

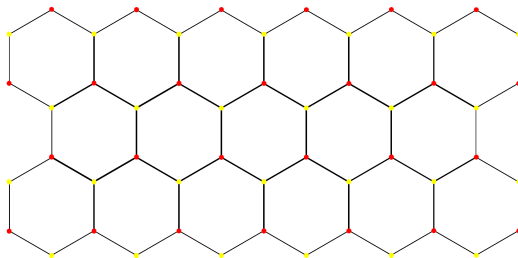
# Topological insulator with interactions

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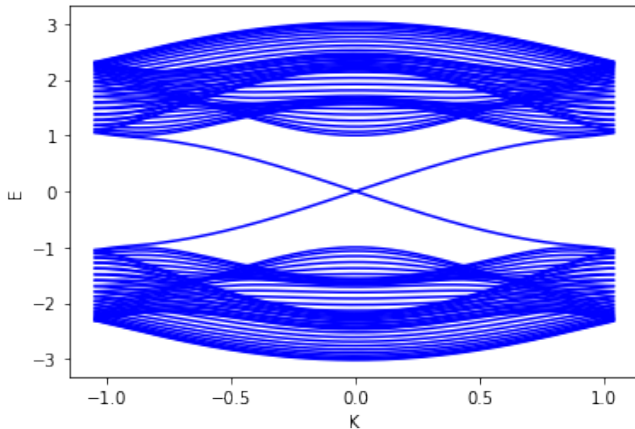
# Haldane model



**Figure:** The honeycomb lattice containing two inequivalent points for each unit cell, namely red and yellow.

- The Haldane model has both a topological and a trivial phase

# Edge states



**Figure:** There is a large gap between the upper conduction band and the lower valence band, but they are connected by edge states

# Introducing interactions and longer range hopping

- If the electrons repel each other strongly they position themselves on only red or only yellow sites
- If the interactions become strong enough the topological phase breaks down