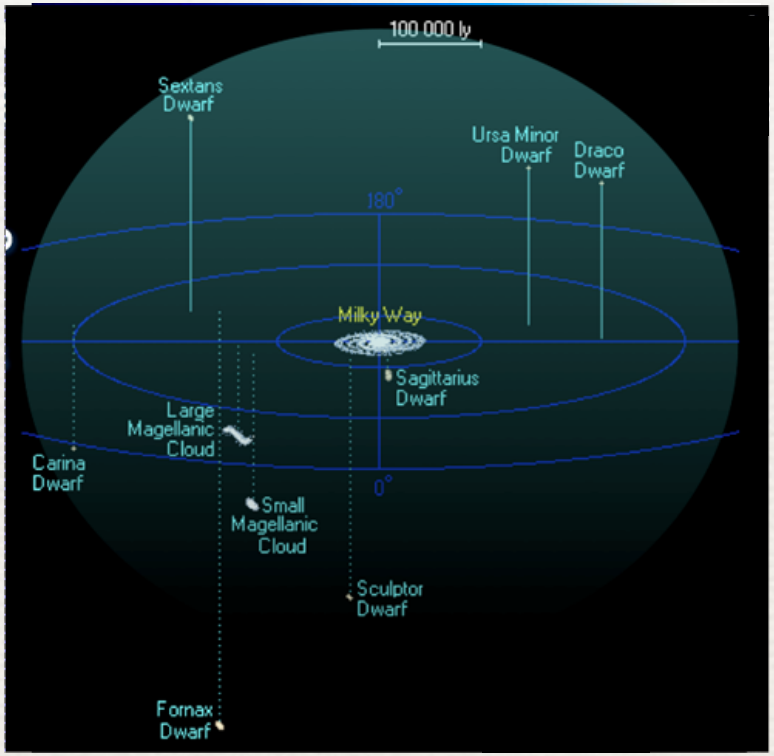
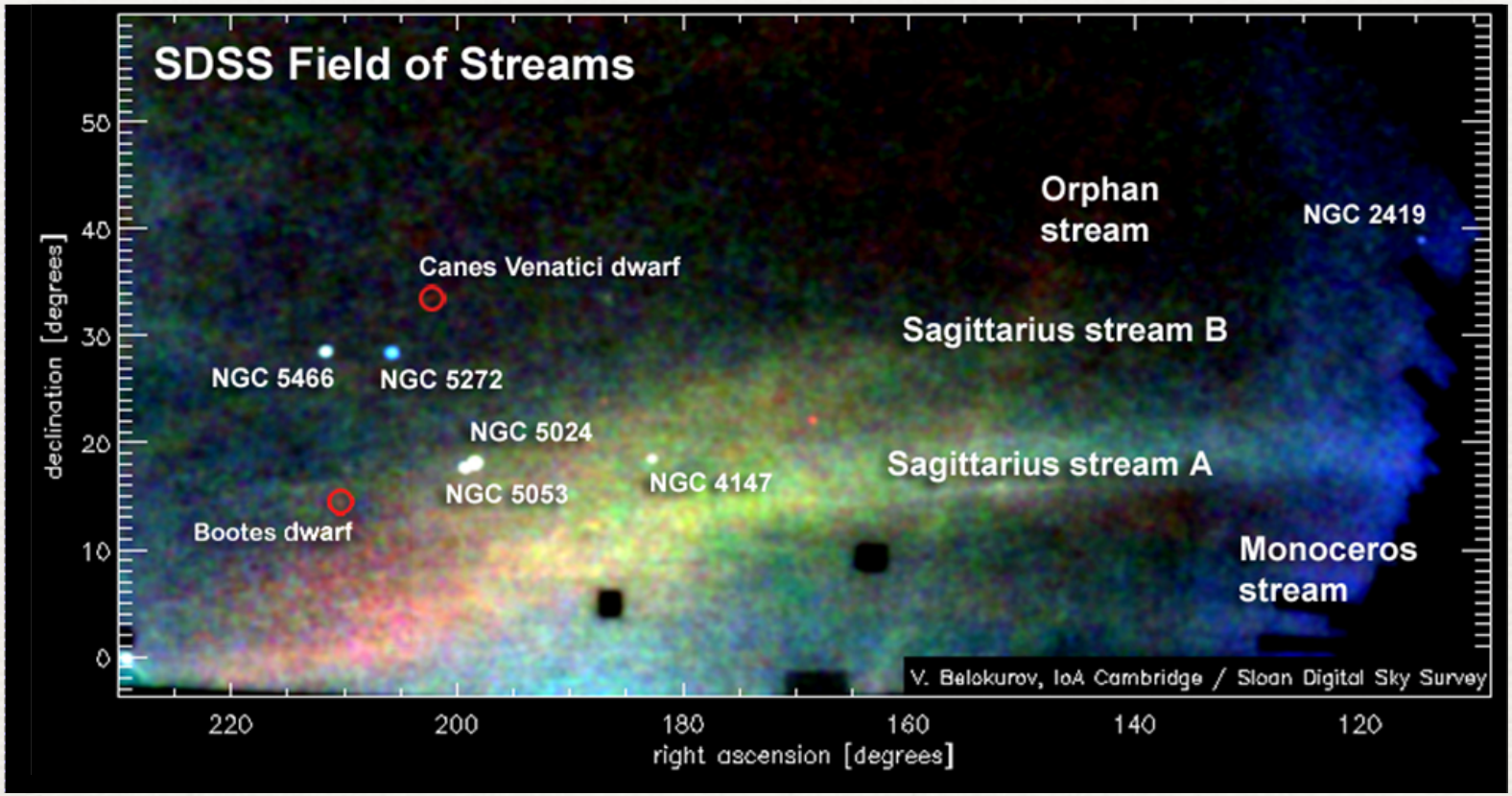
Resolved Stellar Populationswith the ODI Survey



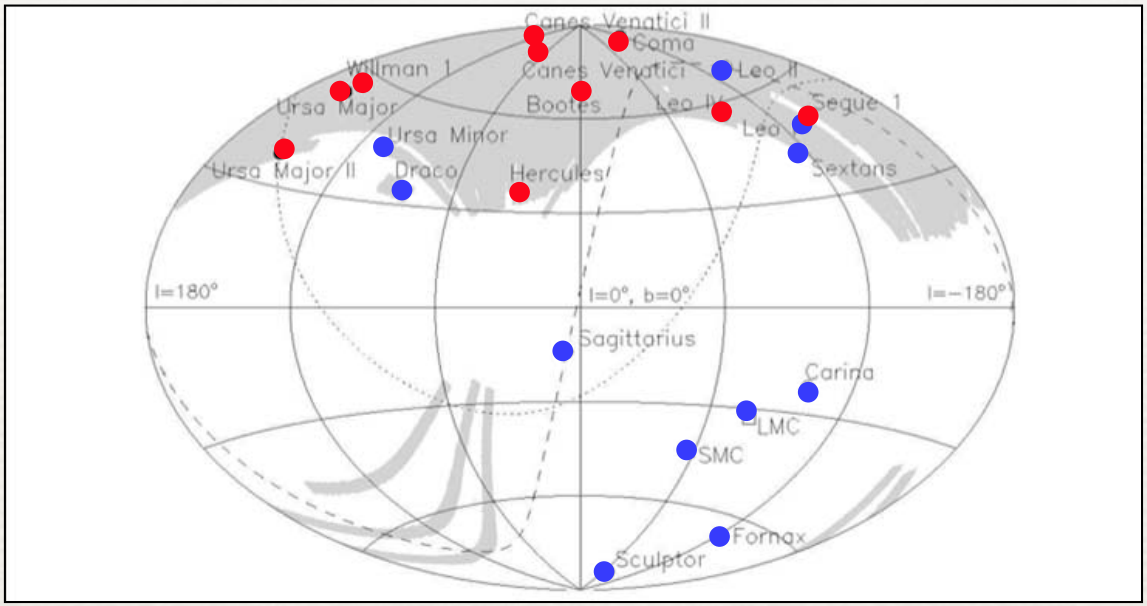
Marla Geha (Yale)

Milky Way Field of Streams



The Milky Way Dwarf Galaxies

Sloan Digital Sky Survey (SDSS) coverage



2009 Milky Way Census Data:

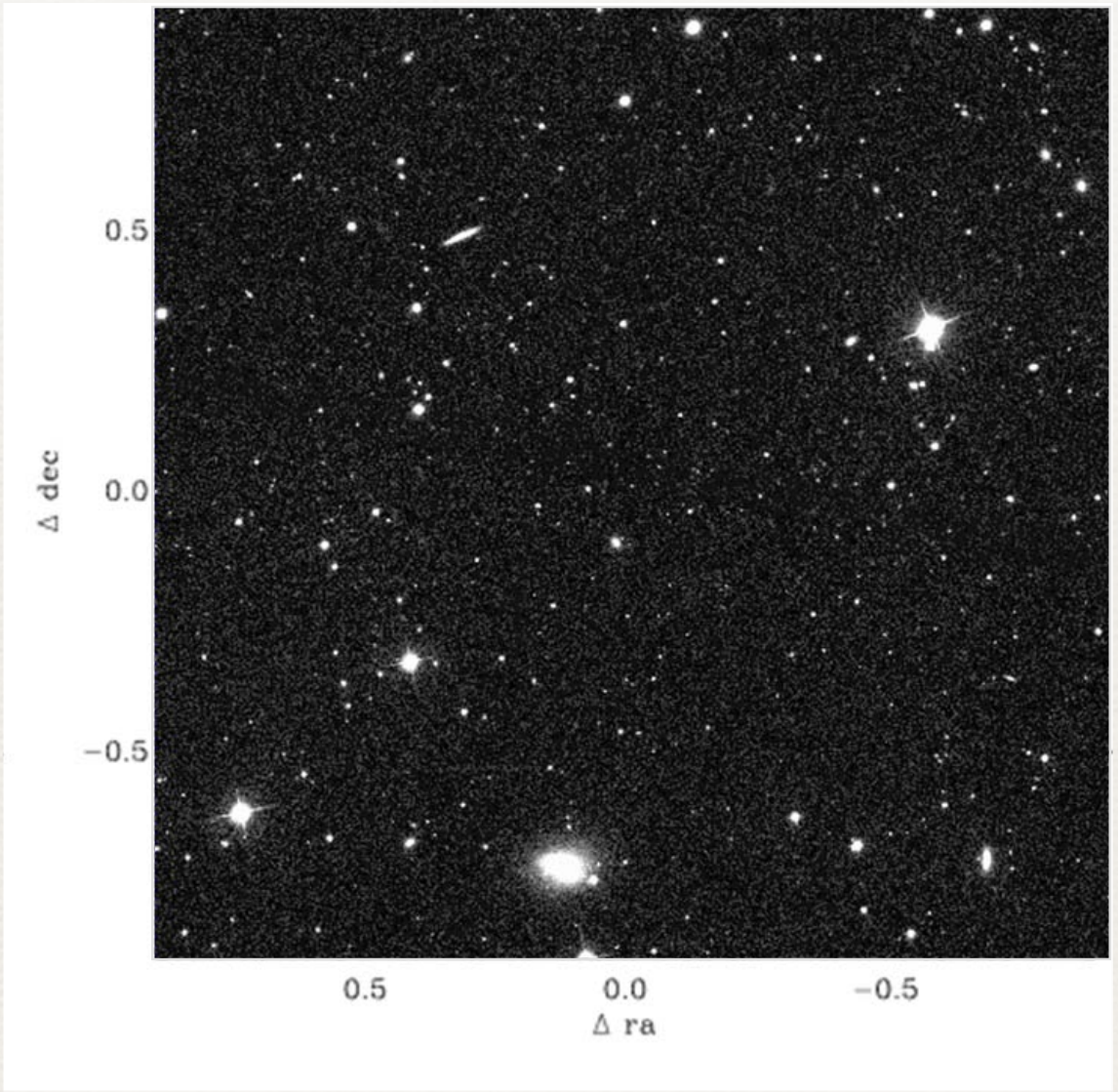
- Classical dSphs = 11
- Ultra-Faint dSphs = 14

SDSS magnitude limits restrict the search for the faintest dwarfs to 50 kpc in distance.

Willman et al (2005a,b) Zucker et al (2006a,b), Belokurov et al (2006a,b,2009), Irwin et al (2007),Walsh et al. (2007)

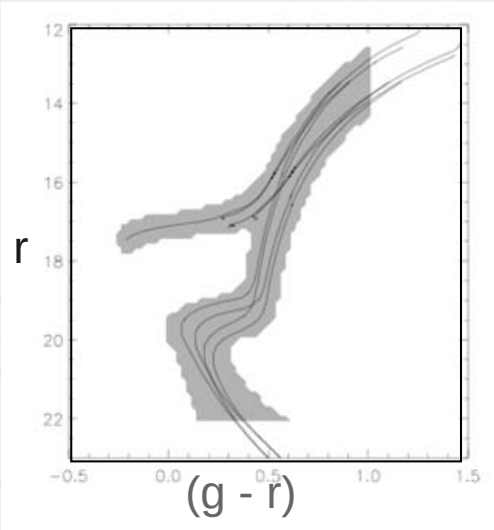
Finding the Milky Way Ultra-Faint Galaxies

The ultra-faint galaxies are found via over-densities of resolved stars.

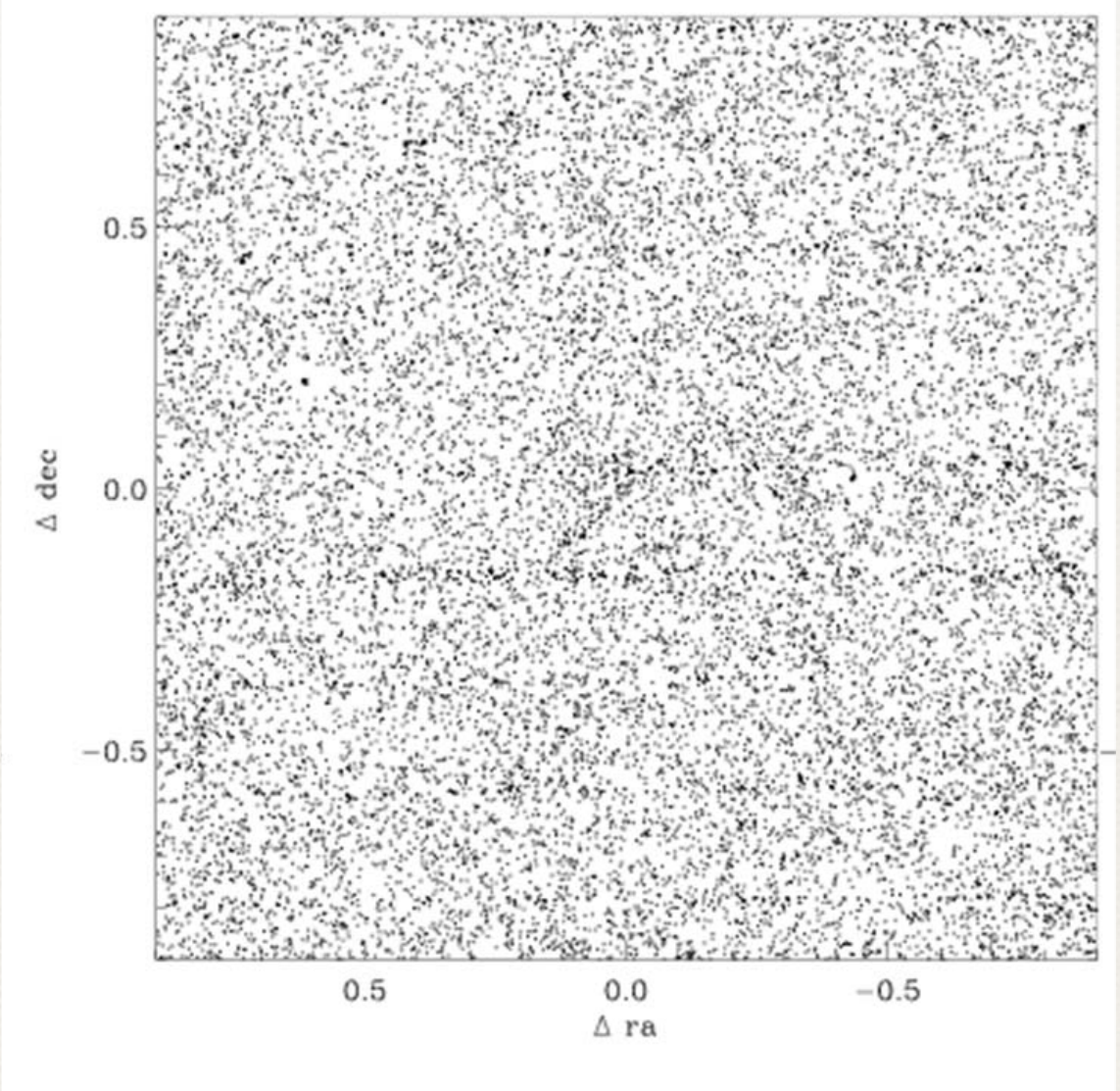


Finding the Milky Way Ultra-Faint Galaxies

Apply CMD filter to star count maps, search for over-densities.

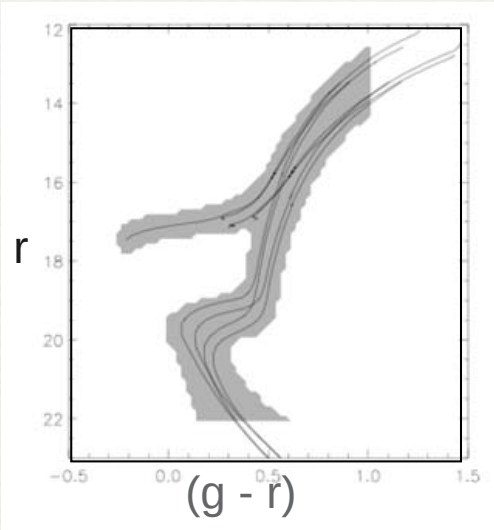


Full Star Counts

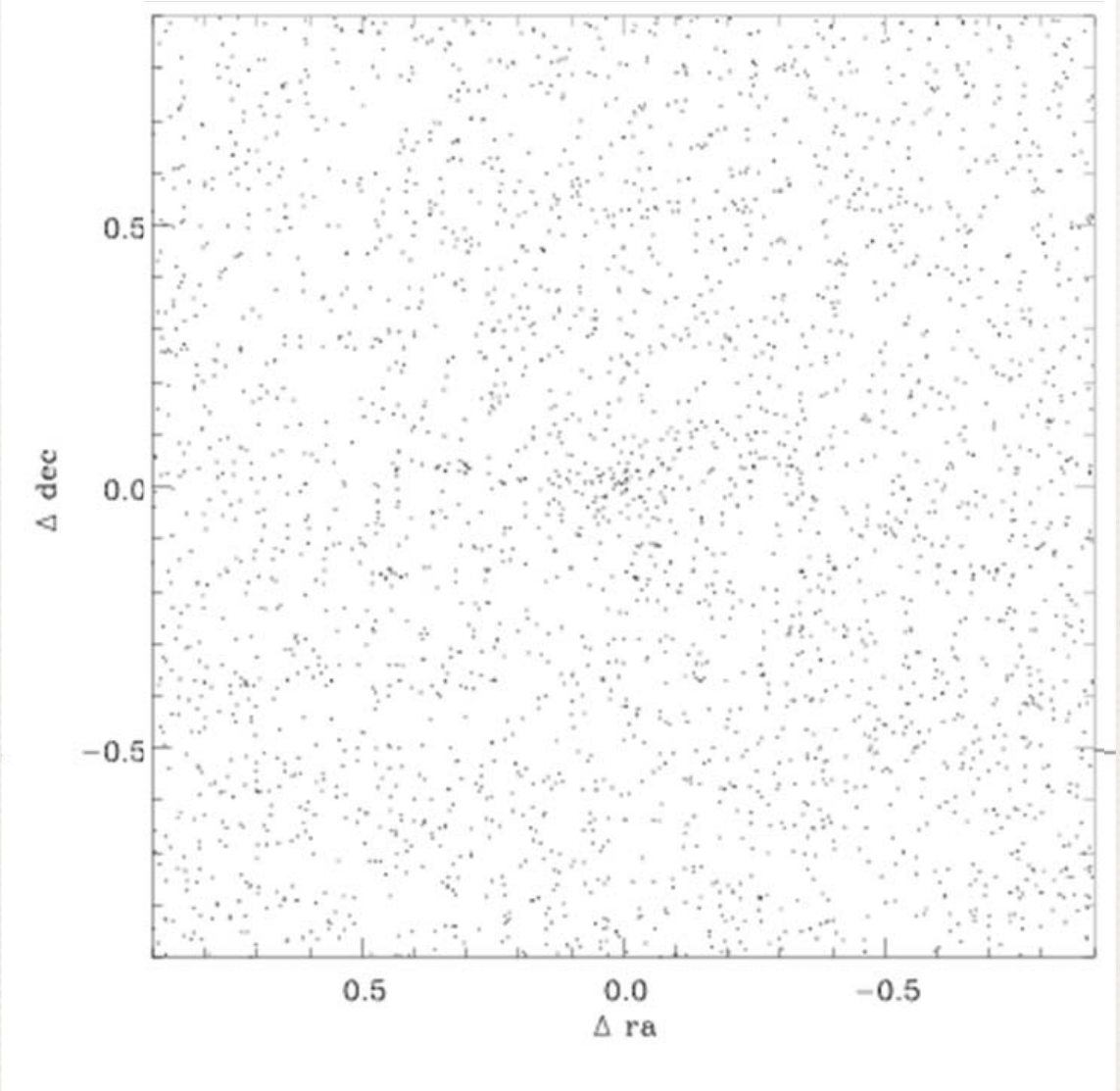


Finding the Milky Way Ultra-Faint Galaxies

Apply CMD filter to star count maps, search for over-densities.

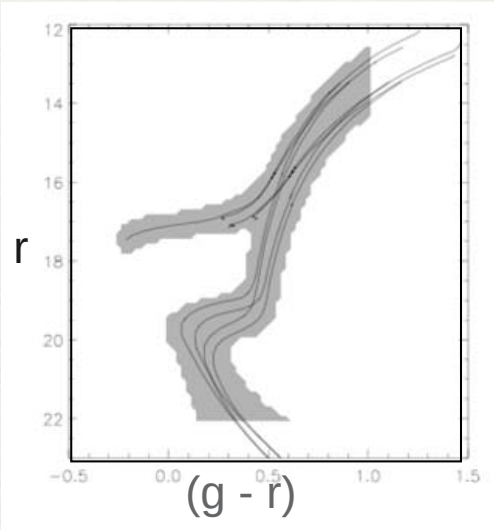


Filtered CMD Stars

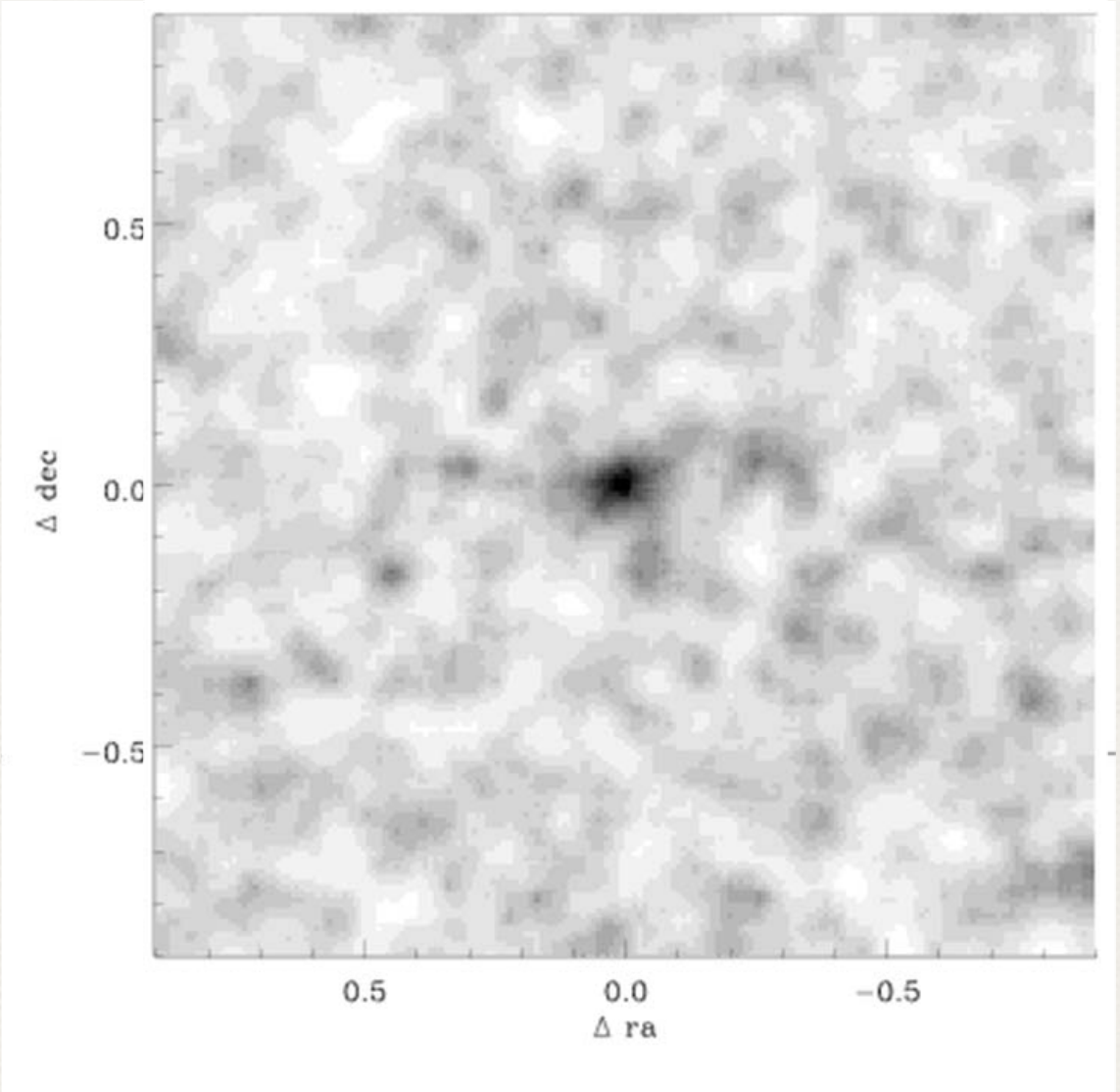


Finding the Milky Way Ultra-Faint Galaxies

Apply CMD filter to star count maps, search for over-densities.

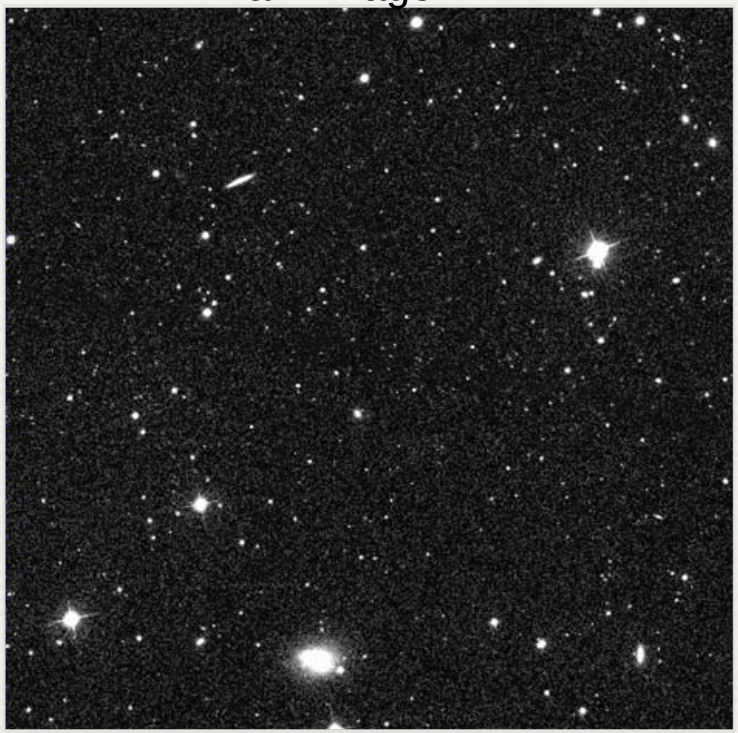


Filtered+Smoothed



Finding the Milky Way Ultra-Faint Galaxies

Raw Image

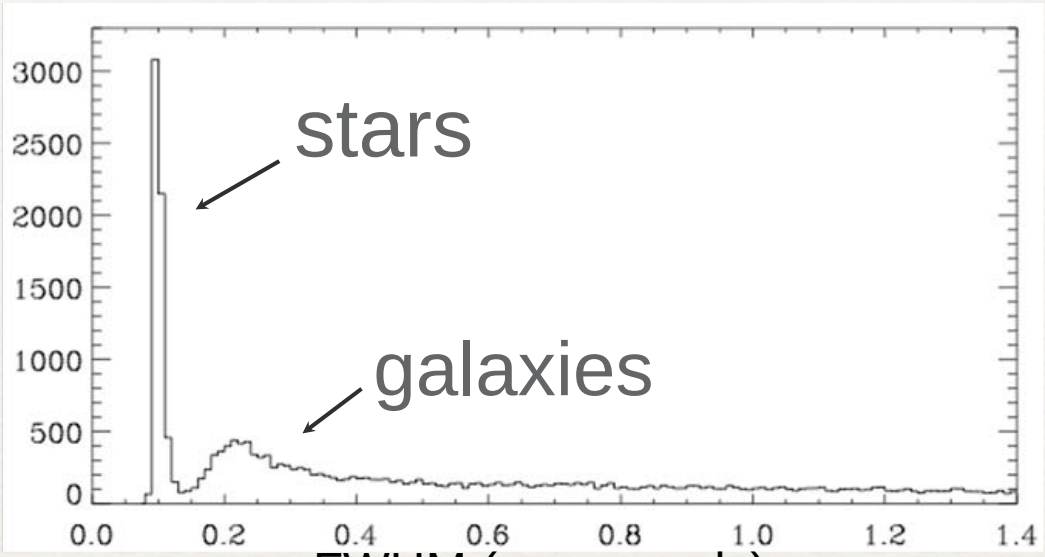


Member Stars only

In SDSS, need to filter out foreground MW stars.

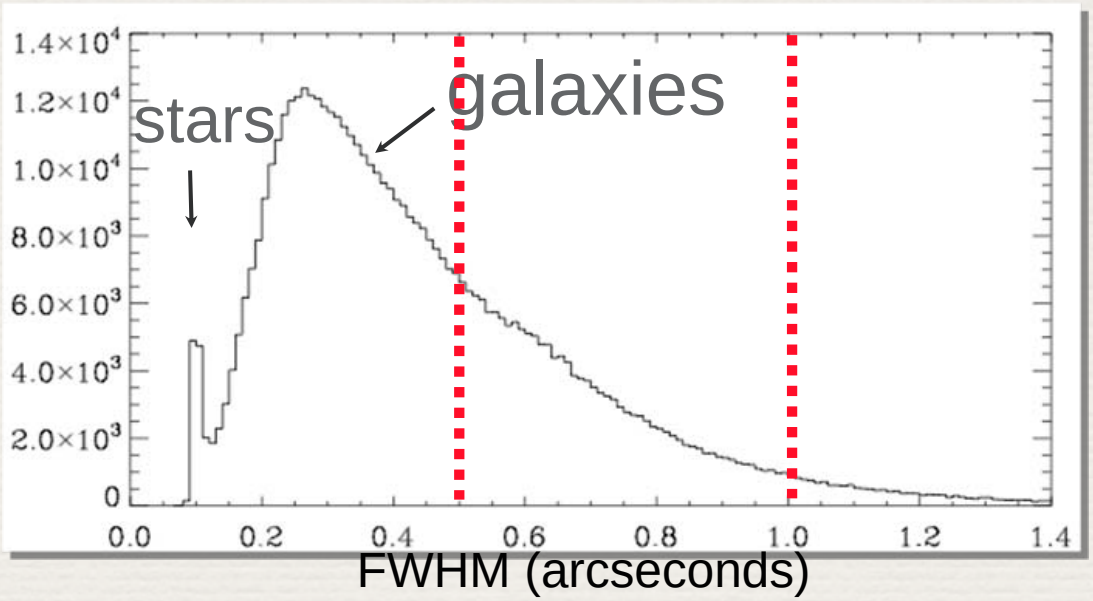
For ODI, need to separate background galaxies.

Galactic Science with ODI



N_{obj}

SDSS depths
r < 23



N_{obj}

ODI depths
25 > r > 23

Galactic Science with ODI

The ODI Survey will be a “pencil beam” survey through the Milky Way Halo.

Open Questions

We will require photometric redshifts to separate stars from galaxies.

This is *different* from the requirement of accurate photometric redshifts.

Depth vs. area?