Contribution ID: **37** Type: **not specified**

Engineering topological states of exciton-polaritons with Non-Hermitian potentials

Sunday, January 27, 2019 4:30 PM (25 minutes)

Emerging research in topological photonic systems promises new ways to control light flow without dissipation and the possibility of creating new functional photonic devices exploiting topology. Creating topological states in the microcavity exciton-polariton system would represent a topological photonic platform where interactions might further be used to control strongly-correlated topological states of matter.

We explore the possibility of creating topological states in exciton-polaritons by the use of non-Hermitian, or engineered 'complex' potentials. Specifically, I will describe our fabrication efforts using 'proton-enhanced interdiffusion' to spatially modulate independently the exciton and photon components of the polariton, creating landscapes not only of energy, but also polariton lifetime. We theoretically study the spontaneous emergence of time-reversal symmetry breaking and vortical flow in these complex potentials. Here, the handedness is controlled by the imaginary potential energy terms, and may be used as an element in larger 'topological complex lattices'.

Primary author: Dr FRASER, Michael (RIKEN CEMS / JST PRESTO)

Presenter: Dr FRASER, Michael (RIKEN CEMS / JST PRESTO)

Session Classification: Condensed Matter II

Track Classification: Condensed matter applications