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Gauge theory and nematic order : the rich landscape of orientational phase transition

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List of Publications

1. *Quantum phase transition in an array of coupled dissipative cavities*, Ke Liu, Lei Tan, Chun-Hai Lv and Wu-Ming Liu, Phys. Rev. A **83**, 063840 (2011).
2. *Extended dual description of Mott transition beyond two-dimensional space*, Yin Zhong, Ke Liu and Hong-Gang Luo, Phys. Rev. B **85**, 075106 (2012).
3. *Alternative Kondo breakdown mechanism: Orbital-selective orthogonal metal transition*, Yin Zhong, Ke Liu, Yong-Qiang Wang and Hong-Gang Luo, Phys. Rev. B **86**, 115113 (2012).
4. *Correlated metallic state in honeycomb lattice: Orthogonal Dirac semimetal*, Yin Zhong, Ke Liu, Yong-Qiang Wang and Hong-Gang Luo, Phys. Rev. B **86**, 165134 (2012).
5. *Half-filled Kondo lattice on the honeycomb lattice*, Yin Zhong, Ke Liu, Yu-Feng Wang, Yong-Qiang Wang and Hong-Gang Luo, Eur. Phys. J. B **86**, 1-8 (2013).
6. *Classification of nematic order in $2 + 1$ dimensions: Dislocation melting and $O(2)/Z_N$ lattice gauge theory*, Ke Liu, Jaakko Nissinen, Zohar Nussinov, Robert-Jan Slager, Kai Wu and Jan Zaanen, Phys. Rev. B, **91**, 075103 (2015).

Chapter 2

7. *Generalized liquid crystals: giant fluctuations and the vestigial chiral order of I , O and T matter*, Ke Liu, Jaakko Nissinen, Robert-Jan Slager, Kai Wu and Jan Zaanen, arXiv: 1512.07822, submitted to Phys. Rev. X.

Chapter 3

8. *Dual gauge field theory of quantum liquid crystals in two dimensions*, Aron J. Beekman, Jaakko Nissinen, Kai Wu, Ke Liu, Robert-Jan Slager, Zohar Nussinov, Vladimir Cvetkovic and Jan Zaanen, arXiv: 1603.04254, submitted to Physics Reports.

Chapter 2

9. *Classification of point-group-symmetric orientational ordering tensors*, Jaakko Nissinen, Ke Liu*, Robert-Jan Slager, Kai Wu and Jan Zaanen, arXiv: 1603.04794, accepted by Phys. Rev. E.

Chapter 4

10. *Hierarchy of orientational phases and axial anisotropies in the gauge theoretical description of generalized nematics*, Ke Liu, Jaakko Nissinen, Josko de Boer, Robert-Jan Slager and Jan Zaanen, arXiv: 1606.04507, submitted to Phys. Rev. E.

Chapter 5

Curriculum Vitæ

I was born in 1987 in the village Futudian in Jize, a village in the northern part of China. I did my primary-school studies in the village, but in 1999 I went to Shijiazhuang, the capital of my home province, for middle-school education. Since then I have moved to several places. My high school was in Qingdao. That is a seaside city in the east of China and produces my favorite green tea Laoshan, named by the region where it grows. My first university was in Shijiazhuang again, and I received the bachelor's degree after another four years there. Then I moved to Lanzhou, the geometric center of China, for the master's degree. That city is famous for two things, ramen and the university, and they were combined well in my everyday life there. In 2012, I moved to Leiden to do my PhD with a four-year state scholarship from China.

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