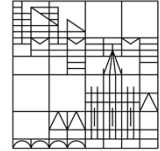


Physikalisches Kolloquium

Universität
Konstanz



Di 29.01.19
15:15 Uhr
14:45 Uhr, Kaffee/Tee
R 513



Prof. Dr. Florian Marquardt
MPL & Universität Erlangen

Topological effects in cavity optomechanics

Optomechanics, the interaction between light and vibrations, can be used to engineer topological transport of both photons and phonons. In this talk, I will describe our theoretical ideas in this field. There are two options: (i) One explicitly breaks time-reversal invariance with the help of the optomechanical interaction and a suitably engineered light field, creating a Chern insulator. (ii) Time-reversal invariance is preserved, but a suitably designed phononic crystal gives rise to helical edge channels. Time permitting, I will also explain our recent work on dynamical gauge fields in optomechanical arrays, where the effective magnetic field acting on photons becomes a dynamical degree of freedom.

References

- [1] V. Peano, C. Brendel, M. Schmidt, and F. Marquardt, "Topological Phases of Sound and Light, Phys. Rev. X **5**, 031011 (2015)
- [2] C. Brendel, V. Peano, O. Painter, and F. Marquardt, "Pseudomagnetic fields for sound at the nanoscale," Proceedings of the National Academy of Sciences (PNAS) **114**, E3390-E3395 (2017)
- [3] C. Brendel, V. Peano, O. Painter, and F. Marquardt, "Snowflake phononic topological insulator at the nanoscale," Phys. Rev. B **97**, 020102 (R) (2018)

