Motivation:
- Spintronics show great potential for information technology including memory and logic.
- CrO₂ half metallicity is promising for applied in magnetoelectronic devices requiring large spin polarization, T_c ~ 395K.
- CrO₂ is produced in a narrow temperature band, 370-400 deg C, which needs high pressure to obtain the metastable CrO₂.
- Plasma and laser CVD provide the possibility of film deposition at lower temperature than thermal CVD.
- Low-P and Low-T synthesis methods are desirable for improving the quality of multilayer CrO₂ films.

Characterization:
- SEM
- AFM
- In-situ XPS
- XRD

Results:
- PECVD at 1 torr yields epitaxial Cr₂O₃ film on C-cut sapphire
- Temperature range for the epitaxial growth, 450 deg C > T > 250 deg C
- A growth rate decreasing with increasing temperatures suggest competing desorption reactions that are promising for epitaxial and selective area growth.
- LCVD experiments result in amorphous growth of Cr₂O₃ on TiO₂ (100)
- Epitaxial growth of Cr₂O₃ (110) film obtained by LPCVD on TiO₂(100)

Future and Current Studies:
- Deposition on TiO₂ (100) and (110) substrates
- Raise pressure without laser to find onset of CrO₂ growth
- Investigation of LCVD with CrO₂Cl₂
- Measure the magnetic properties
- Find the lowest pressure and temperature for CrO₂ film growth