On electronic signatures of topological superconductivity

Diez, M.

Curriculum Vitæ

I was born in Karlsruhe, Germany, on November 28th 1985. After moving to Pliezhausen, a small village near Reutlingen, I attended primary school there. My secondary education I received first at the Gymnasium Bildungszentrum Nord (1996-2000) and then at the Isolode-Kurz-Gymnasium (2000-2005), both in Reutlingen.

After graduating in 2005 I completed nine months of civilian service at the agency for conservation of nature in Reutlingen. In Fall 2006 I started studying physics at the University of Constance. During the course of my studies – from September 2009 to March 2010 – I spent a research internship at the University of Southern California in Los Angeles where I published my first scientific paper in the group of Prof. Dr. Stephan Haas. In Constance I wrote my diploma thesis on "Spin relaxation of mobile electrons in graphene" under the guidance of Prof. Dr. Guido Burkhard.

After my graduation I continued research in condensed matter physics by joining the group of Prof. Dr. Carlo Beenakker in Leiden. I became a PhD student at the Instituut Lorentz, where I was employed by the Foundation for Fundamental Research on Matter (FOM). My work here benefited very much from the unusually open and interactive atmosphere as well as from the close collaboration between the Leiden Institute of Physics and the Kavli Institute of Nanoscience in Delft.

During my time as a PhD student I was a teaching assistant in electrodynamics. I attended many schools, workshops, and conferences. I presented my work in the Netherlands, Germany, France, Denmark, the United States, and Israel.

List of Publications

1. *Local quenches in frustrated quantum spin chains: global vs. subsystem equilibration*, M. Diez, N. Chancellor, S. Haas, L. C. Venuti, P. Zanardi, Phys. Rev. A **82**, 032113 (2010).

2. *Bias-dependent D'yakonov-Perel' spin relaxation in bilayer graphene*, M. Diez, G. Burkard, Phys. Rev. B **85**, 195412 (2012).

3. *Andreev reflection from a topological superconductor with chiral symmetry*, M. Diez, J. P. Dahlhaus, M. Wimmer, C. W. J. Beenakker, Phys. Rev. B **86**, 094501 (2012). [Chapter 2]

4. *Phase-locked magnetoconductance oscillations as a probe of Majorana edge states*, M. Diez, I. C. Fulga, D. I. Pikulin, M. Wimmer, A. R. Akhmerov, C. W. J. Beenakker, Phys. Rev. B **87**, 125406 (2013), Editors' Suggestion. [Chapter 3]

5. *Emergence of massless Dirac fermions in graphene's Hofstadter butterfly at switches of the quantum Hall phase connectivity*, M. Diez, J. P. Dahlhaus, M. Wimmer, C. W. J. Beenakker, Phys. Rev. Lett. **112**, 196602 (2014). [Chapter 6]

6. *Bimodal conductance distribution of Kitaev edge modes in topological superconductors*, M. Diez, I. C. Fulga, D. I. Pikulin, J. Tworzydło, C. W. J. Beenakker, New J. Phys. **16**, 063049 (2014). [Chapter 4]

7. *Extended topological group structure due to average reflection symmetry*, M. Diez, D. I. Pikulin, I. C. Fulga, J. Tworzydło, New J. Phys. **17**, 043014 (2015). [Chapter 5]

8. *Giant negative magnetoresistance driven by spin-orbit coupling at the LAO/STO interface*, M. Diez, A.M.R.V.L. Monteiro, G. Mattoni, E. Cobanera, T. Hyart, E. Mulazimoglu, N. Bovenzi, C.W.J.

Beenakker, A.D. Caviglia, Phys. Rev. Lett. **115**, 016803 (2015). [Chapter 7]

9. *Ballistic Josephson junctions in edge-contacted graphene*, V. E. Calado, S. Goswami, G. Nanda, M. Diez, A. R. Akhmerov, K. Watanabe, T. Taniguchi, T. M. Klapwijk, L. M. K. Vandersypen, arXiv:-1501.06817.

10. *Topologically protected charge transfer along the edge of a chiral p-wave superconductor*, N. V. Gnezdilov, B. van Heck, M. Diez, Jimmy A. Hutasoit, C. W. J. Beenakker, arXiv:1505.06744.