



Thursday, October 19th 2017 - 11:30
CFEL Seminar room I, II (Bldg. 99)

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Quantum phases induced by polarised light --- Floquet-topological states and Higgs modes

Putting materials out of equilibrium can produce new quantum phenomena. When driven by a circularly-polarised laser, a massless Dirac system such as graphene can be converted into the Floquet topological insulator of photon-dressed electrons, which realises the quantum anomalous Hall effect. The phase diagram becomes increasingly intricate for lower laser frequencies where transitions between different Chern numbers take place. If we consider electron correlation, we can predict transitions between Floquet topological insulators and Mott insulator[1]. In another avenue a linearly-polarised light can induce the collective Higgs amplitude mode in superconductors, a condensed-matter analogue of the renowned particle. Then a resonantly strong third-harmonic generation arises, where the Higgs mode contribution is shown to dominate[2] unlike in the BCS approximation.

[1] T. Mikami et al, Phys. Rev. B 93, 144307 (2016).

[2] R. Matsunaga et al, Phys. Rev. B 96, 020505(R) (2017).

Host: Gregor Jotzu / Andrea Cavalleri

