

# 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

### 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. 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)**
2. 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)**
3. 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)**
4. 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 Bi<sub>2</sub>Se<sub>3</sub>*  
**Phys. Rev. B (Rapid Comm.) 93, 220506(R) (2016)**
5. 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)**
6. 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)**
7. N. Sedlmayr, and C. Bena  
*Visualising Majorana bound states in 1D and 2D using the generalized Majorana polarization*  
**Phys. Rev. B, 92, 115115 (2015)**
8. 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)**
9. 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)**
10. J. Sirker, N.P. Konstantinidis, F. Andraschko, and N. Sedlmayr  
*Locality and thermalization in closed quantum systems*  
**Phys. Rev. A, 89, 042104 (2014)**

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

24. N. Sedlmayr and J. Berakdar  
*Transport properties of an interacting quantum dot in a non-uniform magnetization*  
**Europhys. Lett., 83, 57003 (2008)**
25. 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, September
- 2016 University of Wisconsin-Madison, Madison, USA, 15<sup>th</sup> November
- 2016 University of Manitoba, Winnipeg, Canada, 25<sup>th</sup> November
- 2014 Technical University of Kaiserslautern, Germany, 6<sup>th</sup> November
- 2013 *SFB/TRR 49*, Bensheim, Germany, 19<sup>th</sup>-20<sup>th</sup> September
- 2012 Marburg University, Germany, 8<sup>th</sup> November
- 2011 *SFB/TRR 49*, Alzey, Germany, 15<sup>th</sup>-16<sup>th</sup> September
- 2011 Max Planck Institute for Solid State Research, Stuttgart, Germany, 6<sup>th</sup> July
- 2011 Martin-Luther University, Halle, Germany, 2<sup>nd</sup> May

### Contributed talks

- 2017 *APS March Meeting*, New Orleans, USA 13<sup>th</sup>-17<sup>th</sup> March
- 2016 *APS March Meeting*, Baltimore, USA 14<sup>th</sup>-18<sup>th</sup> March
- 2013 *APS March Meeting*, Baltimore, USA 18<sup>th</sup>-22 March
- 2012 *CMD24-CMMP12*, Edinburgh, Scotland, 3<sup>rd</sup>-7<sup>th</sup> September
- 2012 *DPG Spring Meeting*, Berlin, Germany, 26<sup>th</sup>-30<sup>th</sup> March
- 2012 *APS March Meeting*, Boston, USA, 27<sup>th</sup> February-3 March
- 2011 *CMMP11*, Manchester, England, 13<sup>th</sup>-15<sup>th</sup> December
- 2011 *APS March Meeting*, Dallas, USA, 21<sup>st</sup>-25<sup>th</sup> March
- 2010 *Joint European Magnetic Symposia*, Krakow, Poland, 23<sup>rd</sup>-28<sup>th</sup> August
- 2009 *DPG Spring Meeting*, Dresden, Germany, 22<sup>nd</sup>-27<sup>th</sup> March

## Teaching Experience

### 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
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### University of Birmingham, UK

2002-2006	Mathematics for physicists	Tutorials
2004	C++	Lab 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)