

Physikalisches Kolloquium

Topological photonics: from classical to quantum

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There are tremendous efforts underway to better understand systems with topological order --- global properties that are not discernible locally. The best-known examples are quantum Hall effects in electronic systems, where insensitivity to local properties manifests itself as conductance through edge states which are insensitive to defects and disorder. In this talk, I demonstrate how similar physics can be observed for photons; specifically, how various quantum Hall Hamiltonians can be simulated in an optical platform. I report on the first imaging and measurement of topological photonic edge state using silicon-on-insulator technology and our recent advance in studying the quantum transport of such topological photonic structures. Furthermore, the addition of optical nonlinearity to this system provides a platform to implement fractional quantum Hall states of photons and anyonic states that have not yet been observed. More generally, the application of these ideas can lead to the development of optical devices with topological protection for classical and quantum information processing.

Der Gast wird betreut von Herrn Prof. Dr. Fleischhauer

Gäste sind herzlich willkommen

Kaffeeauschank ab 17:00 Uhr

Montag, 29.05.2017, 17:15 Uhr

Gebäude 46, Hörsaal 270