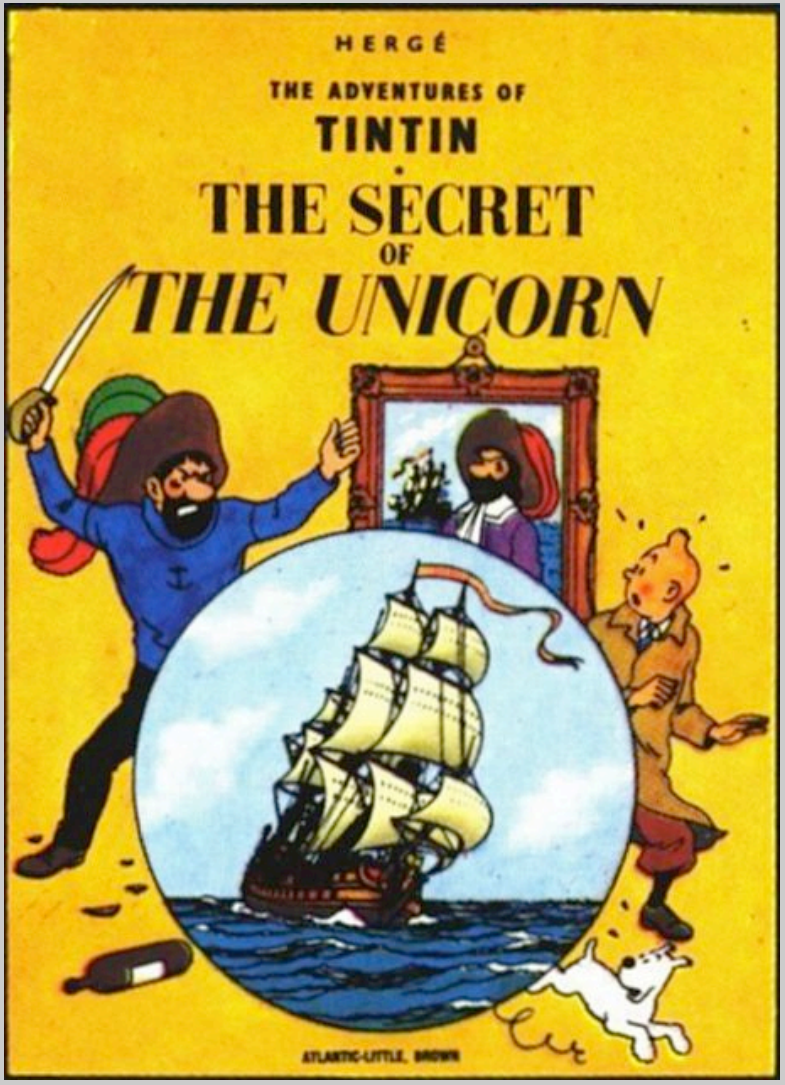
The Secret of the Unicorn:

Uncovering a new structure in the Milky Way



Blair Conn

La Silla, 2p2, WFI IS.

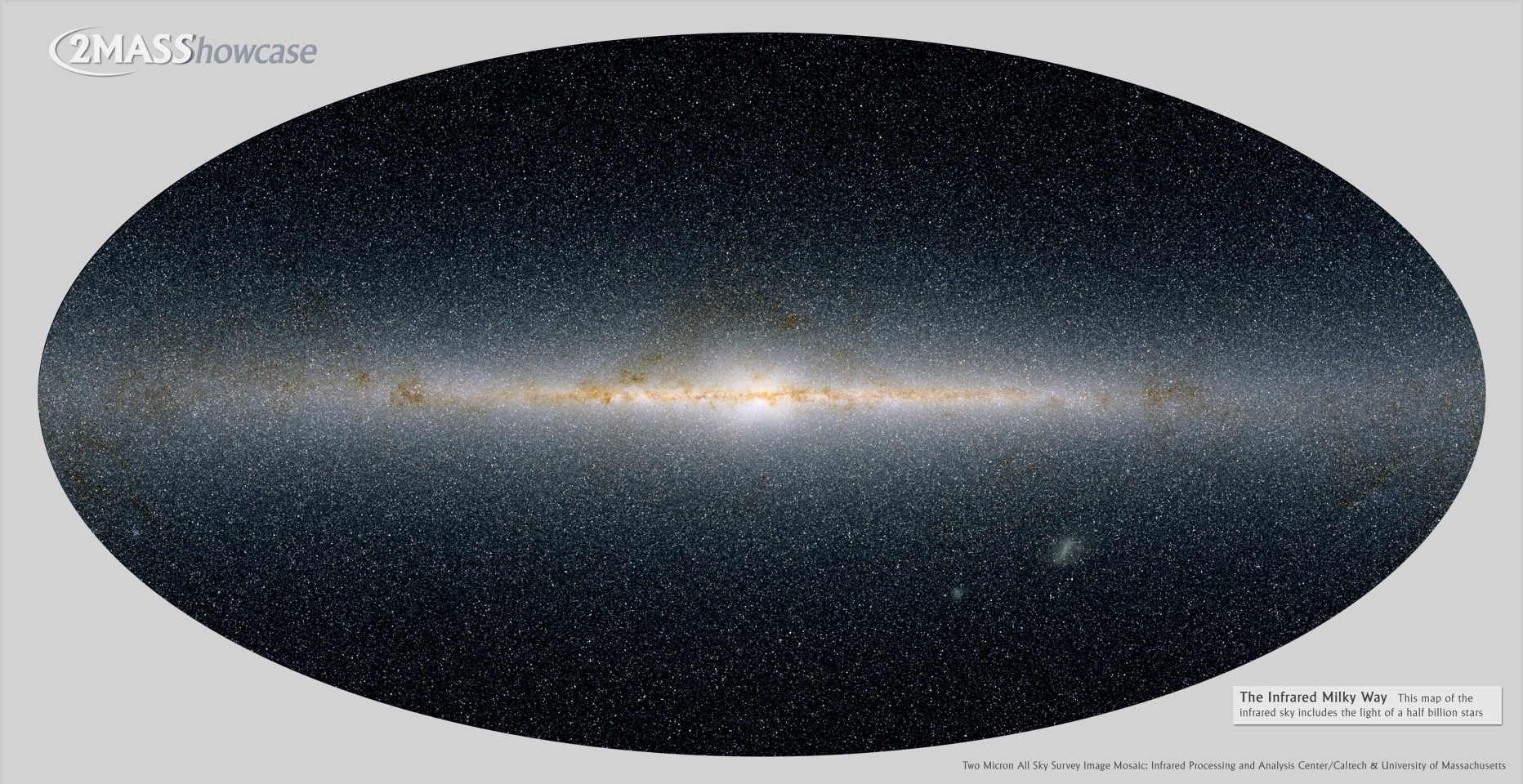
Why Study the Outer Galactic Disc?

To search for possible evidence of how Galaxy formed

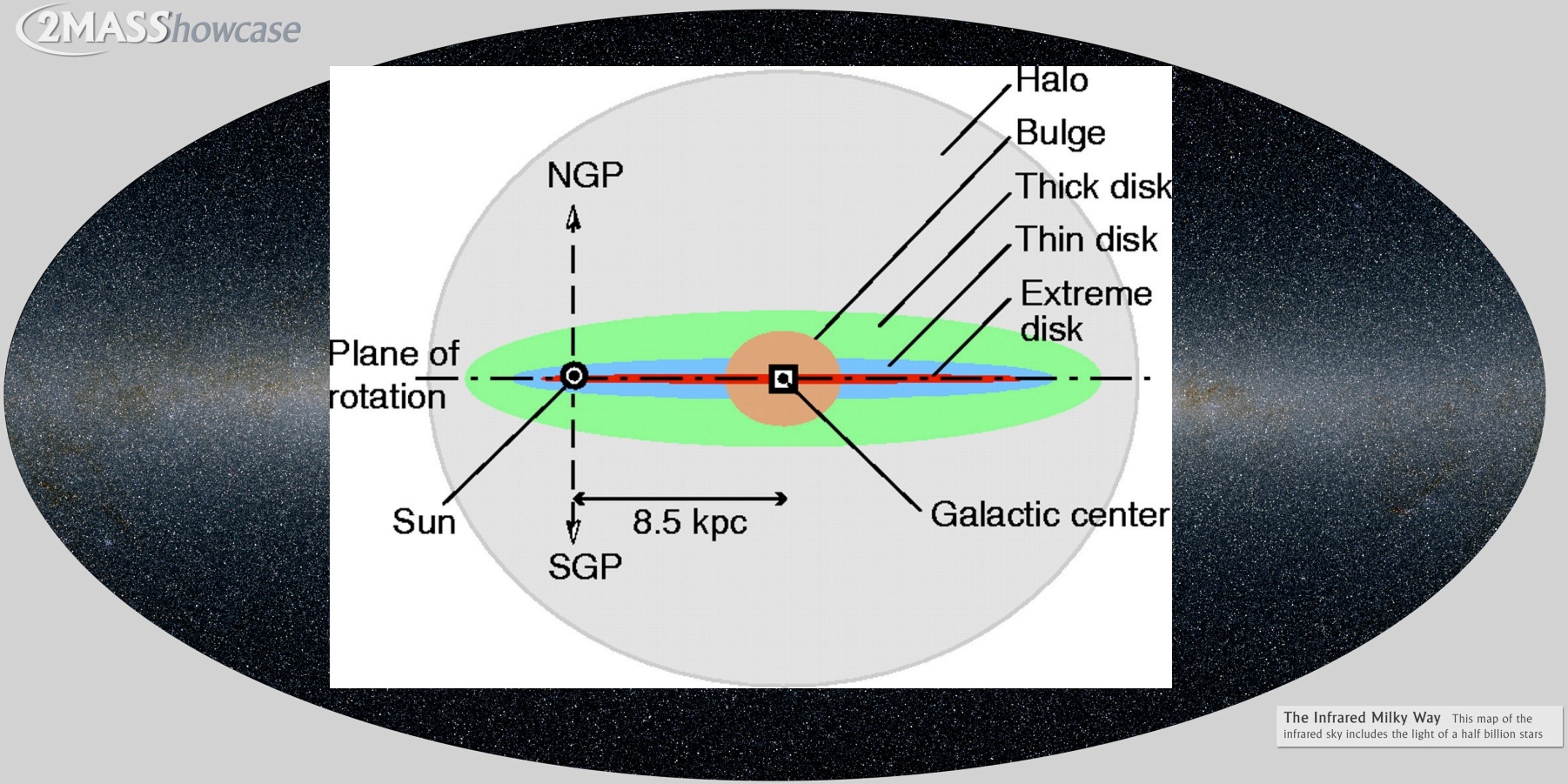
and in particular to see if merger events have played a role in that formation.

The outer Disc is most likely to have remnants of these events due to the long dynamical timescales in that region.

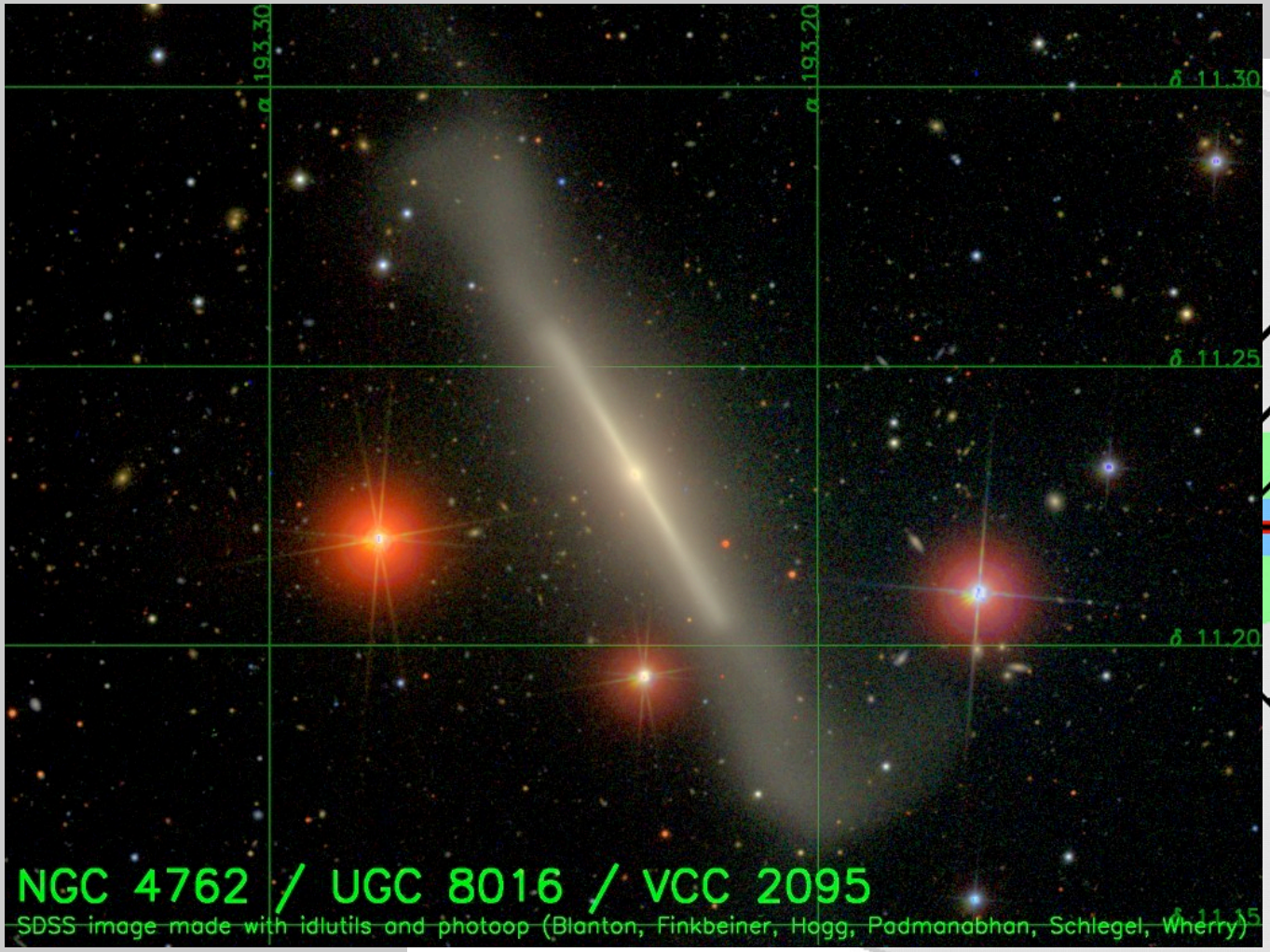
Galactic Structure 101



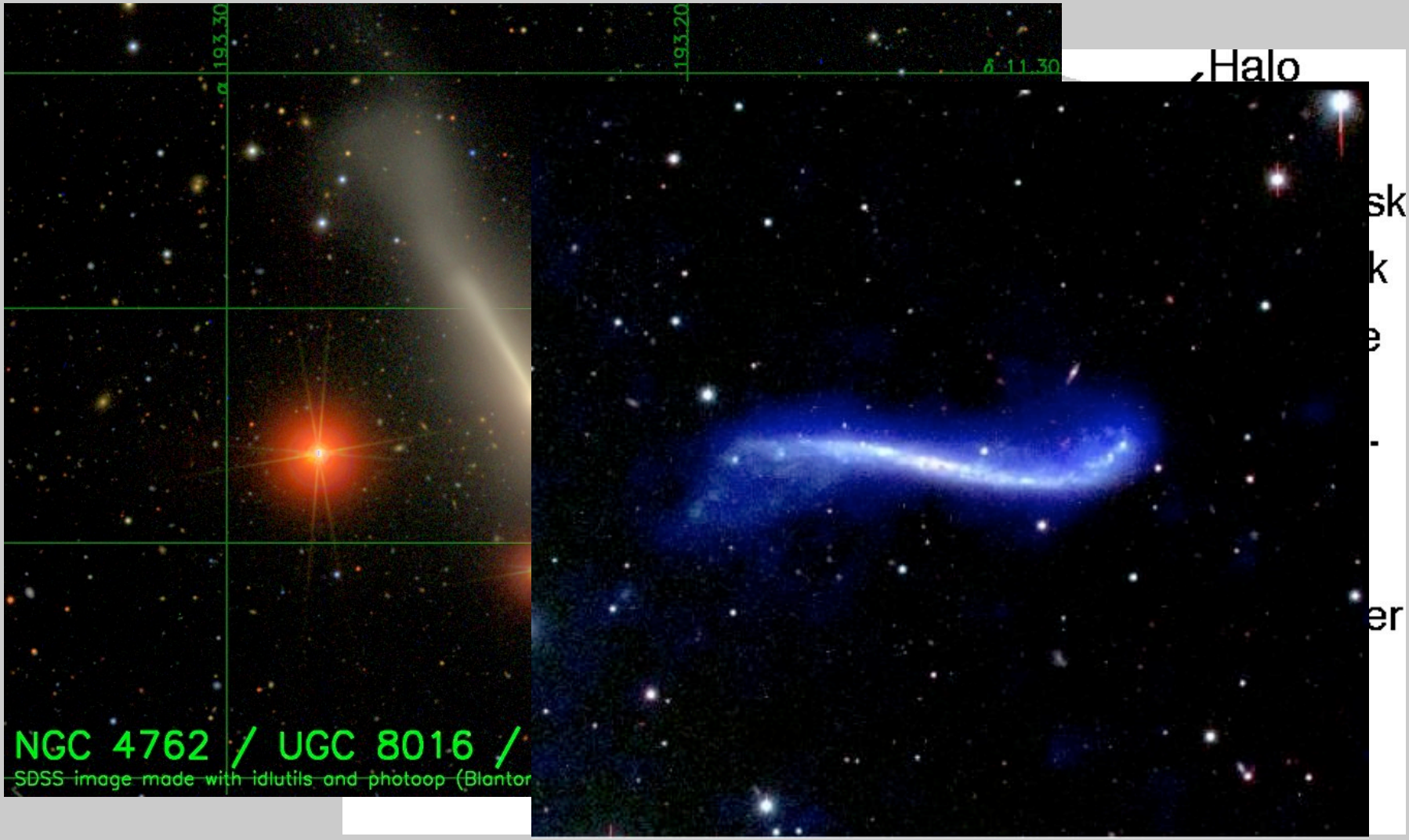
Galactic Structure 101



Galactic Structure 101

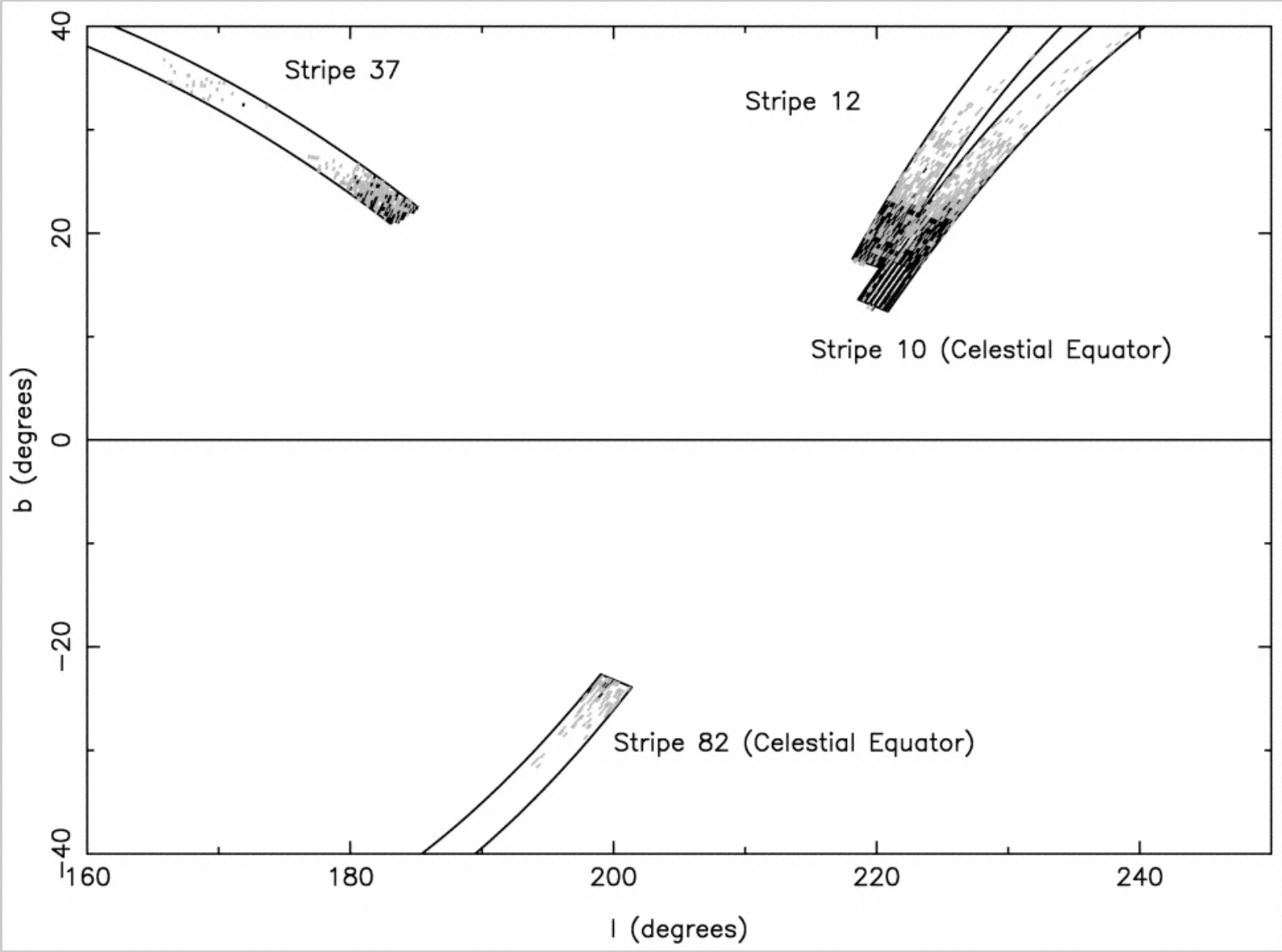


Galactic Structure 101



Discovery of the Monoceros Ring in SDSS data

Newberg et al, 2002



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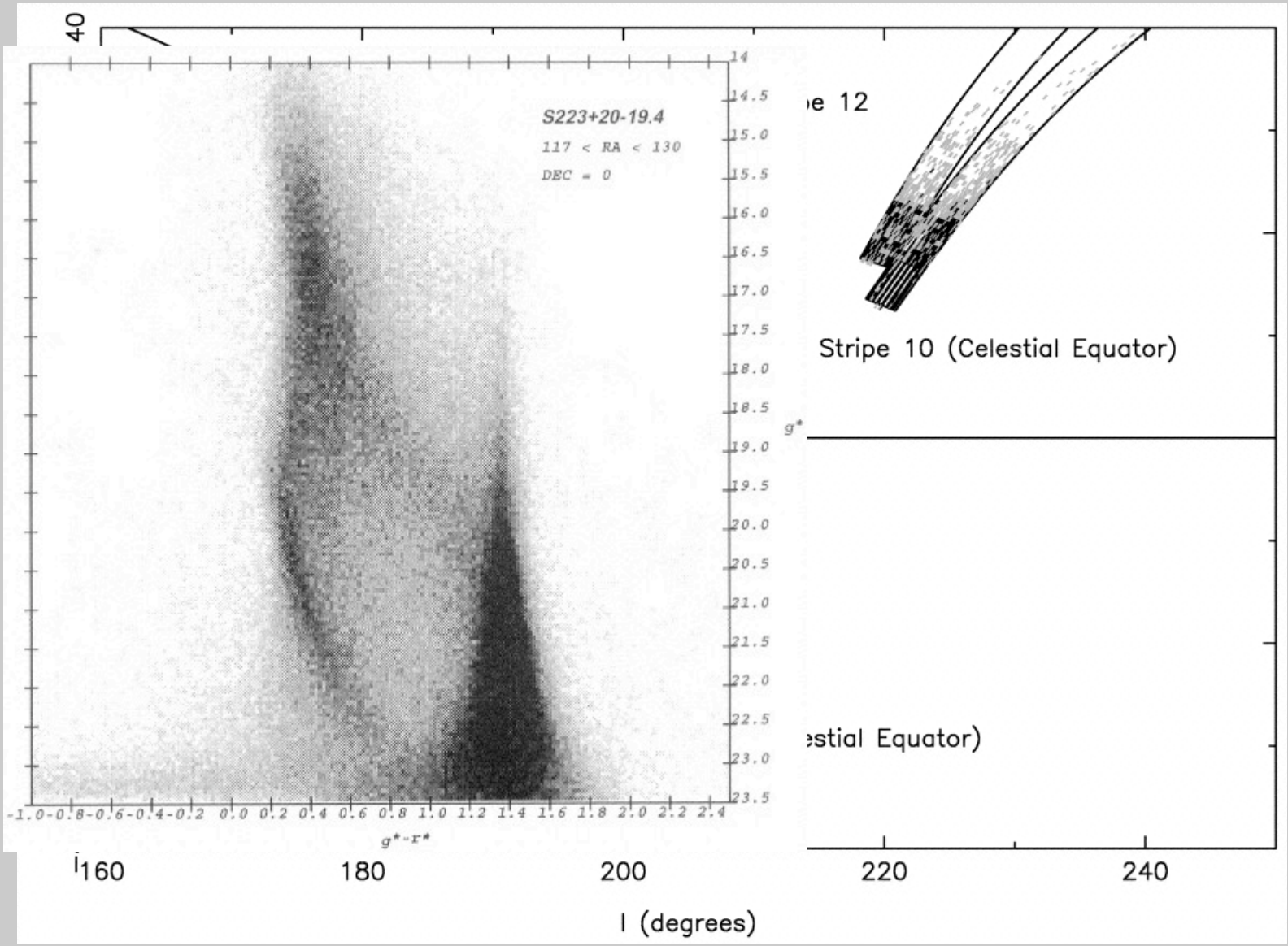
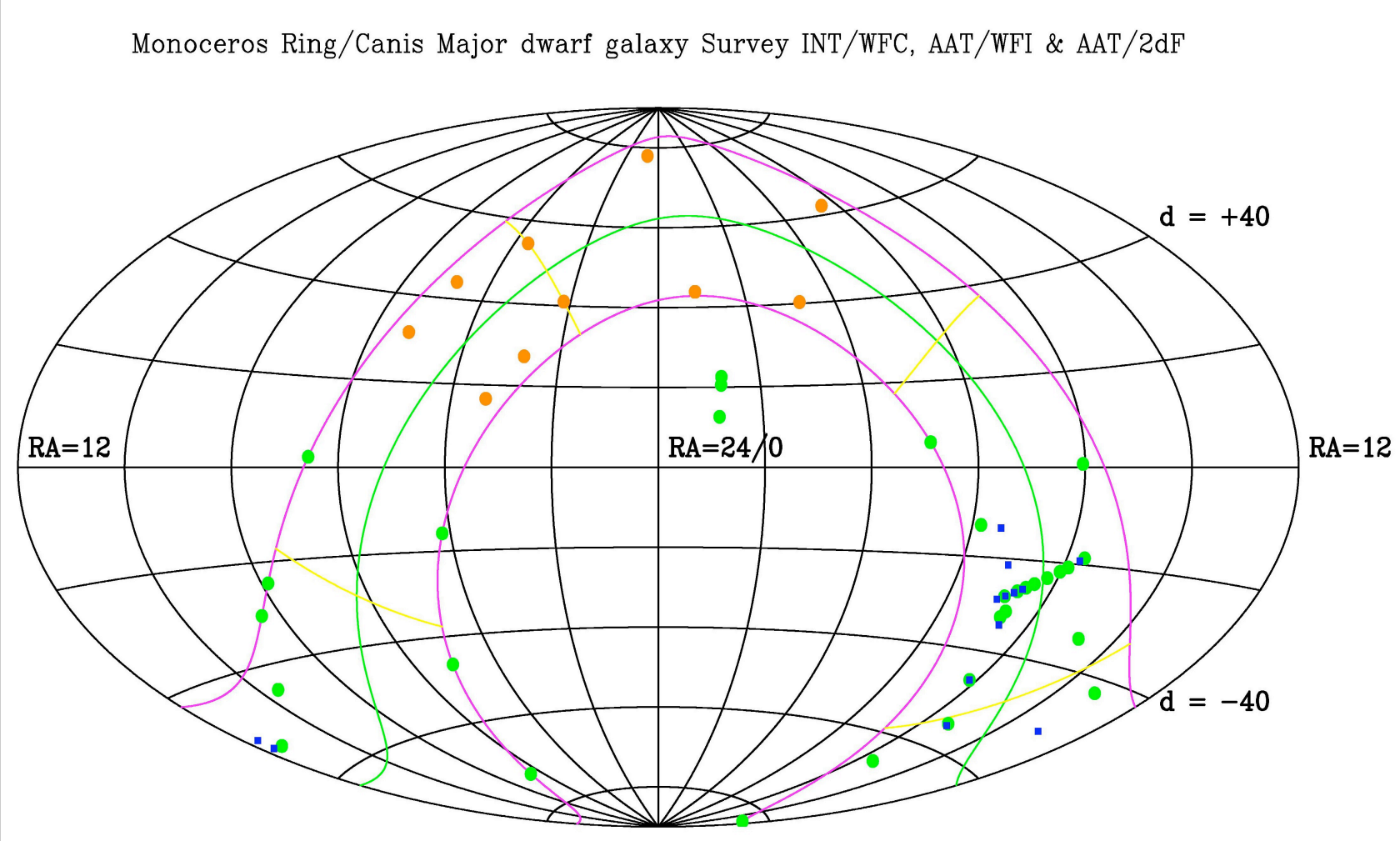
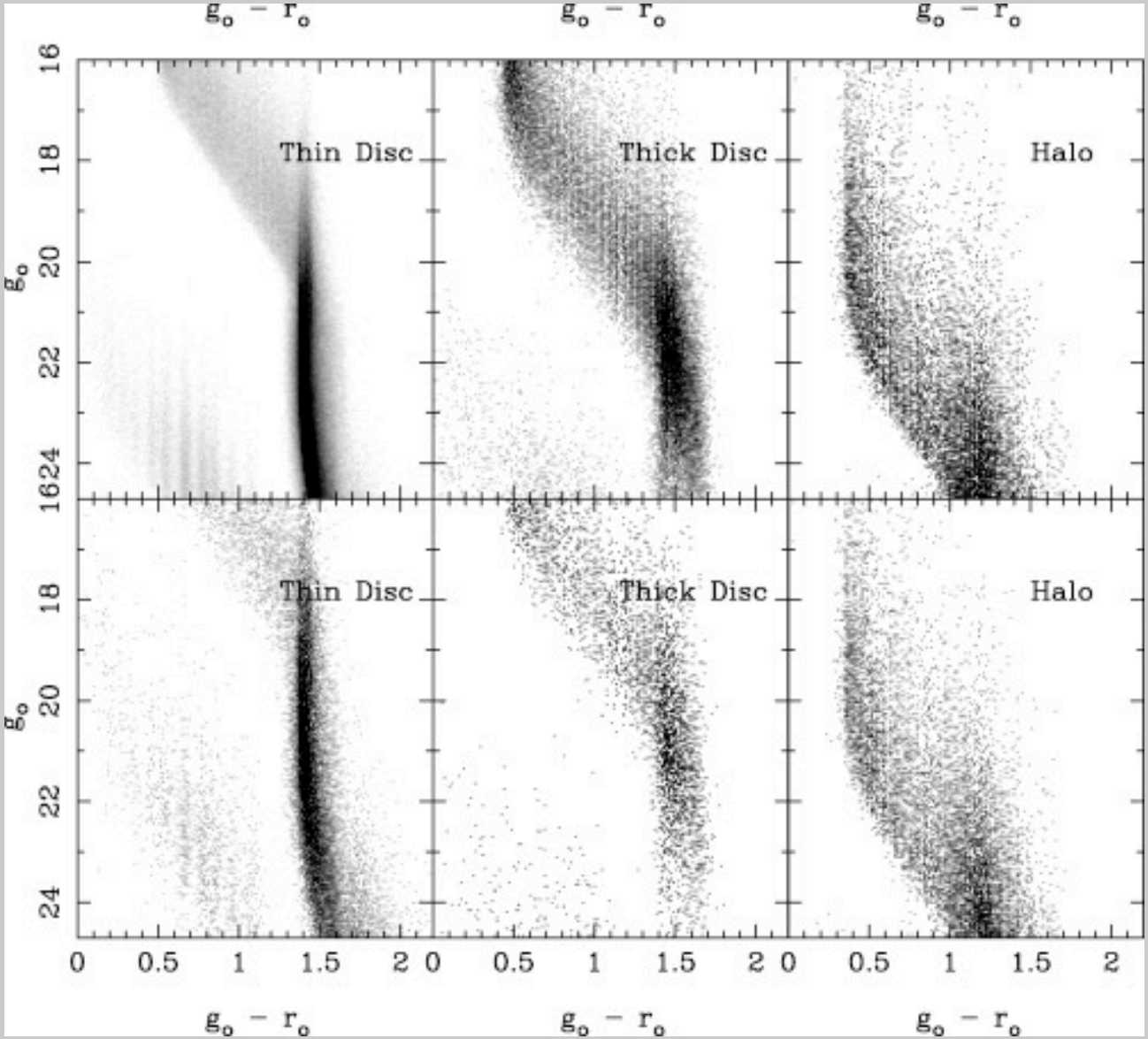


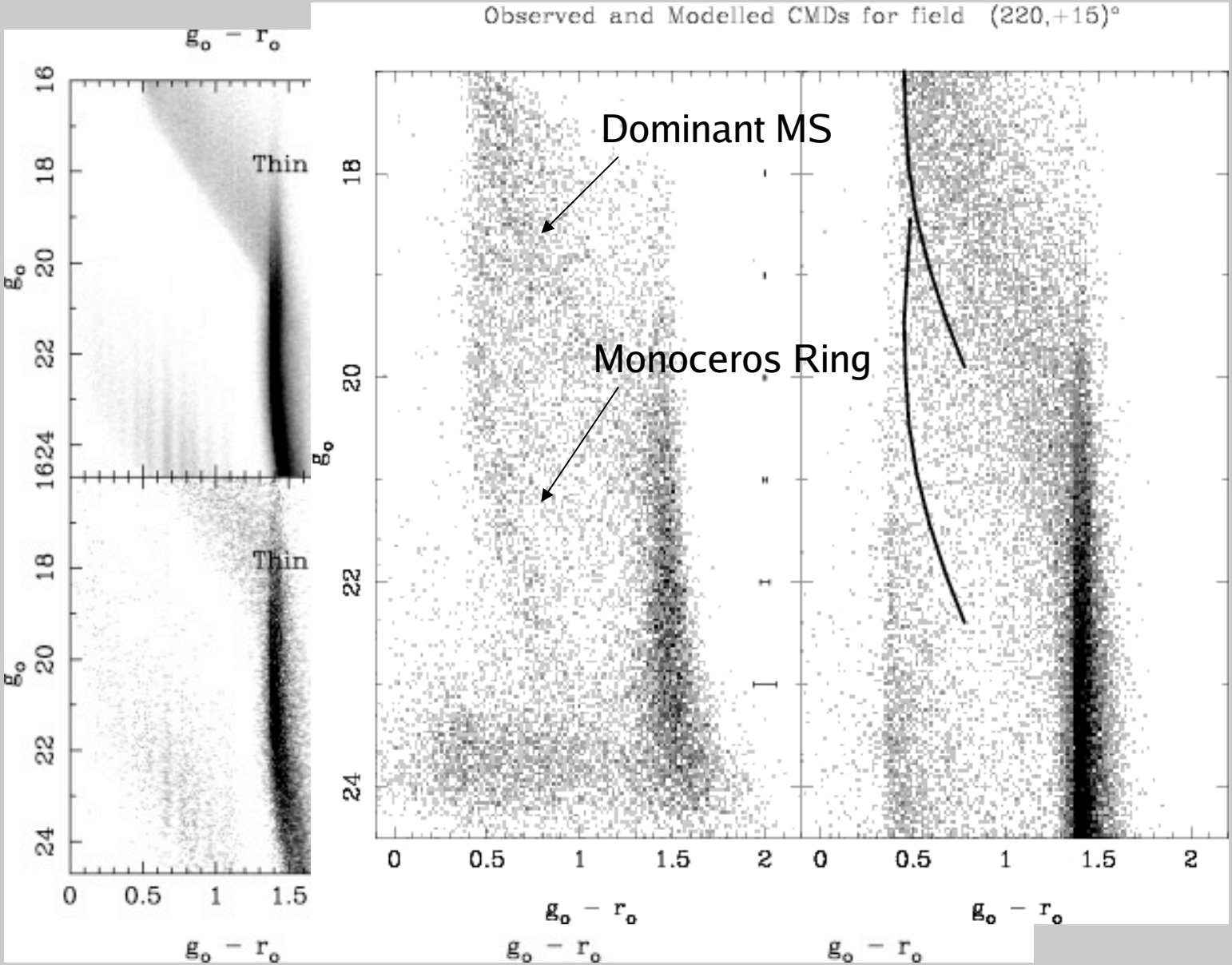
Searching for the Monoceros Ring



Searching for the Monoceros Ring



Searching for the Monoceros Ring



So what did we find .... ?

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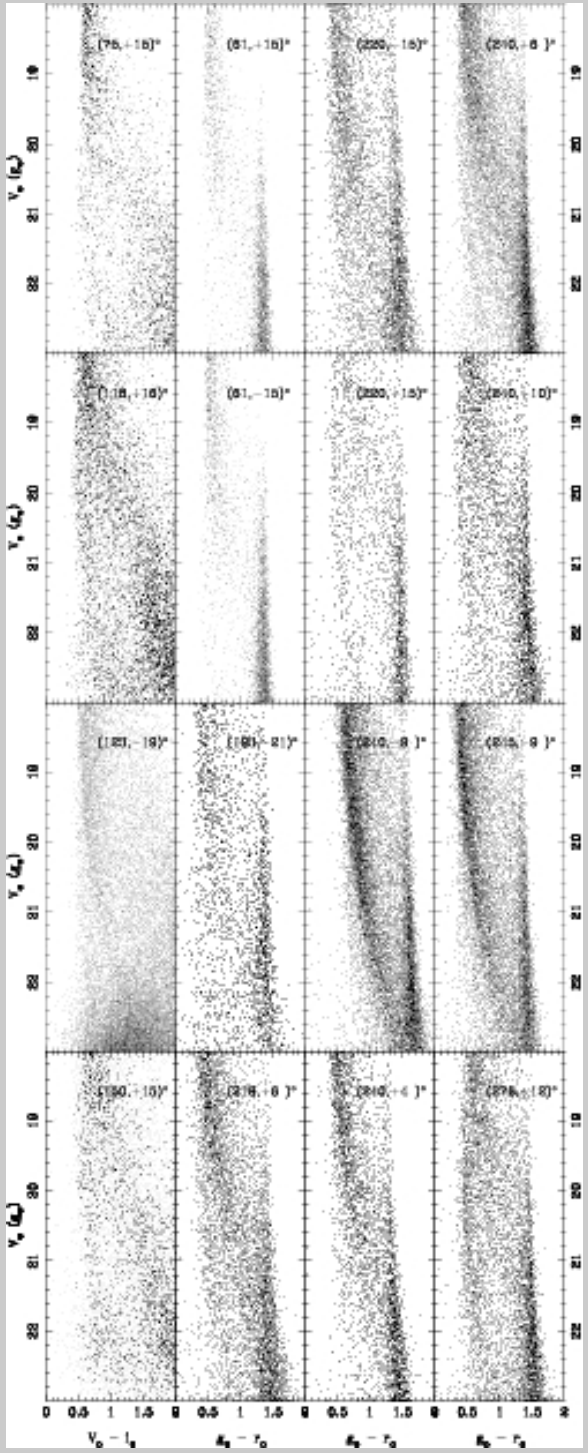
14 detections
+3 maybes



But .....

What are the other options for the Monoceros Ring?

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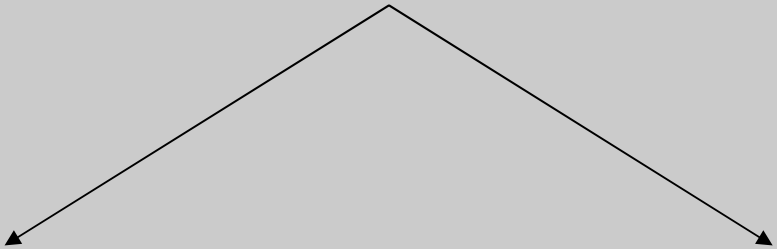
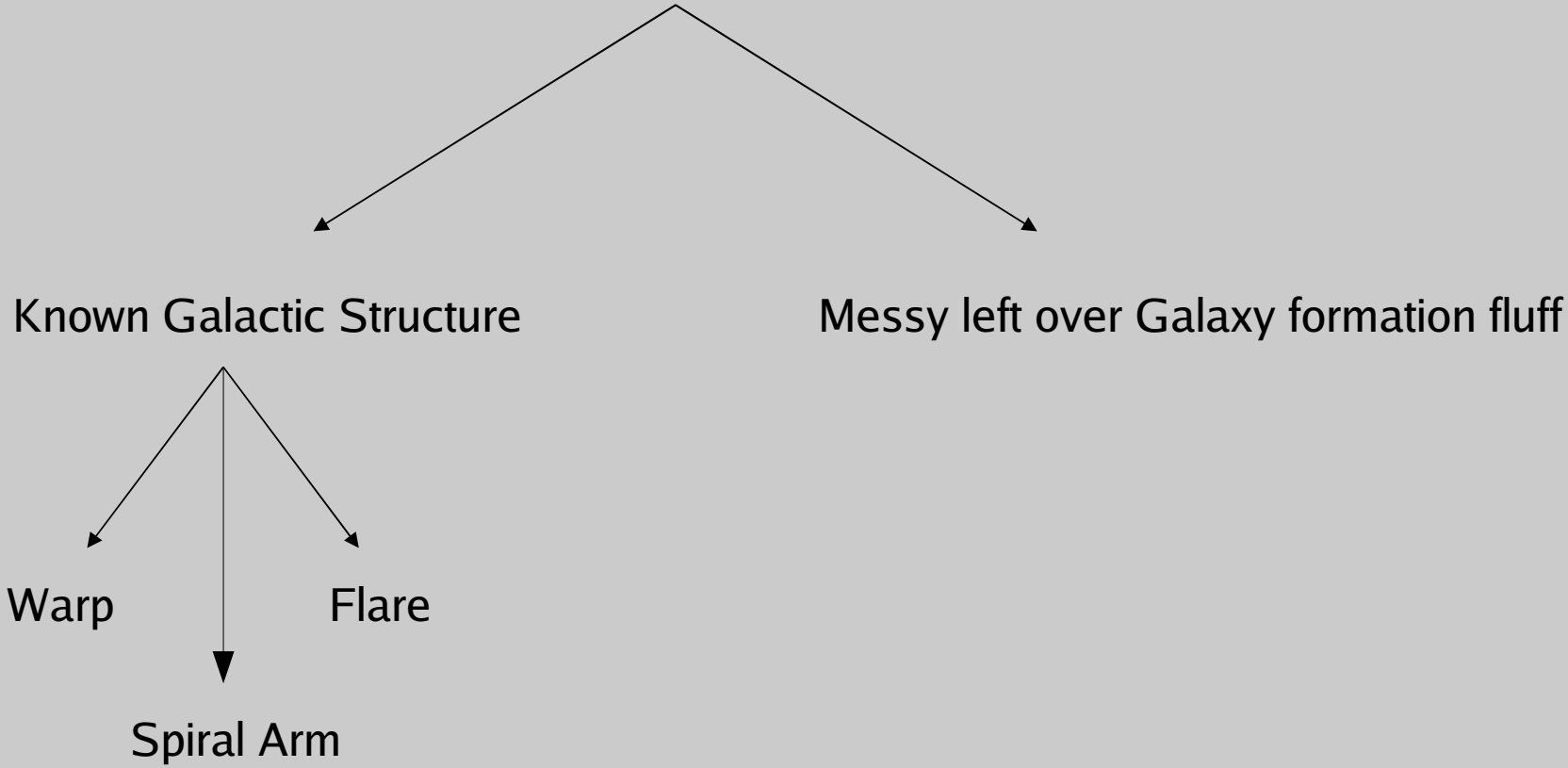


Known Galactic Structure

Messy left over Galaxy formation fluff

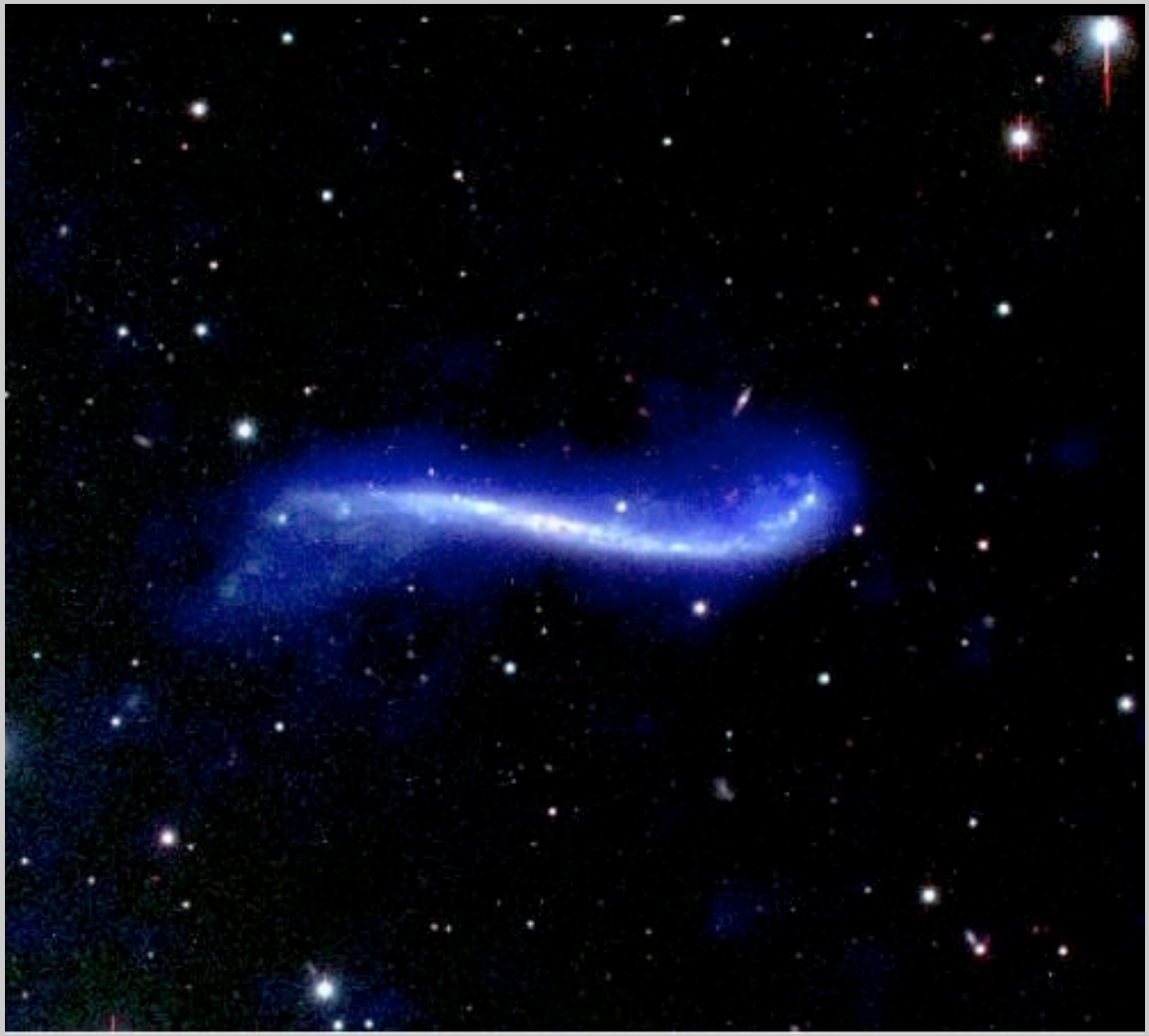
But .....

What are the other options for the Monoceros Ring?



Warp

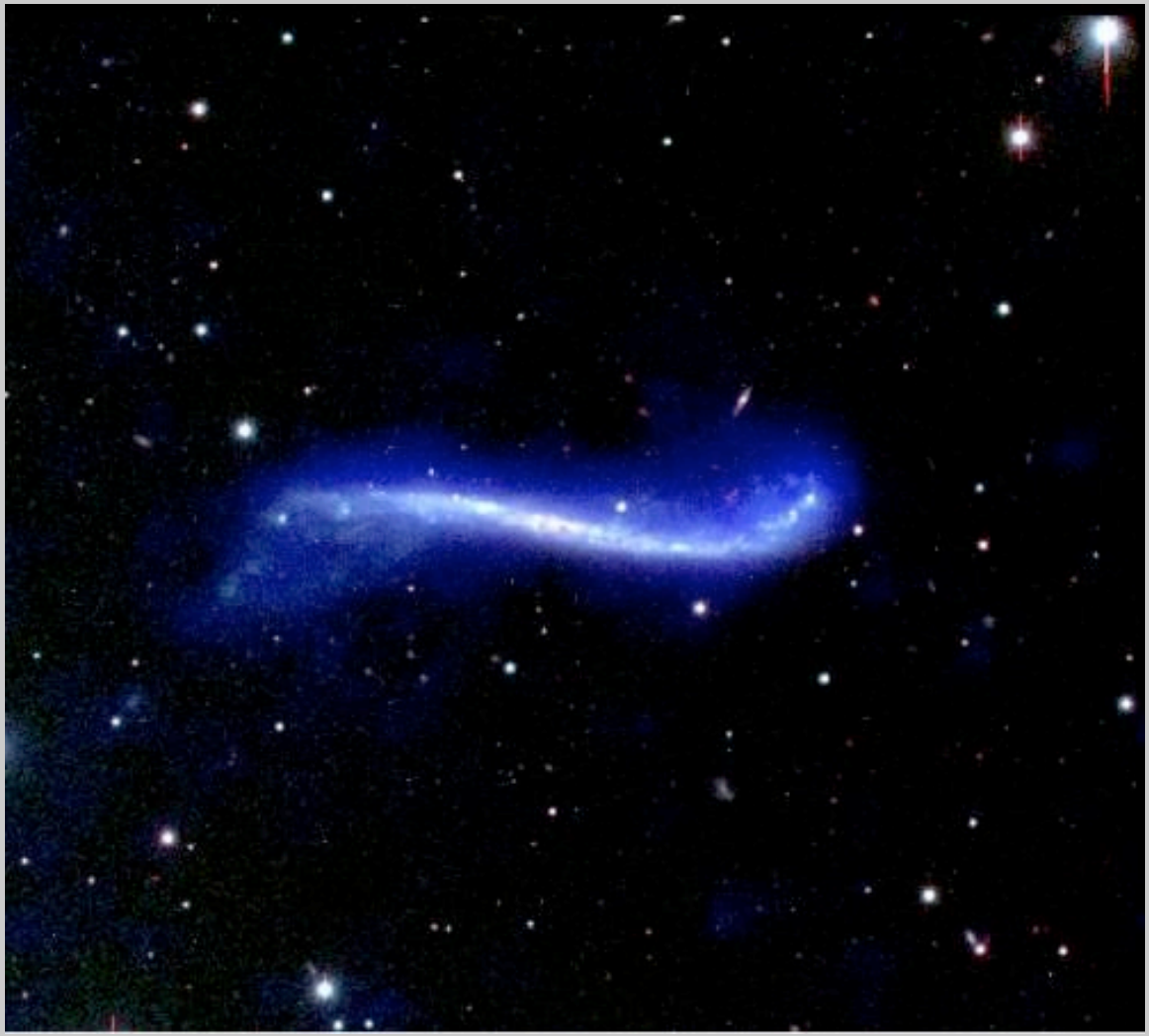
Let's take an extreme example



UGC 3697

Warp

The argument goes that the Canis Major overdensity, the purported progenitor of the Monoceros Ring is simply the shifted midplane of the Galaxy.



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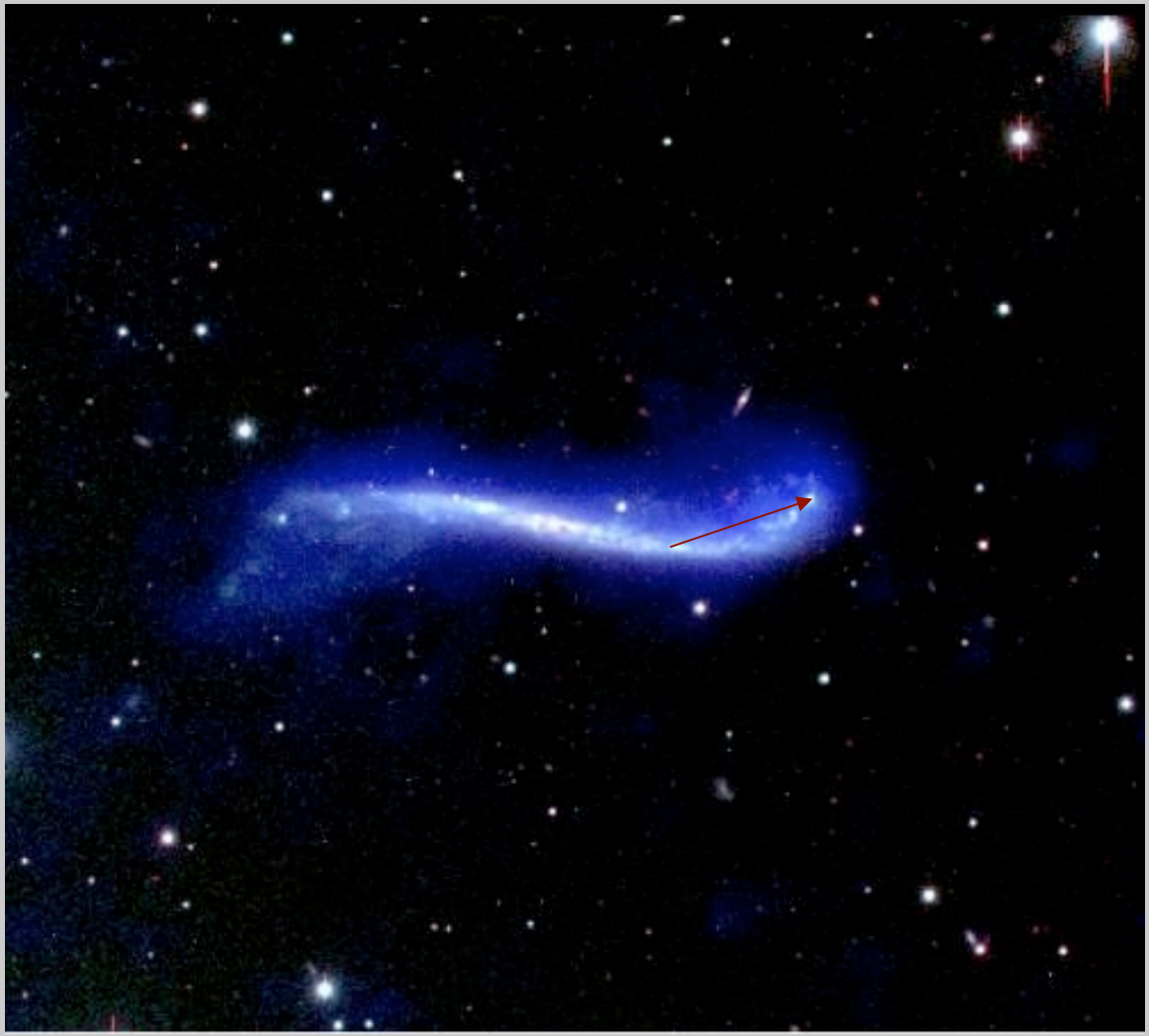
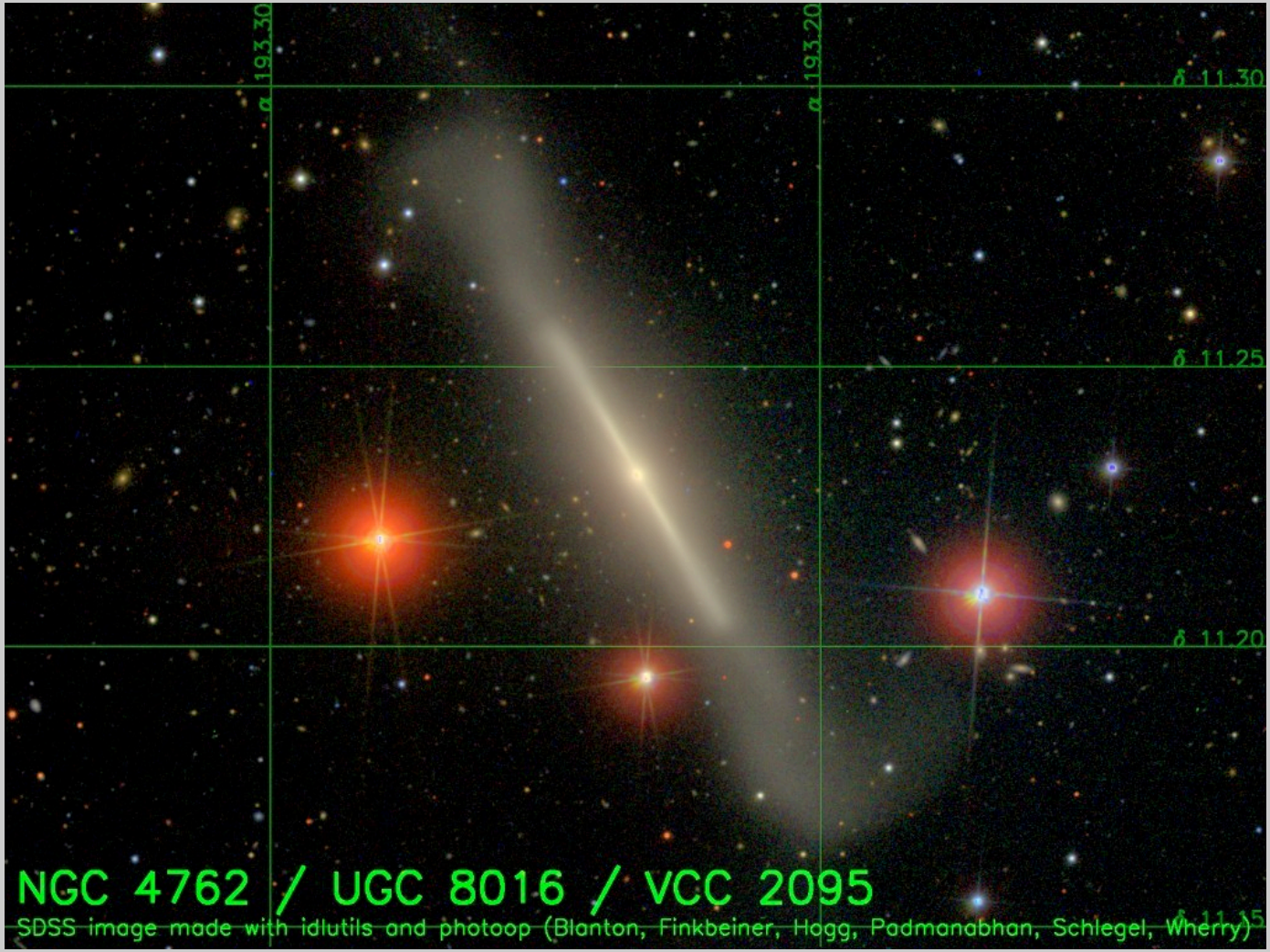


UGC 3697

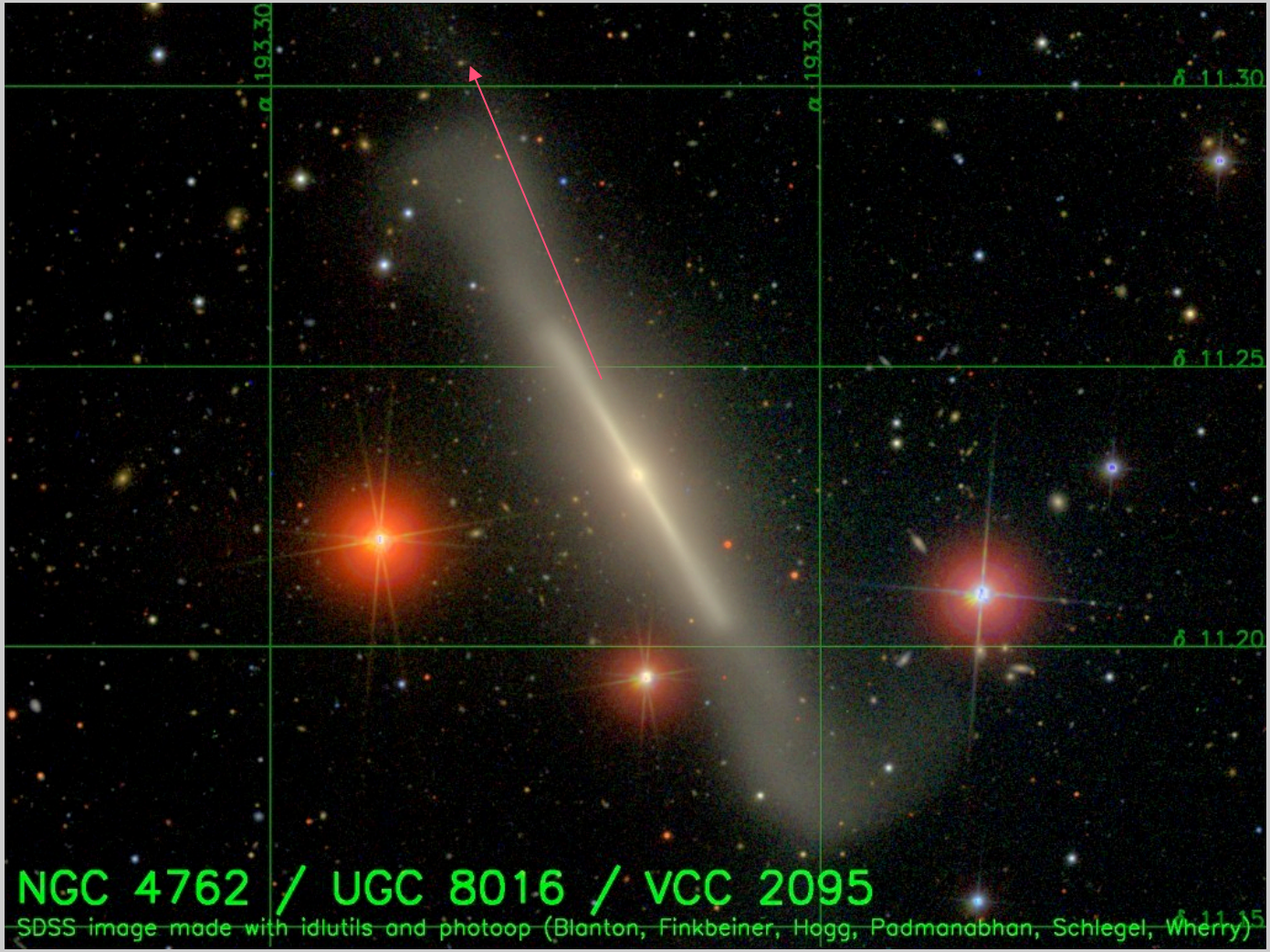
Flare

The Monoceros Ring as the Flare, follows the same logic as the Warp scenario.

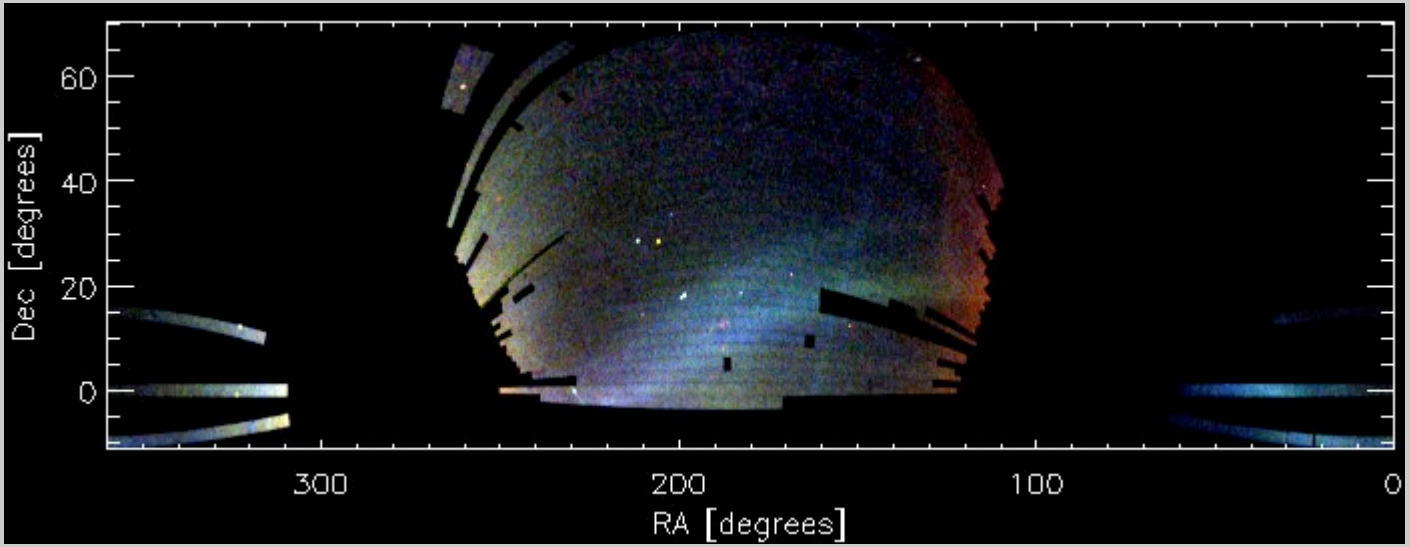


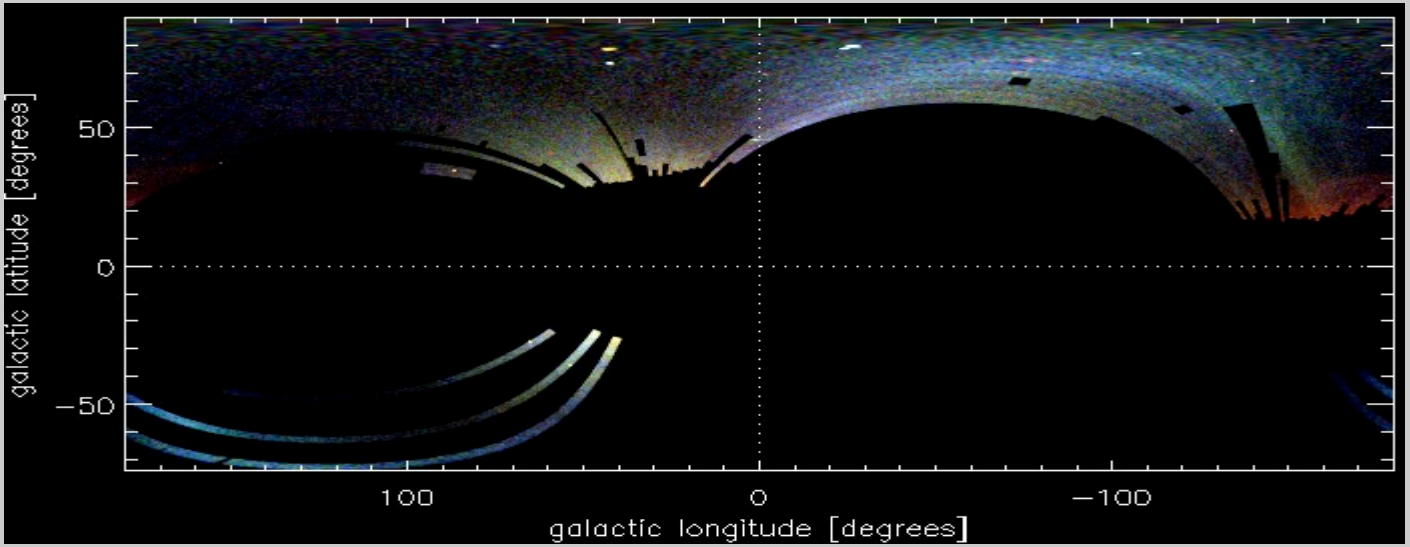
Flare

So the Monoceros Ring appears like this.



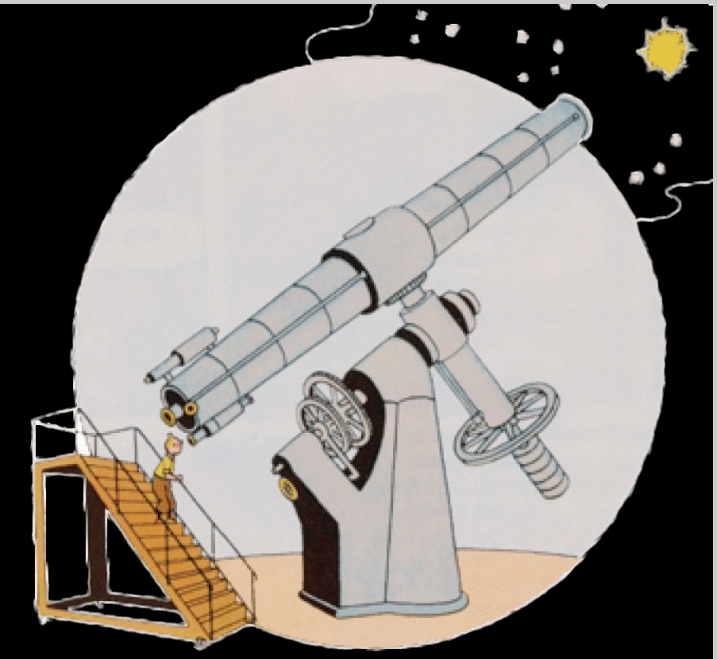
But the new SDSS results look like this ...





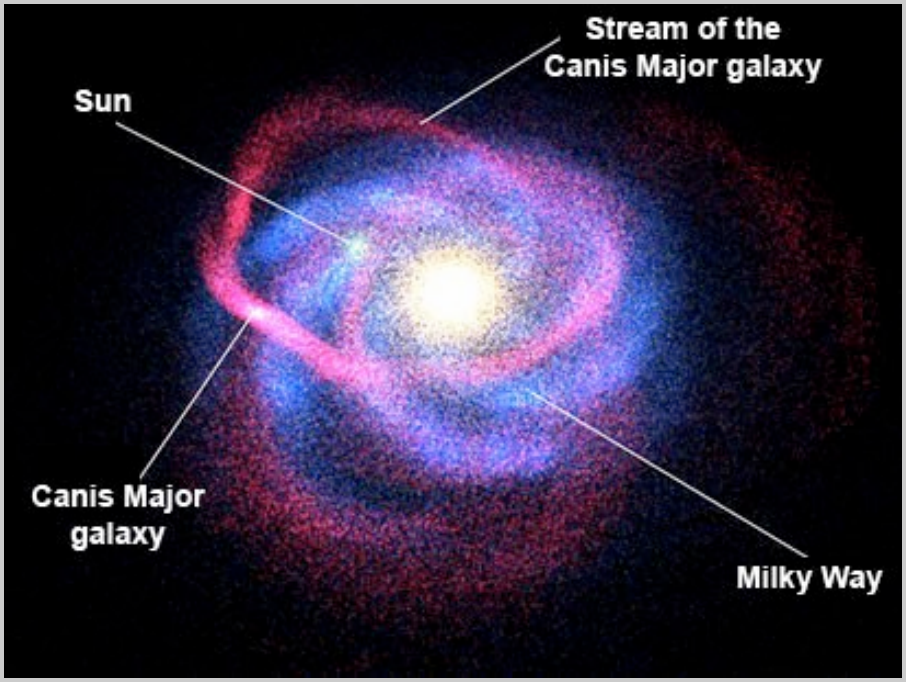
Conclusion?

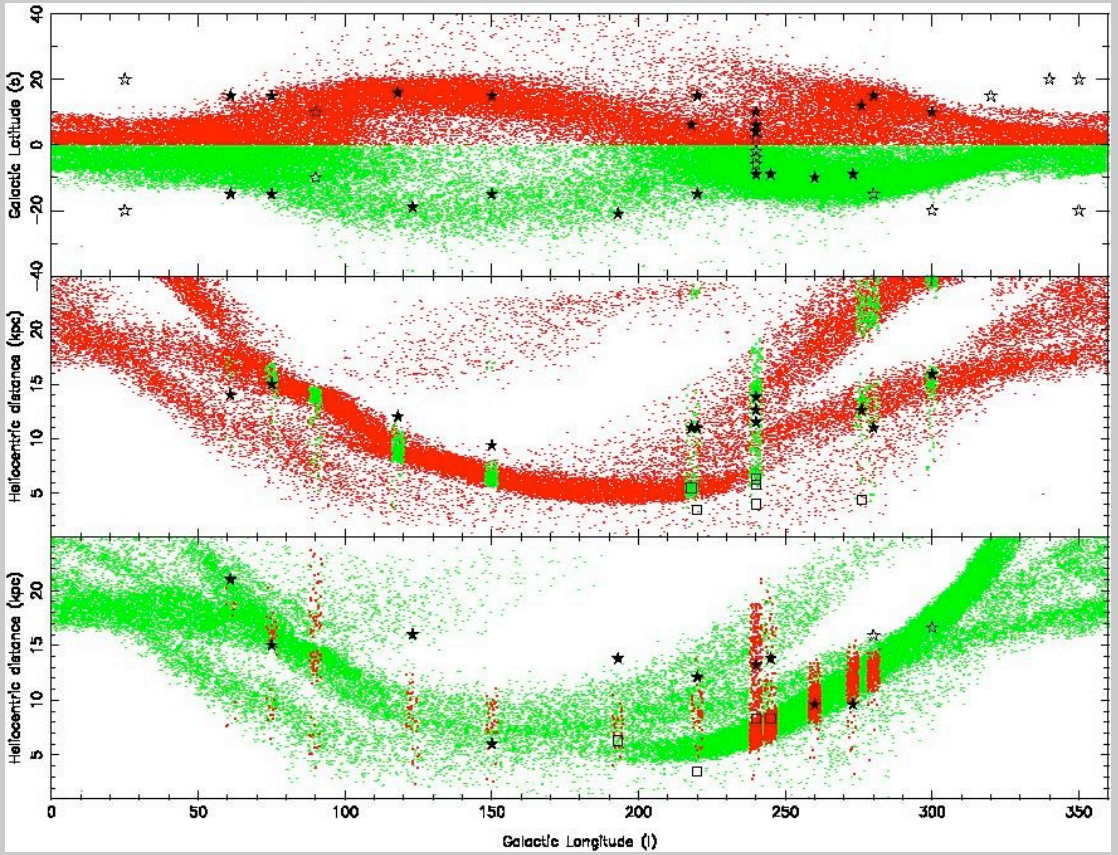
- The Monoceros Ring occupies a distinct region in Galaxy.
- Galactic Structure solutions have problems:
  - The Warp scenario doesn't fit the data very well, but can't be excluded.
  - The Flare solution cannot account for the numbers of stars seen at that distance.
- The Galactic Inner Halo becomes more crowded as time goes by ...



But where can we go from here ....

How can we test the tidal stream model?





On the way, ...

- WHT data, tonight ... (pray for clear skies at La Palma)
- Subaru SuprimeCam data (started)
- 2p2/WFI Jan/Feb 2008