

Research Project Proposal: Galaxy-Halo Connection

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Chosen Research Project Topic: Galaxy-Halo Connection (Project 6)

We have learned about the dark matter webs that connect galaxies, and I am amazed and excited to learn more about them. In particular, I am interested in how the galaxy's angular momentum and its associated dark matter halo interact, both before and after mergers. How does the "dark web" change over time, and will it change the way we look at mergers?

Specific Research Questions

- How does the dark matter web influence the evolution of the MW-M31-M33 halos before and after their merger?
- Does the dark matter filamentary structure remain intact or get disrupted during the merger process?
- How does the angular momentum of the dark matter web compare to that of the stellar and gaseous components?
- What fraction of dark matter particles remain bound to each individual galaxy vs. being redistributed into the larger halo structure?
- Is there evidence that the dark matter web affects the kinematics of the merging galaxies?

- Does the final dark matter halo of the MW-M31 merger remain triaxial, or does it become more spherical due to interactions?