Teaching Lecture: Nov 23rd or 24th
1 hour budgeted.

The Anatomy of a Dark Matter Experiment:
How the DEAP-3600 experiment will reach a world best sensitivity for Dark Matter.

Abstract:

Many experiments world-wide are searching for evidence of the elusive dark matter which to date has only been observed through astronomical observations of its gravitational interactions with the cosmos. Direct detection experiments hope to observe them directly by measuring the tiny energy imparted to recoiling nuclei in occasional dark matter interactions with normal matter. With event rates predicted to be as low as a few events per year for a tonne of material, the detectors must be very large, operate for many years, and be free of background events that would mimic the signal being looked for. In this lecture we will first understand the motivation for the search for Dark Matter. Then, using DEAP-3600 as an example, show the physics care that must be taken to understand and eliminate potential radioactive background sources, and to ensure that the signal can be distinguished from any residual activity.