

No strain for Andromeda: Galaxy is cosmic cannibal

Nature 461, 66-69 (3 September 2009)

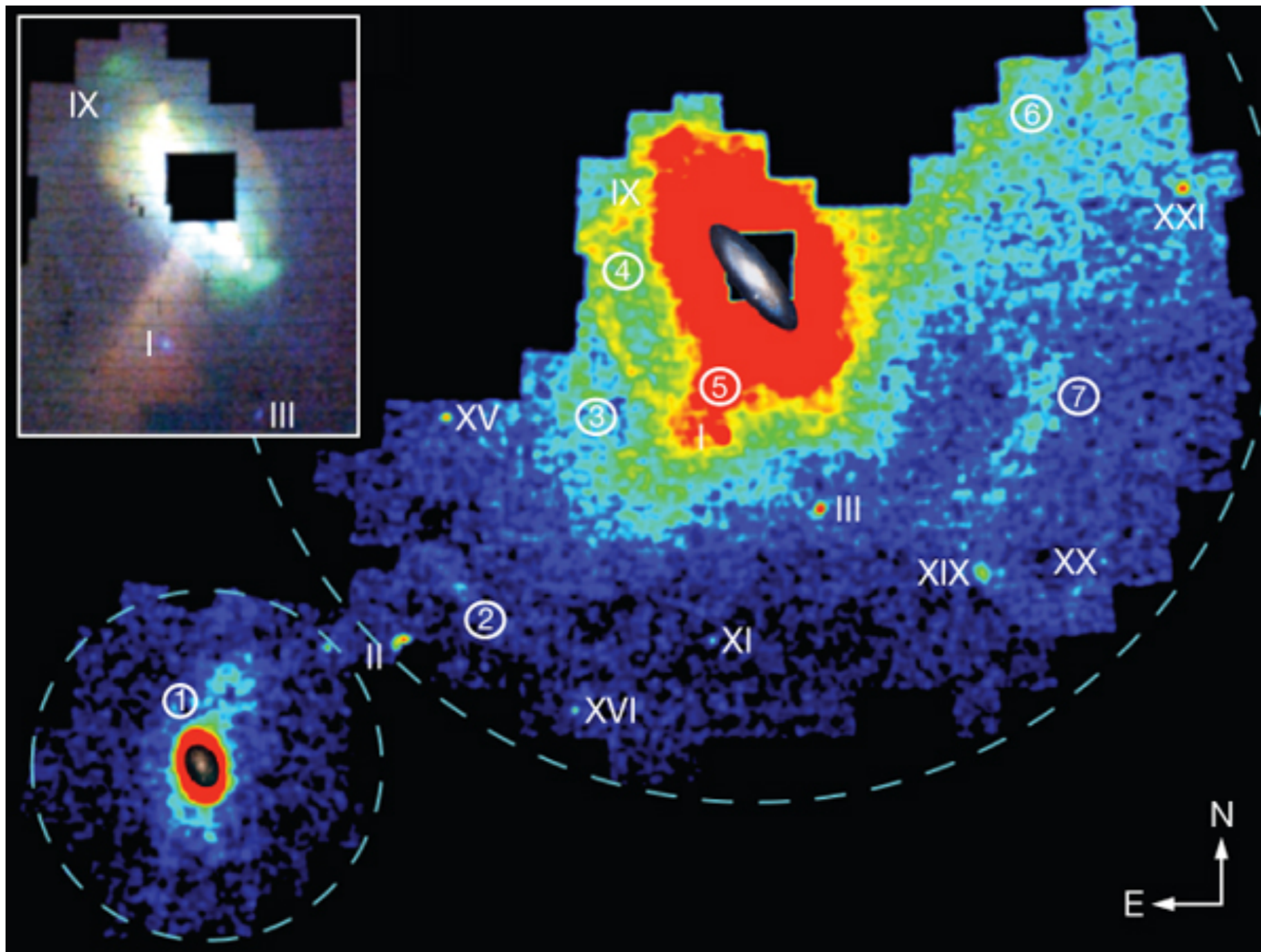
Alan W. McConnachie, Michael J. Irwin, Rodrigo A. Ibata,
John Dubinski, Lawrence M. Widrow, et al.

Ting-Ni Lu
Institute of Astronomy, NTHU
AstroNews
2009.10.01

PAndAS

- Hierarchical formation - small structures form first and merge to form larger systems.
- Pan-Andromeda Archaeological Survey
PAndAS, using CFHT MegaCam to perform deep and extended survey of M31.
- Andromeda Galaxy (M31) in process of digesting its nearest neighbours (Triangulum Galaxy, M33, and other dwarf galaxies).

M31 & M33

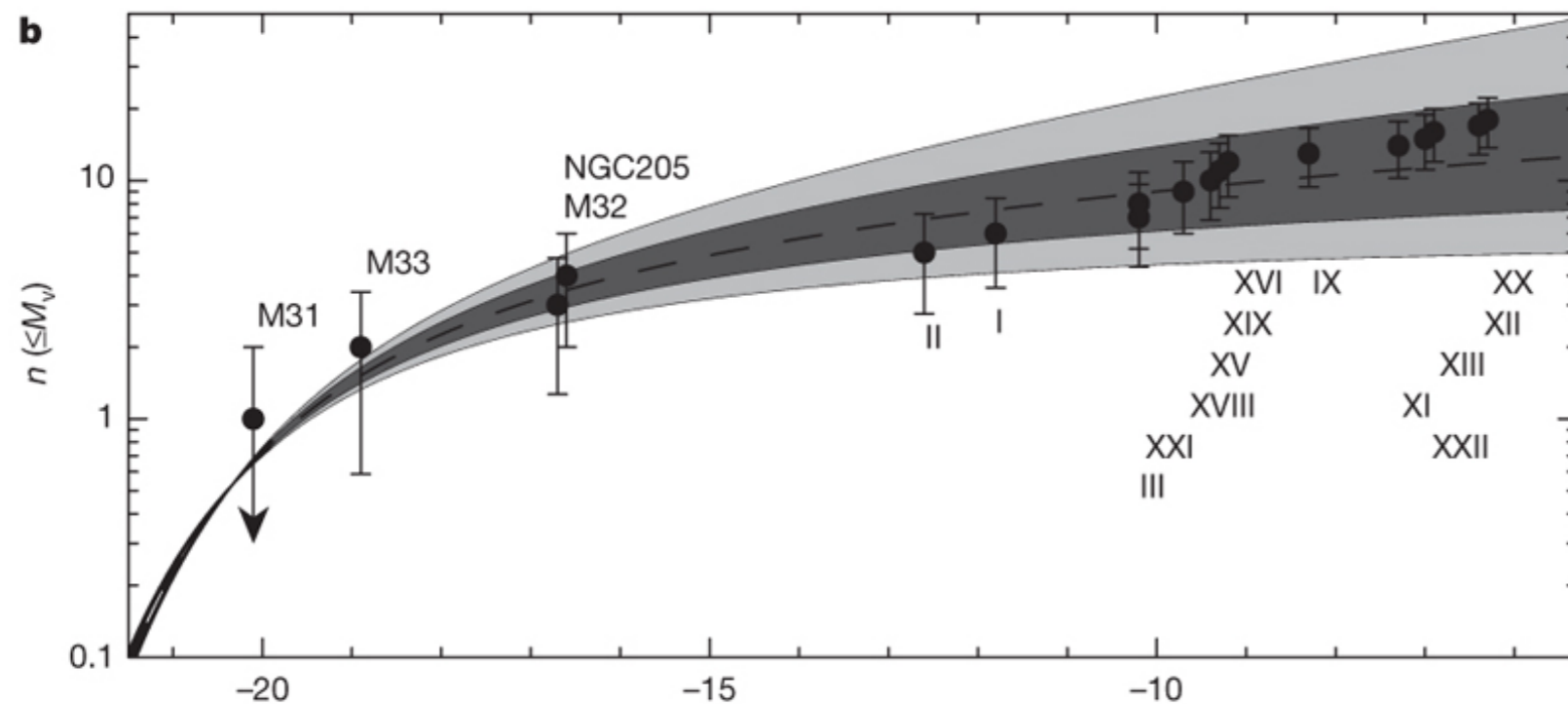
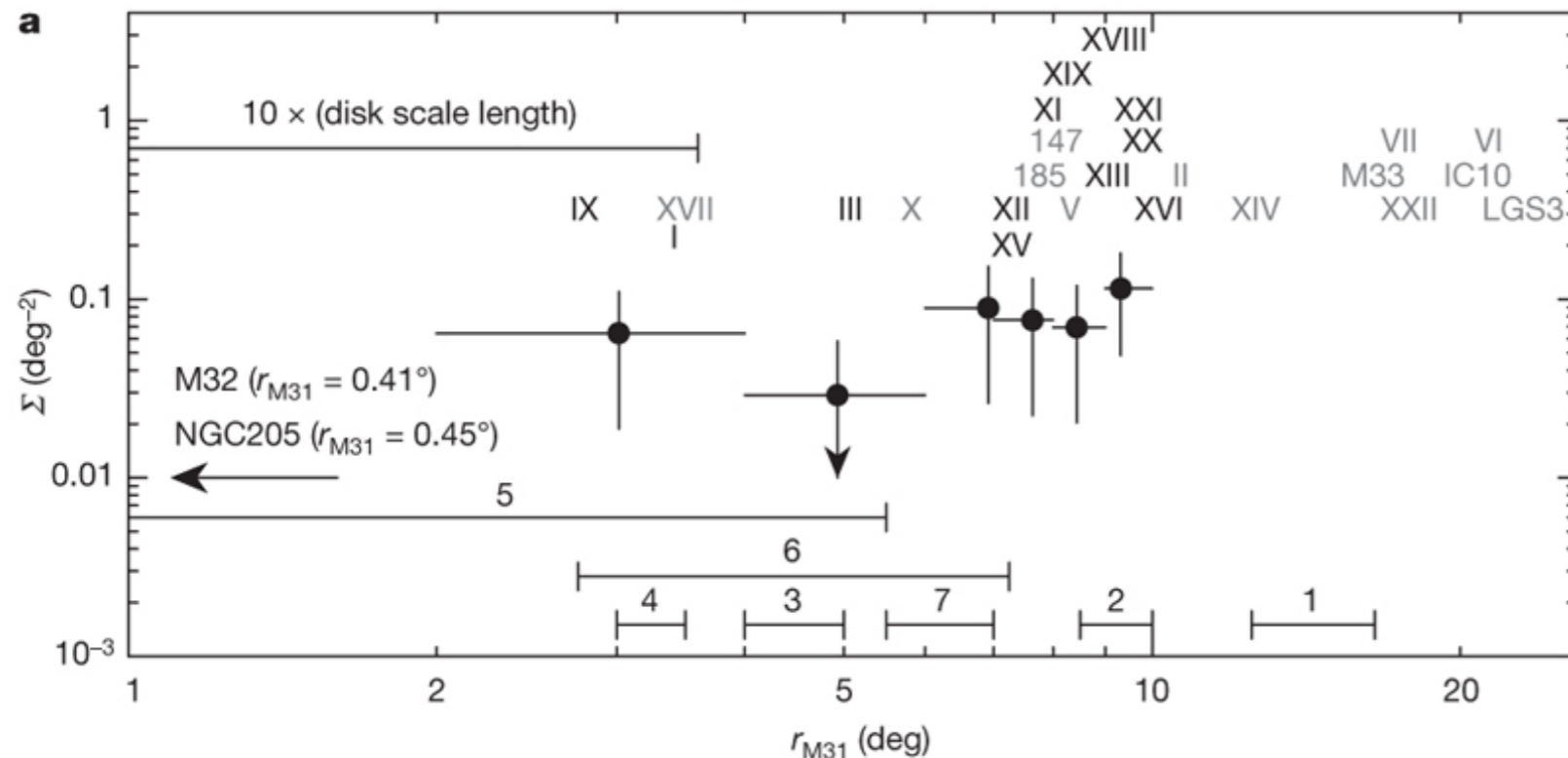


- Spatial density distribution of RGB (older and much fainter population).
- Roman number: dwarf galaxies; numbers in circles: substructures.
- Stars have been accreted from dwarf galaxies, not possibly formed in situ.
- Multiple, large, coherent substructures provide evidences of hierarchical galaxy formation model.

M31 & M33

- M33: the brightest of M31's satellite companions
- M33 is surrounded by a previously unknown extended stellar structure, with similar orientation to the HI warp: the optical counterpart of HI warp.
- Evidence of a tidal disturbance excited as M33 orbits around M31.

Distribution of M31 dwarf galaxies

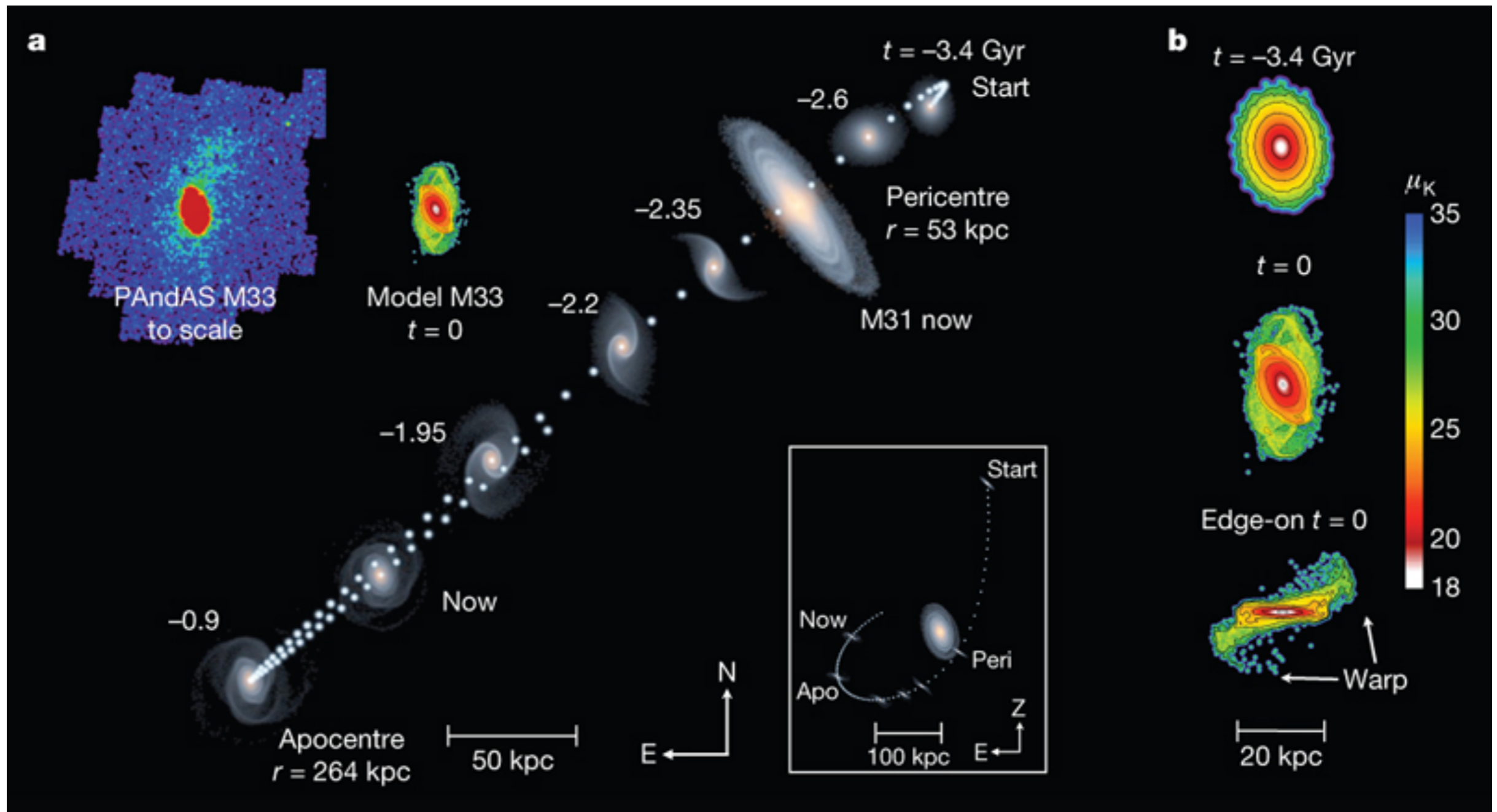


- Top panel: (projected) radial distribution of M31 satellites shows no sign of declining within 150kpc.
- Bottom panel: luminosity function of the M31 satellite system implies 6 ± 4 satellites to $M_v = -6$ remain to be discovered out to $r = 150$ kpc (88 ± 20 out to $r \sim r_{\text{vir}} = 300$ kpc)

News

- Massive coherent substructures surrounding M31 out to very large radius.
- M33 is being tidally disturbed by M31. Optical counterpart to HI warp discovered.
- Preliminary models can reproduce gross observable stellar structures, distances, radial velocities, M33 proper motion and HI warp.

M31-M33 Interaction



- Evolution of M33 about M31 and expected K-band surface brightness of M33.

Movie Time



Thank you!!