

Topics for the Proseminar of the ISP, Summer Semester 2014

Structure and Properties of Solids

Date	Topic	Speaker	Supervisor
1	Crystal structure, symmetry elements and fundamental lattices (Bravais)		
2	Interference of x-rays, Bragg-law, and Miller-Indices		
3	Real and reciprocal lattice (Ewald construction)		
4	Lattice constants by powder diffraction		
5	Size of nano-particles (Scherrer equation)		
6	Defects in crystalline solids		
7	Diffusion in solids		
8	Plasticity of crystals		
9	Phase transitions		
10	Thermal expansion of solids		
11	Pyroelectric and piezoelectric effect		
12	Ferromagnetism		
13	Ferroelectricity		
14	Microscopy with visible light and x-rays		
15	Tomography		
16	Methods of crystal growth		
17	Texture of polycrystals		
18	Recrystallization		
19	Nanomaterials		
20	Geometric optics: mirrors and lenses		
21	Interference and diffraction: understanding wave optics		
22	Holography — what is special about it?		
23	Electron optics: shaping electron beams		
24	Electron: the mystery of particle and wave made visible		