The Dependence of Subhalo Abundance on Halo Concentration

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We propose a model to quantitatively describe the dependence of subhalo abundance on the host halo concentration, and calibrate our model with cosmological simulations and a new suite of zoom-in simulations of Milky Way-mass halos.

The scatter in the subhalo abundance functions of a sample of halos has two components: (1) Poissonian intrinsic scatter of a single halo and (2) halo-to-halo scatter, which depends on halo concentration and affects mostly the normalization of the abundance function.

One should take the concentration of the Milky Way halo into account when investigating the tension between the population of subhalos and that of the observed Milky Way satellite galaxies.
CoSANG
Coupling Semi-Analytic Models and N-Body Simulations: A New Way of Making Galaxies and Stellar Halos

- The N-body simulation determines how the dark matter behaves and the semi-analytic model determines the behavior of the baryonic matter.
- The simulation is a closed loop system where the dark matter influences the baryonic matter and vice versa throughout the evolution of the simulation.
- An analytic potential for the galaxies from the semi-analytic model is added to the dark matter particles.
- Will include a “painting” scheme to tag dark matter particles with stellar properties.
- **Main Goal:** Create 25 high resolution models of Milky Way mass galaxies containing stellar halos with a dark matter particle resolution of $10^4 M_{\text{solar}}$. 
RAM PRESSURE AND YOU*

Are you losing mass tides can’t explain?

Feel like you’ve changed orbits?

You might be suffering from ram pressure stripping.

Learn the symptoms**. Learn how to spot it in your friends.

*If you’re a dwarf galaxy.
**Symptoms may also include increased star formation, decreased star formation, delayed metallicity evolution, morphology changes, and reaccretion.
Analytic models in static halos indicate first infall scenarios

Illustris simulation (Vogelsberger et al. 2014)

Studying massive satellites in cosmological simulations allows us to constrain:
(1) satellite infall time
(2) MW/M31 host properties
Satellite galaxy planes around the MW and M31
Marcel S. Pawlowski, CWRU

- are highly significant (considering survey footprints)
- co-rotate
- are a robust test of cosmology (not strongly affected by baryons)

The phase-space distribution of dwarf galaxies in the Local Group: observed situation vs. cosmological simulations

- are extremely rare in $\Lambda$CDM simulations
- claims of consistency with $\Lambda$CDM often based on statistically flawed analyses

→ Might be $\Lambda$CDM’s most severe small-scale problem
Stream-Subhalo Interactions in a Live Potential
Emily Sandford, Andreas Küpper, Ana Bonaca, Kathryn Johnston
The Waning Dead: Modeling Local Group Supernova Remnants

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Good Fit: "Dark" values

\begin{itemize}
  \item SN Rate = 3 \times 10^{-3} SN yr^{-1}
  \item Ia/CC = 0.7
  \item \( z_0 = 100 \text{ pc} \)
  \item \( \epsilon_B = 2.0 \times 10^{-4} \)
  \item \( \epsilon_E = 0.01 \)
\end{itemize}

Bad Fit: "Light" values

\begin{itemize}
  \item SN Rate = 1.5 \times 10^{-3} SN yr^{-1}
  \item Ia/CC = 0.5
  \item \( z_0 = 100 \text{ pc} \)
  \item \( \epsilon_B = 2.0 \times 10^{-4} \)
  \item \( \epsilon_E = 0.005 \)
\end{itemize}
A Kinematic Study of the Sagittarius Stream using the Michigan/Magellan Fiber System
Meghin Spencer
We have looked for the possible association of known CEMP-no stars and CEMP stars ([Fe/H]<-2.5) with currently recognized UFDs such as CVn I, and use these CEMP stars within close proximity on the sky to identify additional candidate UFDs.