

Curriculum Vitae**Personal data**

Last name: Trauzettel, Prof. Dr.
 First name: Björn
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 Würzburg University
 Am Hubland, 97074 Würzburg, Germany
 Date of birth: 10 November 1973
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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 in the academic year 1999/2000
 2007: Offer at a full professor level (W3) from Saarbrücken University, Germany
 2016: Offer at a full professor level (W3) from Freiburg University, Germany

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
 Since 2019: Dean of the School of Physics and Astronomy at Würzburg University, Germany

Scientific stays

11/2002: Research stay (two weeks) in the group of Prof. Dr. M. Heiblum at the Weizmann Institute in Rehovot, Israel
 02/2004: Research stay (one week) in the group of Prof. Dr. V. Pellegrini at the Scuola Normale Superiore in Pisa, Italy
 01/2006: Research stay (two weeks) 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
02/2012-03/2012	Participant of the KITP workshop at Santa Barbara, USA on the <i>Physics of Graphene</i>
08/2015-02/2016	Sabbatical at UC Berkeley, USA

Other 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 <i>Quantum Spin Coherence and Electronics</i> (QSpICE)
2009-2012:	Co-coordinator of the DFG Priority Program <i>Graphene</i>
02/2010:	Guest editor on the <i>Special issue on Graphene of Semiconductor Science and Technology</i>
04/2010:	Organizer of the ECT* workshop <i>New frontiers in graphene physics</i> at Trento, Italy
10/2010:	Organizer of the ESF QSpICE <i>Workshop on Quantum Spintronics</i> at Acquafredda di Maratea, Italy
10/2011:	Organizer of the ESF QSpICE <i>Workshop on Quantum Spintronics II</i> at Porto Ottiolu, Sardinia, Italy
2012-2015:	Co-coordinator of the DFG Priority Program <i>Topological Insulators</i>
06/2013:	Organizer of the <i>Graphene Week 2013</i> at Chemnitz, Germany
07/2013:	Organizer of the Workshop on <i>Spin Orbit Entanglement: Exotic States of Quantum Matter in Electronic Systems</i> at the MIPPKS in Dresden, Germany
03/2015	Organizer of the International workshop on <i>Topotronics</i> at Okinawa, Japan
06/2017	Organizer of the International workshop on <i>Spin Dynamics in the Dirac Systems</i> in Mainz, Germany
07/2017	Organizer of the International workshop on <i>Spin-Orbit Materials</i> in Luxembourg
07/2018	Organizer of the International conference on <i>Topological and Correlated Electronic Materials</i> (ToCoTronics 2018) in Würzburg, Germany
Since 07/2015	Spokesperson (together with Prof. Ralph Claessen) of the SFB 1170 on <i>Topological and Correlated Electronics at Surfaces and Interfaces</i>
Since 01/2019	Principle investigator and co-initiator of the Cluster of Excellence <i>ct.qmat</i> on <i>Complexity and Topology in Quantum Matter</i> (joined research cluster between Würzburg and Dresden)

Scientific and teaching output

- author of more than 140 scientific publications including 5 Nature Physics, 1 Physical Review X, and 33 Physical Review Letters (>4600 citations; h-index: 33; ISI Web of Science)
- more than 50 invited oral presentations at international conferences; more than 60 invited oral presentations in seminars and physics colloquia at universities and research laboratories
- more than 10 successful grant applications at the Deutsche Forschungsgemeinschaft (DFG), European Science Foundation (ESF), Elite Netzwerk Bayern (ENB), Humboldt Foundation, and Helmholtz Foundation
- supervisor of 14 PhD theses (three of them awarded “with distinction”)
- 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) (**716 citations**; ISI Web of Science)

J. Tworzydło, B. Trauzettel, M. Titov, A. Rycerz, and C.W.J. Beenakker
Sub-Poissonian shot noise in graphene
Phys. Rev. Lett. **96**, 246802 (2006) (**625 citations**; ISI 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) (**188 citations**; ISI 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) (**178 citations**; ISI 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) (**169 citations**; ISI 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. Tworzydło, 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 Sublattice 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
Z₂ 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 nanoelectromechanical 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 excitation 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 signatures 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)
- [80] A. Amaricci, J. C. Budich, C. Capone, B. Trauzettel, and G. Sangiovanni
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)
- [88] F. Geissler, F. Crépin, and B. Trauzettel
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)
- [90] F. Crépin and B. Trauzettel
Flux sensitivity of quantum spin Hall rings
Physica E **75**, 379 (2016)
- [91] N. Traverso Ziani, C. Fleckenstein, F. Crépin, and B. Trauzettel
Charge and spin density in the helical Luttinger liquid
Eur. Phys. Lett. **113**, 37002 (2016)
- [92] A. Amaricci, J.C. Budich, C. Capone, B. Trauzettel, and G. Sangiovanni
Strong Correlation Effects on Topological Quantum Phase Transitions in Three Dimensions
Phys. Rev. B **93**, 235112 (2016)
- [93] M. Kharitonov, S. Jürgens, and B. Trauzettel
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)
- [94] S. Gattenlöhner, I. V. Gornyi, P. M. Ostrovsky, B. Trauzettel, A. D. Mirlin, and M. Titov
Levy flights due to anisotropic disorder in graphene
Phys. Rev. Lett. **117**, 046603 (2016)
- [95] C. De Beule, N. Traverso Ziani, M. Zarenia B. Partoens, and B. Trauzettel
Correlation and current anomalies in topological quantum dots
Phys. Rev. B **94**, 155111 (2016)
- [96] C. Fleckenstein, N. Traverso Ziani, and B. Trauzettel
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)
- [97] S. Jürgens and B. Trauzettel
Exotic surface states in hybrid structures of topological insulators and Weyl semimetals
Phys. Rev. B **95**, 085313 (2017)
- [98] O. Kashuba, B. Sothmann, P. Burset, and B. Trauzettel
Majorana STM as a perfect detector of odd-frequency superconductivity
Phys. Rev. B **95**, 174516 (2017)

- [99] F. Dominguez, O. Kashuba, E. Bocquillon, J. Wiedenmann, R.S. Deacon, T.M. Klapwijk, G. Platero, L.W. Molenkamp, B. Trauzettel, and E.M. Hankiewicz
Josephson junction dynamics in the presence of 2π - and 4π -periodic supercurrents
Phys. Rev. B **95**, 195430 (2017)
- [100] A. Amaricci, L. Privitera, F. Petocchi, M. Capone, G. Sangiovanni, and B. Trauzettel
Edge reconstruction from strong correlations in quantum spin Hall insulators
Phys. Rev. B **95**, 205120 (2017)
- [101] N. Traverso Ziani, C. Fleckenstein, G. Dolcetto, and B. Trauzettel
Fractional charge oscillations in quantum dots with quantum spin Hall effect
Phys. Rev. B. **95**, 205418 (2017).
- [102] S. Heedt, N. Traverso Ziani, F. Crepin, W. Probst, St. Trelenkamp, J. Schubert, D. Grützmacher, B. Trauzettel, and Th. Schäpers
Signatures of interaction-induced helical gaps in nanowire quantum point contacts
Nature Physics **13**, 563 (2017)
- [103] T. Müller, R. Thomale, B. Trauzettel, E. Bocquillon, and O. Kashuba
Dynamical transport measurement of the Luttinger parameter in helical edge states of 2D topological insulators
Phys. Rev. B. **95**, 245114 (2017).
- [104] D. Hetterich, M. Serbyn, F. Dominguez, F. Pollmann, and B. Trauzettel
Non-interacting central site model: Localization and logarithmic entanglement growth
Phys. Rev. B. **96**, 104203 (2017).
- [105] M. Kharitonov, F. Geissler, and B. Trauzettel
Backscattering in a helical liquid induced by Rashba spin-orbit coupling and electron interactions: locality, symmetry, and cutoff aspects
Phys. Rev. B **96**, 155134 (2017)
- [106] T. Posske, B. Trauzettel, and M. Thorwart
Second quantization of Leinaas-Myrheim anyons in one dimension and their relation to the Lieb-Liniger model
Phys. Rev. B **96**, 195422 (2017)
- [107] D. Breunig, P. Burset, and B. Trauzettel
Creation of spin-triplet Cooper pairs in the absence of magnetic ordering
Phys. Rev. Lett. **120**, 037701 (2018)
- [108] S.-B. Zhang, F. Dolcini, D. Breunig, and B. Trauzettel
Appearance of the universal value e^2/h of the zero-bias conductance in a Weyl semimetal-superconductor junction
Phys. Rev. B **97**, 041116(R) (2018)
- [109] F. Keidel, P. Burset, and B. Trauzettel
Tunable hybridization of Majorana bound states at the quantum spin Hall edge
Phys. Rev. B **97**, 075408 (2018)
- [110] C. Fleckenstein, F. Dominguez, N. Traverso Ziani, and B. Trauzettel
Decaying spectral oscillations in a Majorana wire with finite coherence length
Phys. Rev. B **97**, 155425 (2018)
- [111] C. Fleckenstein, N. Traverso Ziani, and B. Trauzettel
Conductance signatures of odd-frequency superconductivity in quantum spin Hall systems using a quantum point contact
Phys. Rev. B **97**, 134523 (2018)

- [112] C. Fleckenstein, N. Traverso Ziani, and B. Trauzettel
Detection of fractional solitons in quantum spin Hall systems
Europhysics Letters **121**, 57003 (2018)
- [113] O. Kashuba, B. Trauzettel, and L.W. Molenkamp
Relativistic Gurzhi effect in channels of Dirac materials
Phys. Rev. B **97**, 205129 (2018)
- [114] S. Körber, B. Trauzettel, and O. Kashuba
Delocalized Yu-Shiba-Rusinov states in magnetic clusters at superconducting surfaces
Phys. Rev. B **97**, 184503 (2018)
- [115] A. Amaricci, A. Valli, G. Sangiovanni, B. Trauzettel, and M. Capone
Coexistence of metallic edge states and anti-ferromagnetic ordering in correlated topological insulators
Phys. Rev. B **98**, 045133 (2018)
- [116] C. Fleckenstein, F. Keidel, B. Trauzettel, and N. Traverso Ziani
The invisible Majorana bound state at the helical edge
Eur. Phys. J. Spec. Top. (2018) 227:1377
- [117] D. Hetterich, N.Y. Yao, M. Serbyn, F. Pollmann, and B. Trauzettel
Detection and characterization of many-body localization in central spin models
Phys. Rev. B **98**, 161122 (2018)
- [118] S.-B. Zhang, J. Erdmenger, and B. Trauzettel
Chirality Josephson current due to a novel quantum anomaly in inversion-asymmetric Weyl semimetals
Phys. Rev. Lett. **121**, 226604 (2018)
- [119] C. Fleckenstein, N. Traverso Ziani, and B. Trauzettel
Z₄ parafermions in weakly interacting superconducting constrictions at the helical edge of quantum spin Hall insulators
Phys. Rev. Lett. **122**, 066801 (2019)
- [120] V. Werner, B. Trauzettel, and O. Kashuba
Semiclassical conservation of spin and large transverse spin current in Dirac systems
Phys. Rev. Lett. **122**, 066801 (2019)
- [121] S.-B. Zhang and B. Trauzettel
Perfect crossed Andreev reflection in Dirac hybrid junctions in the quantum Hall regime
Phys. Rev. Lett. **122**, 257701 (2019)
- [122] D. Hetterich, G. Schmitt, L. Privitera, and B. Trauzettel
Strong frequency dependence of transport in the driven Fano-Anderson model
Phys. Rev. B **100**, 014201 (2019)
- [123] D. Breunig, S.-B. Zhang, M. Stehno, and B. Trauzettel
Influence of a chiral chemical potential on Weyl hybrid junctions
Phys. Rev. B **99**, 174501 (2019)
- [124] S. Porta, L. Privitera, N. Traverso Ziani, M. Sasseti, F. Cavaliere, and B. Trauzettel
Feasible model for photo-induced interband pairing
Phys. Rev. B **100**, 024513 (2019)
- [125] F. Schulz, J.C. Budich, E.G. Novik, P. Recher, and B. Trauzettel
Voltage-tunable Majorana bound states in time-reversal symmetric bilayer quantum spin Hall hybrid systems
Phys. Rev. B **100**, 165420 (2019)

[126] A. Calzona and B. Trauzettel
Moving Majorana bound states between distinct helical edges across a quantum point contact
Phys. Rev. Research **1**, 033212 (2019)

[127] J. Strunz, J. Wiedenmann, C. Fleckenstein, L. Lunczer, W. Beugeling, V.L. Müller, P. Shekhar, N. Traverso Ziani, S. Shamim, J. Kleinlein, H. Buhmann, B. Trauzettel, and L.W. Molenkamp
Interacting topological edge channels
Nature Phys. **16**, 83 (2020)

[128] S.-B. Zhang and B. Trauzettel
Detection of second-order topological superconductors by Josephson junctions
Phys. Rev. Research **2**, 012018 (2020)

Publications in Conference Proceedings

[129] F. Dolcini, B. Trauzettel, I. Safi, and H. Grabert
Transport properties of an interacting quantum wire with an impurity: Effects of the finite length in
“Quantum information and decoherence in nanosystems”, D.C. Glattli, M. Sanquer, and J. Tran Thanh
Van, eds., THE GIOI Publishers, Vietnam, 2004

[130] B. Trauzettel, P. Roche, D.C. Glattli, and H. Saleur
On the appearance of fractional charge in shot noise measurements
in “Quantum information and decoherence in nanosystems”, D.C. Glattli, M. Sanquer, and J. Tran
Thanh Van, eds., THE GIOI Publishers, Vietnam, 2004

[131] B. Trauzettel, I. Safi, F. Dolcini, and H. Grabert
Fractional charge in the noise of Luttinger liquid systems
Proc. SPIE Int. Soc. Opt. Eng. **5843**, 115 (2005)

[132] F. Dolcini, B. Trauzettel, I. Safi, and H. Grabert
Current noise in non-chiral Luttinger liquids: Appearance of fractional charge
AIP Conf. Proc. **780**, 421 (2005)

[133] B. Trauzettel, J. Tworzydło, M. Titov, A. Rycerz, and C.W.J. Beenakker
Minimum conductivity and maximum Fano factor in mesoscopic graphene
Proceedings of the VIth Rencontres du Vietnam, Hanoi, Vietnam, 2006

[134] P. Recher, E. G. Novik, R. W. Reinthaler, D. G. Rothe, E. M. Hankiewicz, and B. Trauzettel
Signatures of topology in ballistic bulk transport of HgTe quantum wells
Proc. SPIE Vol. **7760**, 776018 (2010)

Other publications

[135] B. Trauzettel
Von Graphit zu Graphen
Physik Journal **6** (2007) Nr. 7, 39

[136] B. Trauzettel and D. Loss
Carbon surprises again
Nature Phys. **5**, 317 (2009); news & views

[137] A. Morpurgo and B. Trauzettel
Editorial: Special Issue on Graphene
Semicond. Sci. Technol. **25**, 030301 (2010)

[138] E.M. Hankiewicz and B. Trauzettel
Lückenschluss an der Oberfläche
Physik Journal **9** (2010), Nr. 10, 20

[139] P. Recher and B. Trauzettel
Nobelpreis für Physik: Mit Tesafilm zum molekularen Maschendraht
Spektrum der Wissenschaft, 12/2010, 16

[140] P. Recher and B. Trauzettel
Mit Tesafilm nach Stockholm
Physik Journal **9** (2010), Nr. 12, 22

[141] A. Morpurgo and B. Trauzettel
Progress in topological insulators
Semicond. Sci. Technol. **27**, 120201 (2012)

[142] P. Recher and B. Trauzettel
Moire-Schmetterlinge in Graphen
Physik Journal **12** (2013), Nr. 7, 24

Preprints

[143] E. G. Novik, B. Trauzettel, and P. Recher
Transport signatures of a quantum spin Hall – chiral topological superconductor junction
arXiv:1904.02984

[144] C. Fleckenstein, N. Traverso Ziani, L. Privitera, M. Sassetti, and B. Trauzettel
Transport signatures of a Floquet topological transition at the helical edge
arXiv:1908.11719

[145] C. Fleckenstein, N. Traverso Ziani, A. Calzona, M. Sassetti, and B. Trauzettel
Majorana bound states in quantum spin Hall slits
arXiv:2001.03475

[146] S. Körber, L. Privitera, J. C. Budich, B. Trauzettel
Interacting topological frequency converter
arXiv:2002.01424

[147] S.-B. Zhang, W.B. Rui, A. Calzona, S.-J. Choi, A. P. Schnyder, and B. Trauzettel
Topological and holonomic quantum computation based on second-order topological superconductors
arXiv:2002.05741

[148] N. Traverso Ziani, C. Fleckenstein, L. Vigliotti, B. Trauzettel, and M. Sassetti
From fractional solitons to Majorana fermions in a paradigmatic model of topological superconductivity
arXiv:2002.05996

[149] S.-B. Zhang, A. Calzona, and B. Trauzettel
All-electrically tunable networks of Majorana bound states
arXiv:2003.04053

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

Colloquia

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