

School of Mathematics & Statistics

Colloquium

## **Crystal flexibility and spectral synthesis**

**Stephen Power  
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2 April 2019

15:30

Room 306 Alan Turing

**Abstract:**

The stability of crystal lattices was considered by Max Born and coworkers in the 1940s by means of small vibration methods for which "it is not necessary to consider the complete elastic spectrum with its innumerable proper frequencies". The analysis of associated mechanical modes (a.k.a. zero modes, rigid unit modes) is an ongoing topic in both mathematics (infinitesimal and combinatorial rigidity) and condensed-matter science (surface modes, topological modes). I shall indicate new results and new methods from analysis and from commutative algebra. In particular we have obtained a characterisation of first-order rigidity for a crystal framework via spectral synthesis for invariant spaces of vector-valued functions on a discrete lattice (Kastis and Power, 2018).

Tea and coffee will be available in the common area from 15:00