

Research interests of Sawatzky

- Theoretical and experimental studies of possible new magnetic and electronic materials based on molecular beam epitaxy, surfaces and interfaces, polar surfaces, nanostructuring and substitution
- Applications in spin trionics MRAMS, hard disk drives, organic photovoltaics
- Ultra thin Epitaxial layers of EuO and N substituted EuO half metallic ferromagnet
- Ultra thin films of simple oxides such as SrO with N substitution of SrS with P substitution
- Ultra thin films of C60 and Oligomers of PPV, Thiophene---

Theoretical methods

- Density functional theory, LDA+U surface and interface electronic structure and point defects in simple oxides
- Exact diagonalization of model Hamiltonians
- Cluster dynamic mean field theory

Experimental methods

- Oxide Molecular beam epitaxy, strained layers , lattice constant control, orbital ordering control, substitution with N , Organic molecular MBE
- Electron energy loss , x ray absorption , magnetic x ray dichroism, XPS, ARPES to study electronic structure
- In situ physical properties measurement
- Resonant soft x ray scattering to study charge spin and orbital spatial density fluctuations