

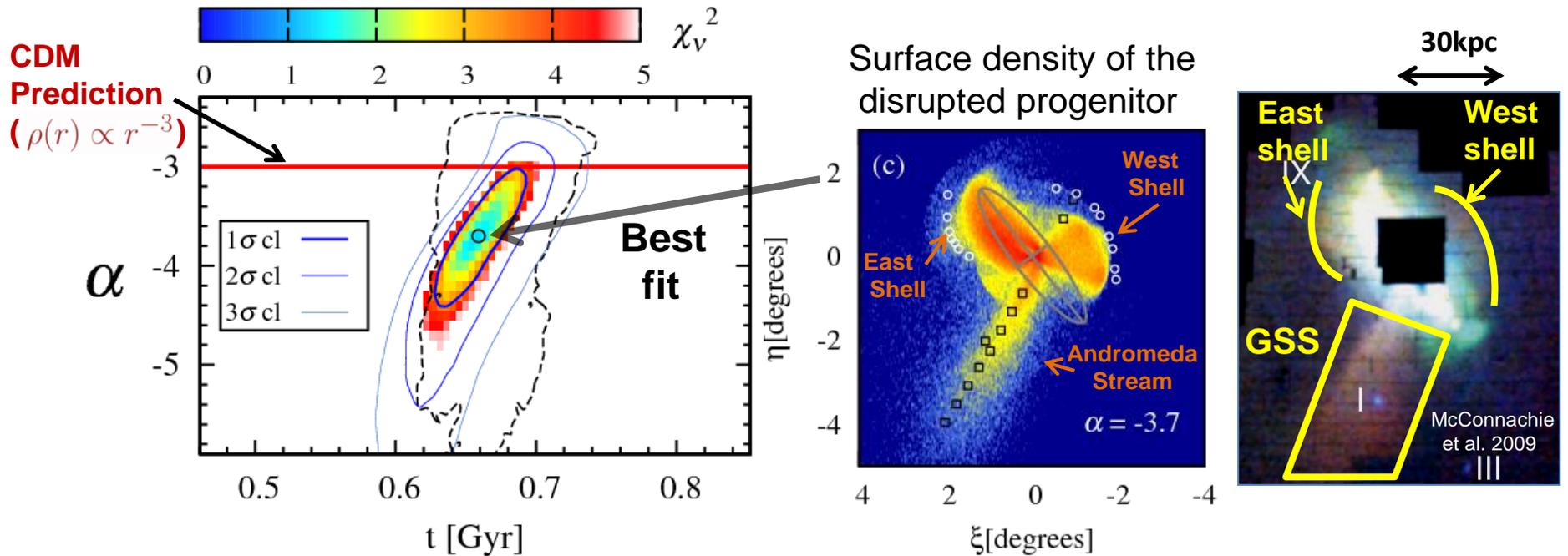
# Puzzling Outer Density Profile of the Dark Matter Halo in the Andromeda Galaxy

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Recent studies have predicted that **CDM halos have a universal mass-density profile** with the outer profile of  $\rho(r) \propto r^{-3}$ .

To examine this prediction, we simulate a galaxy collision in M31 with the DM halo profile of

$$\rho_{\text{DMhalo}}(r) = \rho_{s,\alpha} x^{-1} (1+x)^\alpha + 1, \quad x = r/r_{s,\alpha}.$$



Outer density profile of the DM halo of M31 is **steeper than that of the CDM prediction**