

# Nicholas Sedlmayr

## Curriculum Vitae

### Personal Details

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Institute for Mathematical and Theoretical Physics  
Michigan State University  
East Lansing, MI 48824, U.S.A.

### Education

- 2006      Ph.D., Theoretical Physics  
            The University of Birmingham, UK
- 2002      MSci. First Class (Honours), Theoretical Physics and Applied Mathematics  
            The University of Birmingham, UK

### Academic Employment

- 2015      Research Associate Postdoctoral Fellow  
            Institute for Mathematical and Theoretical 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  
            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

- 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 Condensed Matter Systems with Variable Many-Body Interactions*, Bensheim, Germany, 19<sup>th</sup>-20<sup>th</sup> September
- 2012 Marburg University, Germany, 8<sup>th</sup> November
- 2011 *SFB/TRR 49 Condensed Matter Systems with Variable Many-Body Interactions*, 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

- 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 *German Physical Society (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 *German Physical Society (DPG) Spring Meeting*, Dresden, Germany, 22<sup>nd</sup>-27<sup>th</sup> March

## Teaching Experience

### Michigan State University

- |                |                         |
|----------------|-------------------------|
| Calculus       | Complete lecture course |
| Linear Algebra | Complete lecture course |

### University of Kaiserslautern, Germany

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|----------------------------|-----------------------------|
| Advanced quantum mechanics | Tutorials and writing exams |
| Many-body theory           | Tutorials and writing exams |

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

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|----------------------|-----------|
| Quantum field theory | Tutorials |
|----------------------|-----------|

### University of Birmingham, UK

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|----------------------------|---------------|
| Mathematics for physicists | Tutorials     |
| C++                        | Lab assistant |

## **Other Relevant Experience and Skills**

Societies      Associate member of the Institute of Physics (UK)

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