

Detectors and Detection Techniques for Dark Matter Search Experiments

Thursday 16 February 2017 10:00 (45 minutes)

From the astronomical observations involving terrestrial telescopes as well as space borne observatories, such as Hubble Space Telescope (HST) to WMAP and Planck, it is inferred that more than 83% of the gravitating matter in the Universe is Dark Matter (DM). Apart from only a few experimental endeavours, it has eluded direct or indirect detection in the terrestrial experiments involving possible interaction of the particle dark matter candidates with active mass of a detector under observation. This is primarily because the DM candidates do not interact with normal matter by any form of known interactions other than gravitational interaction. Direct detection of the DM candidates, conjectured as some kind of Weakly Interacting Massive Particles (WIMPs), with mass spanning in the range of a few GeVs to several TeVs, is one of the most challenging goals in contemporary physics, which involves multidisciplinary endeavours and involve development of new and challenging strategies in detectors, electronics, signal processing and data analysis. Current status of DM search results will be discussed in this talk, followed by review of laboratory based dark matter search experiments through observation of the signal trails left behind by the interaction of WIMPs with the nuclei of suitable detector materials.

Presentation type

Presenter: Prof. SAHA, Satyajit (Saha Institute of Nuclear Physics)