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## On the random-matrix theory of Majorana fermions in topological superconductors

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# Curriculum Vitæ

I was born in Rome, Italy, on the 28<sup>th</sup> of January 1989. There, I received my primary education and completed it with scientific-oriented high school studies.

In 2007, I enrolled in the Physics department at the university “La Sapienza” (Rome). As a bachelor student I attended additional courses associated to an “Excellence program”. In 2010 I graduated *cum laude* at the bachelor level with the dissertation “An essay on Bianchi’s Universes and their isotropic limit” with prof. Giovanni Montani. After that, I enrolled in the master program on general theoretical physics and, in early 2013, I obtained the master degree in Physics *cum laude* with the thesis “Collective modes in multiband superconductors” under the supervision of dr. Lara Benfatto. After the graduation I spent a few months working with prof. Claudio Castellani’s group with a grant subsidized by the Centro Nazionale di Ricerca (CNR).

In September 2013 I became employed by the University of Leiden, The Netherlands, as a Ph.D. student at the Instituut-Lorentz in the group of prof. Carlo Beenakker. For my thesis I worked mostly on the random-matrix theory applied to topological superconductors. For three consecutive years, I have served as teaching assistant to the master-degree course “Quantum Theory”. During my Ph.D. I have attended a number of courses, a summer school and several workshops presenting my work in the Netherlands, Italy, Spain, France, Germany and Israel.



# List of publications

- M. Marciani, L. Fanfarillo, C. Castellani, L. Benfatto. *Leggett modes in iron-based superconductors as a probe of Time Reversal Symmetry Breaking*. Phys. Rev. B **88**, 214508, (2013).
- M. Marciani, P. W. Brouwer, C. W. J. Beenakker. *Time-delay matrix, midgap spectral peak, and thermopower of an Andreev billiard*. Phys. Rev. B **90**, 045403, (2014). [Chapter 2]
- Shuo Mi, D. I. Pikulin, M. Marciani, C. W. J. Beenakker. *X-shaped and Y-shaped Andreev resonance profiles in a superconducting quantum dot*. JETP **119**, 1018–1027, (2014).
- H. Schomerus, M. Marciani, C. W. J. Beenakker. *Effect of chiral symmetry on chaotic scattering from Majorana zero modes*. Phys. Rev. Lett. **114**, 166803, (2015). [Chapter 3]
- M. Marciani, H. Schomerus, C. W. J. Beenakker. *Effect of a tunnel barrier on the scattering from a Majorana bound state in an Andreev billiard*. Physica E **77**, 54–64, (2016). [Chapter 4]
- M. Marciani, C. Hübner, B. Baxevanis. *General scheme for stable single and multiatom nanomagnets according to symmetry selection rules*. Phys. Rev. B **95**, 125433 (2017). [Chapter 5]



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Secondly, I thank my research group and in general all colleagues of the Instituut-Lorentz. During these years I have greatly enjoyed to work and share with them laughs, bureaucratic problems, parties and quite some science. I must confess I began this experience with several prejudices about other countries cultures. I would not say now they were totally wrong, however I have learned (and even began to enjoy) that differences might be difficult to accept but make us richer and more aware of personal limits. I want to give a special thanks to Nicandro who made me realize that social interactions and a relaxed attitude are important and can not be neglected in the name of career and success seeking.

I also want thank the secretaries Fran and Marianne without whom an important Appendix would have never reached the Beadle, I would have never gotten a discount on my first bike and many other things.

How not to mention Lola and my housemate Gyllion, with whom I have shared my deepest thoughts and who have on a daily basis endured my complexes of superiority and inferiority.

I would like to thank also the neocathecumenal communities I am part of, both the Dutch and the Italian ones, for constantly reminding me that God loves me.

Finally, I thank my beautiful family. Their support and love have been the only certainty I had during the toughest periods, a wonderful cherry on the cake during the best moments.

