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Lecture 7: Dark Matter Detection-III

Tuesday 13 October 2015 11:45 (1h 15m)

The quest for the mysterious missing mass of the Universe has become one of the big challenges of today's particle physics and cosmology. Astronomical observations show that only 1% of the matter of the Universe is luminous. Moreover there is now convincing evidence that 85% of all gravitationally observable matter in the Universe is of a new exotic kind, different from the "ordinary" matter surrounding us. In a series of three lectures we discuss past, recent and future efforts made world- wide to detect and/or decipher the nature of Dark Matter.

In Lecture I we review our present knowledge of the Dark Matter content of the Universe and how experimenters search for it's candidates;

In Lecture II we discuss so-called "direct detection" techniques which allow to search for scattering of galactic dark matter particles with detectors in deep-underground laboratories; we discuss the interpretation of experimental results and the challenges posed by different backgrounds;

In Lecture III we take a look at the "indirect detection" of the annihilation of dark matter candidates in astrophysical objects, such as our sun or the center of the Milky Way; In addition we will have a look at efforts to produce Dark Matter particles directly at accelerators and we shall close with a look at alternative non-particle searches and future prospects.

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