



Topological aspects of condensed-matter physics - Theory

Rules as for the experimental talks; for further information, please contact
maria.daghofer@fmq.uni-stuttgart.de

April 7 “Chern number, Hall conductivity and protected edge states”, Tobias Pitters

1. Xiao, D., Chang, M.-C. and Niu, Q. Berry phase effects on electronic properties. *Rev. Mod. Phys.*, **82**, 1959 (2010).
2. Xiao-Liang Qi and Shou-Cheng Zhang, *Rev. Mod. Phys.* **83**, 1057
3. E. Witten, arXiv:1510.07698

April 14 “Topological states for light”, Sascha Böhrkircher

1. M. C. Rechtsman, J. M. Zeuner, Y. Plotnik, Y. Lumer, D. Podolsky, F. Dreisow, S. Nolte, M. Segev, and A. Szameit, *Nature* **496**, 196 (2013).
2. Konstantin Y. Bliokh, Daria Smirnova, Franco Nori, Quantum spin Hall effect of light, *Science* **348**, 1448-1451 (2015)
3. K. Y. Bliokh, F. J. Rodríguez-Fortuno, F. Nori, A. V. Zayats, Spin-orbit interactions of light, *Nature Photonics* **9**, 796 (2015)

April 21 “Kitaev spin liquid, its excitations, Kitaev-Heisenberg model”, Friedemann Aust

1. A. Kitaev, *Annals of Physics* **321**, 2 (2006).
2. J. Chaloupka, G. Jackeli, and G. Khaliullin, *Phys. Rev. Lett.* **105**, 027204 (2010).
3. I. Kimchi and A. Vishwanath, *Phys. Rev. B* **89**, 014414 (2014).

April 28 “Topological Superconductors and Majorana Fermions”, Yuan Miao

1. S. R. Elliott and M. Franz, *Rev. Mod. Phys.* **87**, 137 (2015)
2. T. Karzig, G. Refael, and F. von Oppen *Phys. Rev. X* **3**, 041017 (2013)

May 12 “Topological order, entanglement and entropy”, Patric Rommel

1. Rajibul Islam, Ruichao Ma, Philipp M. Preiss, M. Eric Tai, Alexander Lukin, Matthew Rispoli, Markus Greiner, *Nature* **528**, 77 (2015)
2. Kitaev, A. and Preskill, J., entropy. *Phys. Rev. Lett.* **96**, 110404 (2006)
3. Levin, M. and Wen, X.-G., *Phys. Rev. Lett.* **96**, 110405 (2006)

4. Jiang, H.-C., Wang, Z. and Balents, L., Nature Phys. **8**, 902 (2012)

June 2 “Interacting topological phases proposed in iridates”, Moritz Fischer

1. Pesin, D., and Balents, L. Mott physics and band topology in materials with strong spin-orbit interaction. Nature Physics, **6**, 376 (2010).
2. A Go, W Witczak-Krempa, GS Jeon, K Park, YB Kim - Phys. Rev. Lett., **109**, 066401 (2012)
3. A. Shitade, H. Katsura, J. Kuneš, X.-L. Qi, S.-C. C. Zhang, and N. Nagaosa, Phys. Rev. Lett. **102**, 256403 (2009).

June 9 “Absence of symmetry breaking as indicator of topological order?”, Kevin Kleinbeck

1. Balents L, Phys. Rev. B **69**, 104431 (2004).
2. Senthil T, Vishwanath A, Balents L, Sachdev S, Fisher MPA, Nature **464**, 199 (2010).
3. I. Kimchi, S. A. Parameswaran, A. M. Turner, F. Wang and A. Vishwanath, Proc. Natl. Acad. Sci. **110**, 16378-16383 (2013)

June 16 “Topological crystalline insulators”, Daiki Shinatmi

1. Fu L., Phys. Rev. Lett. **106**, 106802 (2011).
2. Hsieh H. et al., Nat. Comm. **3**, 982 (2012).
3. Su-Yang Xu et al., Nature Communications **3**, 1192 (2012)

June 23 “ n -fold ways”, Kiryl Asheichyk

1. Altland, A., and M. R. Zirnbauer, 1997, Phys. Rev. B **55**, 1142
2. Schnyder, A. P., S. Ryu, A. Furusaki, and A. W. W. Ludwig, Phys. Rev. B **78**, 195125 (2008).
3. A. Kitaev, AIP Conf. Proc. **1134**, 22 (2009).

June 30 “Defects: Fractal/hierarchical TIs, Shiba states, ...”, Oleksii Maistrenko

1. Jay D. Sau and Eugene Demler, Phys. Rev. B **88**, 205402 (2013).
2. Jing He, Ying Liang and Su-peng Kou, EPL **112**, 17010 (2015)
3. Falko Pientka, Leonid I. Glazman, and Felix von Oppen, Phys. Rev. B **88**, 155420 (2013).

July 7 “Connections between topological insulators and spin liquids”, Assem Adam

1. G. A. Fiete, V. Chua, M. Kargarian, R. Lundgren, A. Rüegg, J. Wen, and V. Zyuzin, Physica E **44**, 845 (2012).
2. Dung-Hai Lee, Guang-Ming Zhang, and Tao Xiang, Phys. Rev. Lett. **99**, 196805 (2007).

3. A. Kitaev, *Annals of Physics* **321**, 2 (2006).

July 14 “Floquet Topological Insulators”, Ruben Pöhl

1. N. H. Lindner, G. Refael and V. Galitski, *Nature Physics* **7**, 490 (2011)

2. J. Cayssol, B. Dóra, F. Simon, R. Moessner, *Phys. Status Solidi RRL* **7**, 101 (2013)

3. Y. H. Wang, H. Steinberg, P. Jarillo-Herrero, N. Gedik, *Science* **342**, 453 (2013)