Random-matrix theory and stroboscopic models of topological insulators and superconductors

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List of Publications

- *Spin current generation and detection by a double quantum dot structure*, J. P. Dahlhaus, S. Maier, and A. Komnik, Phys. Rev. B **81**, 075110 (2010).

- *Random-matrix theory of thermal conduction in superconducting quantum dots*, J. P. Dahlhaus, B. Béri, and C. W. J. Beenakker, Phys. Rev. B **82**, 014536 (2010) [Chapter 2].

- *Geodesic scattering by surface deformations of a topological insulator*, J. P. Dahlhaus, C.-Y. Hou, A. R. Akhmerov, and C. W. J. Beenakker, Phys. Rev. B **82**, 085312 (2010) [Chapter 8].

- *Quantized conductance at the Majorana phase transition in a disordered superconducting wire*, A. R. Akhmerov, J. P. Dahlhaus, F. Hassler, M. Wimmer, and C. W. J. Beenakker, Phys. Rev. Lett. **106**, 057001 (2011).

- *Random-matrix theory of Andreev reflection from a topological superconductor*, C. W. J. Beenakker, J. P. Dahlhaus, M. Wimmer, and A. R. Akhmerov, Phys. Rev. B **83**, 085413 (2011) [Chapter 3].

- *Quantum point contact as a probe of a topological superconductor*, M. Wimmer, A. R. Akhmerov, J. P. Dahlhaus, and C. W. J. Beenakker, New J. Phys. **13**, 053016 (2011) [Chapter 4].

- *Quantum Hall effect in a one-dimensional dynamical system*, J. P. Dahlhaus, J. M. Edge, J. Tworzydło, and C. W. J. Beenakker, Phys. Rev. B **84**, 115133 (2011) [Chapter 6].

- *Metal–topological-insulator transition in the quantum kicked rotator with $\mathbb{Z}_2$ symmetry*, E. P. L. van Nieuwenburg, J. M. Edge, J. P. Dahlhaus,

J. Tworzydło, and C. W. J. Beenakker, Phys. Rev. B **85**, 165131 (2012) [Chapter 7].

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

- *Zero-voltage conductance peak from weak antilocalization in a Majorana nanowire*, D. I. Pikulin, J. P. Dahlhaus, M. Wimmer, H. Schomerus, and C. W. J. Beenakker, submitted to New J. Phys.

- *Scattering theory of topological invariants in nodal superconductors*, J. P. Dahlhaus, M. Gibertini, and C. W. J. Beenakker, submitted to Phys. Rev. B [Chapter 5].

Curriculum Vitæ

I was born in Essen, Germany on the 31st of August 1982. In my first years my family moved several times before we settled in Neckargemünd in 1990, where I received my primary and the first part of my secondary school education. After finishing my school education 2002 in close-by Heidelberg, I studied Mathematics at the FernUniversität Hagen for one year while I did my alternative civilian service at a boarding school for disabled children.

In 2003 I started to study physics at the Ruprecht-Karls Universität Heidelberg. During the first years I was also enrolled in Mathematics, achieving an intermediate diploma in 2005. Shortly after I was granted a scholarship of the Studienstiftung des Deutschen Volkes. With financial support of the German Academic Exchange Service (DAAD) I obtained a Bachelor of Science (Degree with Honors) in physics at the University of Melbourne, Australia in 2007, performing research on *Non-linear laser-induced dynamics and high harmonic generation in electronic systems* under the supervision of Prof. Dr. Keith Nugent. With a thesis on *Interaction effects in the charge transfer statistics of double quantum dot nanostructures* in the group of Prof. Dr. Andreas Komnik I finished my diploma studies in Heidelberg in 2009. After graduation I joined the group of Prof. Dr. Carlo Beenakker at the Universiteit Leiden for my PhD studies, employed by the Foundation for Fundamental Research on Matter (FOM). Part of the research I performed during the last three years is presented in this thesis.

During my studies in Leiden, Heidelberg, and Melbourne I taught several classes on physics, mathematics, and computer science and supervised lab work. As a PhD student I attended a variety of summer schools, workshops, and conferences and presented my work in the Netherlands, Germany, France, Italy, and Japan.