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## Thouless pumping of photons

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Non-abelian gauge fields emerge naturally in the description of adiabatically evolving quantum systems. In this talk we show that they also play a role in Thouless pumping in the presence of degenerate bands. Specifically, we consider a photonic Lieb lattice and show that when the lattice parameters are slowly modulated, the propagation of the photons bear the fingerprints of the underlying non-abelian gauge structure. The non-dispersive character of the bands enables a high degree of control on photon propagation. Our work paves the way to the generation and detection of non-abelian gauge fields in photonic and optical lattices. The talk includes a review of abelian pumping in photonic and superconducting systems and perspectives on quantum applications of photonic pumps.

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