

Science Discussion groups

- What can HI do uniquely?
- What can HI do that is critical for multiwavelength studies?
- Surveys vs PI-projects
- Commensal observing
- Full cost accounting:
 - Human resources
 - Data management/processing/distribution

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Evolution of Galaxies through the HI Window
February 1-3, 2008

Science Discussion groups

- Dark ages science/EOR ($z > 6$)
- High redshift galaxies ($z > 0.5$)
- Intermediate redshifts (0.25 -0.5)
- Cosmic web, local DLAs
- HI mass function
- HI \Leftrightarrow SF connection
- DM Halo \Leftrightarrow galaxy connection
- Near-near field: Milky Way/Local Group

Not one survey!

- Survey depth: BOTH rms and redshift \Leftrightarrow need to match.
- At low z , need to build volume by covering solid angle vs higher z , need to go deep/long integration.
- Dwarf galaxies, detected nearby, need high spectral resolution vs redshift surveys which don't.
- 99% of ALFALFA detections above $10^{9.4} M_{\odot}$ have an optical counterpart \Rightarrow targeted surveys vs blind
- Detection (catalog targets) \Rightarrow Characterize
- Absorption not dependent on z .
- "Survey speed" is not single metric; not all observations are surveys (at least at the beginning...).
- John is right!

Practical challenges to "US"

- Need **well defined survey** science requirements
 - What surveys are needed to do what science?
 - Design surveys to optimize science
 - Mechanisms to prioritize/coordinate
- Need to understand **resource requirements** of surveys
 - Survey results must be delivered on optimal schedule
 - Observing team support & software development
 - Automation + quality assurance
 - Data management, archiving, data products, access

Data volumes are huge!
- **R&D** for **RFI** mitigation/identification/excision
- Timely and convenient delivery of data products to public archive
 - Permanent **curation**/delivery
 - Public access tools; visualization tools
- How to **engage and energize the community** at large?!