

PHYSICS 472 Solid-State Physics – Fall 2015

Instructor: Philip B. Allen **office:** B-146 **email:** philip.allen@stonybrook.edu

Office hours: I am very often in my office and always happy to talk. Official hours are Monday, 1:30-2:30 and Wednesday 3:30-4:30.

Web page: I will mostly use the PHY 472 Blackboard account. A secondary web page, <felix.physics.sunysb.edu/~allen/472-15/>, will be used for early announcements, but may not be updated as the course proceeds. Homework assignments will be posted on Blackboard.

The **course meets** Tu-Th 10:00 – 11:20 in room B-131, the Solid State Physics seminar room.

Bulletin Description: A study of the different types of solids, with emphasis on their thermal, electrical, and optical properties. It introduces the concepts of phonons and electronic bands, and applications to metals, semiconductors, superconductors, and magnetism.

3 credits; HW (50%), exams (50%)

Exams: *midterm* Thursday October 15 (in class)
final Friday December 11 (11:15 – 1:45)

Prerequisites: PHY 306 (Stat Mech) and 308 (Quantum I)

Text: S. H. Simon, The Oxford Solid State Basics, (Oxford 2013).
Solid State Physics is a large subject and continues to thrive. New discoveries and experimental tools open up new ways of thinking about and exploiting solids. The boundaries between solid state physics and chemistry, biology, and materials science, are very active. “Nanoscience” is the code name for much of this. Atomic physicists now make artificial solids on optical lattices. Ways of thinking about solids evolve, as new tools open previously inaccessible doors, and as mathematics and computers are applied in new ways. Discoveries such as new superconducting materials force us to admit that there is much still not understood. The text provides an excellent concise introduction.

