Contribution ID: **43** Type: **Poster**

Realising topological phases in the spin-1/2 quantum kicked rotor

Monday 2 September 2024 17:00 (2 hours)

The quantum kicked rotor (QKR) is an archetypal system in the study of quantum chaos, and can be realised by periodically delta-kicking a cloud of ultracold atoms. This system is mathematically equivalent to a tight-binding model - up to an exchange of position and momentum space - and therefore exhibits behaviour analogous to electrons evolving in a lattice. Early work focused on "dynamical localisation" in the QKR, a phenomenon equivalent to Anderson localisation, but in momentum space rather than position space. More recently, interest has arisen in realising a QKR with a spin-1/2 degree of freedom. With the appropriate form of kicking, this system supports topological phases, analogous to a topological insulator. We propose an experiment to realise this setup using ultracold atoms, allowing for the detection of these topological phases via their associated topological invariants.

References

Short bio (50 words) or link to website

https://smp.uq.edu.au/profile/9399/andrew-groszek

Relevant publications (optional)

Career stage

Postdoc

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