

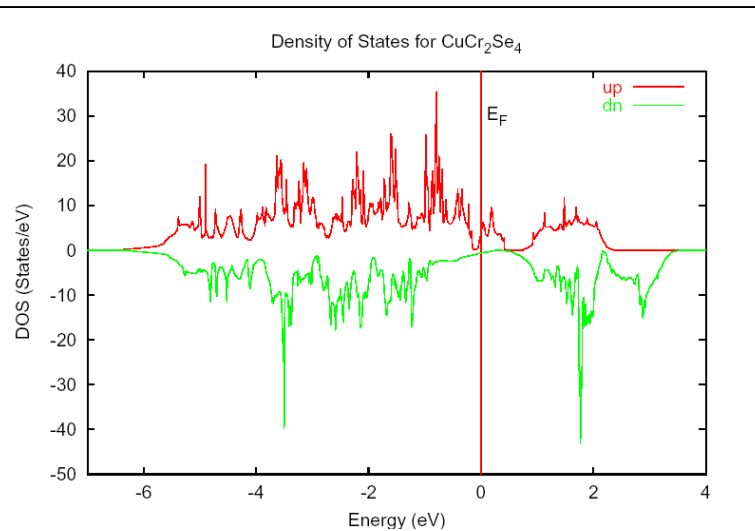
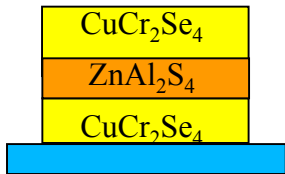
# NIRT: Nanomagnetism in Complex Magnetic Materials and Devices

W. Butler, Y. Idzerda, J. Moodera, A. Stacy and Y. Suzuki

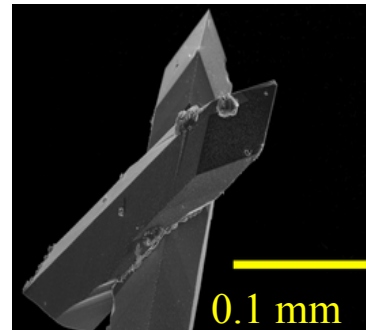
## $\text{CuCr}_2\text{Se}_4$

The development of novel spin polarized chalcogenide spinel structure materials for incorporation into nanoscale spin-based devices

- Complex chalcogenides have largely been ignored for spin based studies -> **NEW CLASS OF MATERIALS FOR SPIN APPLICATIONS**
- Large variation in properties from one member to another in spinels makes this class of materials important for nanodevices

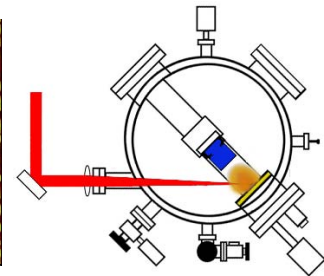
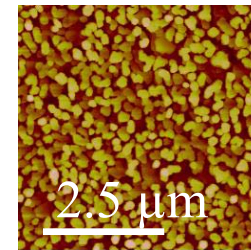


Density of states (DOS) for  $\text{CuCr}_2\text{Se}_4$  calculated in GGA-DFT has very low minority DOS at the Fermi energy.



Bulk single crystal of  $\text{CuCr}_2\text{Se}_4$  as well as bulk polycrystalline pellet synthesis for thin film deposition

Pulsed laser deposition synthesis of  $\text{CuCr}_2\text{Se}_4$  thin films



Spontaneous magnetization at room temperature in thin films

