

Hempel
Spring 98

Physics 551, Syllabus

Basic concepts about solids and surfaces: Bonding, band theory, electrons, phonons, quasiparticles.

Measurement techniques: Common methods, including lab demos of scanning tunneling microscopy, photoelectron spectroscopy, X-ray diffraction.

Magnetism: Its quantum mechanical origin, phase transitions, magnetic data storage.

Semiconductors: Basic structures and devices, such as CMOS, LED's, lasers, solar cells.

Superconductors: Electron pairing, devices, high-temperature superconductors.

Low-dimensional physics: Quantum Hall effect, surfaces, nanostructures.