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The assembly history and structure of cold dark matter halos

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I will discuss the relation between the accretion history and mass profile of cold dark matter (CDM) haloes, emphasizing how an appropriate definition of their formation times can be used to determine their characteristic radii. This result is based on the finding that the average mass accretion history, expressed in terms of the critical density of the Universe, resembles the enclosed density profile, at any redshift: both follow closely the Navarro, Frenk & White (NFW) profile. This suggests that the self-similarity of halo mass profiles results from the mass-independence of their accretion histories, an interpretation which is supported by outliers whose mass profiles differ substantially from the NFW form. Using these results I will present a simple algorithm that can be used to predict the mass and redshift dependence of dark matter halo concentrations for various cosmological models

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