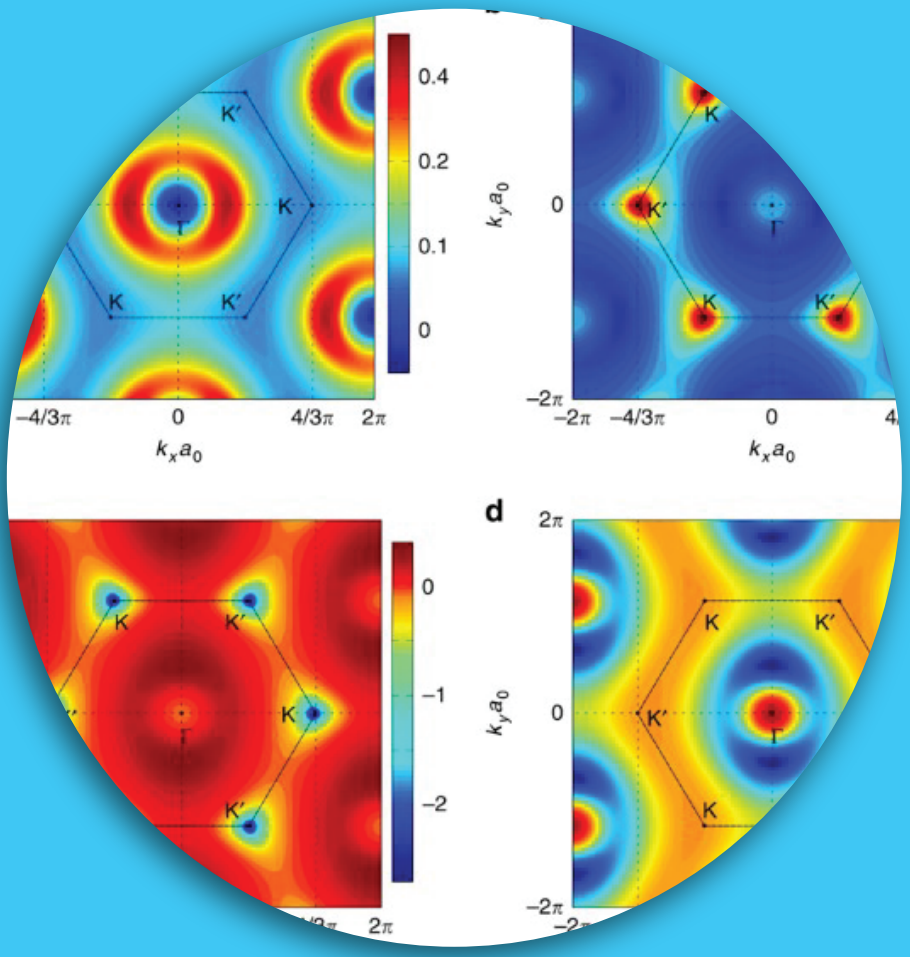
Math Colloquium Series

UCCS University of Colorado Colorado Springs



Dr. Sean Nixon
CU Boulder-Applied Math

Date: October 28, 2021

Time: 12:30pm-1:30pm

Location: Please visit the UCCS Math Colloquium page for the link:
https://math.uccs.edu/research/colloquia

Analytical study of Floquet Topological Insulators

The search for novel phenomena in photonic waveguides centers on engineering systems that feature unique dispersive properties often involving spectral degeneracies. From optical graphene to unidirectional invisibility to the anomalous quantum Hall effect, spectral degeneracies are a driving factor even when the system has been perturbed away from the degenerate case. Recently this has extended the study of topological (global) properties of the spectrum. Here longitudinal driving of the waveguides produce topological insulators and protected edge modes. This talk will give an introduction to topological photonics and the analytical tools capable of deriving reduced dynamical systems to model the Floquet spectrum. These tools range from tight-binding approximations to multiple-scales analysis and provide an approach that will be applicable in a wide range of waveguide arrays with nontrivial topologies. Key topolical constants like the Chern number are obtained as well as governing equations for the envelope dynamics in the presence of Kerr nonlinearity.

For more information, scan the QR code with your phone's camera