

Particle dark matter

Postgraduate course

Vitaly Kudryavtsev
University of Sheffield

Syllabus

1. Non-baryonic dark matter candidates: summary of the evidence for non-baryonic dark matter, dark matter candidates.
2. Weakly Interacting Massive Particles (WIMPs) as dark matter candidates: WIMP 'miracle', standard model of particle physics and supersymmetry, methods for particle dark matter search, direct WIMP searches: kinematics of WIMP collisions, rates and energy spectra of WIMP-induced events.
3. Detection of WIMPs: techniques for direct WIMP detection, backgrounds to WIMP detection and ways to tackle them, example experiments.
4. Indirect detection of WIMPs: search for gamma-rays, antiprotons, positrons, neutrinos from different astrophysical sources.
5. Search for supersymmetry at the LHC and axion search