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Dislocations in stripes and lattice Dirac fermions

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PUBLICATIONS

1. S. I. Mukhin, A. Mesaros, J. Zaanen and F. V. Kusmartsev,
Enhanced electronic polarizability of metallic stripes and the universality of the bond-stretching phonon anomaly in high-temperature cuprate superconductors,
Phys. Rev. B **76**, 174521 (2007) [Chapter 6].
2. A. Mesaros, D. Sadri and J. Zaanen,
The Berry phase of dislocations in graphene and valley conserving decoherence,
Phys. Rev. B **79**, 155111 (2009) [Chapter 3].
3. A. Mesaros, D. Sadri and J. Zaanen,
Parallel Transport in Graphene Parallels Gravity,
Phys. Rev. B **82**, 073405 (2010) [Chapter 2].
4. A. Mesaros, S. Papanikolaou, C. F. J. Flipse, D. Sadri and J. Zaanen,
Electronic States of Graphene Grain Boundaries,
arXiv:1007.1137, submitted to Phys. Rev. B [Chapter 4].
5. A. Mesaros, S. Papanikolaou and J. Zaanen,
Straining the Identity of Majorana Fermions,
arXiv:1007.2350, submitted to Phys. Rev. Lett. [Chapter 5].
6. A. Mesaros, K. Fujita, I. Firmo, H. Eisaki, S. Uchida, S. Sachdev, J. Zaanen, J. C. Davis, M.J. Lawler, and E.-A. Kim,
Behavior of Smectic Topological Defects in Cuprate Superconductors,
to be submitted to *Science* [Chapter 7].

CURRICULUM VITAE

I was born in Senta, Serbia (SFR Yugoslavia at the time), on the 16th of February 1982. After finishing primary school and *Gymnasium* there, I started my undergraduate studies at the Faculty of Physics, University of Belgrade, in 2001. I chose the theory track, and the diploma work with which I graduated in summer of 2006, “Full Symmetry Implementation in Multi-Orbit Single-Particle Models” was supervised by Prof. Milan Damnjanović. During undergraduate studies, I attended an astrophysics summer school in Odessa, and a European quantum mechanics school in Strasbourg. In the last year of studies I received two awards intended for a selection of best students, one covering the students of my Faculty, and the other all of Serbia. Starting from second year of high-school, I enjoyed being part of the astronomy program of the Petnica Science Center, a science camp for talented elementary- and high-school students. There I completed research projects, and after starting undergraduate studies, continued attending as a junior assistant involved in giving lectures and supervising projects.

In autumn of 2006., I began my Ph.D. studies under the supervision of Prof. Jan Zaanen at the Instituut-Lorentz for theoretical physics in Leiden. This thesis contains the main results of the research during this period. In the last year of my studies, I spent three months working at Cornell University. As a graduate student, I presented my work through talks and posters at several conferences in the Netherlands and the United States. During three years of my studies, I was teaching exercise classes at Leiden University, within condensed matter and advanced quantum mechanics courses for master students.

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