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Curriculum Vitae

The author was born on the 24th of March 1988 in Goes, the Netherlands. Upon completion of the gymnasium as part of the bilingual pre-university stream vwo, an enrollment in mathematics and physics at the University of Leiden followed. The associated bachelor degrees were obtained three years later.

Subsequently, a master in theoretical physics was pursued. This track was cum laude concluded with the thesis entitled "Topological aspects of Aharonov-Bohm vortices in topological band insulators", which was carried out under the supervision of prof. dr. J. Zaanen. The results obtained during the master track were also awarded with a Shell prize. Moreover, after an extended summer holiday, this naturally resulted in the employment as a PhD researcher under the same supervisor at the Institute Lorentz of Leiden University. A coherent subset of this work is reported in this thesis.

The teaching duties during the PhD period comprised assisting the courses renewable energy at the University college the Hague, special relativity, statistical physics and elementary particles. In addition, other attempts to serve the community were made by acting as a reviewer for Phys. Rev. B and the American Department of Energy and by being a member of the Instituutsraad of the Leiden Institute of Physics.

Finally, the author had the privilege to attend conferences and/or to present his work in various places in Europe and the USA, including one invited opportunity at the EMRS meeting in Warsaw.

Acknowledgements

The moment I entered the building as a freshman I was quite intrigued by the theoretical physics section, as it seemed a rather special place. Now a few years later, I feel very privileged that in fact I have gotten the opportunity to be part of the warm atmosphere at the Institute Lorentz. Although I cannot appropriately acknowledge everybody in this short section, let me make a few exceptions.

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Finally, words cannot express how grateful I am for my parents and my brother. Being quite a complex character, I have notwithstanding always been positively stimulated and raised in a prosperity that still reflects in every conceivable aspect of life. In fact, despite my parents' successes, they have provided us with some of the initial conditions that they were actually not given. I sincerely hope that our world lines will tie a highly non-trivial knot in the eternal fabric that is space-time.