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## Direct and In-Direct Detection

*Thursday 4 May 2023 12:00 (1 hour)*

This talk will cover two ways of searching for dark matter: direct and indirect detection. Direct detection uses sensitive particle detectors to search for dark matter colliding with nuclei or electrons in the lab, allowing us to measure or constrain its scattering cross section. In indirect detection, we search for astronomical signals—such as photons and cosmic rays—which could have been produced by dark matter decay or annihilation. I will briefly discuss evidence for dark matter, and the argument for the popular WIMP (Weakly Interacting Massive Particle) model of dark matter. I will then cover techniques used for indirect detection. We will discuss several observed excesses, unexplained astrophysical signals that could be caused by dark matter, and see how different observations and background modeling can challenge or constrain the dark matter interpretation of these signals. We will then cover the history of direct detection, and the basics of computing detection rates. We will end by looking at how different types of direct detection experiment are optimized to search for different models of dark matter, motivating a wide variety of different techniques and technologies.

**In-Person (Stirling Rm 501)**

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