Würzburg, August 2024

Curriculum Vitae

Personal data

Last name:	Trauzettel, Prof. Dr.
First name:	Björn
Address:	Chair of Theoretical Physics IV Institute of Theoretical Physics and Astrophysics Würzburg University Am Hubland, 97074 Würzburg, Germany
Date of birth:	10 November 1973
Place of birth:	Mannheim, Germany
Nationality:	German
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Education

1984-1993:	High school at Ludwigshafen/Rhein, Germany
1993-1994:	Civilian service as an ambulance man at the German Red Cross at Ludwigshafen/Rhein, Germany
1994-1997:	Studies of physics at Freiburg University, Germany
1997-1998:	Visiting graduate student at the University of Washington in Seattle, USA
1998-2000:	Studies of physics at Freiburg University, Germany
1999-2000:	Diploma thesis at Freiburg University, Germany; advisor: PD Dr. Reinhold Egger; final grade: 1.0 with distinction
2000-2003:	PhD studies with thesis title „Current noise in metallic nanostructures“ at Freiburg University, Germany; advisor: Prof. Dr. Hermann Grabert; final grade: summa cum laude

Scientific awards

2000:	Gustav-Mie-Award for the best diploma thesis in physics at Freiburg University, Germany
2007:	Offer at a full professor level (W3) from Saarbrücken University, Germany
2016:	Offer at a full professor level (W3) from Freiburg University, Germany
2023:	APS Outstanding Referee Award

Scientific employment

05-09/2003:	PostDoc with Prof. Dr. H. Grabert at Freiburg University, Germany
2003-2004:	PostDoc at the Laboratoire de Physique des Solides in Orsay, France with Dr. I. Safi (Orsay) and Prof. Dr. H. Saleur (Saclay)
2004-2006:	PostDoc with Prof. Dr. C.W.J. Beenakker at Leiden University, The Netherlands
2006-2007:	University assistant with Prof. Dr. C. Bruder at Basel University, Switzerland
2007-2011:	Associate Professor (W2) for theoretical condensed matter physics at Würzburg University, Germany
since 2011:	Full Professor (W3) for theoretical condensed matter physics at Würzburg University, Germany

Scientific stays

11/2002:	Research stay in the group of Prof. Dr. M. Heiblum at the Weizmann Institute in Rehovot, Israel
02/2004:	Research stay in the group of Prof. Dr. V. Pellegrini at the Scuola Normale Superiore in Pisa, Italy
01/2006:	Research stay in the group of Prof. Dr. P. Zoller at Innsbruck University, Austria

2004-2006:	Extended research stay (2 days per week) in the groups of Prof. Dr. J.E. Mooij and Prof. Dr. L.P. Kouwenhoven at the TU Delft, The Netherlands
10/2007-03/2008:	Extended research stay (2 days per week) in the groups of Prof. Dr. C. Bruder and Prof. Dr. D. Loss at Basel University, Switzerland
08/2015-02/2016:	Sabbatical at UC Berkeley, USA

Professional activities

since 2003:	Regular referee activity for top international scientific journals (Nature, Nature Physics, PRL, PRA, PRB, EPL, EPJB, Nanotechnology, etc.) and funding agencies (NSF (USA), SNF (Switzerland), DFG, BMBF (Germany), NOW/FOM (The Netherlands), European Community, ERC, etc.)
2009-2013:	Program Chair of the ESF Research Networking Program *Quantum Spin Coherence and Electronics* (QSpiCE)
2009-2012:	Co-coordinator of the DFG Priority Program *Graphene*
02/2010:	Guest editor on the *Special issue on Graphene* of *Semiconductor Science and Technology*
2012-2015:	Co-coordinator of the DFG Priority Program *Topological Insulators*
2015-2027:	Spokesperson (together with Prof. Ralph Claessen) of the SFB 1170 on *Topological and Correlated Electronics at Surfaces and Interfaces*
2019-2025:	Principle investigator and member of the Steering Comittee of the Cluster of Excellence *ct.qmat* on *Complexity and Topology in Quantum Matter*
2019-2025:	Elected Dean of the School of Physics and Astronomy at Würzburg University, Germany

Scientific and teaching output

- author of more than 180 scientific publications including 5 Nature Physics, 1 Physical Review X, 2 Nano Letters, and 41 Physical Review Letters (>6500 citations; h-index: 41 @ Clarivate Web of Science; >9000 citations; h-index: 47 @ Google Scholar)
- ca. 80 invited oral presentations at international conferences physics colloquia
- more than 15 successful grant applications at the Deutsche Forschungsgemeinschaft (DFG), European Science Foundation (ESF), Elite Netzwerk Bayern (ENB), Humboldt Foundation, and Helmholtz Foundation
- supervisor of 12 completed PhD theses (four of them awarded “with distinction”)
- 9 former PhD students and postdocs received permanent positions in academia
- regular teaching activities at bachelor, master, and graduate level
- head of the Chair of Theoretical Physics IV (Mesoscopic Physics) at Würzburg University formed by approximately 20 members

Top 5 publications (according to the number of citations)

B. Trauzettel, D.V. Bulaev, D. Loss, and G. Burkard
Spin qubits in graphene quantum dots
Nature Phys. **3**, 192 (2007) (**906 citations**; Clarivate Web of Science)

J. Tworzydlo, B. Trauzettel, M. Titov, A. Rycerz, and C.W.J. Beenakker
Sub-Poissonian shot noise in graphene
Phys. Rev. Lett. **96**, 246802 (2006) (**711 citations**; Clarivate Web of Science)

B. Büttner, C.X. Liu, G. Tkachov, E.G. Novik, C. Brüne, H. Buhmann, E.M. Hankiewicz, P. Recher, B. Trauzettel, S.C. Zhang, and L.W. Molenkamp
Single valley Dirac fermions in zero-gap HgTe quantum wells
Nature Phys. **7**, 418 (2011) (**229 citations**; Clarivate Web of Science)

P. Recher, B. Trauzettel, A. Rycerz, Ya.M. Blanter, C.W.J. Beenakker, and A.F. Morpurgo
Aharonov-Bohm effect and broken valley-degeneracy in graphene rings
Phys. Rev. B **75**, 235404 (2007) (**223 citations**; Clarivate Web of Science)

E. Onac, F. Balestro, B. Trauzettel, C. Lodewijk, and L.P. Kouwenhoven
Shot noise detection on a carbon nanotube quantum dot
Phys. Rev. Lett. **96**, 026803 (2006) (**200 citations**; Clarivate Web of Science)

List of publications

Publications in peer-reviewed journals

[1] B. Trauzettel, R. Egger, and H. Grabert
Coulomb drag shot noise in coupled Luttinger liquids
Phys. Rev. Lett. **88**, 116401 (2002)

[2] S. Chen, B. Trauzettel, and R. Egger
Landauer-type transport theory for interacting quantum wires: Application to carbon nanotube Y junctions
Phys. Rev. Lett. **89**, 226404 (2002)

[3] B. Trauzettel and H. Grabert
Long wavelength spatial oscillations of high frequency current noise in 1D electron systems
Phys. Rev. B **67**, 245101 (2003)

[4] A. Koutouza, H. Saleur, and B. Trauzettel
How irrelevant operators affect the determination of fractional charge
Phys. Rev. Lett. **91**, 026801 (2003)

[5] R. Egger, B. Trauzettel, S. Chen, and F. Siano
Transport theory of carbon nanotube Y junctions
New J. Phys. **5**, 117 (2003) (Focus issue on *Carbon Nanotubes*)

[6] F. Dolcini, H. Grabert, I. Safi, and B. Trauzettel
Oscillatory nonlinear conductance of interacting one-dimensional quantum wires
Phys. Rev. Lett. **91**, 266402 (2003)

[7] B. Trauzettel, I. Safi, F. Dolcini, and H. Grabert
Appearance of fractional charge in the noise of non-chiral Luttinger liquids
Phys. Rev. Lett. **92**, 226405 (2004)

[8] B. Trauzettel, P. Roche, D. C. Glattli, and H. Saleur
Effect of interactions on the noise of chiral Luttinger liquid systems
Phys. Rev. B **70**, 233301 (2004)

[9] F. Dolcini, B. Trauzettel, I. Safi, and H. Grabert
Transport properties of single channel quantum wires with an impurity: Influence of finite length and temperature on average current and noise
Phys. Rev. B **71**, 165309 (2005)

[10] M. Kindermann and B. Trauzettel
Current fluctuations of an interacting quantum dot
Phys. Rev. Lett. **94**, 166803 (2005)

[11] C.W.J. Beenakker, M.Titov, and B. Trauzettel
Optimal spin-entangled electron-hole pair pump
Phys. Rev. Lett. **94**, 186804 (2005)

[12] C. Emary, B. Trauzettel, and C.W.J. Beenakker
Entangled microwave photons from a pair of quantum dots
Phys. Rev. Lett. **95**, 127401 (2005)

[13] M.Titov, B. Trauzettel, B. Michaelis, and C.W.J. Beenakker
Transfer of entanglement from electrons to photons by optical selection rules
New J. Phys. **7**, 186 (2005) (Focus issue on *Solid State Quantum Information*).

[14] E. Onac, F. Balestro, B. Trauzettel, C. Lodewijk, and L.P. Kouwenhoven
Shot noise detection on a carbon nanotube quantum dot

Phys. Rev. Lett. **96**, 026803 (2006)

[15] B. Trauzettel, A.N. Jordan, C.W.J. Beenakker, and M. Büttiker
Parity meter for charge qubits: an efficient quantum entangler
Phys. Rev. B **73**, 235331 (2006)

[16] J. Tworzydlo, B. Trauzettel, M. Titov, A. Rycerz, and C.W.J. Beenakker
Sub-Poissonian shot noise in graphene
Phys. Rev. Lett. **96**, 246802 (2006)

[17] B. Trauzettel, Ya.M. Blanter, and A.F. Morpurgo
Photon-assisted electron transport in graphene
Phys. Rev. B **75**, 035305 (2007)

[18] F. Dolcini, B. Trauzettel, I. Safi, and H. Grabert
Negativity of the excess noise in a quantum wire coupled to a gate
Phys. Rev. B **75**, 045332 (2007)

[19] B. Trauzettel, D.V. Bulaev, D. Loss, and G. Burkard
Spin qubits in graphene quantum dots
Nature Phys. **3**, 192 (2007)

[20] J. Peguiron, C. Bruder, and B. Trauzettel
Temperature dependence of Coulomb drag between finite-length quantum wires
Phys. Rev. Lett. **99**, 086404 (2007)

[21] A. Komnik, B. Trauzettel, and U. Weiss
Statistics of charge transfer through impurities in strongly correlated 1D metals
Ann. Phys. (Leipzig) **16**, 661 (2007)

[22] A.N. Jordan, B. Trauzettel, and G. Burkard
Weak measurement of quantum dot spin qubits
Phys. Rev. B **76**, 155324 (2007)

[23] C.B. Doiron, B. Trauzettel, and C. Bruder
Improved position measurement of nano electromechanical systems using cross-correlations
Phys. Rev. B **76**, 195312 (2007)

[24] P. Recher, B. Trauzettel, A. Rycerz, Ya.M. Blanter, C.W.J. Beenakker, and A.F. Morpurgo
Aharonov-Bohm effect and broken valley-degeneracy in graphene rings
Phys. Rev. B **76**, 235404 (2007)

[25] C.B. Doiron, B. Trauzettel, and C. Bruder
Measuring the momentum of a nanomechanical oscillator through the use of two tunnel junctions
Phys. Rev. Lett. **100**, 027202 (2008)

[26] B. Trauzettel, M. Borhani, M. Trif, and D. Loss
Theory of spin qubits in nanostructures
J. Phys. Soc. Jpn. **77**, 031012 (2008)

[27] A.J. Daley, P. Zoller, and B. Trauzettel
Andreev-like reflections with cold atoms
Phys. Rev. Lett. **100**, 110404 (2008)

[28] D.V. Bulaev, B. Trauzettel, and D. Loss
Spin-orbit interaction and anomalous spin relaxation in carbon nanotube quantum dots
Phys. Rev. B **77**, 235301 (2008)

[29] B. Trauzettel, P. Simon, and D. Loss
Ac magnetization transport and power absorption in non-itinerant spin chains
Phys. Rev. Lett. **101**, 017202 (2008)

[30] P. Recher, J. Nilsson, G. Burkard, and B. Trauzettel
Bound states and magnetic field-induced valley splitting in gate-tunable graphene quantum dots
Phys. Rev. B **79**, 085407 (2009)

[31] V. Körting, T.L. Schmidt, C.B. Doiron, B. Trauzettel, and C. Bruder
Transport properties of a superconducting single-electron transistor coupled to a nanomechanical oscillator
Phys. Rev. B **79**, 094415 (2009)

[32] M.J. Schmidt, E.G. Novik, M. Kindermann, and B. Trauzettel
Optical manipulation of edge state transport in HgTe quantum wells in the quantum Hall regime
Phys. Rev. B **79**, 241306(R) (2009)

[33] J. Fischer, B. Trauzettel, and D. Loss
Hyperfine interaction and electron-spin decoherence in graphene and carbon nanotube quantum dots
Phys. Rev. B **80**, 155401 (2009)

[34] M. Müller, M. Bräuninger, and B. Trauzettel
Temperature dependence of the conductivity of ballistic graphene
Phys. Rev. Lett. **103**, 196801 (2009)

[35] T.L. Schmidt, K. Borkje, C. Bruder, and B. Trauzettel
Detection of qubit-oscillator entanglement in nanoelectromechanical systems
Phys. Rev. Lett. **104**, 177205 (2010)

[36] J. Schelter, D. Bohr, and B. Trauzettel
Interplay of the Aharonov-Bohm effect and Klein tunneling in graphene
Phys. Rev. B **81**, 195441 (2010)

[37] E.G. Novik, P. Recher, E.M. Hankiewicz, and B. Trauzettel
Signatures of topological order in ballistic bulk transport of HgTe quantum wells
Phys. Rev. B **81**, 241303(R) (2010)

[38] J. Budich and B. Trauzettel
Entanglement transfer from electrons to photons in quantum dots: An open quantum system approach
Nanotechnology **21**, 274001 (2010) (Special Issue on *Quantum Science and Technology at the Nanoscale*)

[39] P. Recher and B. Trauzettel
Quantum dots and spin qubits in graphene
Nanotechnology **21**, 302001 (2010)

[40] C.X. Liu, J.C. Budich, P. Recher, and B. Trauzettel
Charge-spin duality in non-equilibrium transport of helical liquids
Phys. Rev. B **83**, 035407 (2011)

[41] B. Büttner, C.X. Liu, G. Tkachov, E.G. Novik, C. Brüne, H. Buhmann, E.M. Hankiewicz, P. Recher, B. Trauzettel, S.C. Zhang, and L.W. Molenkamp
Single valley Dirac fermions in zero-gap HgTe quantum wells
Nature Phys. **7**, 418 (2011)

[42] S. Walter and B. Trauzettel
Momentum and position detection in nanoelectromechanical systems beyond Born and Markov approximation
Phys. Rev. B **83**, 155411 (2011)

[43] J. Schelter, P.M. Ostrovsky, I. V. Gornyi, B. Trauzettel, and M. Titov
Color-dependent conductance of graphene with adatoms
Phys. Rev. Lett. **106**, 166806 (2011)

[44] C.X. Liu and B. Trauzettel
Helical Dirac-Majorana interferometer in a superconductor-topological insulator sandwich structure
Phys. Rev. B **83**, 220510(R) (2011)

[45] M. Guigou, P. Recher, J. Cayssol, and B. Trauzettel
Spin Hall effect at interfaces between HgTe/CdTe quantum wells and metals
Phys. Rev. B **84**, 094534 (2011)

[46] S. Walter, T.L. Schmidt, K. Borkje, and B. Trauzettel
Detecting Majorana Bound States by Nanomechanics
Phys. Rev. B **84**, 224510 (2011)

[47] J.C. Budich, F. Dolcini, P. Recher, and B. Trauzettel
Phonon induced backscattering in helical edge states
Phys. Rev. Lett. **108**, 086602 (2012)

[48] B. Verberck, B. Partoens, F.M. Peeters, and B. Trauzettel
Strain-induced band gaps in bilayer graphene
Phys. Rev. B **85**, 125403 (2012)

[49] J. Schelter, B. Trauzettel, and P. Recher
How to distinguish between specular and retroconfigurations for Andreev reflection in graphene rings
Phys. Rev. Lett. **108**, 106603 (2012)

[50] J.C. Budich and B. Trauzettel
Low energy theories describing topological properties of periodic systems
Eur. Phys. J. B **85**, 94 (2012)

[51] J.C. Budich, S. Walter, and B. Trauzettel
Failure of protection of Majorana based qubits against decoherence
Phys. Rev. B **85**, 121405(R) (2012)

[52] J. Schelter, P. Recher, and B. Trauzettel
The Aharonov-Bohm effect in graphene rings
Solid State Comm. **152**, 1411 (2012)

[53] J.C. Budich, D.G. Rothe, E.M. Hankiewicz, and B. Trauzettel
All-electric qubit control in heavy hole quantum dots via non-Abelian geometric phases
Phys. Rev. B **85**, 205425 (2012)

[54] M. Fuchs, V. Rychkov, and B. Trauzettel
Spin decoherence in graphene quantum dots due to hyperfine interaction
Phys. Rev. B **86**, 085301 (2012)

[55] F. Crépin, J.C. Budich, F. Dolcini, P. Recher, and B. Trauzettel
Renormalization group approach for the scattering off a single Rashba impurity in a helical liquid
Phys. Rev. B **86**, 121106(R) (2012)

[56] D.G. Rothe, E.M. Hankiewicz, B. Trauzettel, and M. Guigou
Spin-dependent thermoelectric transport in HgTe/CdTe quantum wells
Phys. Rev. B **86**, 165434 (2012)

[57] H. Hettmansperger, F. Duerr, J.B. Oostinga, C. Gould, B. Trauzettel, and L.W. Molenkamp
Quantum Hall effect in narrow graphene ribbons
Phys. Rev. B **86**, 195417 (2012)

[58] A. Varykhalov, D. Marchenko, J. Sanchez-Barriga, M. R. Scholz, B. Verberck, B. Trauzettel, T. O. Wehling, C. Carbone, and O. Rader
Intact Dirac Cones at Broken Subblattice Symmetry: Photoemission Study of Graphene on Ni and Co
Phys. Rev. X **2**, 041017 (2012)

[59] T. Posske, C.-X. Liu, J.C. Budich, and B. Trauzettel
Exact results for the Kondo screening cloud of two helical liquids
Phys. Rev. Lett. **110**, 016602 (2013)

[60] J. C. Budich and B. Trauzettel
From the adiabatic theorem of quantum mechanics to topological states of matter
Phys. Status Solidi RRL **7**, 109 (2013)

[61] P. Michetti and B. Trauzettel
Devices with electrically tunable topological insulating phases
Appl. Phys. Lett. **102**, 063505 (2013)

[62] S. Nakosai, J. C. Budich, Y. Tanaka, B. Trauzettel, and N. Nagaosa
Majorana bound states and non-local spin correlations in a quantum wire on an unconventional superconductor
Phys. Rev. Lett. **110**, 117002 (2013)

[63] F. Crépin, H. Hettmansperger, P. Recher, and B. Trauzettel
Even-odd effects in NSN scattering problems: Application to graphene nanoribbons
Phys. Rev. B **87**, 195440 (2013)

[64] J. C. Budich, B. Trauzettel, and G. Sangiovanni
Fluctuation driven topological Hund insulator
Phys. Rev. B **87**, 235104 (2013)

[65] J.C. Budich and B. Trauzettel
Z_2 Green's function topology of Majorana wires
New J. Phys.**15**, 065006 (2013)

[66] S. Walter, J.C. Budich, J. Eisert, and B. Trauzettel
Entanglement of nanoelectomechanical oscillators by Cooper-pair tunneling
Phys. Rev. B **88**, 035441 (2013)

[67] F. Geissler, J.C. Budich, and B. Trauzettel
Group theoretical and topological analysis of the quantum spin Hall effect in silicene
New J. Phys. **15**, 085030 (2013)

[68] S. Walter, B. Trauzettel, and T.L. Schmidt
Transport properties of double quantum dots with electron-phonon coupling
Phys. Rev. B **88**, 195425 (2013)

[69] Z. B. Tan, A. Puska, T. Nieminen, F. Duerr, C. Gould, L. W. Molenkamp, B. Trauzettel, and P. J. Hakonen
Shot Noise in Lithographically Patternded Graphene Nanoribbons
Phys. Rev. B **88**, 245415 (2013)

[70] M. Fuchs, J. Schliemann, and B. Trauzettel
Ultra long spin decoherence times in graphene quantum dots with a small number of nuclear spins
Phys. Rev. B **88**, 245441 (2013)

[71] T. Posske and B. Trauzettel
Direct proportionality between the Kondo cloud and current cross correlations in helical liquids
Phys. Rev. B **89**, 075108 (2014)

[72] S. Jürgens, P. Michetti, and B.Trauzettel
Plasmons due to the interplay of Dirac and Schrödinger fermions
Phys. Rev. Lett. **112**, 076804 (2014)

[73] F. Crépin and B.Trauzettel
Parity measurement in topological Josephson junctions
Phys. Rev. Lett. **112**, 077002 (2014)

[74] J. C. Budich, B. Trauzettel, and P. Michetti
Time reversal symmetric topological excition condensate in bilayer HgTe quantum wells
Phys. Rev. Lett. **112**, 146405 (2014)

[75] F. Crépin, B. Trauzettel, and F. Dolcini
Signature of Majorana bound states in transport properties of hybrid structures based on helical liquids
Phys. Rev. B **89**, 205115 (2014)

[76] F. Geissler, F. Crépin, and B. Trauzettel
Random Rashba spin-orbit coupling at the quantum spin Hall edge
Phys. Rev. B **89**, 235136 (2014)

[77] P. Burset, F. Keidel, Y. Tanaka, N. Nagaosa, and B. Trauzettel
Transport singatures of superconducting hybrids with mixed singlet and chiral triplet states
Phys. Rev. B **90**, 085438 (2014)

[78] S. Jürgens, P. Michetti, and B. Trauzettel
Screening properties and plasmons of Hg(Cd)Te quantum wells
Phys. Rev. B **90**, 115425 (2014)

[79] Y. Baum, T. Posske, I. C. Fulga, B. Trauzettel, and A. Stern
Coexisting edge states and gapless bulk in topological states of matter
Phys. Rev. Lett. **114**, 185701 (2015)

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First order character and observable signatures of topological quantum phase transitions
Phys. Rev. Lett. **114**, 185701 (2015)

[81] G. Tkachov, P. Burset, B. Trauzettel, and E. M. Hankiewicz
Quantum interference of edge supercurrents in a two-dimensional topological insulator
Phys. Rev. B **92**, 045408 (2015)

[82] Y. Baum, T. Posske, I. C. Fulga, B. Trauzettel, and A. Stern
Gapless topological superconductors – Model Hamiltonian and Realization
Phys. Rev. B **92**, 045128 (2015)

[83] M. Fuchs, F. Krauss, D. Hetterich, and B. Trauzettel
Thermal electron spin flip in quantum dots
Phys. Rev. B **92**, 035310 (2015)

[84] F. Crépin, P. Burset, and B. Trauzettel
Odd-frequency triplet superconductivity at the helical edge of a topological insulator
Phys. Rev. B **92**, 100507(R) (2015)

[85] D. Hetterich, M. Fuchs, and B. Trauzettel
Equilibration in closed quantum systems: Application to spin qubits
Phys. Rev. B **92**, 155314 (2015)

[86] N. Traverso Ziani, F. Crépin, and B. Trauzettel
Fractional Wigner crystal in the helical Luttinger liquid
Phys. Rev. Lett. **115**, 206402 (2015)

[87] P. Burset, B. Lu, G. Tkachov, Y. Tanaka, E. M. Hankiewicz, and B. Trauzettel
Superconducting proximity effect in three-dimensional topological insulators in the presence of a magnetic field
Phys. Rev. B **92**, 205424 (2015)

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Evidence of broken Galilean invariance at the quantum spin Hall edge
Phys. Rev. B **92**, 235108 (2015)

[89] G. Li, W. Hanke, G. Sangiovanni, and B. Trauzettel
Interacting weak topological insulators and their transition to Dirac semimetal phases
Phys. Rev. B **92**, 235149 (2015)

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Flux sensitivity of quantum spin Hall rings
Physica E **75**, 379 (2016)

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Charge and spin density in the helical Luttinger liquid
Eur. Phys. Lett. **113**, 37002 (2016)

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Strong Correlation Effects on Topological Quantum Phase Transitions in Three Dimensions
Phys. Rev. B **93**, 235112 (2016)

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Interplay of topology and interactions in quantum Hall topological insulators: U(1) symmetry, tunable Luttinger liquid, and interaction-induced phase transitions
Phys. Rev. B **94**, 035146 (2016)

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Levy flights due to anisotropic disorder in graphene
Phys. Rev. Lett. **117**, 046603 (2016)

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Correlation and current anomalies in topological quantum dots
Phys. Rev. B **94**, 155111 (2016)

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Chiral anomaly in real space from stable fractional charges at the edge of a quantum spin Hall insulator
Phys. Rev. B **94**, 241406 (R) (2016)

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Exotic surface states in hybrid structures of topological insulators and Weyl semimetals
Phys. Rev. B **95**, 085313 (2017)

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Majorana STM as a perfect detector of odd-frequency superconductivity
Phys. Rev. B **95**, 174516 (2017)

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Josephson junction dynamics in the presence of 2 pi- and 4 pi-periodic supercurrents
Phys. Rev. B **95**, 195430 (2017)

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Edge reconstruction from strong correlations in quantum spin Hall insulators
Phys. Rev. B **95**, 205120 (2017)

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Fractional charge oscillations in quantum dots with quantum spin Hall effect
Phys. Rev. B. **95**, 205418 (2017).

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Signatures of interaction-induced helical gaps in nanowire quantum point contracts
Nature Physics **13**, 563 (2017)

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Dynamical transport measurement of the Luttinger parameter in helical edge states of 2D topological insulators
Phys. Rev. B. **95**, 245114 (2017).

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Non-interacting central site model: Localization and logarithmic entanglement growth
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Mit Tesafilm nach Stockholm
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arXiv:2402.13074

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Transition between scattering regimes of 2D electron transport
arXiv:2404.11353

[191] H.-P. Sun, S.-B. Zhang, C.-A. Li, and B. Trauzettel
Field-Enhanced Critical Current and Tunable Skewness in Altermagnetic Josephson Junctions
arXiv:2407.19413

Invited talks at international conferences

Current noise in one-dimensional electron systems
ISSP International Summer School, Tokyo, Japan, August 2003

Transport theory of nanotube Y junctions
Annual meeting of the RTN Spintronics, Munich, Germany, November 2003

Fractional charge in the noise of Luttinger liquid systems
International Conference, *Fluctuations and Noise 2005*, Austin, Texas, USA, May 2005

Quantum-limited shot noise in graphene
Rencontres du Vietnam, Hanoi, Vietnam, August 2006

Quantum-limited shot noise in graphene
Journées de la Matière Condensée, Toulouse, France, August 2006

Spin qubits in graphene quantum dots
QUROPE Winter School on Quantum Information, Obergurgl, Austria, February 2007

Transport properties of mesoscopic graphene
DPG March Meeting, Regensburg, Germany, March 2007

Transport properties of mesoscopic graphene
Journées du graphène, Laboratoire de Physique des Solides, Orsay, France, May 2007

Functional nanostructures in graphene
CFN Summer School on Nanoelectronics, Bad Herrenalb, Germany, August 2007

A nanometer-scale momentum detector
ESF Conference, *Fundamental Problems of Mesoscopic Physics and Nanoelectronics*, Mojacar, Spain, September 2007

Transport properties of mesoscopic graphene
GK638 (Regensburg University) Workshop, Frauenchiemsee, Germany, October 2007

A momentum detector of nano-electromechanical systems
International Workshop on Nanoscopic Transport, Freiburg, Germany, November 2007

Spin qubits in graphene and carbon nanotube quantum dots
International Conference, *Frontiers in Nanoscale Science and Technology*, Basel, Switzerland, January 2008

Spin qubits and spin relaxation in graphene and carbon nanotube quantum dots
International Conference, *Spin and charge flow in nanostructures*, Oslo, Norway, May 2008

Spin relaxation in carbon nanotube quantum dots
NCCR Nanoscience Workshop, Davos, Switzerland, June 2008

Theory of ballistic transport in graphene
DPG kickoff meeting „Graphene“, Kloster Banz, Germany, September 2008

Spin relaxation in carbon nanotube quantum dots
International Conference, *Quantum Dynamics in Dots and Junctions*, Riva del Garda, Italy, October 2008

Theory of ballistic transport in graphene
Symposium *Transport in Graphene*, DPG March Meeting, Dresden, Germany, March 2009

Optical manipulation of edge state transport in topological insulators
EU Network (STREP) Meeting, *Carbon Nanotube Devices at the quantum limit*, Dresden, Germany, March 2009

Phase coherent transport in 2D topological insulators
Mini-School on Topological Insulators and QSHE, Lyon, France, December 2009

Peculiarities of ballistic transport in graphene
Workshop *New frontiers in graphene physics*, at the European Centre for Theoretical Studies in Nuclear Physics and Related Areas (ECT*), Trento, Italy, April 2010

Spin qubits and decoherence in graphene and carbon nanotube quantum dots
457. WE-Heraeus Seminar *Graphene Electronics*, Bad Honnef, Germany, August 2010

Spin qubits and decoherence in graphene and carbon nanotube quantum dots
School and conference on spin-based quantum information processing, Konstanz, Germany, August 2010

Introduction to Topological Insulators
22. Edgar Lüscher Seminar, Klosters, Switzerland, February 2011

Color-dependent conductance of graphene with adatoms
Int. Workshop on Graphene Nanostructures, Regensburg, Germany, September 2011

Spin decoherence in graphene quantum dots due to hyperfine interaction
KITP workshop on the *Physics of Graphene*, Santa Barbara, USA, February 2012

Holonomic quantum computing with heavy hole spin qubits
Varenna Summer School on *Quantum Spintronics*, Varenna, Italy, June 2012

Transport properties of helical Tomonaga Luttinger liquids
CECAM-Workshop Topological Materials, Bremen, Germany, August 2012

Transport properties of helical Tomonaga Luttinger liquids
Minisymposium *Quantum Coherence in Nanostructures*, Leipzig, Germany, October 2012

Transport properties of helical Tomonaga Luttinger liquids
Minerva-Gentner Symposium 2013, Tel Aviv University, Israel, February 2013

Symmetries and peculiarities of the electronic spectrum of graphene
Physics Academy, Universität Erlangen-Nürnberg, Germany, April 2013

Transport properties of graphene nanostructures
Workshop on nanostructured graphene, Antwerp, Belgium, May 2013

Transport properties of helical Tomonaga Luttinger liquids
IXth Rencontres du Vietnam Nanophysics: from fundamentals to applications, Quy-Nhon, Vietnam, August 2013

Transport properties of helical edge liquids
International workshop on *Topology and Nonequilibrium in Low-Dimensional Electron Systems*, Dresden, Germany, September 2013

Spin dynamics in graphene quantum dots
Sino-German Solid-State Quantum Information Symposium, Würzburg, Germany, September 2013

Spin qubits in graphene – a playground for quantum thermodynamics
2nd School and Conference on spin-based quantum information processing, Konstanz, Germany, August 2014

Gapless Topological Phases
International focus workshop *Quantum correlations out of equilibrium*, ETH Zürich, Switzerland, November 2014

Transport properties of helical edge states
Virtual Institute of Topological Insulators School, Aachen, Germany, December 2014

Superconducting hybrids based on quantum spin Hall systems
International workshop on *Topotronics*, Okinawa, Japan, March 2015

Superconducting hybrids based on quantum spin Hall systems
Lecture series at the 11th Capri Spring School *Transport in Nanostructures*, Capri, Italy, April 2015

Superconducting hybrids based on quantum spin Hall systems
International Workshop on *New Perspectives in Spintronics and Mesoscopic Physics*, Kashiwa, Japan, June 2015

Equilibration in closed quantum systems: Application to spin qubits
FRIAS Workshop on *Quantum Dissipation Progress & Perspective*, Freiburg, Germany, July 2015

Odd-frequency superconductivity at the helical edge of a topological insulator
Focus Workshop *Majorana*, Mainz, Germany, February 2016

Physical properties of helical edge states
Lecture series at the *International workshop on Graphene and TIs*, El Jadida, Morocco, March 2016

Exotic physics at the quantum spin Hall edge
Workshop *Topological States of Matter*, San Sebastian, Spain, September 2016

Topological superconductivity and Majorana fermions
ToCoTronics Fall School 2016, Würzburg, Germany, October 2016

Exotic physics at the quantum spin Hall edge
International Workshop on *Contacts in Nanosystems*, Goslar, Germany, October 2016

Physical properties of topological edge states
Lecture at the 48th IFF Spring School on *Topological Matter*, Jülich, Germany, March 2017

Chiral anomaly and fractional charge at the quantum spin Hall edge
Symposium on Quantum Science and Quantum Engineering, Würzburg, Germany, April 2017

Odd-frequency superconductivity and Majorana fermions
VITI Meeting @ SIMIT, Shanghai, China, April 2017

Chiral anomaly and fractional charge at the quantum spin Hall edge
Workshop on *Boundary Effects and Correlations in 1D systems*, Regensburg, Germany, June 2017

Chirality Josephson current due to a novel quantum anomaly in Weyl semimetals
Workshop on *Topological Matter beyond the Ten-Fold Way*, Stockholm, Sweden, July 2018

Fractional excitations at the helical edge
Workshop on *Quantum Information and Correlation in Quantum Dots*, Daejeon, South Korea, August 2018

Central spin models: spin qubits meet many body localization
Workshop on *Dynamic Quantum Matter*, Stockholm, Sweden, December 2018

Superconductivity in Weyl semimetals
Tutorial on *Nodal Semimetals* at *APS March Meeting*, Boston, MA, USA, March 2019

Majorana fermions and parafermions in superconducting constrictions at the helical edge
Workshop on *Quantum Designer Physics*, San Sebastian, Spain, July 2019

Majorana fermions and parafermions in superconducting constrictions at the helical edge
SPP 1666 Workshop, Berlin, Germany, September 2019

Majorana-induced DC Shapiro steps in topological JJs
Online Conference TOPOSUPER 2021, Aalto, Finland, June 2021

Topological insulators and topological superconductors
Lecture Series at Doctoral School, Santa Margherita, Italy, March 2022

Random flux driven metal to HOTI transition
Workshop on Topological Quantum Matter, Buenos Aires, Argentina, April 2022

Topological burning glass effect
Workshop on *Frontiers in physics of disordered and interacting quantum systems*, Karlsruhe, Germany, November 2022

Dynamics of biased Josephson junctions
Workshop on *Non-equilibrium quantum many body systems*, Genova, Italy, July 2024

Dynamics of biased Josephson junctions
Workshop on *Gate-controlled superconductivity*, Paestum, Italy, October 2024

Colloquia and public outreach

Dirac fermions in graphene
Physics Colloquium, Erlangen, Germany, November 2009

Dirac fermions in graphene and topological insulators
Physics Colloquium, Konstanz, Germany, November 2010

Dirac fermions in graphene and topological insulators
Physics Colloquium, Freiburg, Germany, February 2011

Dirac fermions in graphene and topological insulators
Physics Colloquium, Ulm, Germany, May 2011

Dirac fermions in graphene and topological insulators
Physics Colloquium, Aachen, Germany, May 2011

Dirac fermions in graphene and topological insulators
Physics Colloquium, Wuppertal, Germany, November 2011

Dirac fermions in graphene and topological insulators
Physics Colloquium, Braunschweig, Germany, June 2012

Dirac fermions in graphene and topological insulators
Physics Colloquium, Bremen, Germany, January 2013

Dirac fermions in topological insulators
Physics Colloquium, Düsseldorf, Germany, June 2013

Dirac fermions in topological insulators
Physics Colloquium, Greifswald, Germany, May 2014

Dirac fermions in topological insulators
Physics Colloquium, Regensburg, Germany, June 2015

Correlation effects in topological insulators
SFB 668 Colloquium, Hamburg, Germany, July 2016

Exotic physics at the quantum spin Hall edge
Theory Colloquium, TU Dresden, Germany, October 2016

Correlation effects in topological insulators
IFW Colloquium, Dresden, Germany, September 2017

Wie funktioniert ein Quantencomputer und was kann man damit berechnen?
Schülervortrag, Highlights der Physik 2021, Würzburg, Germany, September 2021

Faszination Quantencomputer
Weihnachtsvorlesung, Hochschule für angewandte Wissenschaften, Schweinfurt, Germany, December 2021