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The many lives of Cold Dark Matter model

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Our current understanding of galaxy formation is based on the presence of an elusive matter component: the Cold Dark Matter (CDM). Such a component is extremely successful explaining and reproducing the large scale structure of the Universe. On the other hand many have claimed that CDM is incompatible with observations on galactic and sub-galactic scales. In my talk I will first summarize the numerical techniques used to study structure formation and then revisit the problems of CDM on small scales within the galaxy formation framework. I will show that current data do not disprove or challenge the CDM model, and that claims in this direction are based on a poor comparison between data and theoretical predictions. I will conclude presenting some future tests that might tell us if CDM is indeed the right model for the unseen matter component of our Universe.