FLEET
ARC CENTRE OF EXCELLENCE IN FUTURE LOW-ENERGY ELECTRONICS TECHNOLOGIES

Monash Centre for Atomically Thin Materials
INNOVATIVE MATERIALS | TRANSFORMATIVE TECHNOLOGY

IMAGING THE SURFACE STATES OF A STRONGLY CORRELATED TOPOLOGICAL INSULATOR

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ABSTRACT:

The prediction and subsequent discovery of topological band insulators with robust spin-polarized surface states has launched a new subfield of physics over the last decade. In the last few years it has been recognized that when topology is combined with strong electron-electron correlations, even more interesting and potentially useful states of matter can arise, such as new topological classifications, fractionalized states, and many-body localization that preserves the topology of the insulating state against thermal destruction.

Here I will give a general introduction to topological materials, and show the first direct proof of a strongly correlated topological insulator. Using scanning tunneling microscopy to probe real and momentum space structure, our measurements on the heavy fermion material SmB_6 reveal the evolution of the insulating gap arising from strong interactions, and a surface state with Dirac point close to the chemical potential. Our observations present the first opportunity to explore a strongly correlated topological state of matter.

ABOUT THE SPEAKER:

Professor Jenny Hoffman is interested in how electrons behave within exotic materials. Her research team at Harvard has designed and constructed three low-temperature scanning probe microscopes to visualize and manipulate this behavior directly. Materials of particular interest include high temperature superconductors, topological insulators, and strongly correlated vanadates, all of which present deep physics questions as well as potential for novel applications.

When: **THURSDAY 24th August, 2017**
Time: **2.00pm**
Where: **Level 1, Large Seminar Room 107, 10 College Walk, Clayton Campus**
Info: **education@fleet.org.au**

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