

Curriculum vitæ

General

Name: **Matthias Droth**
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Affiliation: Department of Physics, Institute of Physics, Faculty of Sciences,
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Research interest

- Nanoelectromechanical systems
- Electron-phonon interaction
- Quantum dots in graphene
- Spintronics and qubits

Career

since 07/2016	DFG Research Fellow at the Budapest University of Technology and Economics (BUTE) in Budapest, Hungary
01/2015 - 06/2016	Post-doctoral research collaborations with Guido Burkard (University of Konstanz, Germany), András Pályi (BUTE, Hungary), and Vitor Pereira (National University of Singapore)
08/2010 - 12/2014	Graduate studies on <i>Spins and Phonons in Graphene Nanostructures</i> in the group of Guido Burkard at the University of Konstanz
10/2004 - 06/2010	Undergraduate studies of physics, University of Konstanz Master thesis <i>Spin Coherence in Graphene Quantum Dots</i> in the group of Guido Burkard, University of Konstanz
02/2007 - 12/2007	Studies abroad and research project <i>Probing Planck Scale Physics with IceCube</i> in the group of Jenni Adams at the University of Canterbury in Christchurch, New Zealand

Awards & grants

04/2016	Research Fellowship of the <i>Deutsche Forschungsgemeinschaft</i>
02/2014	ESF EUROCORES dissemination travel grant for visiting Vitor Pereira at the National University of Singapore (four-week visit)
11/2011	<i>Nycomed Young Talents Award</i> (shared with Dirk Heinecke)
10/2011	ESF QSpiCe short visit grant for visiting Lieven Vandersypen at the Delft University of Technology (two-week visit)

Publications

- [1] M. Droth, G. Burkard, and V. M. Pereira, *Piezoelectricity in planar boron nitride via a geometric phase*, Phys. Rev. B **94**, 075404 (2016)
- [2] M. Droth and G. Burkard, *Spintronics with graphene quantum dots*, Phys. Status Solidi RRL **10**, 75 (2016)
- [3] M. Droth and G. Burkard, *Tuning antiferromagnetism of vacancies with magnetic fields in graphene nanoflakes*, Phys. Rev. B **91**, 115439 (2015)
- [4] M. Droth and G. Burkard, *Electron spin relaxation in graphene nanoribbon quantum dots*, Phys. Rev. B **87**, 205432 (2013)
- [5] M. Droth and G. Burkard, *Acoustic phonons and spin relaxation in graphene nanoribbons*, Phys. Rev. B **84**, 155404 (2011)

Invited talks

- [1] BUTE, Nanoelectronics seminar (Budapest, Hungary, 10.11.2015)
Electron spin relaxation in graphene nanoribbon quantum dots
- [2] ELTE, Nanophysics seminar (Budapest, Hungary, 23.03.2015)
Piezoelectricity in planar boron nitride via a geometric phase
- [3] NUS, Condensed matter seminar (Singapore, 26.02.2014)
Electron spin relaxation in graphene nanoribbon quantum dots
- [4] SFB 912 PhD school (Konstanz, Germany, 13.07.2013)
Electron spin relaxation in graphene nanoribbon quantum dots
- [5] TU Delft, Quantum transport group seminar (Delft, the Netherlands, 11.10.2011)
Acoustic phonons and spin relaxation in graphene nanoribbons

Contributed talks & posters

- [1] Poster, IPS Meeting 2016 (Singapore, 08.03.2016)
- [2] Poster, IEGR workshop (Donostia – San Sebastián, Spain, 14.07.2015)
- [3] Poster, Graphene Week (Manchester, United Kingdom, 23.06.2015)
- [4] Talk, DPG spring meeting (Berlin, Germany, 19.03.2015)
- [5] Poster, Spin-based quantum information processing (Konstanz, Germany, 19.08.2014)
- [6] Poster, CECAM workshop on graphene's strain engineering (Zurich, Switzerland, 14.07.2014)
- [7] Poster, Graphene Week (Gothenburg, Sweden, 24.06.2014)
- [8] Poster, Graphene 2014 (Toulouse, France, 06.05.2014)
- [9] Talk, DPG spring meeting (Dresden, Germany, 03.04.2014)
- [10] Talk, APS March meeting (Denver, Colorado, USA, 05.03.2014)
- [11] Talk, Carbon based nano materials and devices (Hualien, Taiwan, 07.11.2013)

- [12] Poster, Graphene Week (Chemnitz, Germany, 04.06.2013)
- [13] Poster, Workshop on nanostructured graphene (Antwerp, Belgium, 22.05.2013)
- [14] Talk, APS March meeting (Baltimore, Maryland, USA, 18.03.2013)
- [15] Talk, DPG spring meeting (Regensburg, Germany, 12.03.2013)
- [16] Poster, Graphene Week (Delft, the Netherlands, 06.06.2012)
- [17] Poster, National School on the Physics of the Matter (Erice (Sicily), Italy, 29.08.2011)
- [18] Poster, Graphene 2011 (Bilbao, Spain, 19.04.2011)
- [19] Talk, SFB 912 PhD school (Munich, Germany, 06.04.2011)
- [20] Talk, DPG spring meeting (Dresden, Germany, 17.03.2011)
- [21] Talk, EuroGRAPHENE symposium (Strasbourg, France, 19.11.2010)
- [22] Poster, Spintronics and quantum computation (São Paulo, Brazil, 01.11.2010)
- [23] Poster, Spin-based quantum information processing (Konstanz, Germany, 19.08.2010)
- [24] Talk, SFB 912 PhD school (Hirschegg, Austria, 08.04.2010)
- [25] Poster, DPG spring meeting (Regensburg, Germany, 25.03.2010)

Teaching

- Supervision of undergraduate students
 - Bachelor thesis *Theory of spin-orbit interaction in graphene flakes* (2013)
 - Bachelor thesis *Tight-Binding von Graphen-Flocken im Magnetfeld* (2012)
- Temporary lecturer
 - Lecture *IK4 – fourth semester main lecture in physics* (2015)
 - Lecture *Advanced Quantum Mechanics and Electromagnetism* (2012/2013)
- Coordinator of written exam
 - Lecture *Advanced Quantum Mechanics and Electromagnetism* (2014/2015)
- Teaching assistant
 - Various lectures and seminars (2009-2015)