetization
Europhys. Lett., **83**, 57003 (2008)
26. 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. Barnas
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. Barnas
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

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

2017 Mechanics Laboratory

Michigan State University

2017 Calculus Complete lecture course
2016 Linear Algebra Complete lecture course

University of Kaiserslautern, Germany

2012 Condensed matter field theory Tutorials and writing exams
2011 Advanced quantum mechanics Tutorials and writing exams
2011 Many-body theory Tutorials and writing exams
2011 Quantum mechanics Tutorials and writing exams

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

2009 Quantum field theory Tutorials

University of Birmingham, UK

2002-2006 Mathematics for physicists Tutorials
2004 C++ Laboratory assistant

Other

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)