



Symmetry in Condensed Matter Physics Group and representation Theory Lectures 1 - 8

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Course Synopsis

This series of lectures is adapted from a graduate course I have given in Oxford for the past 8 years, and is aimed at providing a basic mathematical introduction to the theory of discrete groups and their representations, and to their practical use for a variety of research applications in condensed matter physics. The emphasis is on the representations of point groups and on the decomposition of physical tensors into irreducible representations. Although the material is quite generic to suit a variety of Oxford research topics from neutron and X-ray scattering to first-principle calculations, I will include some specific examples aimed at an audience with interests in non-linear optics. The course is complemented by extensive lecture notes and some problem sheets (optional for this audience).

Thursday, November 2nd 2017, 2:00 pm, SR IV

Lecture 1: Introduction to symmetry in CMP

Thursday, November 2nd 2017, 3:30 pm, SR IV

Lecture 2: Crystallographic point groups and group theory

Monday, November 13th 2017, 2:00 pm, SR IV

Lecture 3: Introduction to the theory of representations

Wednesday, November 16th 2017, 14:00 am, SR II, III

Lecture 4: Key theorems about irreducible representations

Monday, November 20th 2017, 11:00 am, SR II, III

Lecture 5: Applications of representations to physics problems

Wednesday, November 22nd 2017, 10:00 am, SR II, III

Lecture 6: Projectors, subduction and group product

Tuesday, December 5th 2017, 11:00 am, SR IV

Lecture 7: Tensors and tensor products of representations

Thursday, December 7th 2017, 11:30 am, SR IV

Lecture 8: “Physical” tensors

Host: Andrea Cavalleri

