ALFALFA, a Legacy Survey

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The Arecibo Legacy Fast ALFA Survey

Main People Science Schedule Data Documentation Links Publications Undergrads
Non-experts News/Events Observing/Data Team

Overview

Check out the ALFALFA blog!

Arecibo is the world's most sensitive radio telescope at L-band. In addition to that all-important sensitivity advantage, Arecibo equipped with ALFA offers important and significant improvements in angular and spectral resolution over the available major wide area extragalactic HI line surveys such as HIPASS and HIJASS. To break ground into new science areas, extragalactic HI surveys with ALFA must exploit those capabilities to explore larger volumes with greater sensitivity than have the previous surveys. The lowest mass objects will only be detected nearby; wide areal coverage is the most efficient means of increasing the volume sampled locally. An extragalactic survey covering the high galactic latitude sky visible from Arecibo will produce an extensive database of HI spectra that will be of use to a broad community of investigators, including many interested in the correlative mining of multiwavelength datasets; we thus dub this program the *Arecibo Legacy Fast ALFA* survey: ALFALFA. A comparison

http://egg.astro.cornell.edu/alfalfa

ALFALFA

ALFALFA: 35% dataset

"Spring"

RA: 07h40m to 16h30m

Dec: +04deg to +16deg, +26 to +28 deg

Solid Angle: ~1800 sq deg

RG et al. 2007; Kent et al (2008); Stierwalt et al. (2009, AJ) + …

"Fall"

RA: 22h00m to 03h00m

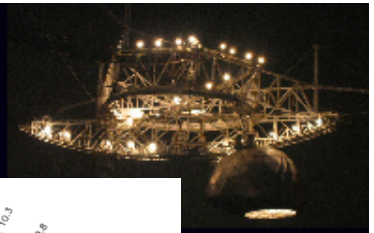
Dec: +14deg to +16deg, +24deg to +32deg

Solid Angle: ~750 sq deg

Saintonge et al. (2008); Martin et al. (2009, ApJS) + …

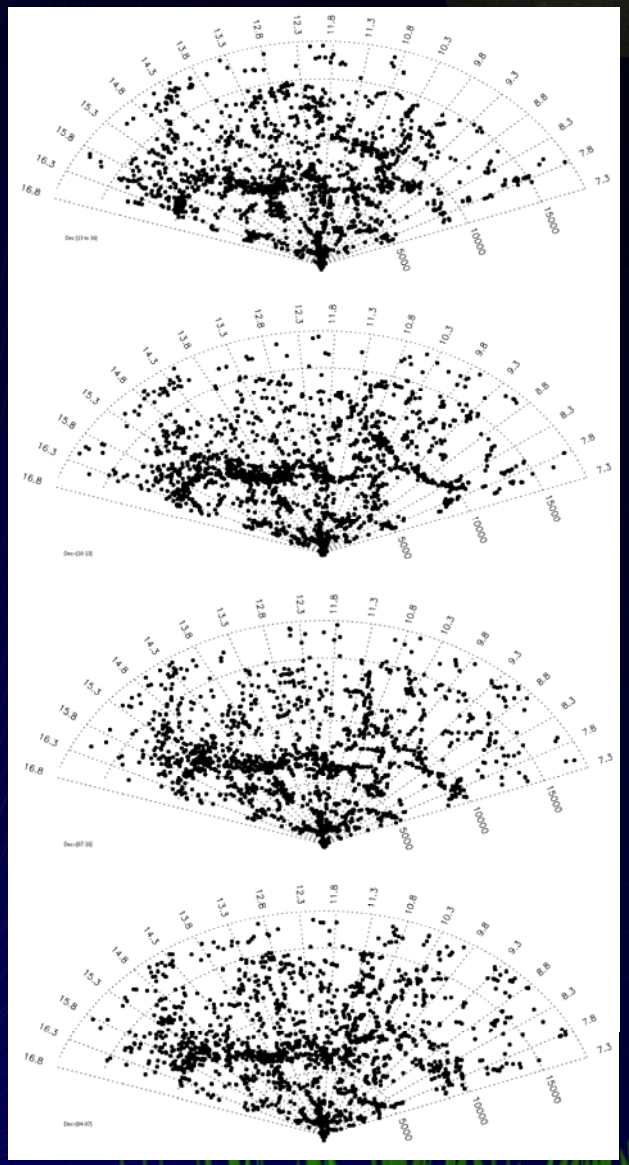
ALFALFA

ALFALFA 2009 = 35%



- Spring + Fall regions now yield first comparison of high vs low density in nearby universe (but significant volume)
- 12000 good quality detections over 2400 sqd
- Very few massive HI clouds w/out OC => where there is a lot of HI, stars form
- But some tidal debris, extended disks, other surprises.

We can now *begin* to do cosmology
A. Martin *et al.* (in prep)
We now predict ~25000+ detections.

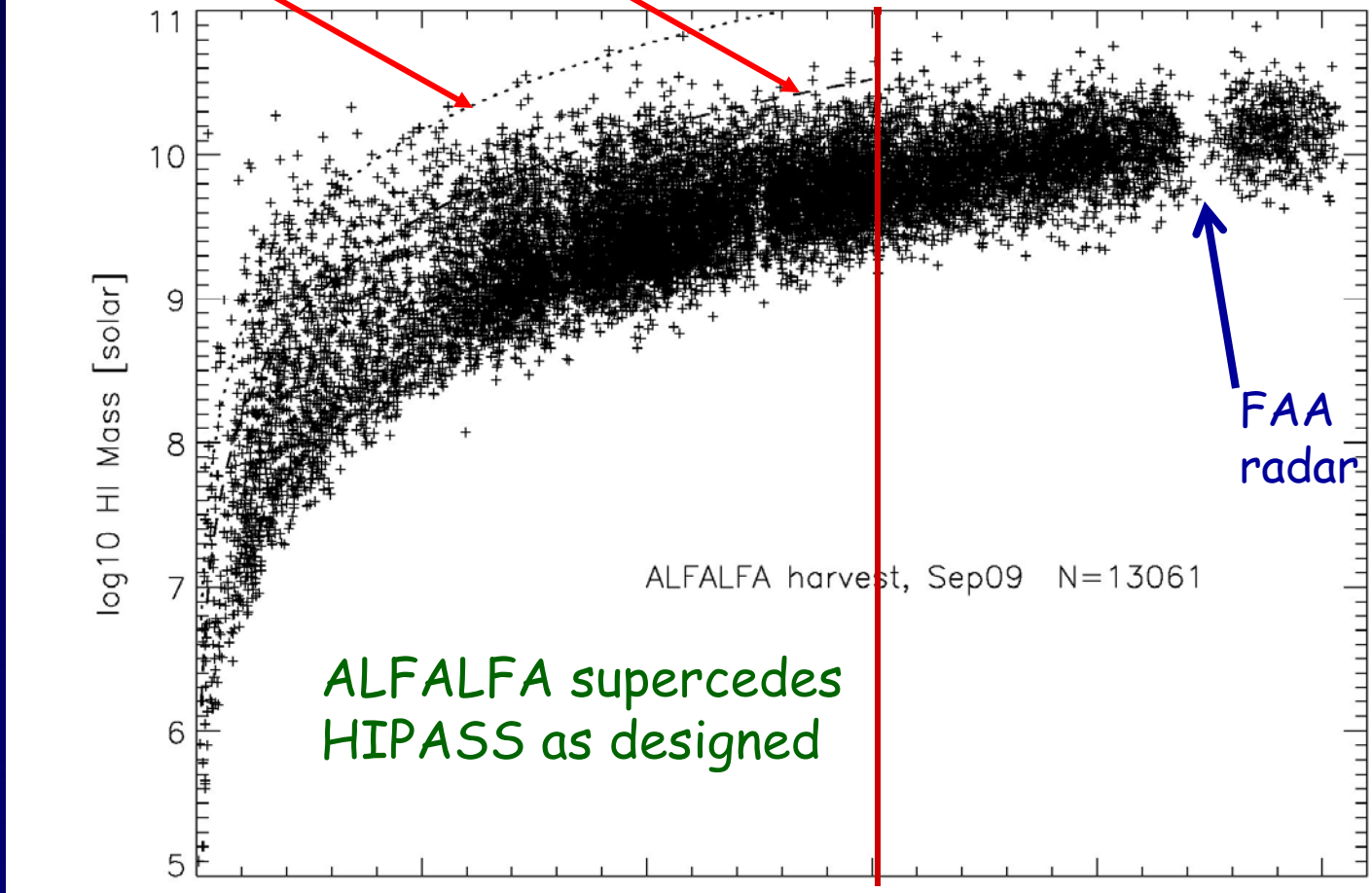


ALFALFA

HIPASS Completeness Limit

HIPASS Limit

HIPASS bandwidth



ALFALFA supercedes HIPASS as designed

ALFALFA

ALFALFA: 2009 status

"Spring"

RA: 07h30m to 16h30m, except now: 09h15m to 15h30m
Dec: 0deg to +36deg
Observations complete: 0 to +16deg, +21 to +32 deg
Flagging complete: +00 to +16deg, +24 to +28deg
+28 to +30deg (in progress)
Currently catalogued: +04 to +16deg, +26 to +28 deg
+24 to +26 (in progress)

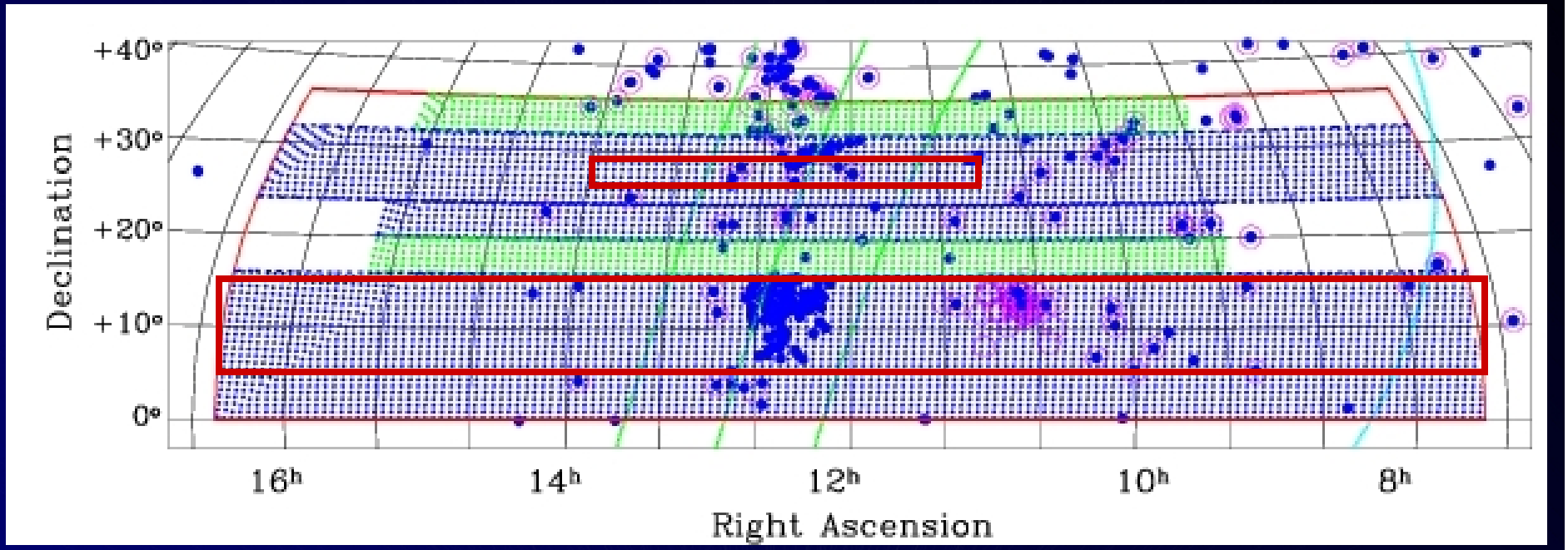
"Fall"

RA: 22h00m to 03h00m
Dec: 0 deg to +36deg
Observations complete: +00 to +16deg, +24 to +32deg
Flagging complete: +06 to +08, +10 to +16, +24 to +32
+00 to +02 (in progress)
Currently catalogued: +14 to +16 deg, +24 to +32deg
+06 to +08, +10 to +14 (in progress)

ALFALFA

ALFALFA: 2009 status

"Spring" region as of end 2009



- Restriction imposed 2009 to 9h15-15h30
- Hope to complete in spring 2010 (!)

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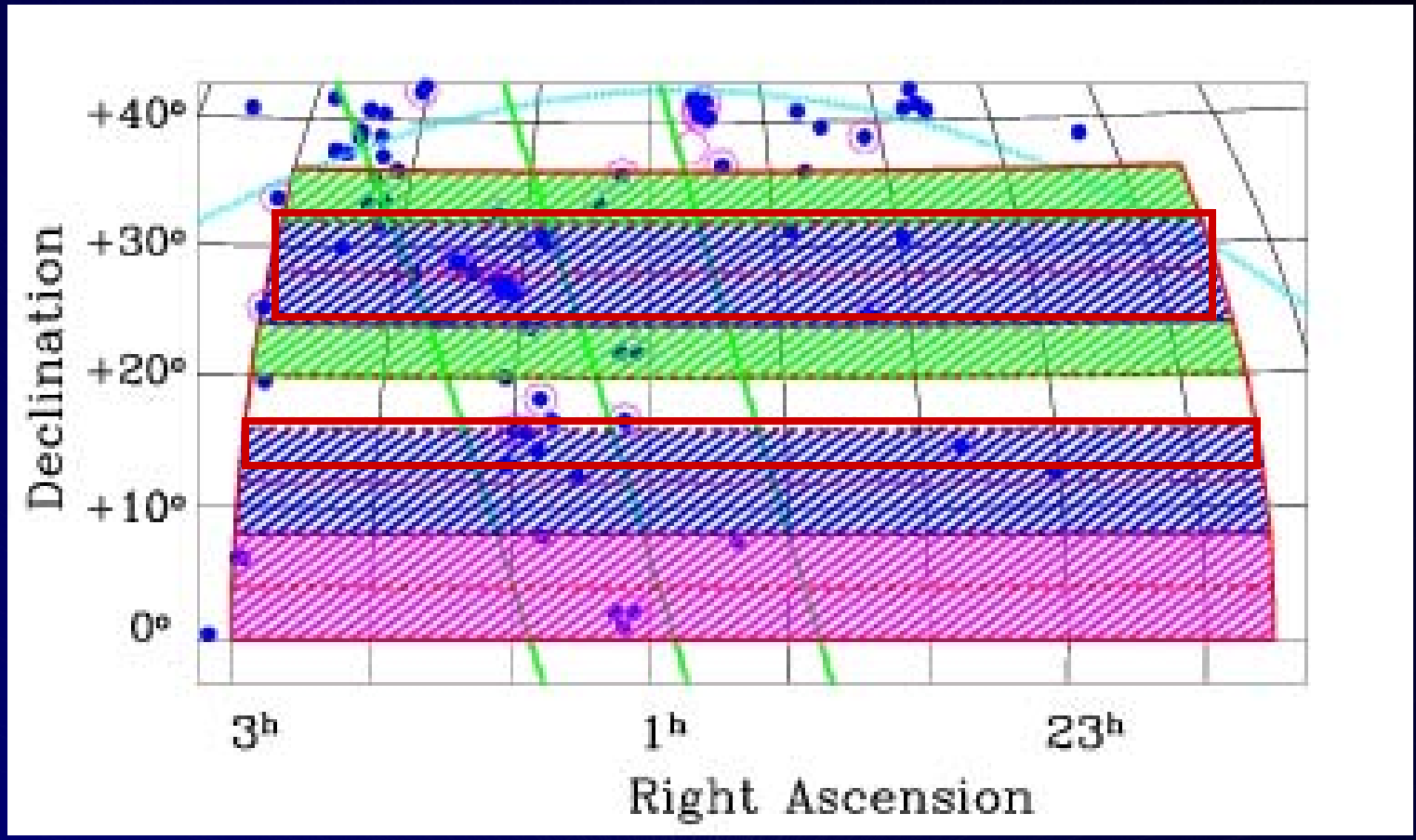
ALFALFA: 2009 status

"Fall" region as of end 2009



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ALFALFA Ph.D. Theses

Grad	Institution	Adviser	Project
A. Saintonge	Cornell	Giovanelli	Low mass halos, voids
B. Kent	Cornell	Giovanelli	ALFALFA/Virgo Cluster
S. Stierwalt	Cornell	Haynes	ALFALFA/Leo Group
J. Dowell	Indiana	Van Zee	HI diameter function
L. Giordano	Zurich	Tran/Moore	Barred spirals
M.-C. Toribio	Barcelona	Solanes	Standard of HI content
A. Martin	Cornell	Haynes	HI mass function/correlation function
O. Spector	Tel Aviv	Brosch	Isolated galaxies
K. Hess	Wisconsin	Wilcots	A1367-Coma supercluster
S. Fabello	Munich	Kauffmann	GALEX-Arecibo-SDSS Survey (GASS)
E. Adams	Cornell	Haynes	HVC and minihalos
S. Huang	Cornell	Haynes	ALFALFA/GALEX
E. Papastergis	Cornell	Giovanelli	GALEX UV Virgo Survey (GUViCS)
D. Stark	North Carolina	Kannappan	ALFALFA/RESOLVE
G. Hallenbeck	Cornell	Giovanelli	TBD

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ALFALFA Undergrad Groups Project

- Investigation of environmental impact on HI content in range of group environments
- Telecons, local meetings to discuss methodology, progress
- Catalogs/grids provided by Cornell team; further analysis undertaken by undergraduates at UAT schools
- Current participants include:
  - Colgate (Tom Balonek)
  - Cornell (Martha Haynes)
  - Lafayette (Lyle Hoffman)
  - St. Lawrence (Aileen O'Donoghue)
  - Siena (Rose Finn)
  - Skidmore (Mary Crone Odekon)
  - Union (Becky Koopmann)
  - U. Wisconsin-Stevens Point (Katie Jore)

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ALFALFA Spin-Off Surveys

- ALFALFA + GASS (D. Schiminovich, Columbia)
  ALFALFA provides HI mass detections for GASS
- ALFALFA + IRAM 30m Key Project (L. Tacconi, MPE)
- ALFALFA + RESOLVE (S. Kannappan, UNC)
  ALFALFA extension to SDSS Strip 92
- ALFALFA as testbed for signal processing techniques for high z HI experiments (M. Morales, U Washington)

+ more in development

ALFALFA