

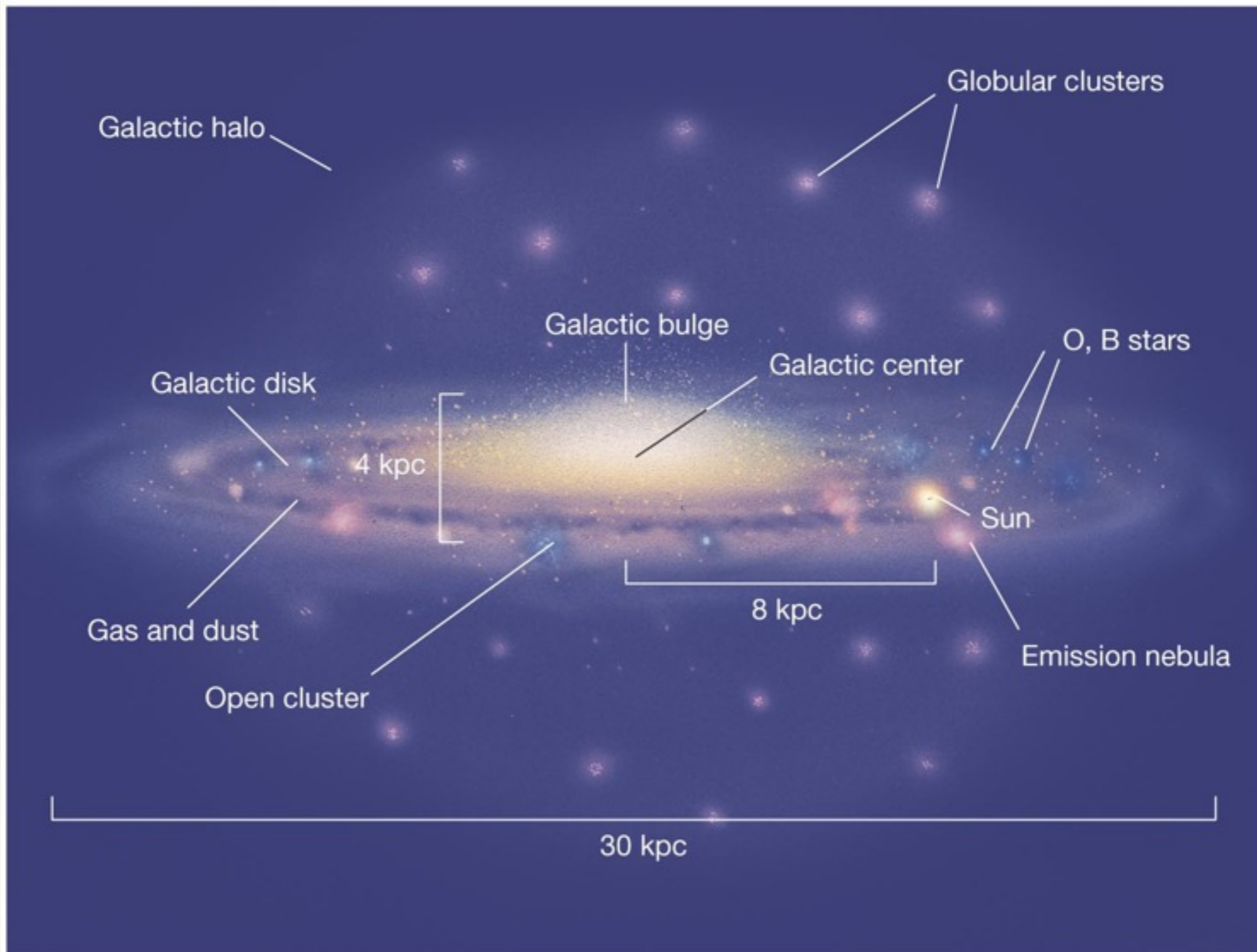
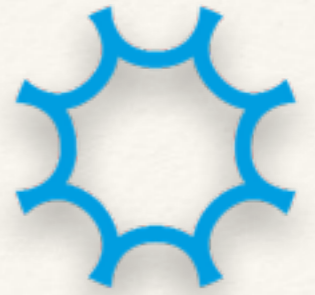
STELLAR ASTROPHYSICS CENTRE

Milky Way structure and formation with the LSST

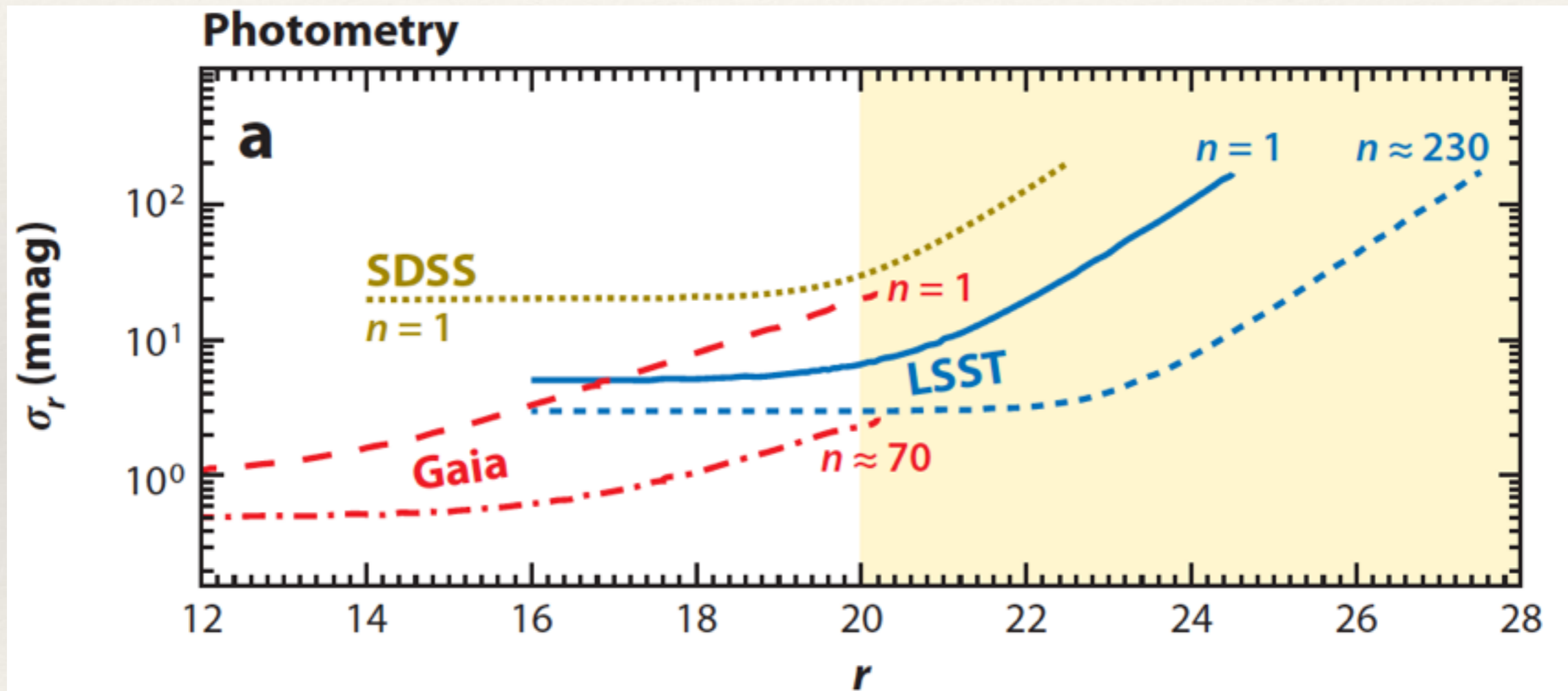
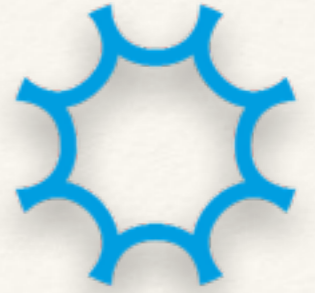
Víctor Silva Aguirre

NBI, September 16th 2015

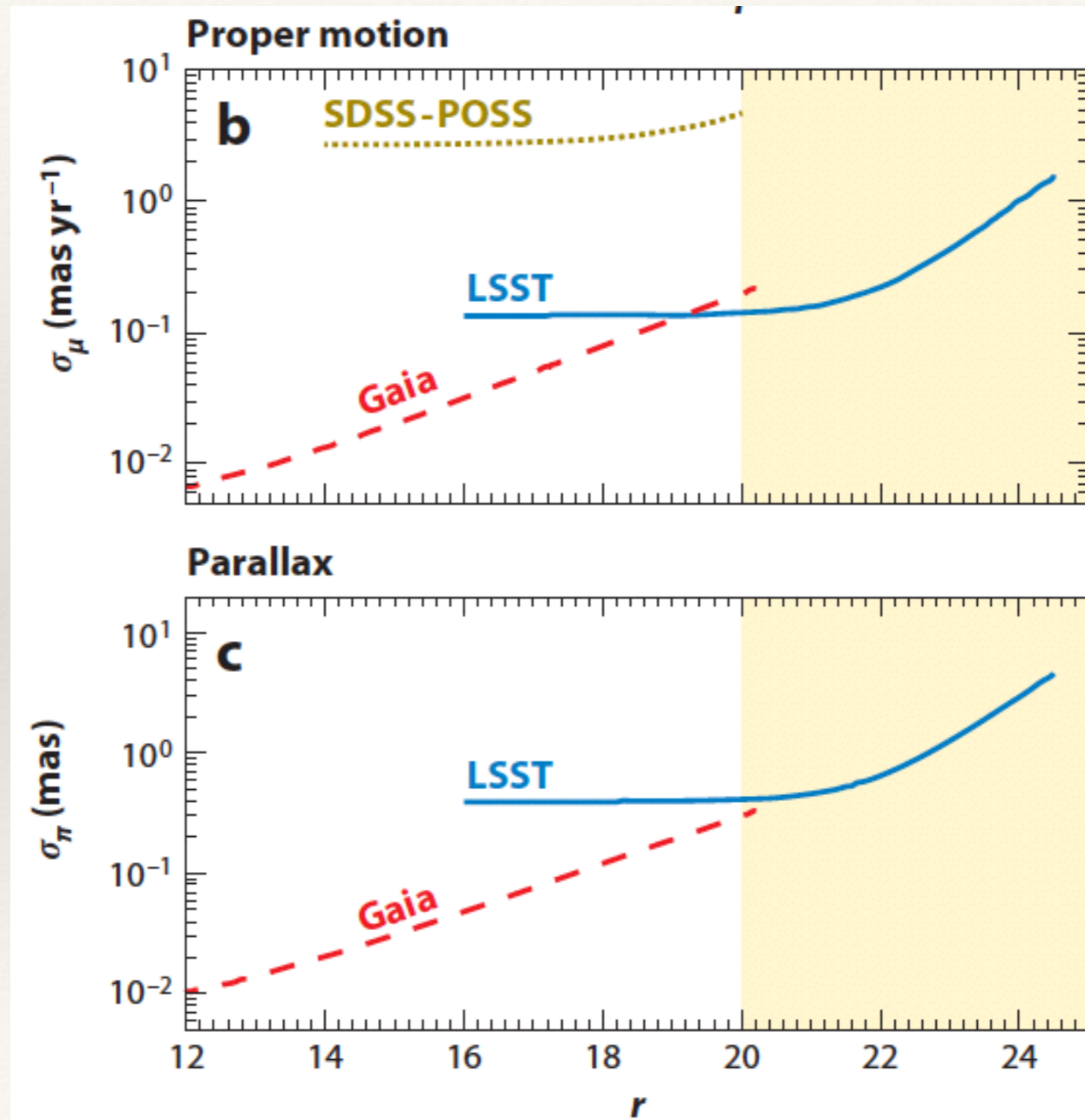
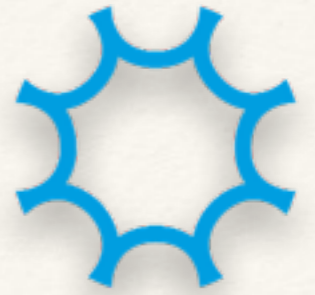
The Milky Way



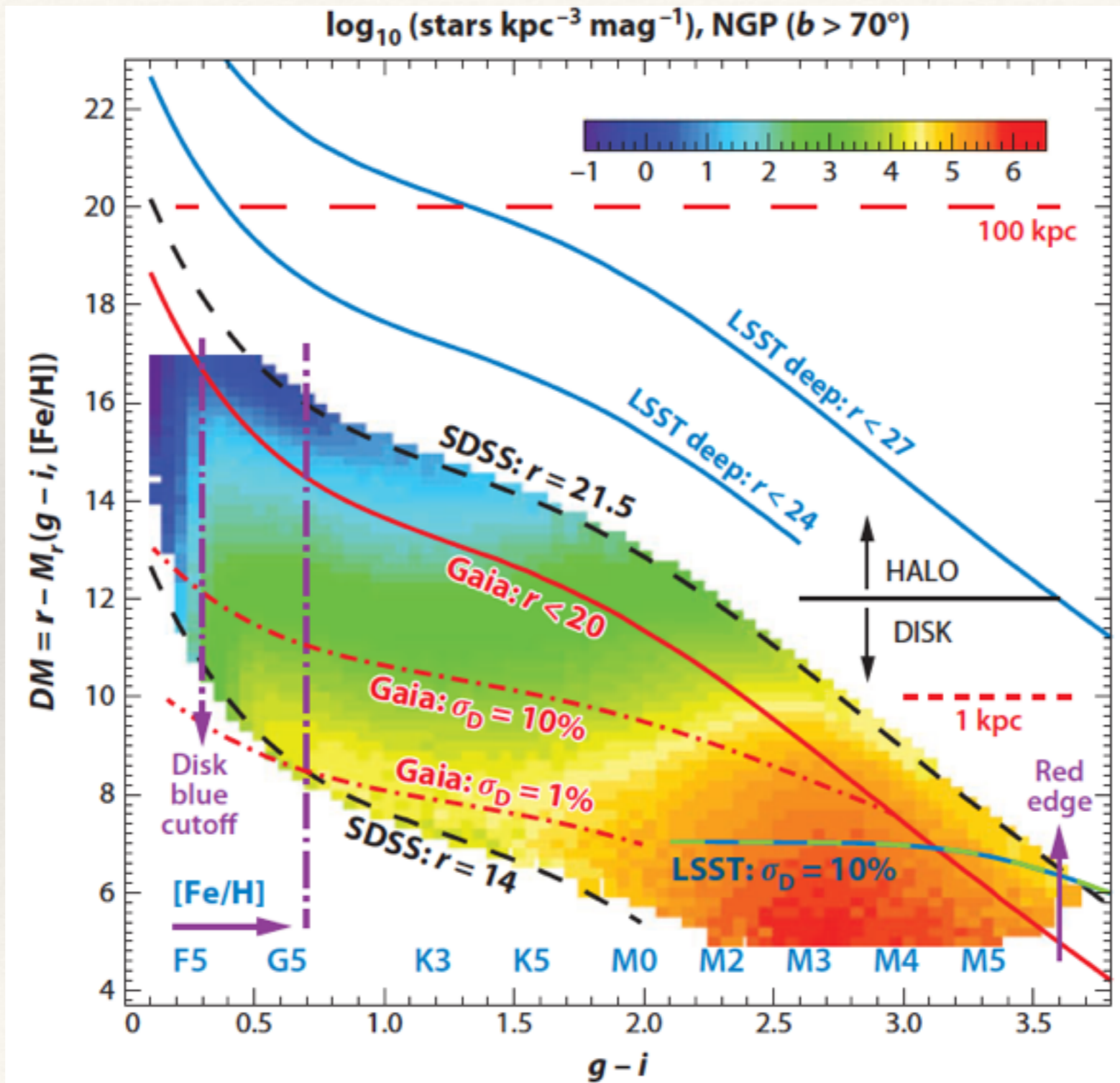
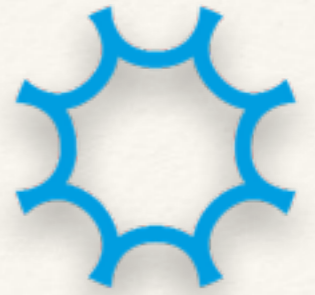
LSST & Gaia



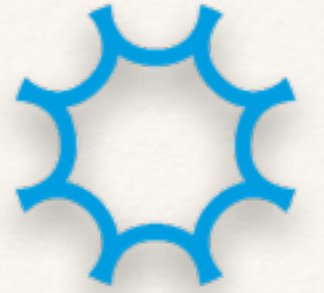
LSST & Gaia



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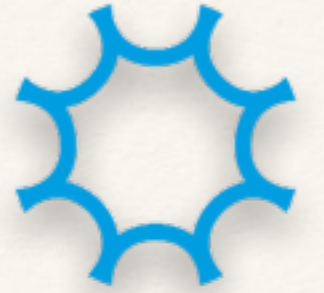
The Milky Way Halo



Some things we (think we) know:

- Halos of MW-type galaxies form inside-out
- Majority of gas accreted from massive satellites more than 9Gyr ago
- Remaining $\sim 30\%$ of gas accreted from smaller satellites 5-9 Gyr ago
- Spacial distribution of star well reproduced with a simple power law down to $R \sim 20\text{kpc}$ ($|Z| \sim 10\text{kpc}$)

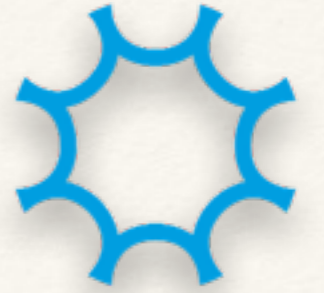
The Milky Way Halo



Current status of available data

- RR Lyrae and BHB stars detected down to ~ 100 kpc
- M-giants beyond ~ 30 kpc
- Most studies: up to ~ 10 - 20 kpc using i.e. SDSS detected main-sequence stars

The Milky Way Halo



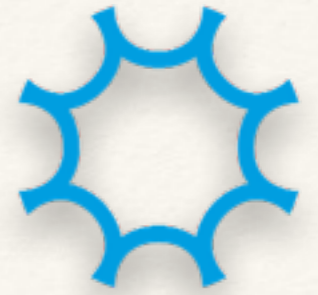
Current status of available data

Extrapolated!

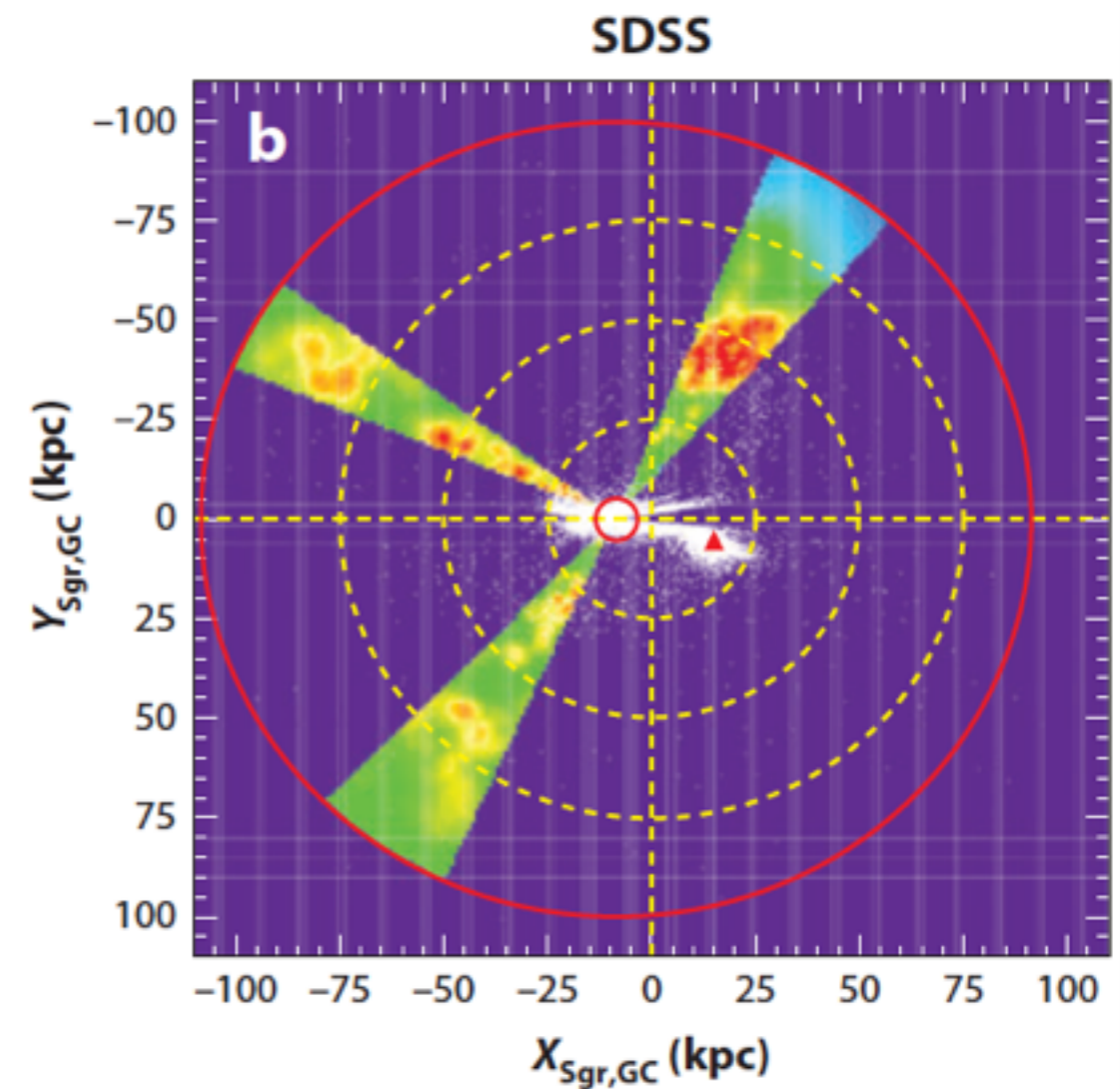
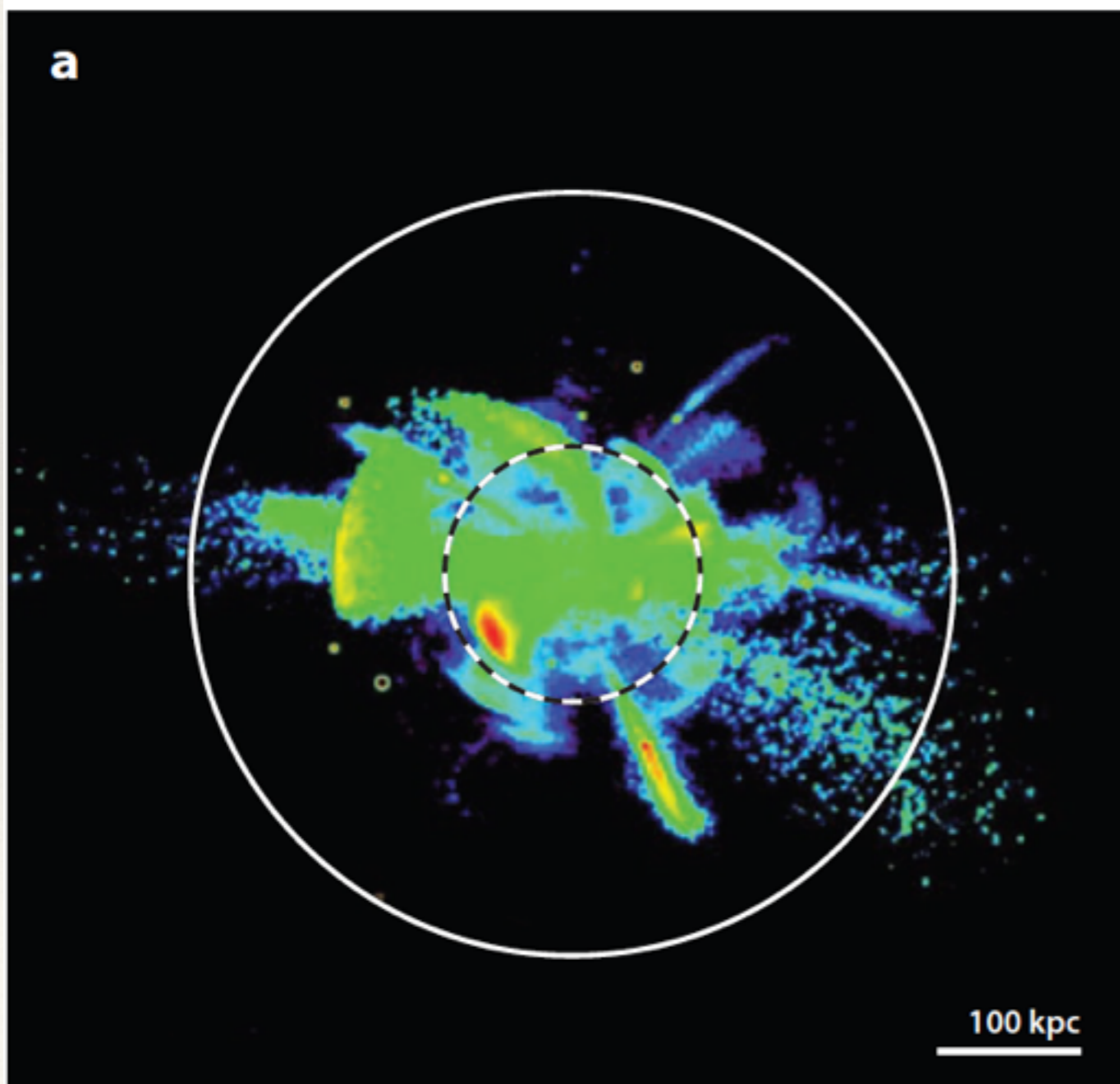
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Probed in situ!

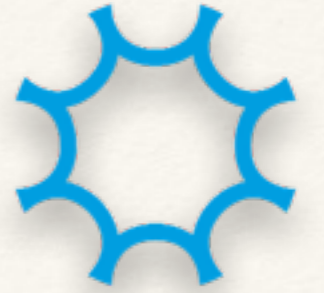
The Milky Way Halo



Bridging two fields



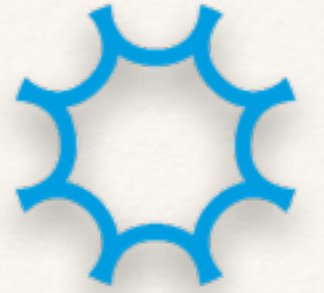
The Milky Way Halo



Some open questions

- Several halo components?
- Density distribution beyond $\sim 30\text{kpc}$?
- Net retrograde rotation?
- If inner and outer halo are distinct, what is the origin?

The Milky Way Halo

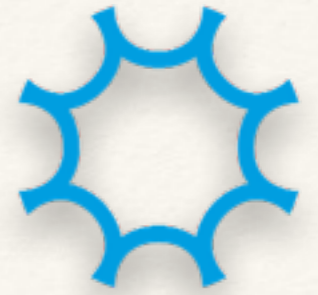


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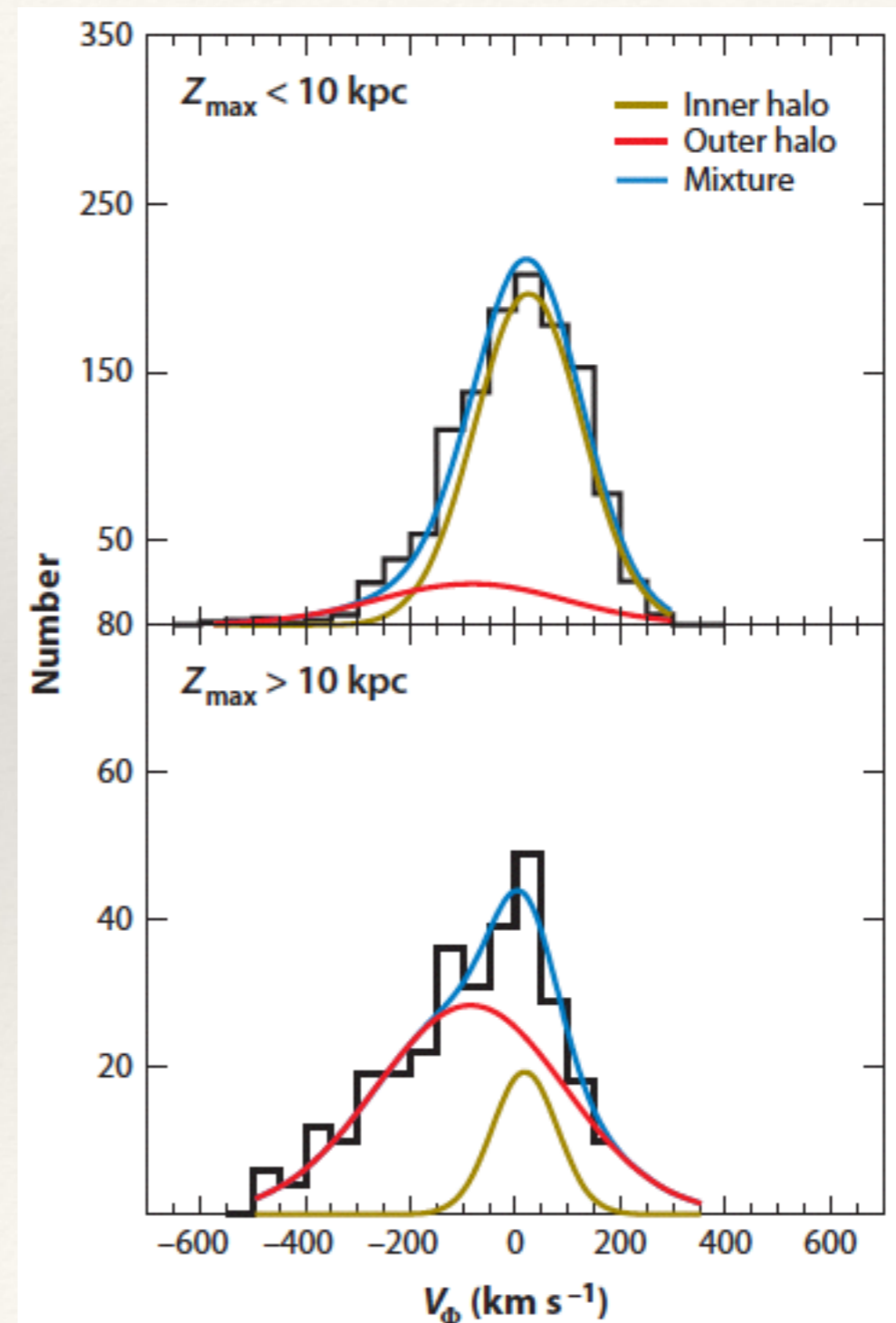
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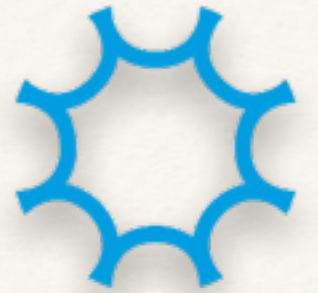
The Milky Way Halo



Extrapolated!



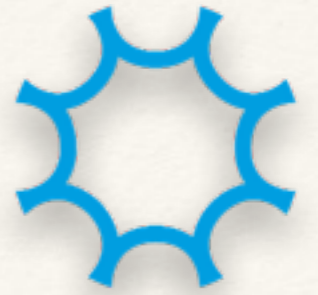
Structure and Formation



What LSST will bring

- Improve accuracy and coverage of current photometric surveys
- Characterisation of the halo population
- Metallicity and kinematics of stars $\sim 40\text{kpc}$
- Spacial distribution $\sim 100\text{kpc}$ using turn-off stars
- RR Lyrae out to $\sim 400\text{kpc}$
- Excellent synergies with Gaia

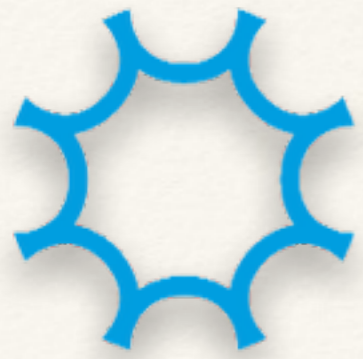
Structure and Formation



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Measured in situ!



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