

## Abstract

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### *Universal quantum Hamiltonians*

*Joint with Toby Cubitt and Stephen Piddock*

In this talk, I will discuss a particular notion of universality for quantum Hamiltonians. A family of quantum Hamiltonians is said to be “universal” if any other finite-dimensional Hamiltonian can be approximately encoded within the low-energy space of a Hamiltonian from that family. Universal quantum Hamiltonians can be used to construct universal analogue quantum simulators and universal quantum computers. Over the last few years, based on techniques from the field of quantum Hamiltonian complexity, many universal families of Hamiltonians have been found. I will summarise the results obtained in this classification programme, and the mathematical ingredients behind them.