Stellar Opportunities with BigBOSS

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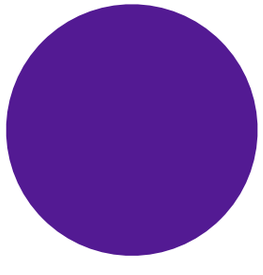
with great ideas from the participants in the
NOAO BigBOSS Community Workshop
Galactic chair, M. Geha

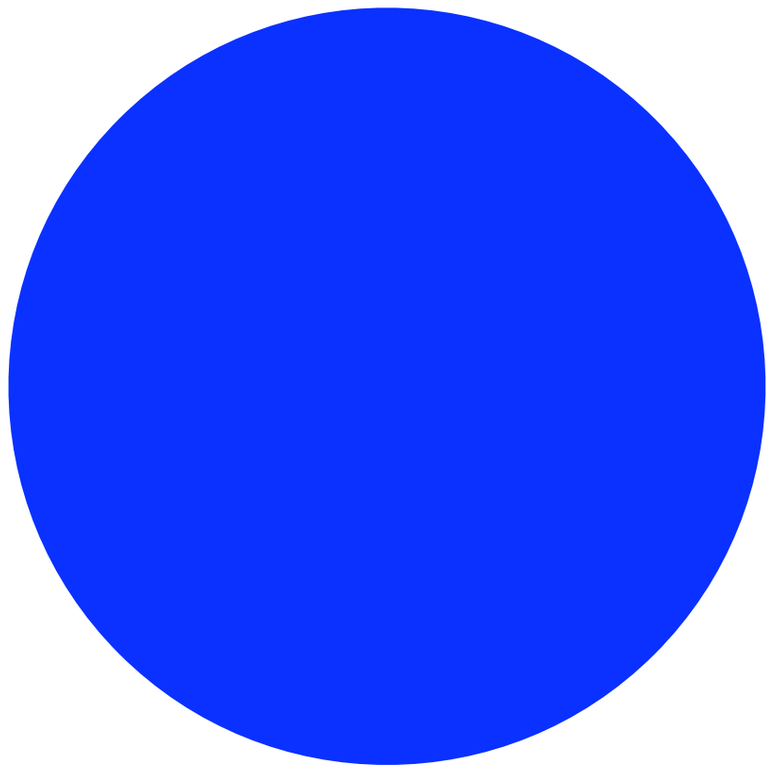
Area Matters

and is a unique opportunity for stellar, Galactic and Local Group science with BigBOSS

GMOS-N
5 x 5 arcmin FoV
~30-60 objects



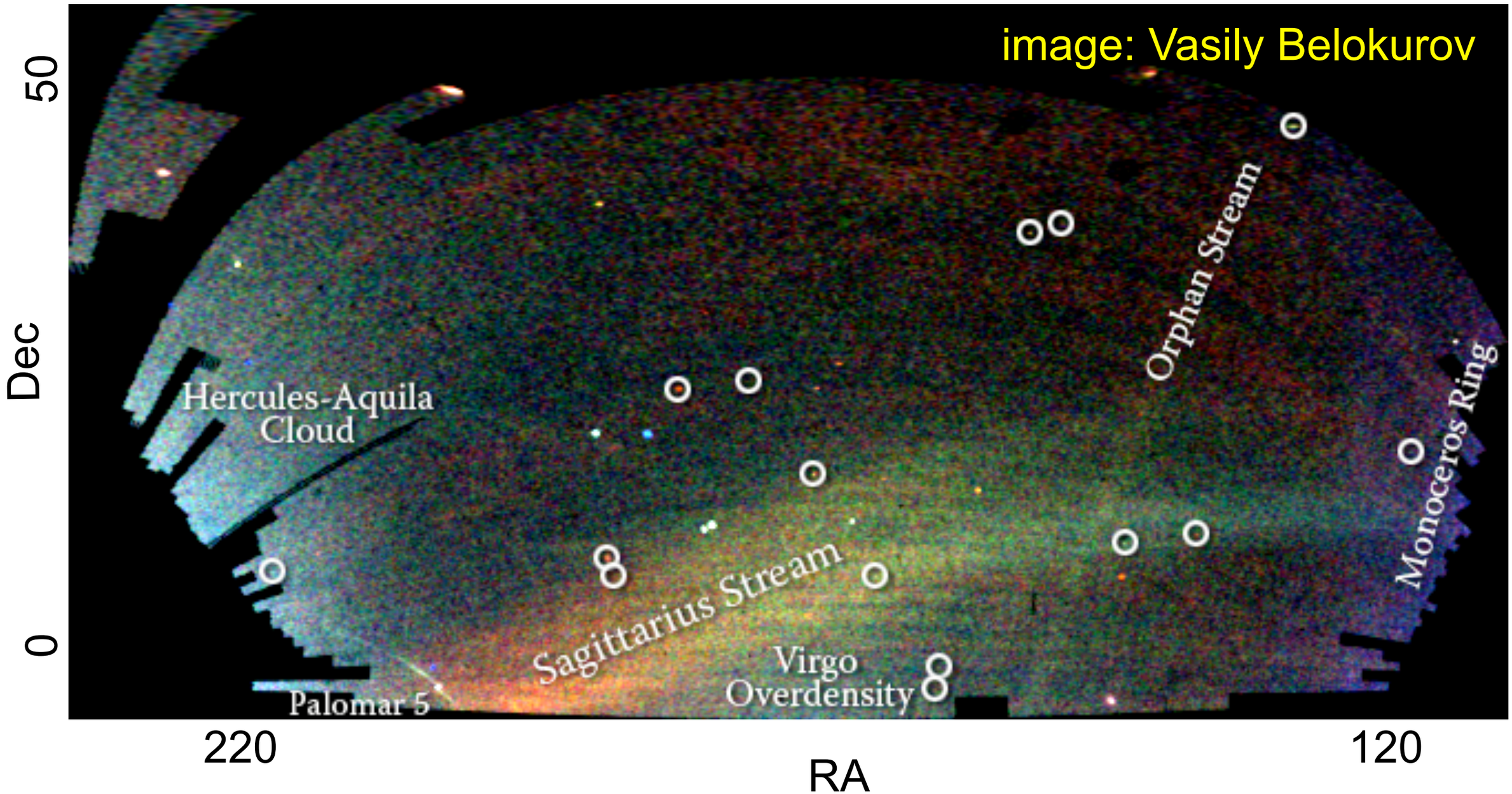
Hydra
1º dia FoV
93 objects



BigBOSS 3º dia. FoV
5000 fibers

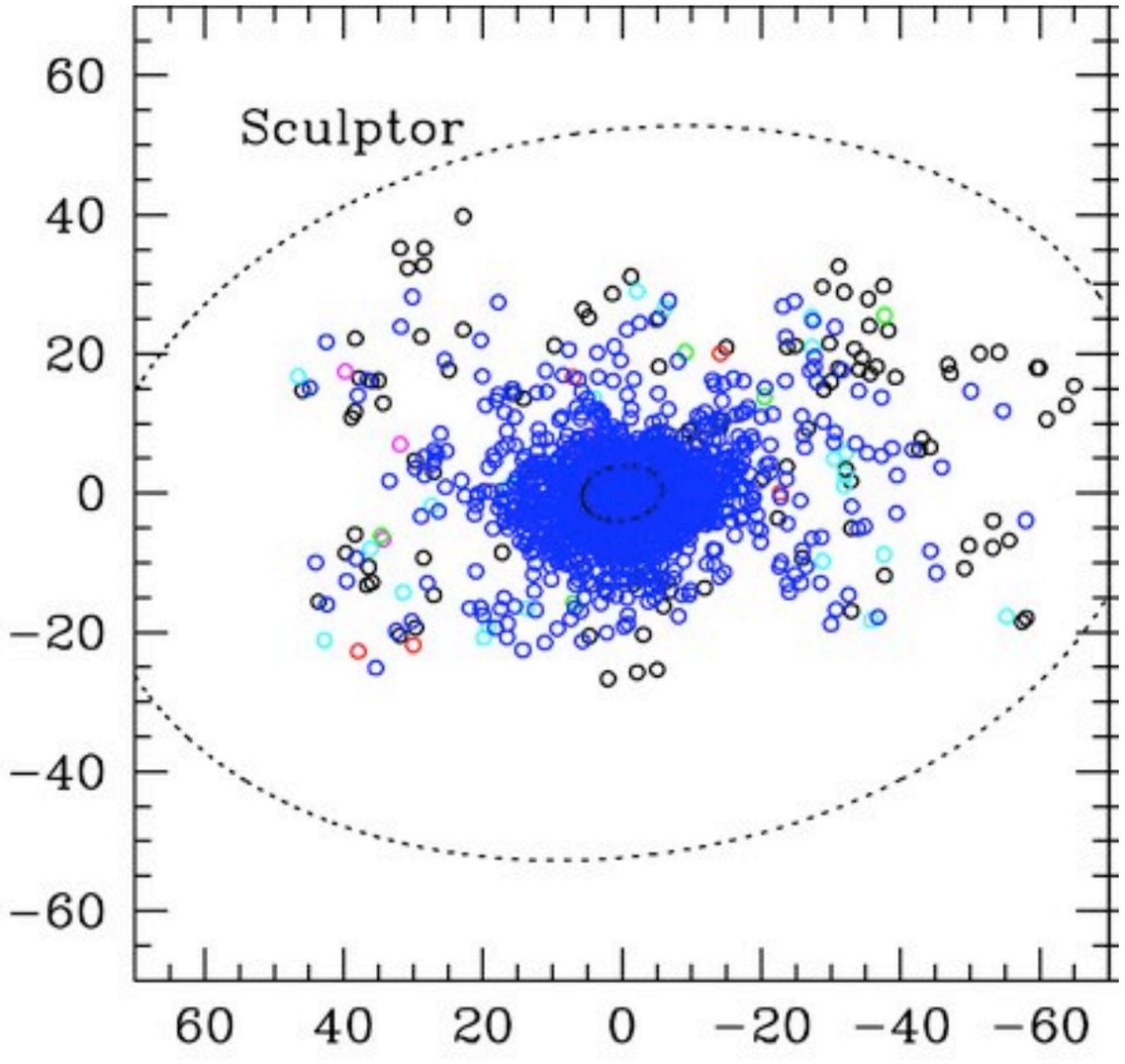
Substructure features in the disk and halo span many degrees on the sky

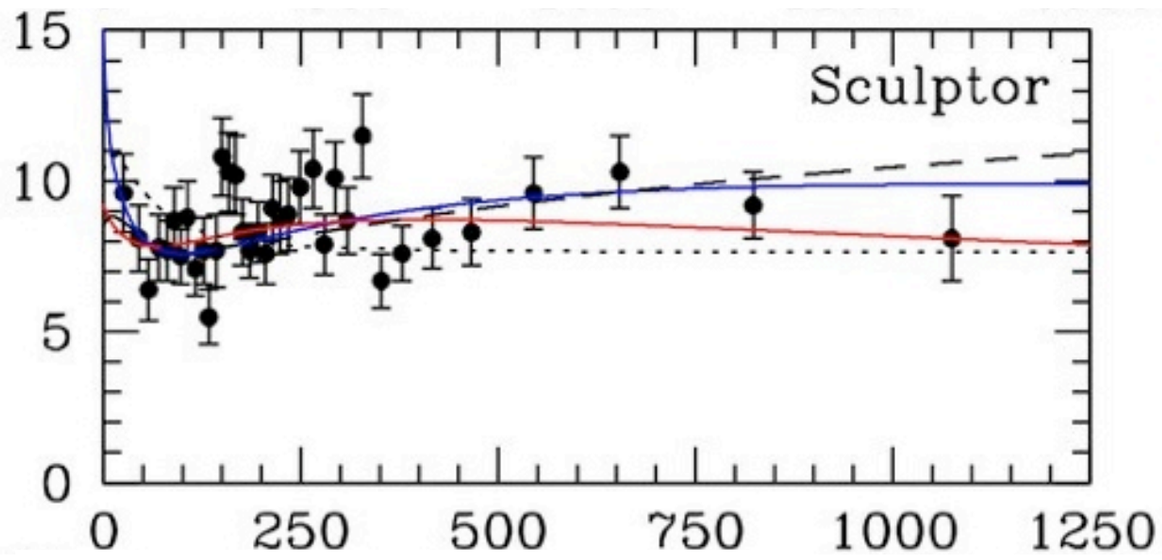
Well matched to BigBOSS FoV



Masses of MW dSph: need rare stars at large radii

Use BigBOSS fibers over large area to separate members from background





Walker et al. 2009

BigBOSS field centered on Sculptor is off slide!

Example Targeted Mode Projects

Projects that match the fiber density and field size

Shared focal plane among projects?

Synchronous mode for PI observations, too?

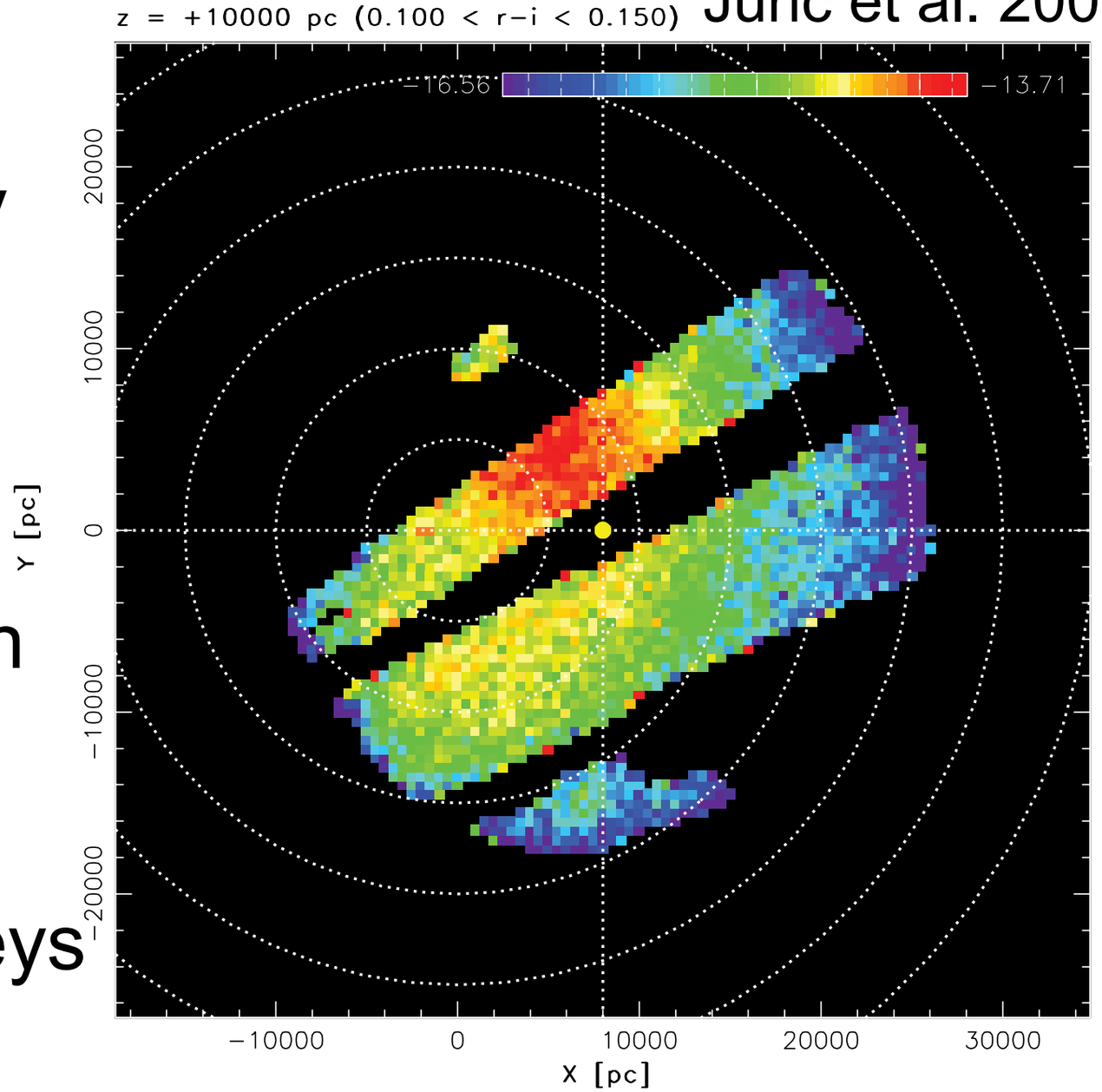
- Open clusters and young associations
  - nearby associations span degrees on the sky

Hyades
7º field

Example Targeted Mode Projects

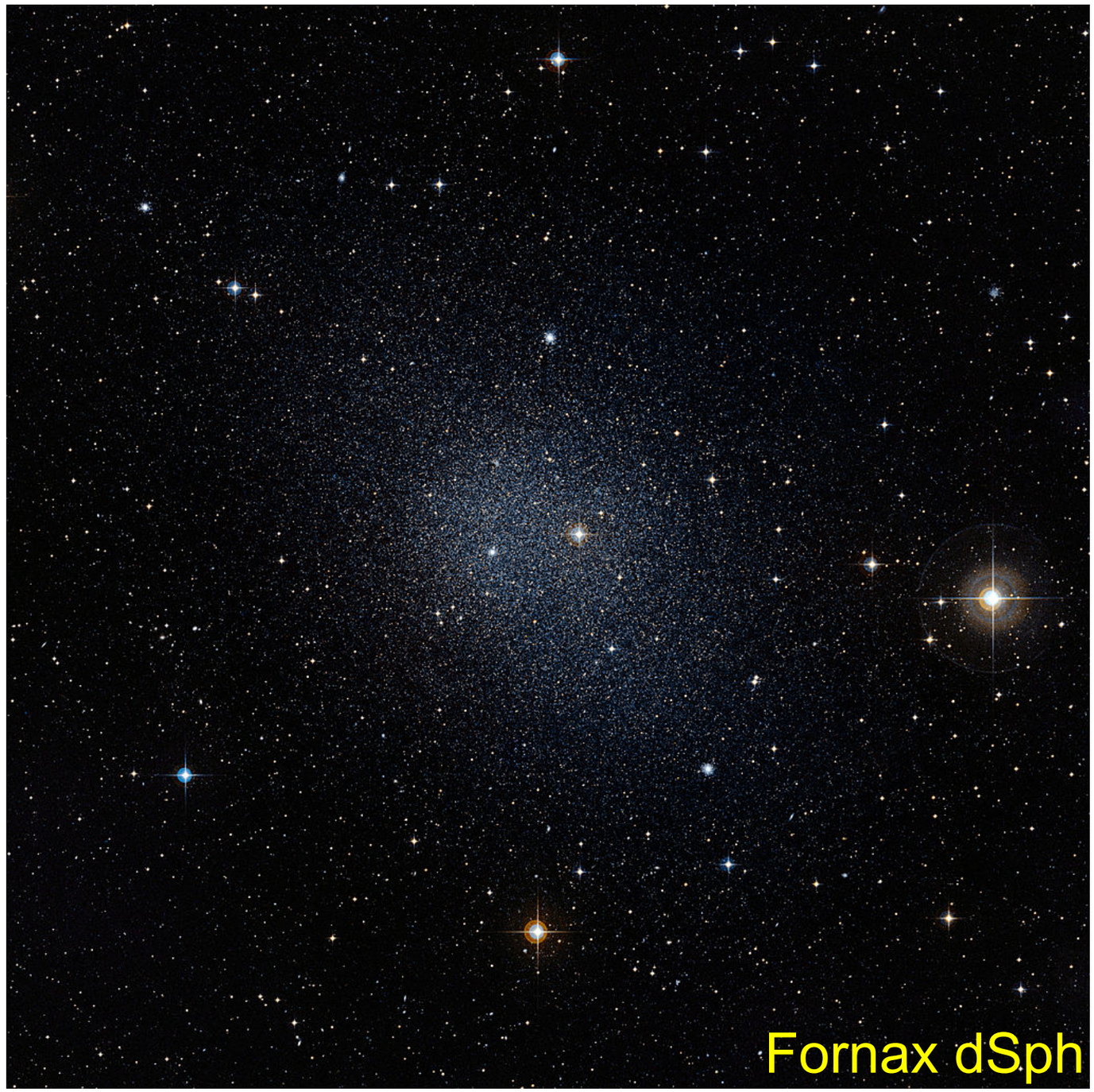
- Surveys of known MW substructure
  - radial velocity, metallicity information
  - map bulk and random velocities, spatial density structure and extent
  - stellar population information
  - already more known than we can follow up with existing instruments
  - Gaia, new imaging surveys are coming!

Jurić et al. 2008



Example Targeted Mode Projects

- Resolved stellar spectroscopy of dSph galaxies
  - stellar density profiles, dynamical masses, stellar population information
- Search for stars in the Magellanic Stream
  - high risk, high reward



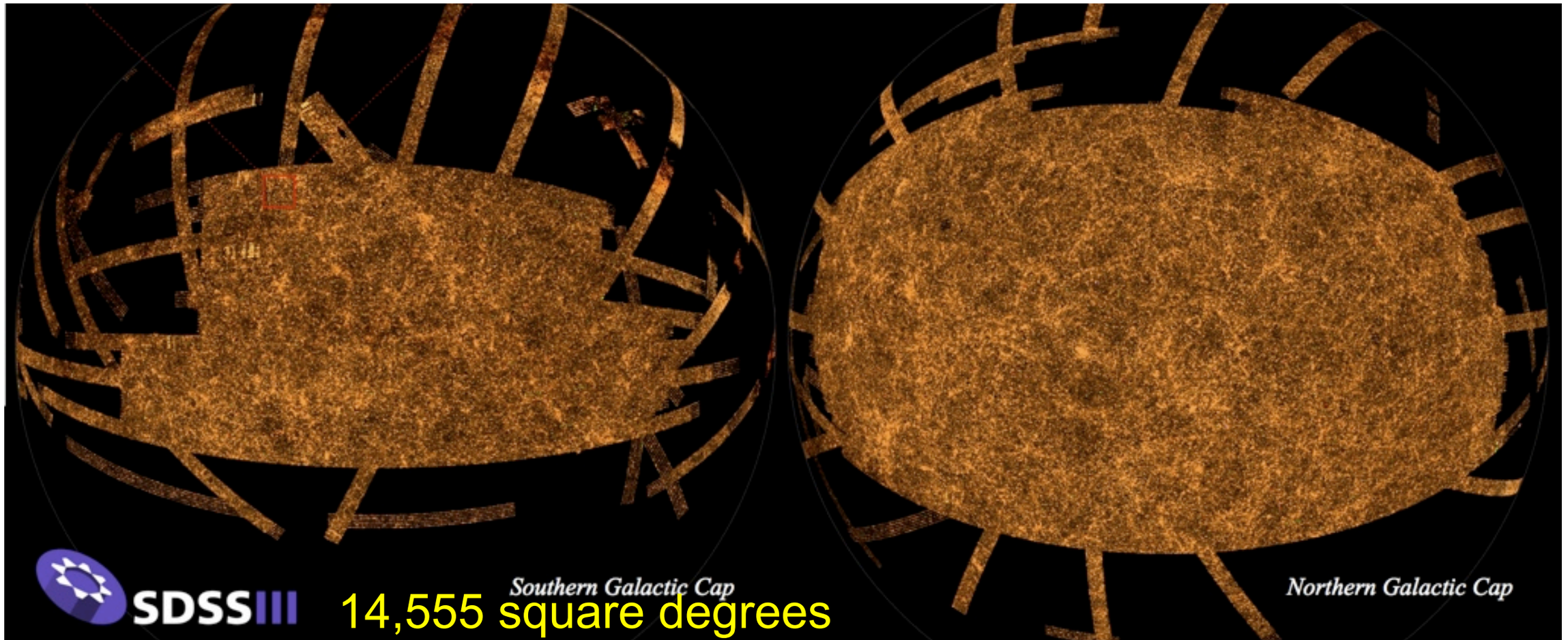
Example Targeted Mode Projects

- M31

- deep, 3-hour pointings to ID halo RGB stars, measure velocities
  - demanding for sensitivity
- Single pointing in central region
  - bright HII regions and OB associations
  - fill fibers with RGB candidates

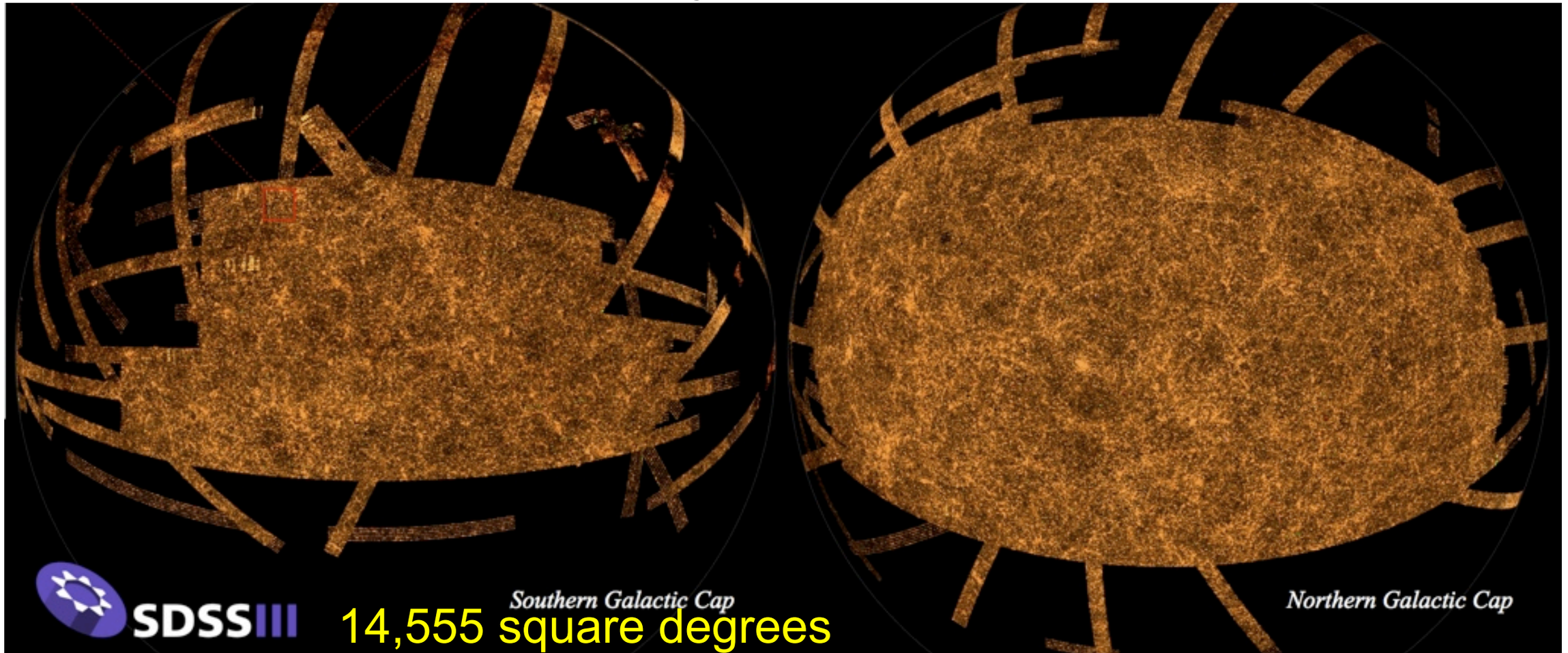
Synchronous observing

- 10% - 20% of 5000 fibers in 7 square degrees
- compare the SDSS: 640 fibers in 7 square degrees
- 14,000 square degrees in the BB survey
- simultaneous with the cosmology survey, the BigBOSS survey will also be a survey > the SDSS in area and number of fibers for the astronomical community to fill



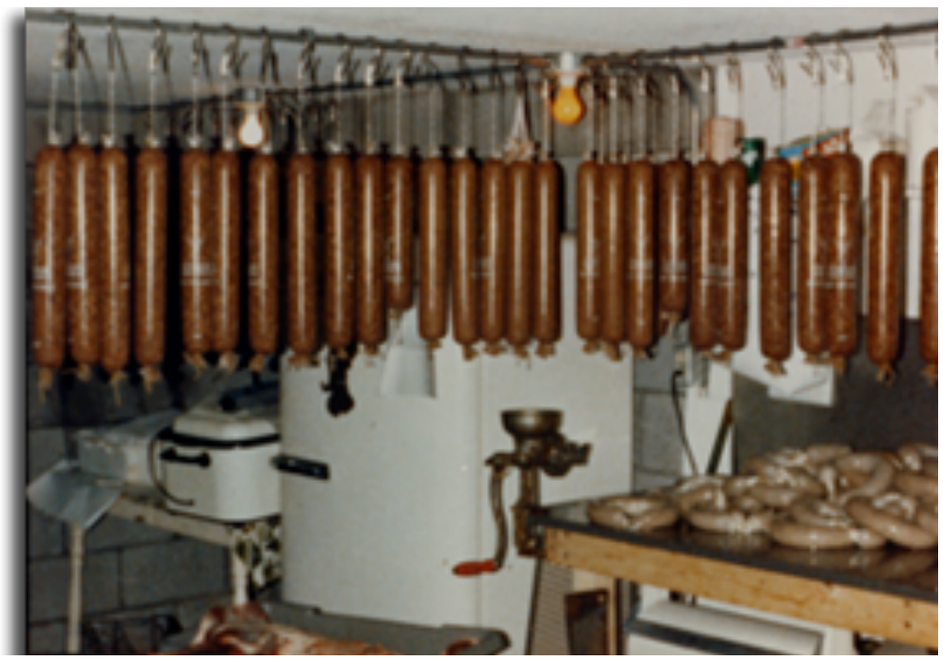
Synchronous observing

- a unique opportunity for rare objects that can’t use multiplex advantage
- create large samples from a few fibers per square degree over 14,000 square degrees of BigBOSS
- BHB, RGB candidates in the stellar halo
- white dwarfs, extremely metal poor star candidates, ...



How to seize this Stellar Opportunity

- Engage with BigBOSS team on technical concerns:
- Wavelength calibration, blue response, dynamic range of targets for synchronous mode
- Projects need to happen from the beginning so the PIs are engaged before the BigBOSS pipeline team moves on
- Fiber assignment: rare synchronous targets vs. large candidate pools + BigBOSS survey efficiency requirements:



There will be some sausage-making, we'll have to help cook...

...but the results should be a feast!