HOW MERGERS AFFECT DARK MATTER HALOS

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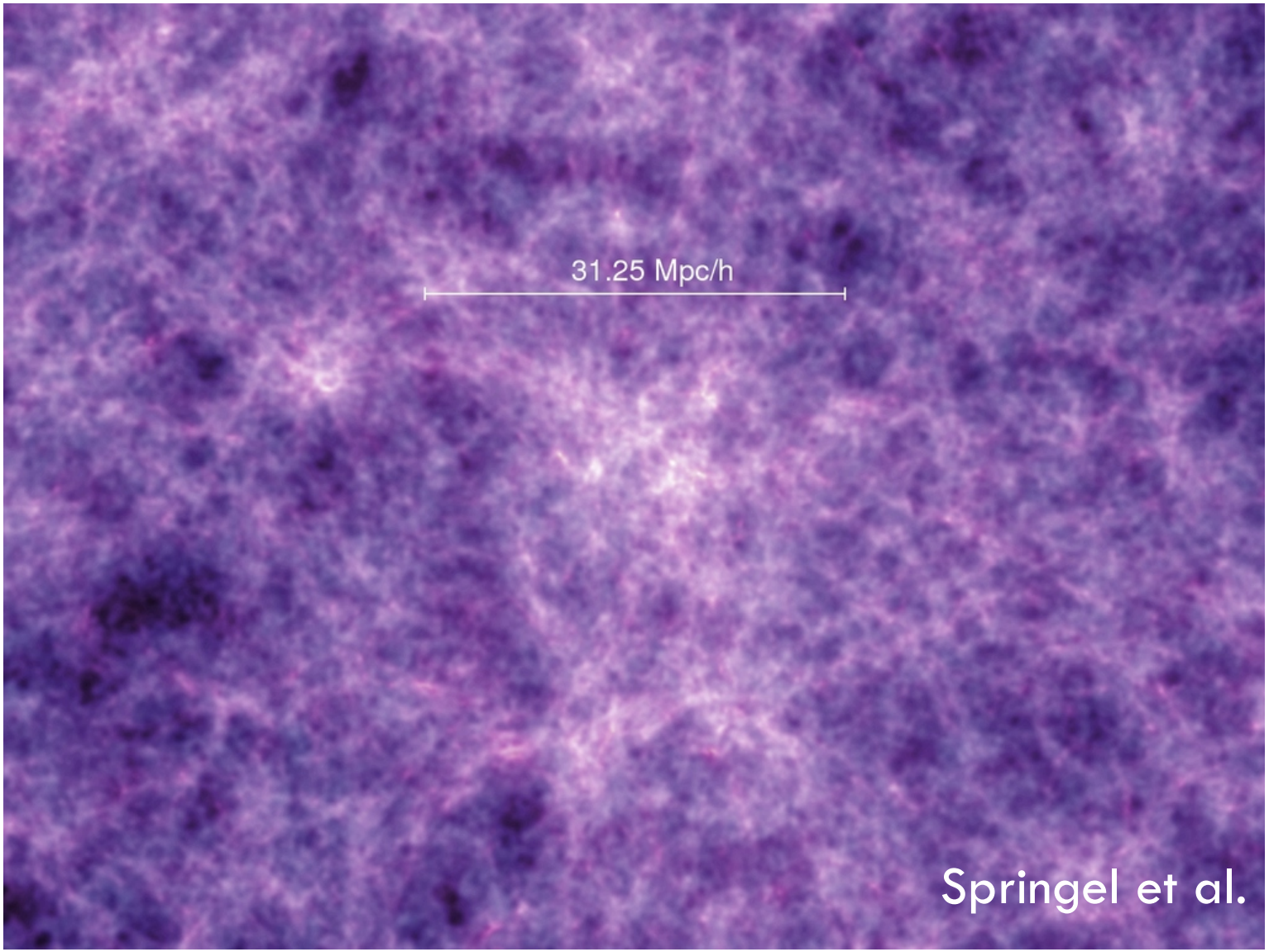
Outline

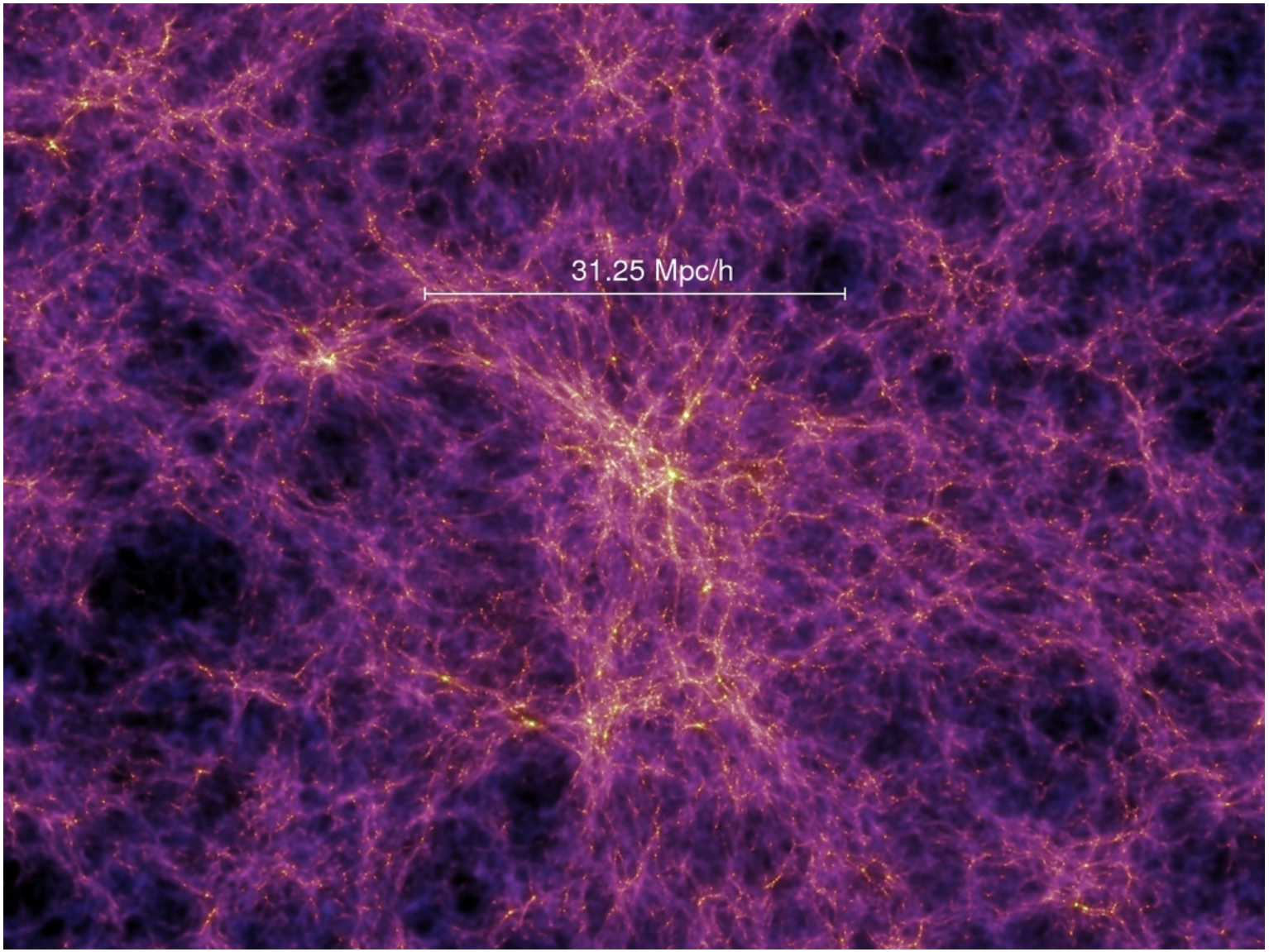
1. Structure formation
2. Merger simulations: Ejection of particles
3. Properties of merger remnants

Formation of structures



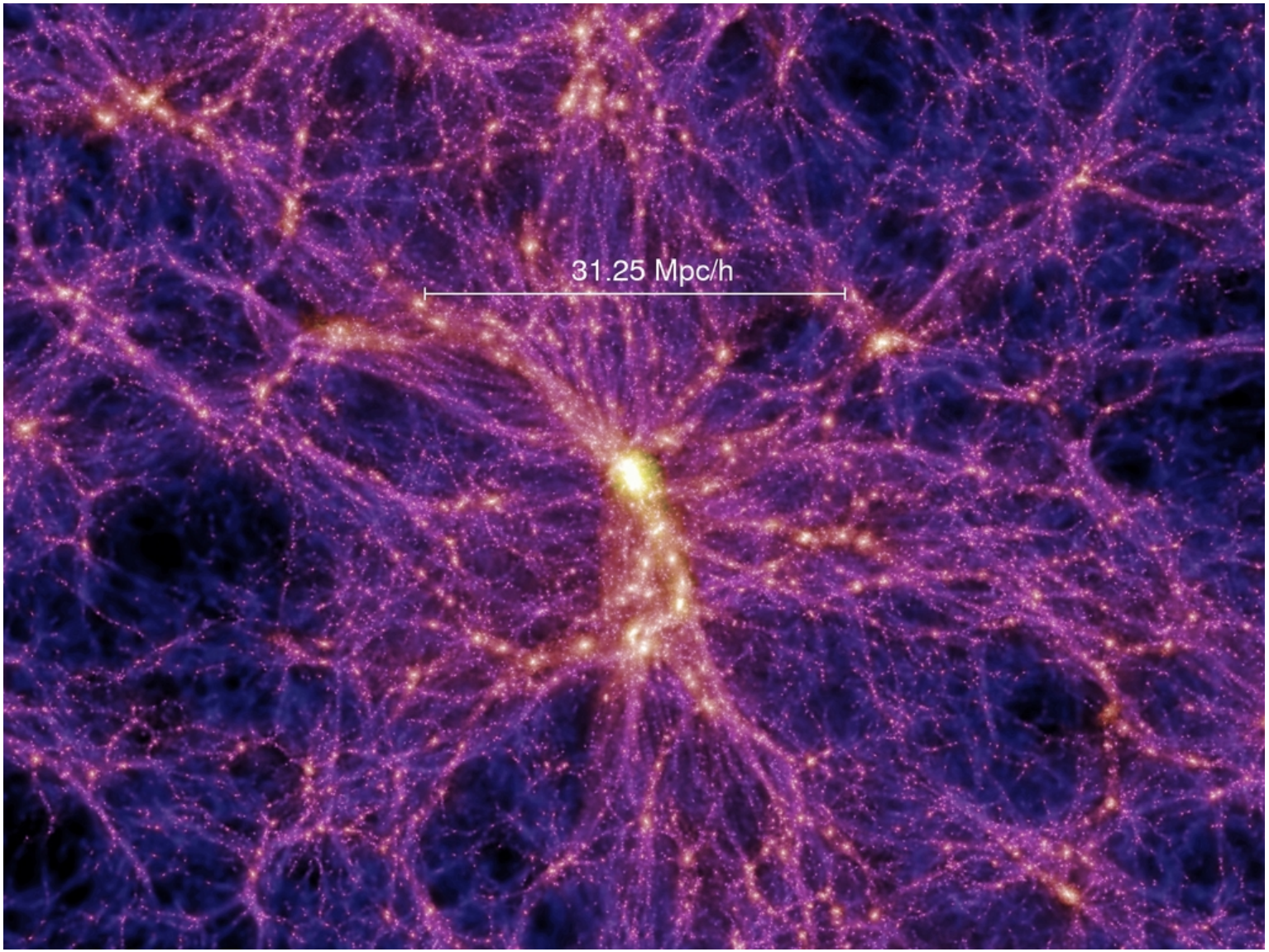
Redshift
18.3

Formation of structures



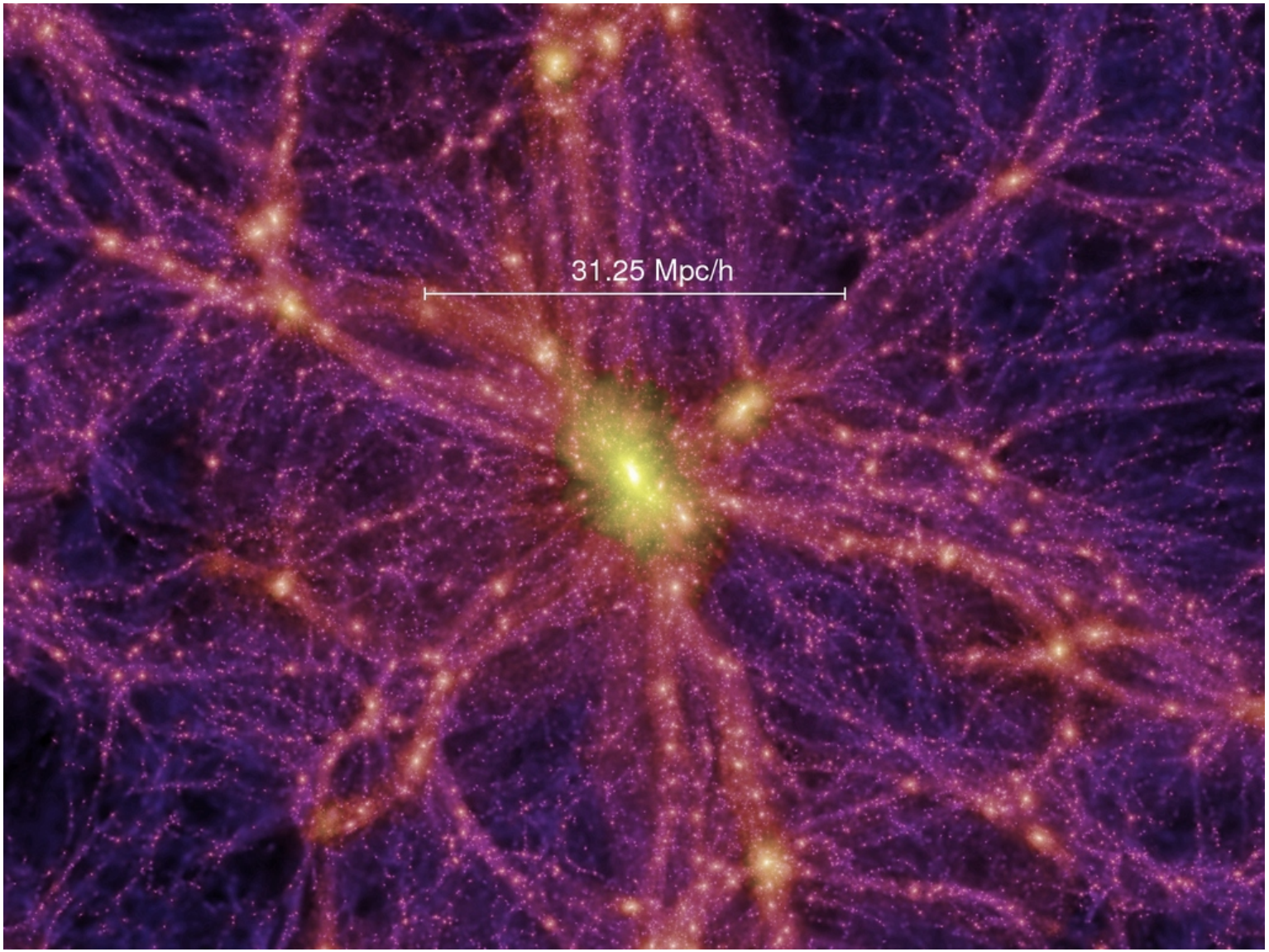
Redshift 5.7

Formation of structures



Redshift
1.4

Formation of structures

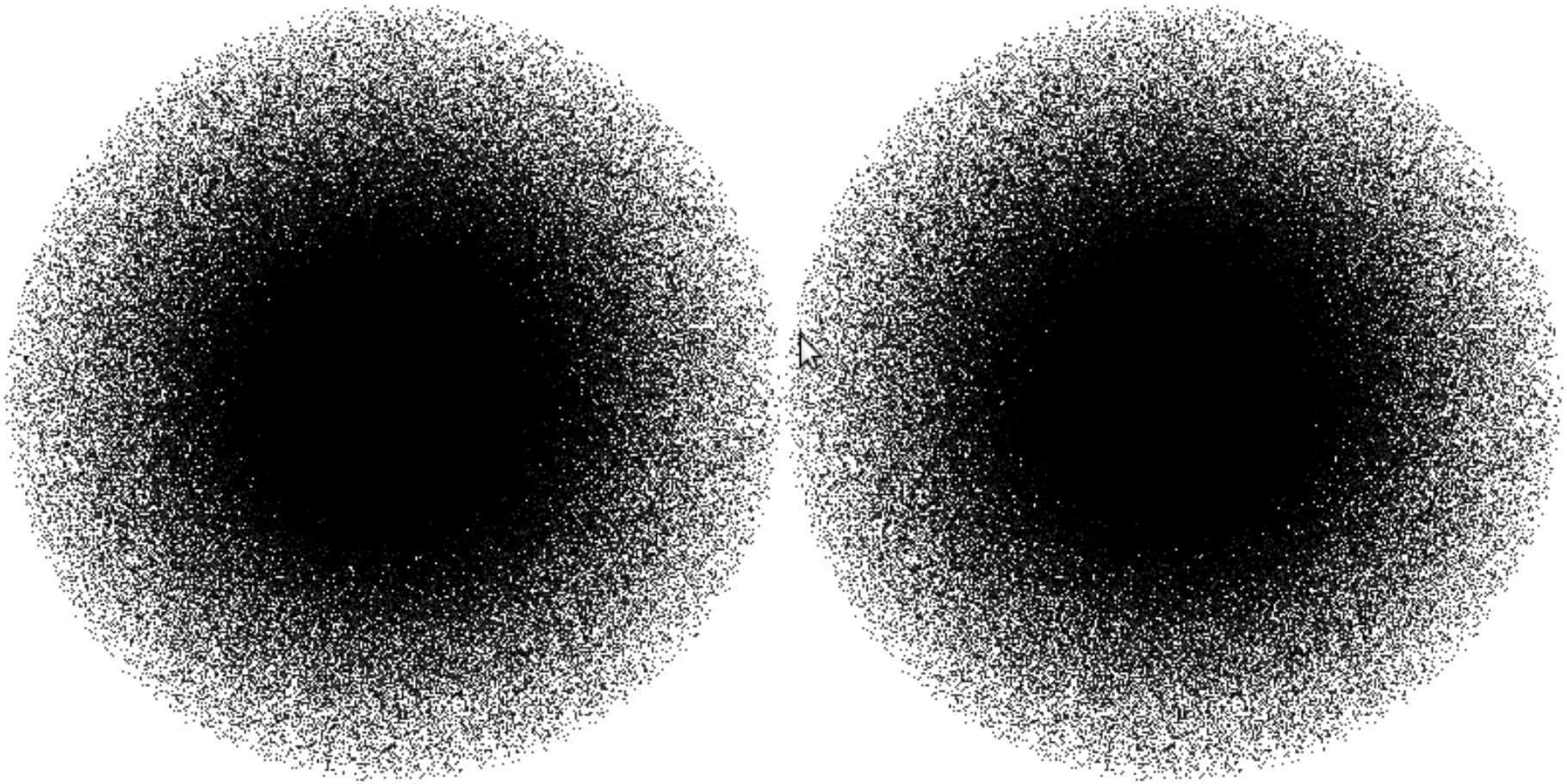


Redshift
0

Processes in halo formation

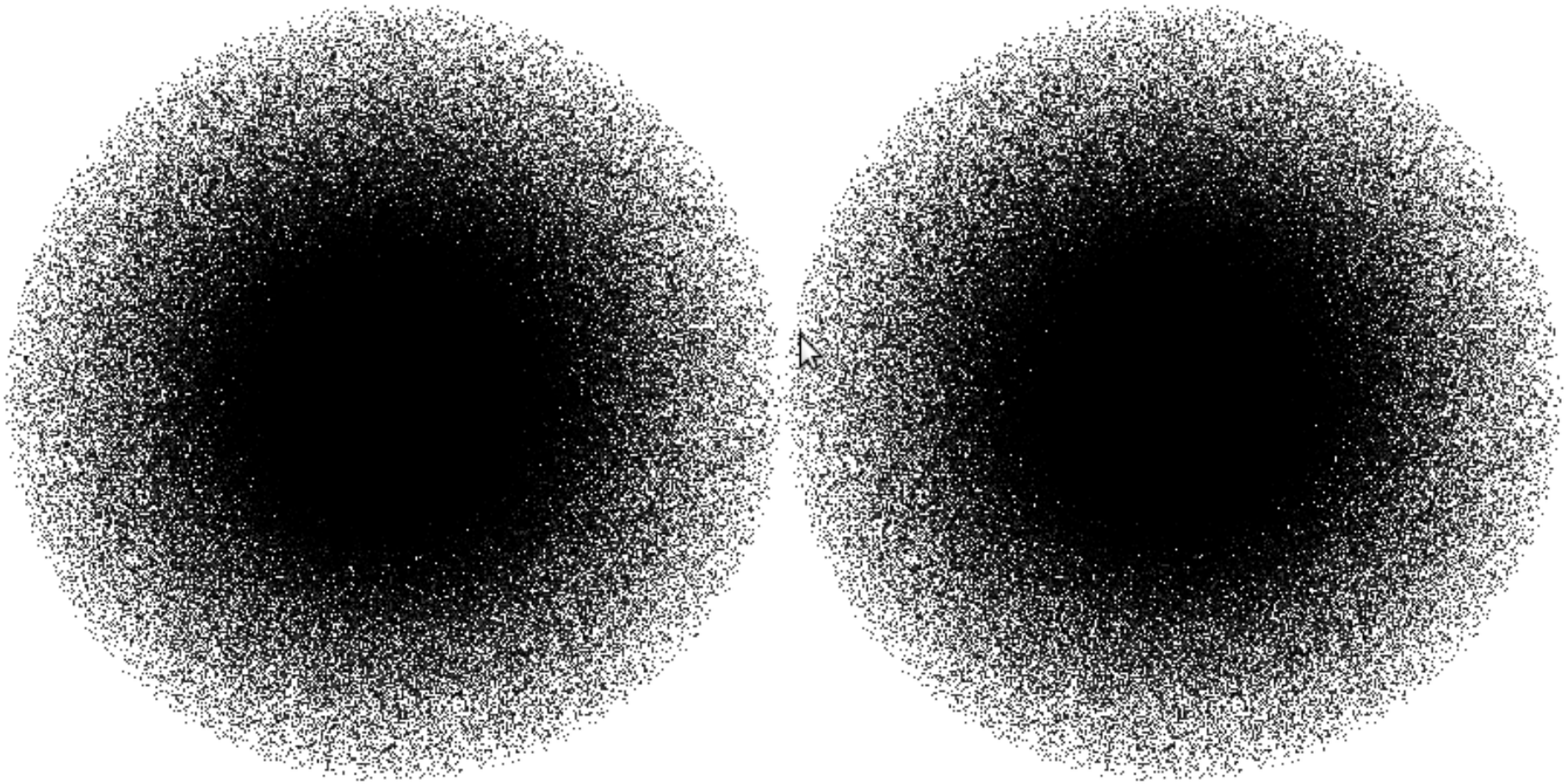
- Accretion of matter
- Mergers

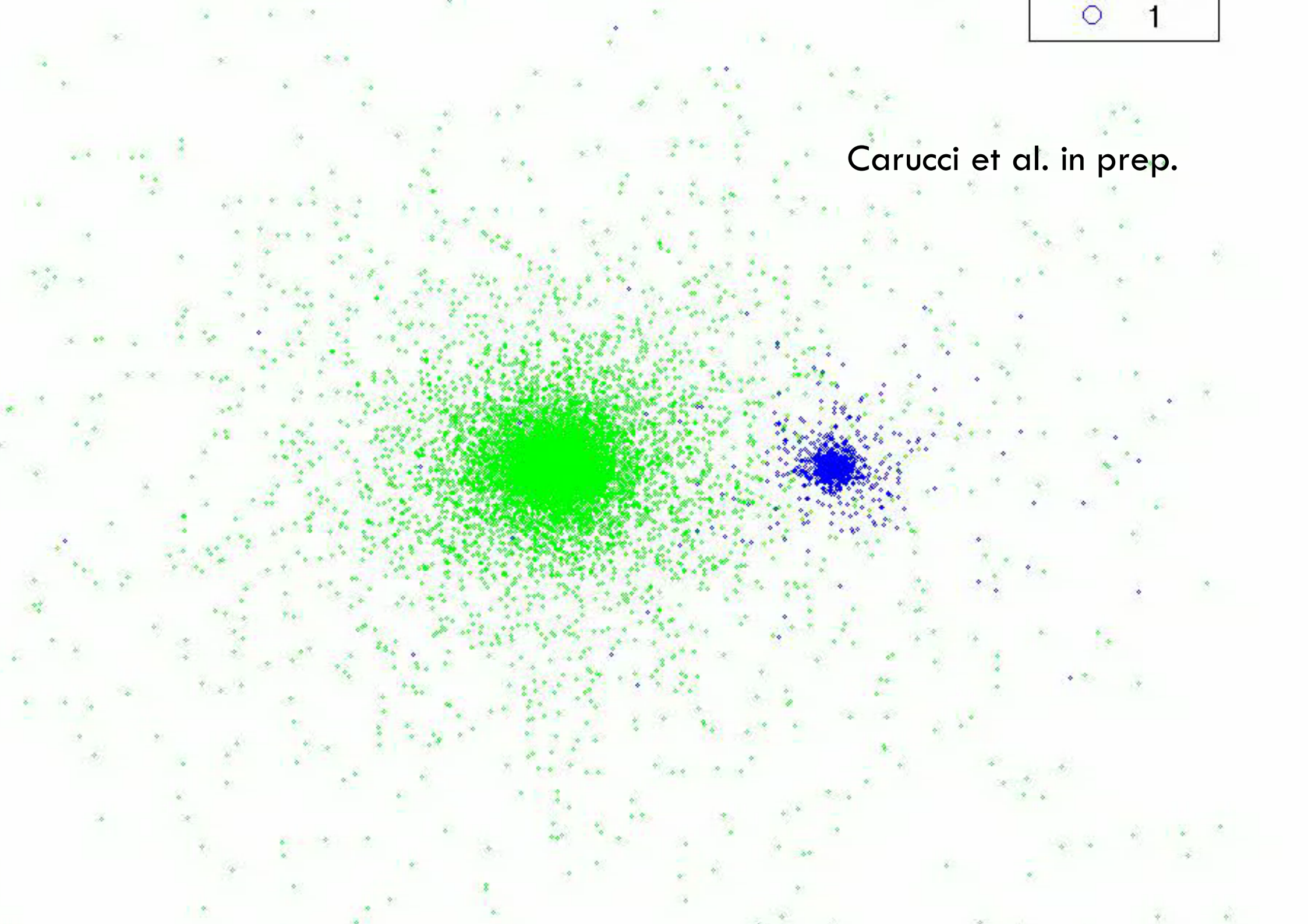
N-body simulations of mergers



N-body simulations of mergers

Collaborators: Steen H. Hansen, Isabella Carucci, Morten Medici, Mikkel Stockmann, Diana Juncher, Anders Ossowicki





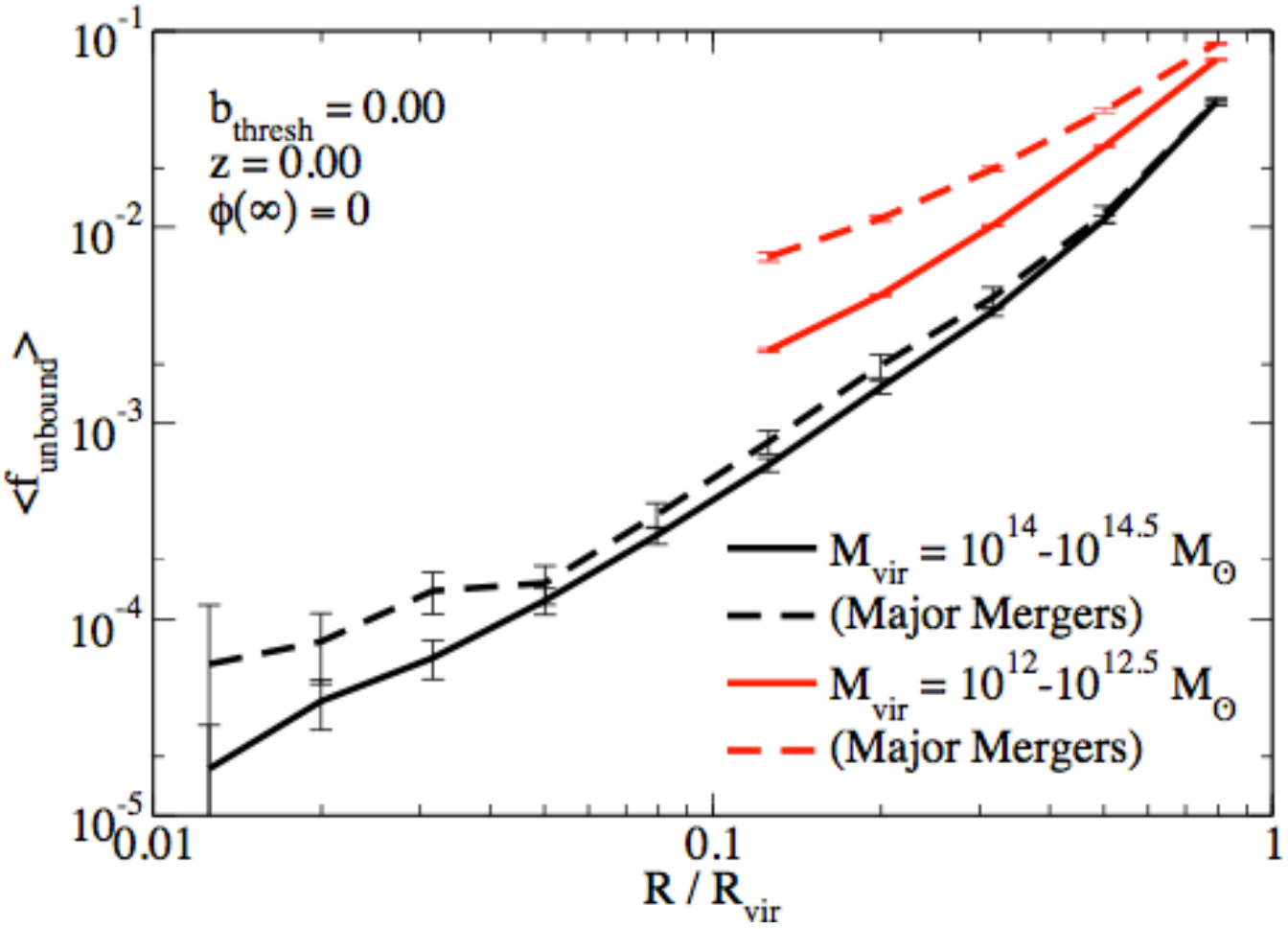
Carucci et al. in prep.

- Some particles are ejected.
- Others are captured in the big halo.

Which particles are ejected?

Why are they ejected?

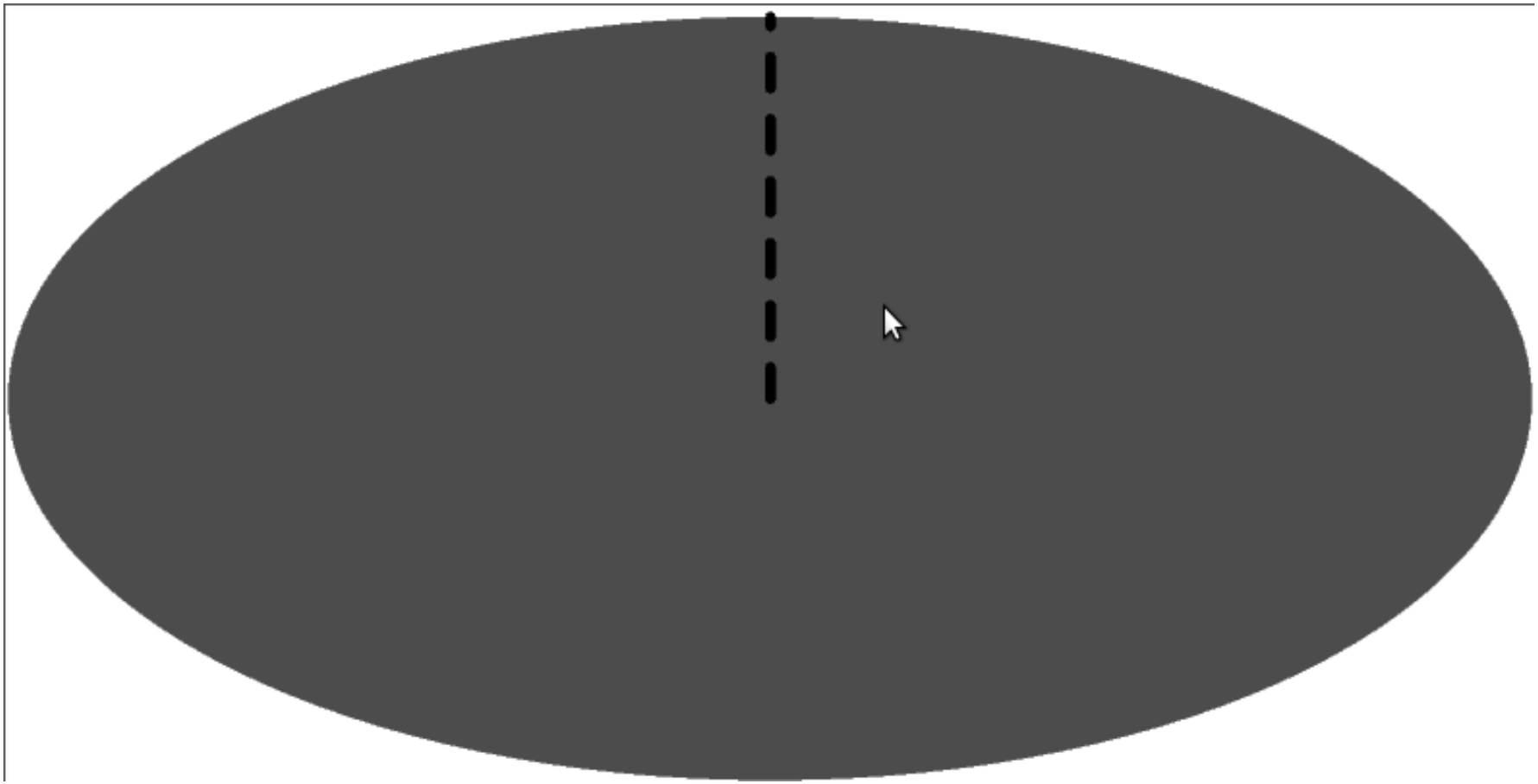
Unbound Particles in Dark Matter Halos



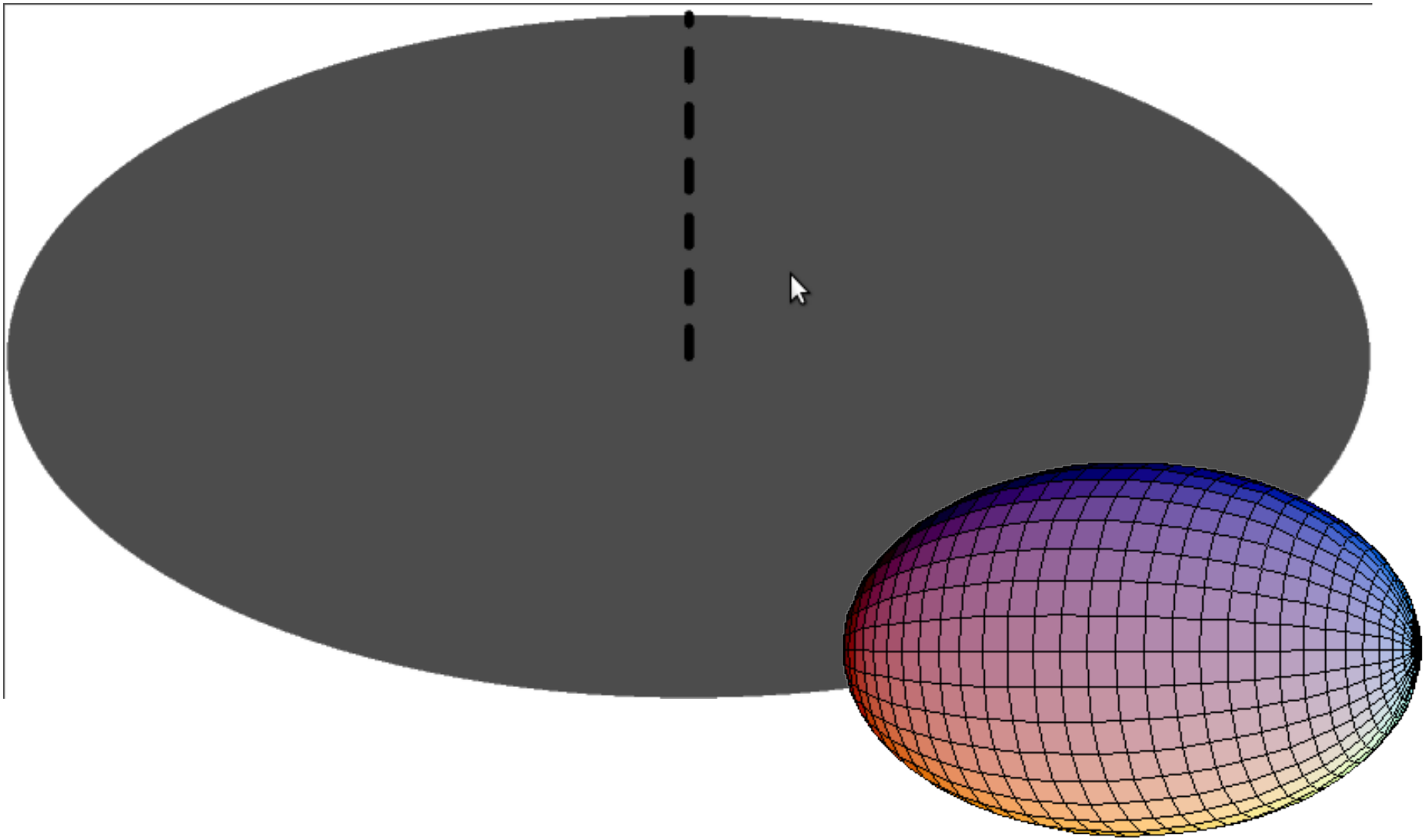
Behroozi, Loeb and Wechsler 2012, arXiv:1208.0334

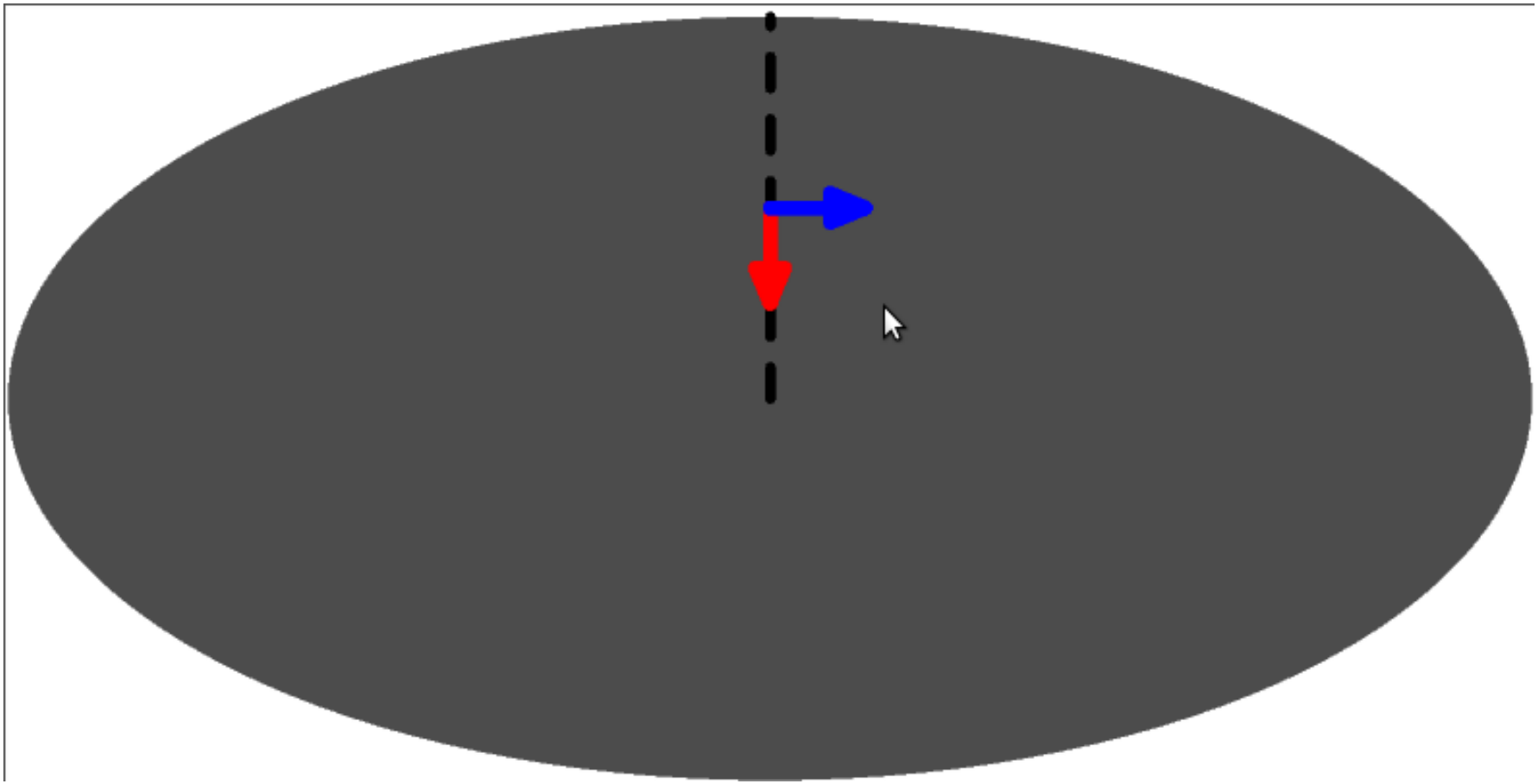
Merger remnants

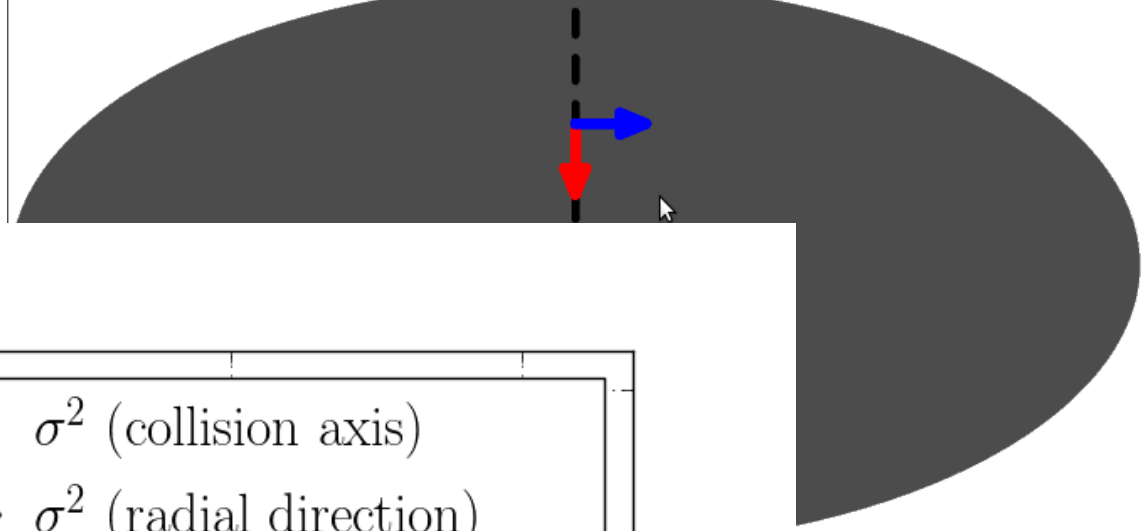
How are the bound particles affected by a merger?

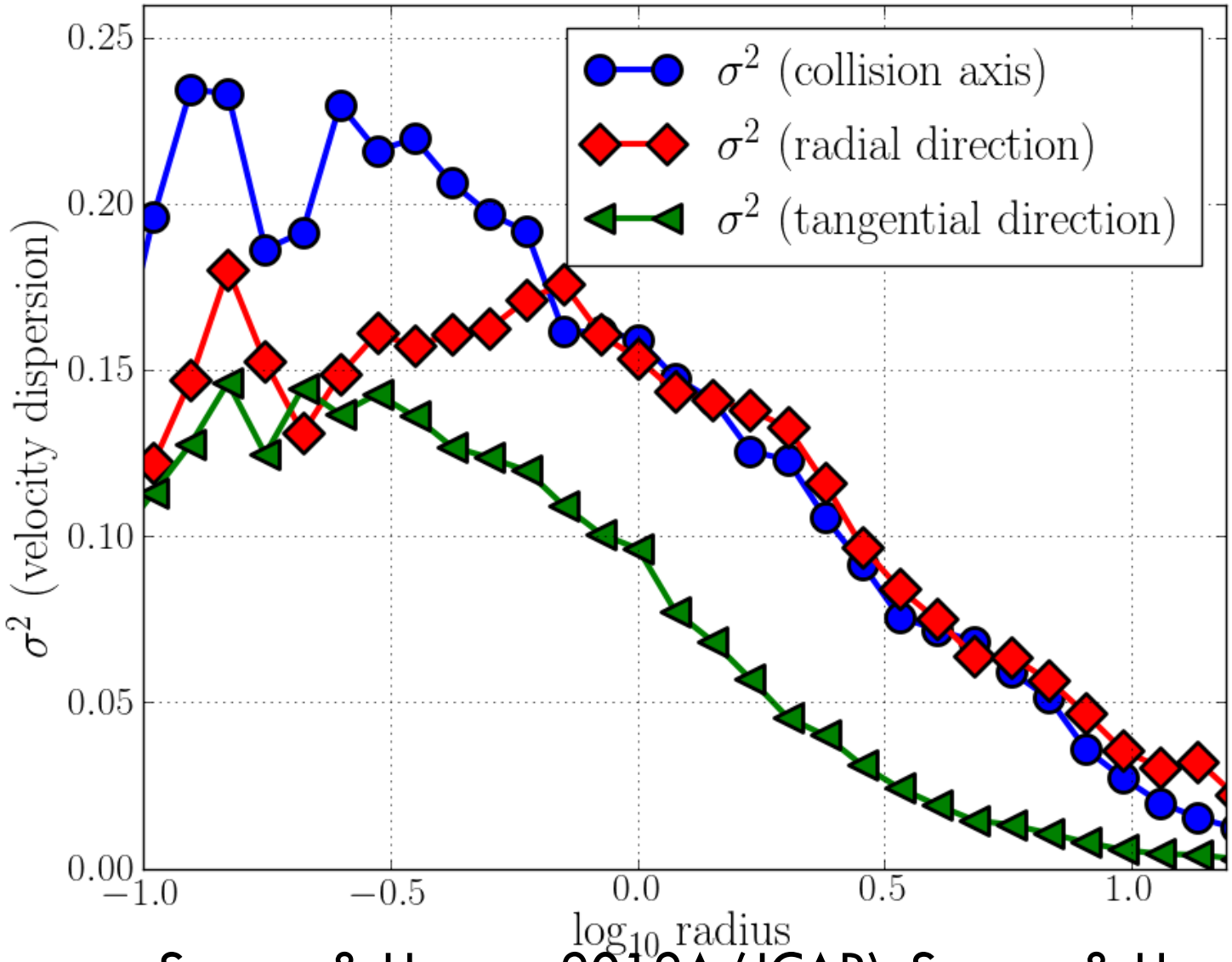


How are the bound particles affected by a merger?



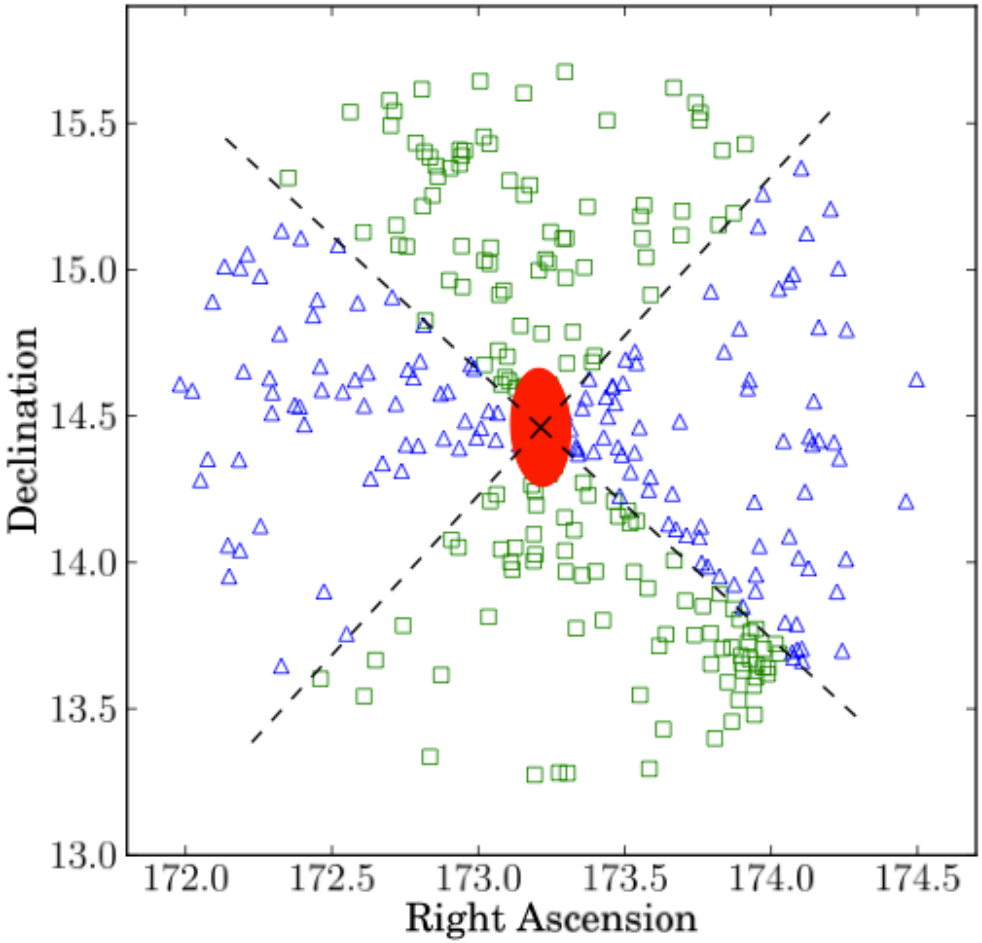






Sparre & Hansen 2012A (JCAP), Sparre & Hansen 2012B (JCAP)

Galaxies in galaxy clusters



Stacked sample of 1743 galaxy clusters from SDSS

Andreas Skielboe et al. 2012, ApJ Letters

Halos in cosmological simulations

- The same trends that we have found in idealised merger simulations have been found in cosmological simulations (Wojtak et al. in prep.)

Conclusion

- The velocity distribution is affected by the merger history (Sparre & Hansen 2012).