NOVEMBER 14, 2011. – Ordered to be printed

Mr. Rogers, from the Committee of Conference , submitted the following

CONFERENCE REPORT

[To accompany H.R. 2112

...

The Wide Field Infrared Survey Telescope (WFIRST) was identified as the first priority in the recent astronomy and astrophysics decadal survey. NASA should build on the work of the Joint Dark Energy Mission project and should pursue WFIRST to the extent that foreseeable budget resources can accommodate this mission. ...

Kocevski et al. http://www.arxiv.org/pdf/1109.2588

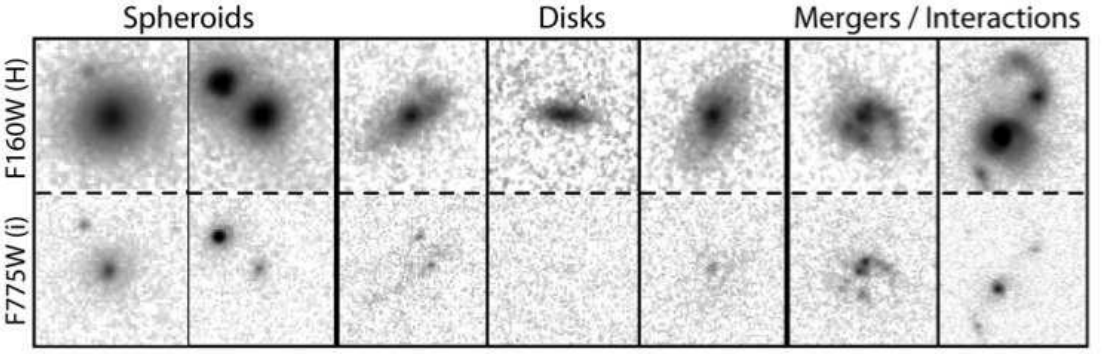
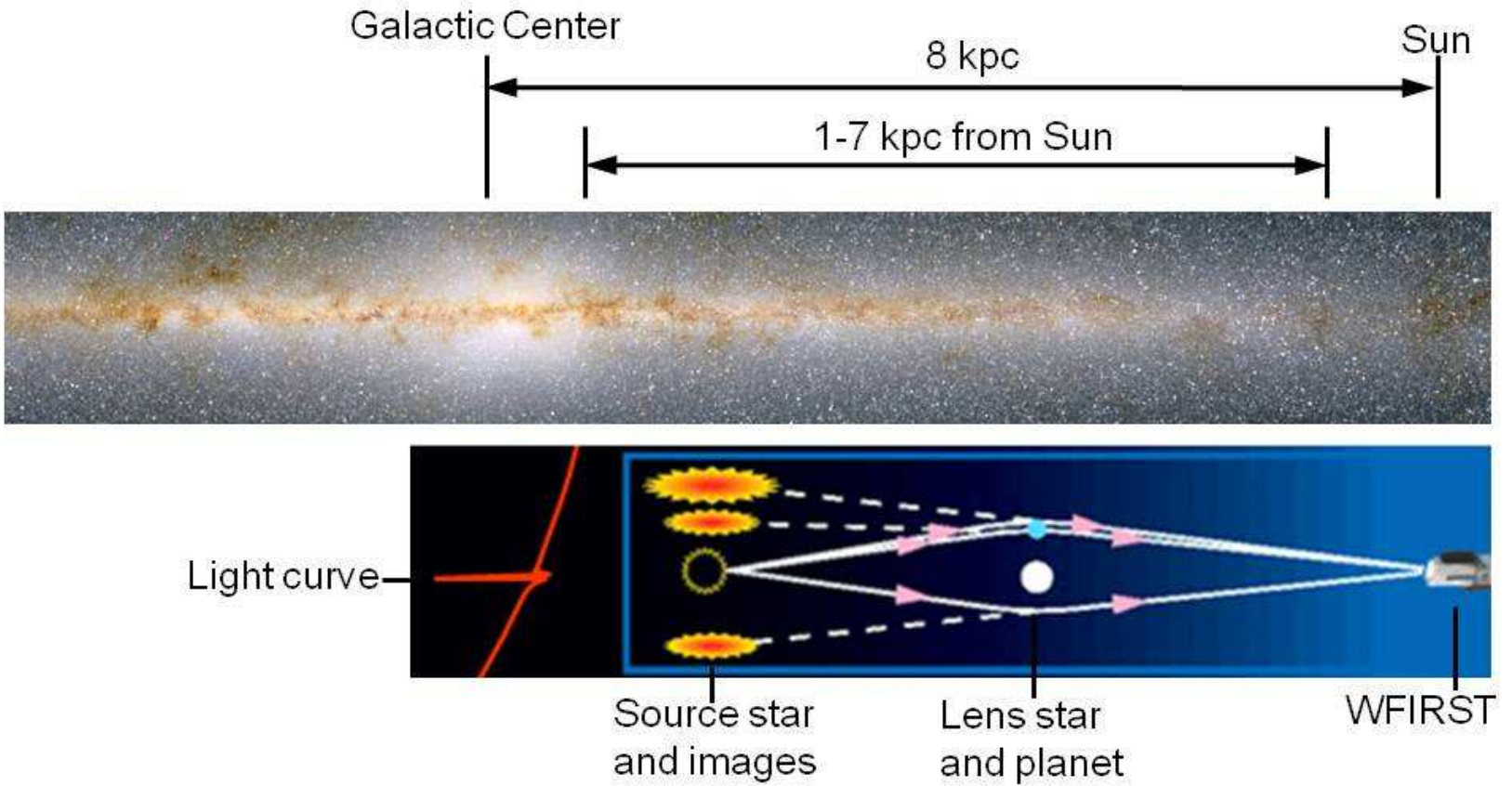


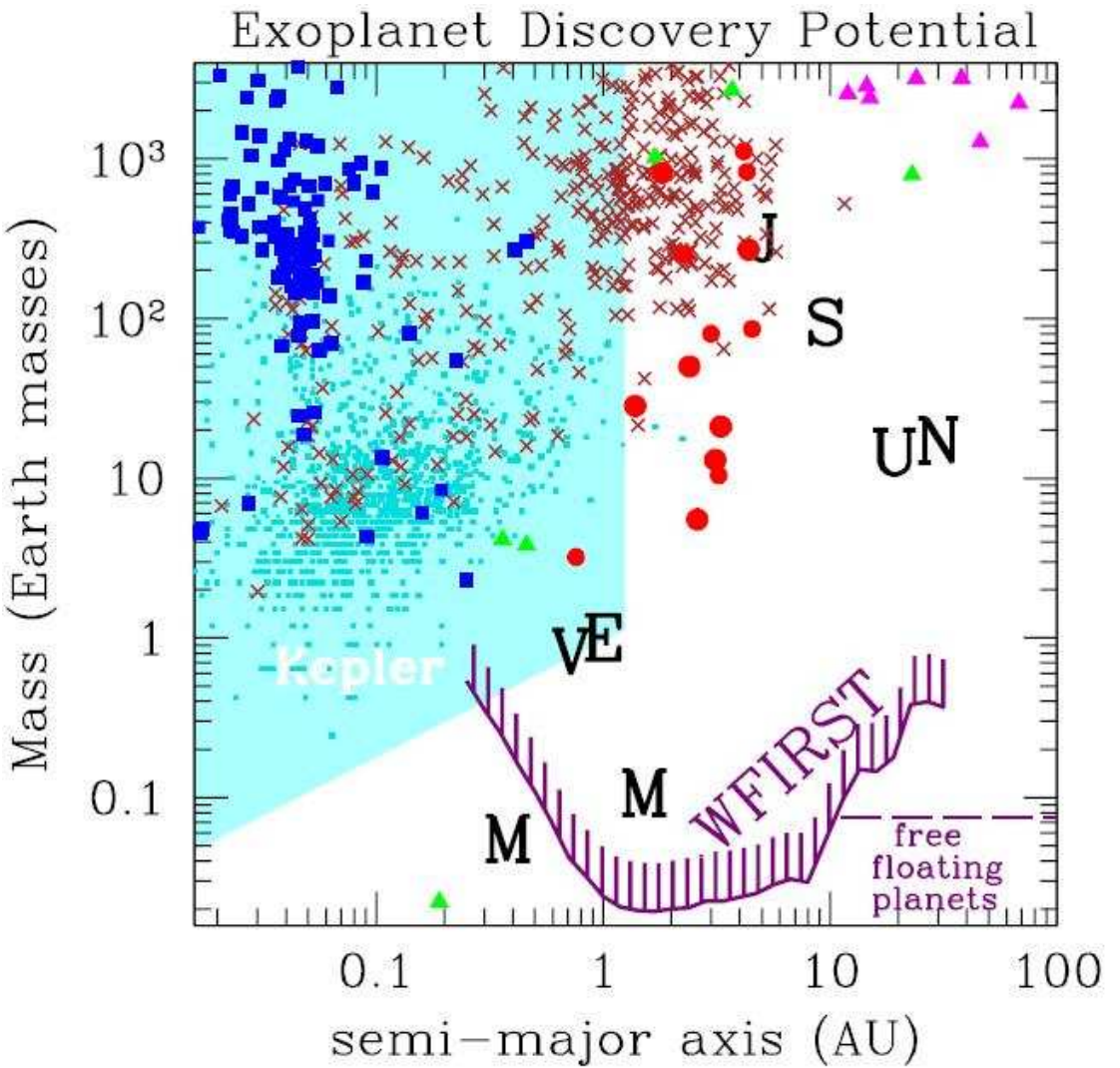
FIG. 3.— Examples of AGN host galaxies that were classified as having spheroid and disk morphologies, as well as two galaxies experiencing disruptive interactions. Thumbnails on the top row are WFC3/IR images taken in the F160W (H) band (rest-frame optical), while those on the bottom row are from ACS/WFC in the F775W (i) band (rest-frame ultraviolet). These images demonstrate that accurately classifying the morphology of these galaxies at $z \sim 2$ requires H-band imaging.

NOMINAL PROGRAM

program	**years**	**why IR?**	**why space?**
exoplanet microlensing	1.5	extinction red lenses	photometry 24/7
supernovae	0.5	smaller σ	resolution
BAO	1.0	redshift	background
weak lensing	1.0	photons	PSF
MW survey	0.5	extinction	confusion
high latitutde	"free"	redshift	background
guest investigator	1.0	all of the above	

Planetary Microlensing




Exoplanet Discovery Potential
Mass (Earth masses)
10³
10²
10
1
0.1
0.1
1
10
100
semi−major axis (AU)
J
S
UN
VE
M
M
Kepler
WFIRST
free
floating
planets

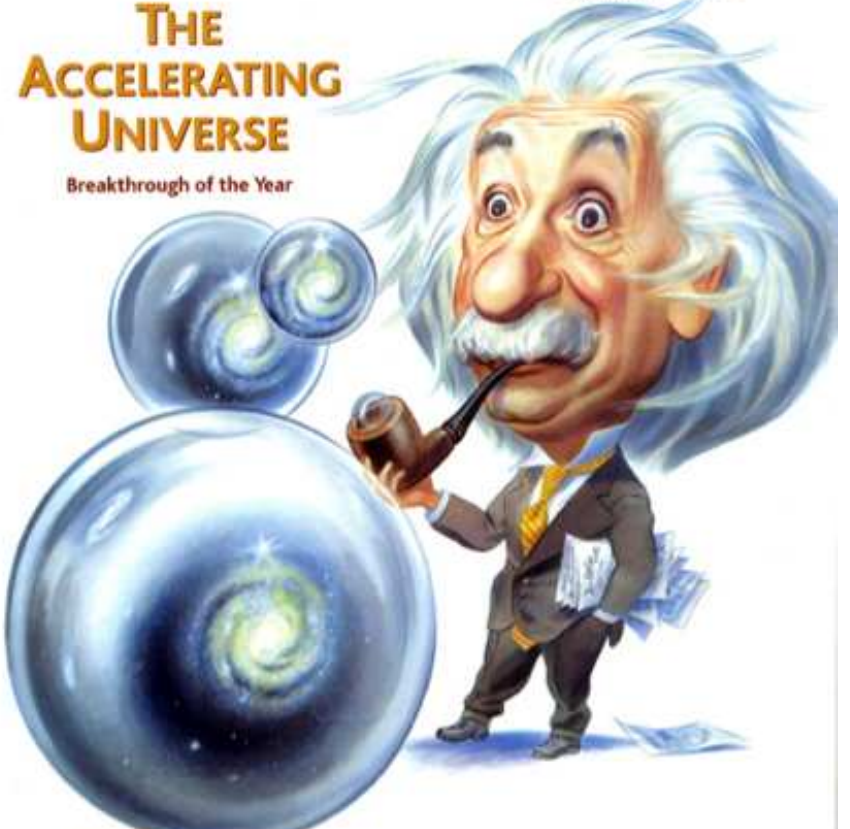
18 December 1998

Science

Vol. 282 No. 5397
Pages 2141–2336 $7

THE ACCELERATING UNIVERSE

Breakthrough of the Year

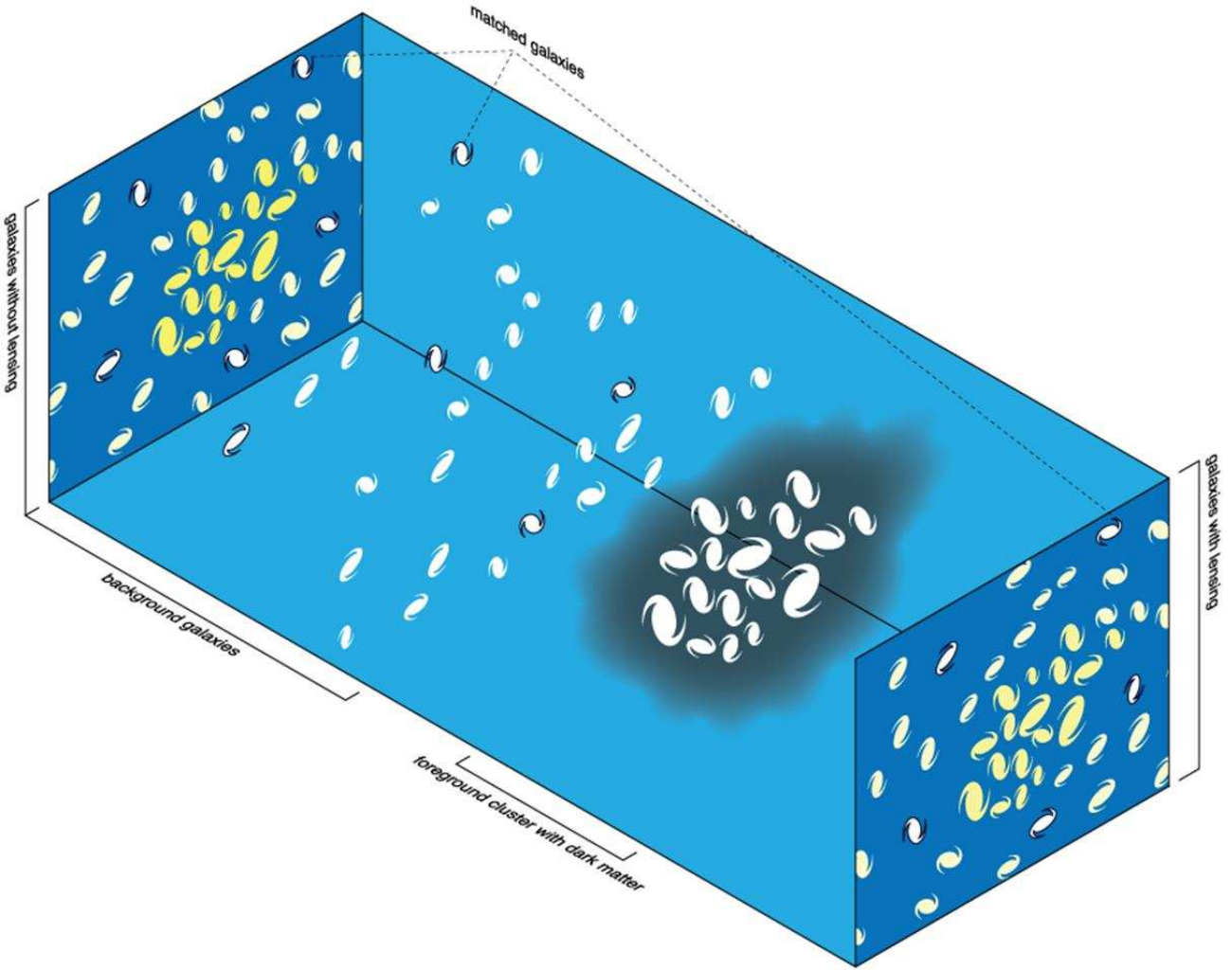


AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

IF general relativity is correct then:

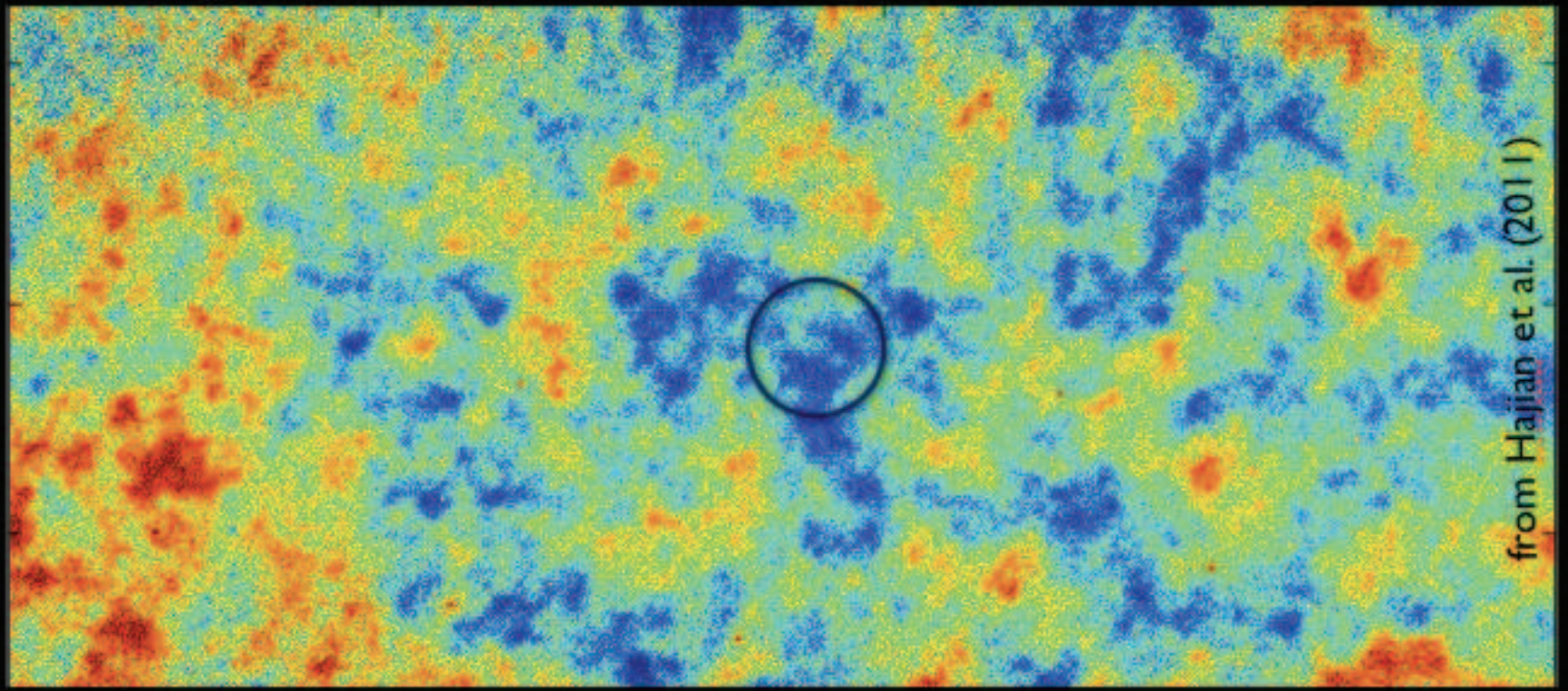
$$H(z)^2 = H_0^2[\underbrace{\Omega_m(1+z)^3}_{\text{matter}} + \underbrace{\Omega_r(1+z)^4}_{\text{radiation}} + \underbrace{\Omega_w(1+z)^{3(1+w)}}_{\text{dark energy}} + \underbrace{\Omega_k(1+z)^2}_{\text{curvature}}],$$

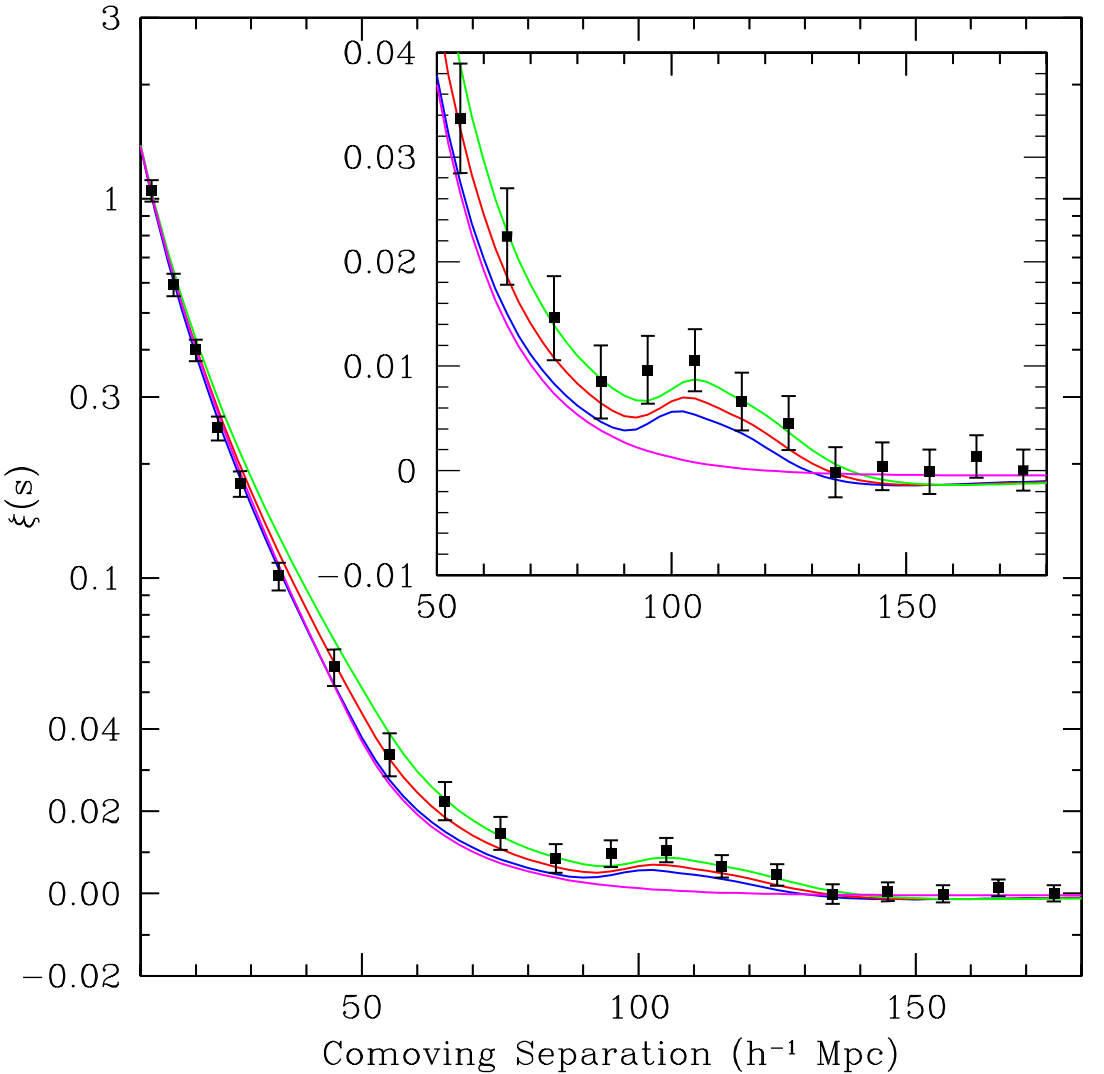
where $w = -1 \Leftrightarrow$ cosmological constant Λ.

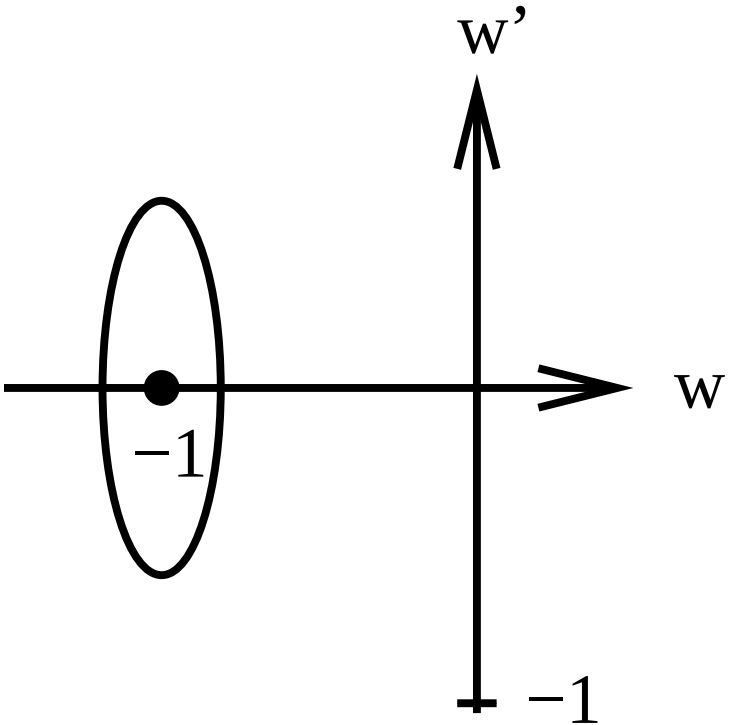

matched galaxies
galaxies without lensing
background galaxies
foreground cluster with dark matter
galaxies with lensing

$$\left(\begin{array}{c}\textbf{uncertainty in local}\\ \textbf{mean image ellipticity}\end{array}\right) < \mathbf{0.0002}$$

A 6° x 14° CUTOUT FROM A MAP MADE FROM 148 GHz ACT OBSERVATIONS OPTIMALLY COMBINED WITH WMAP 7YEAR OBSERVATIONS

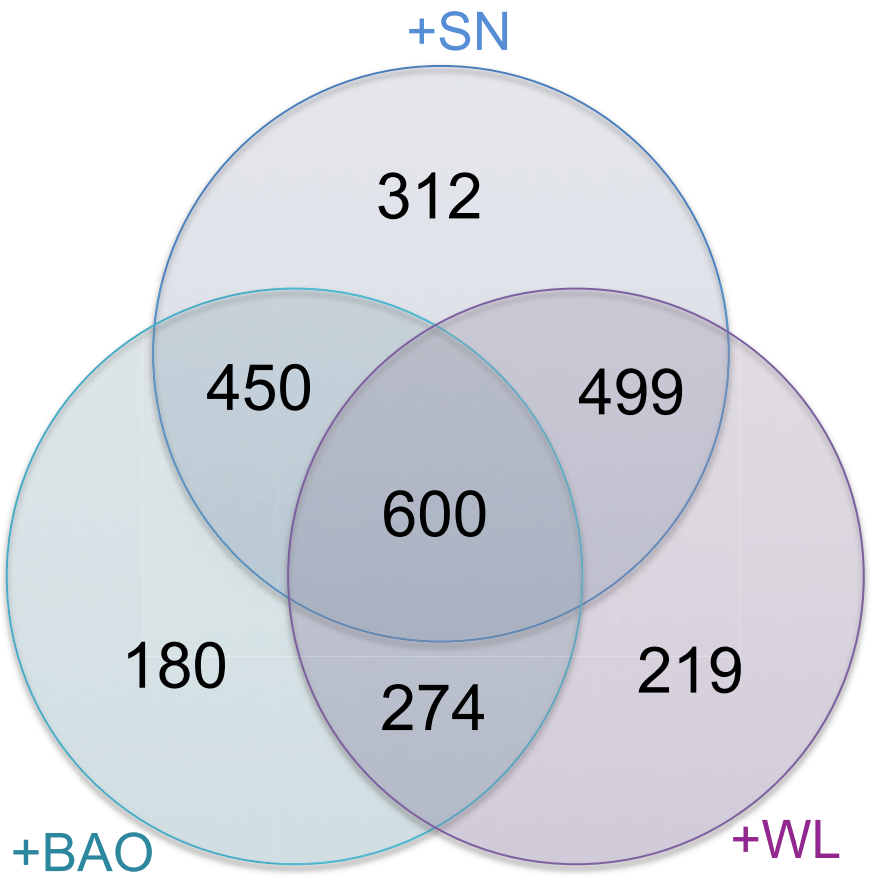



3
1
0.3
0.1
0.04
0.02
0.00
−0.02
ξ(s)
50
100
150
Comoving Separation (h⁻¹ Mpc)
0.04
0.03
0.02
0.01
0
−0.01
50
100
150


w'
w
−1
−1

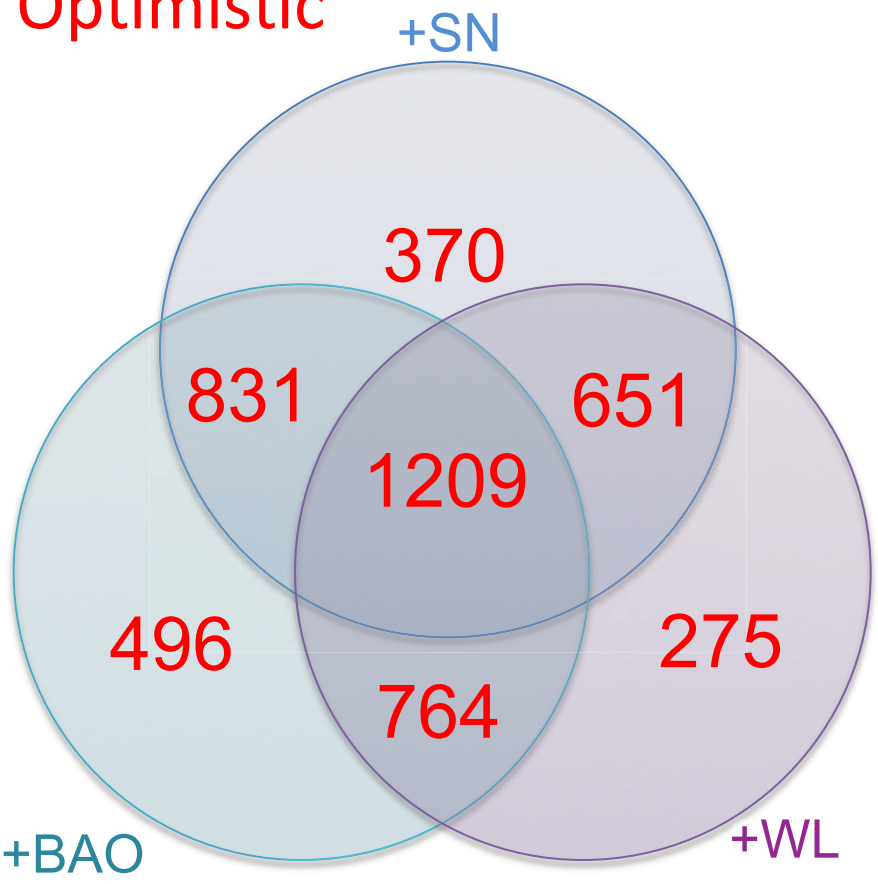
DETF FoM Venn diagrams

Conrervanve



Planck+StageIII priors
Weak Lensing 12months wide
BAO 12 months deep,
12 months wide
Supernova 6 months slitless

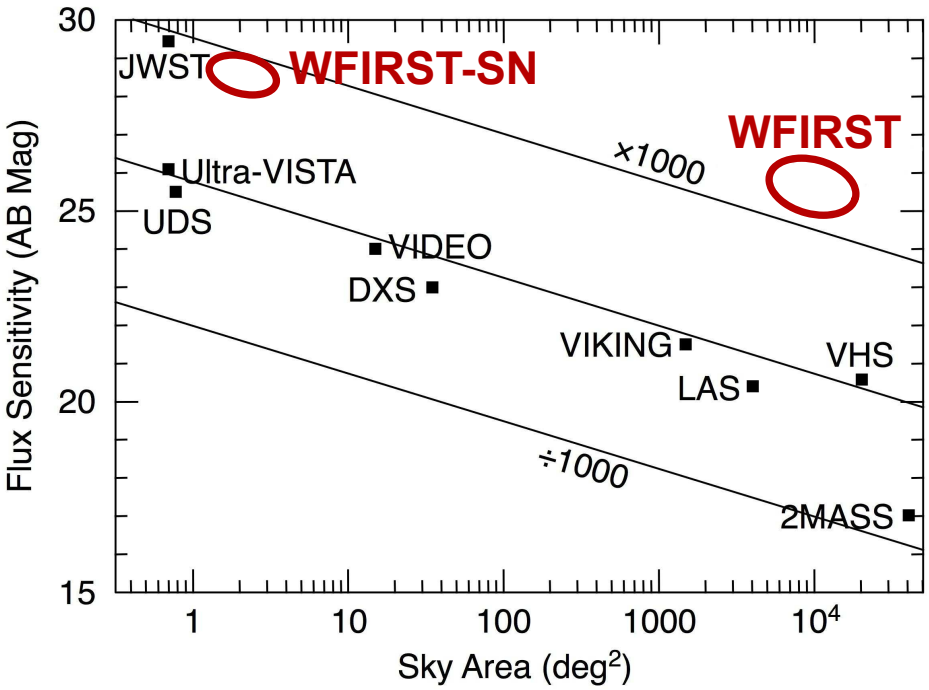
Optimistic



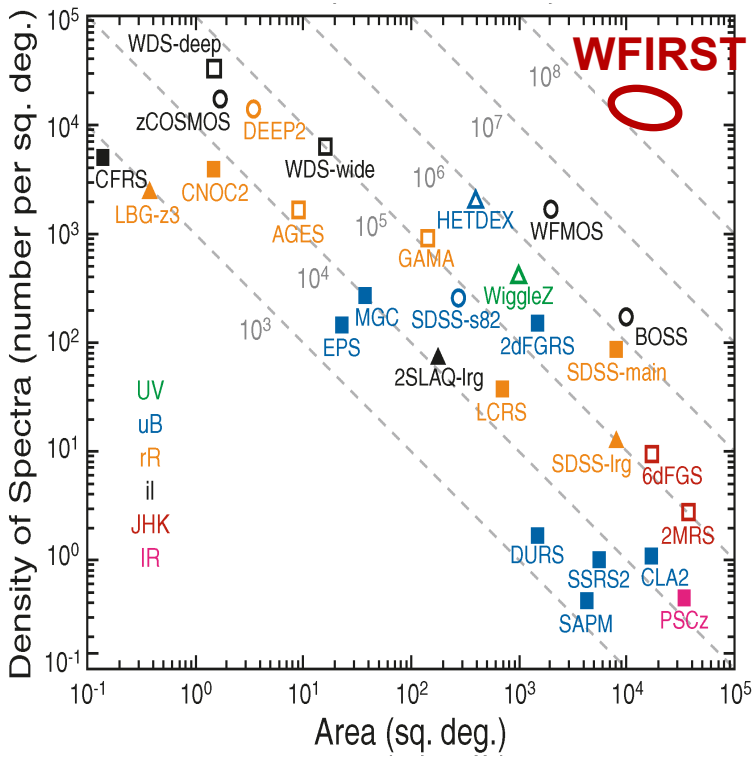
Planck+StageIII priors
Weak Lensing
BAO+RSD
Supernova

WFIRST NIR Surveys

NIR Imaging Surveys



NIR Redshift Surveys



WFIRST provides a factor of 100 improvement in IR surveys

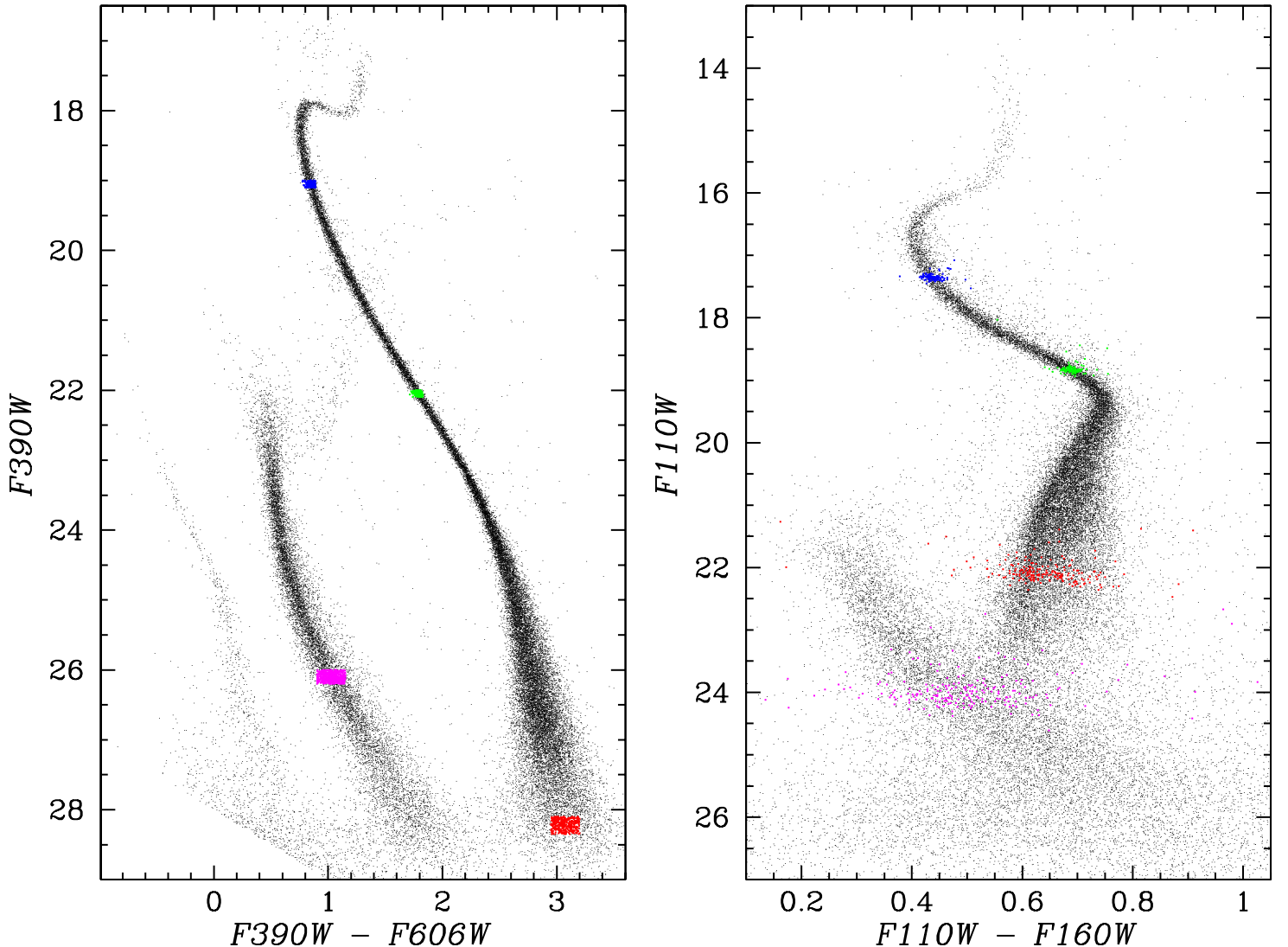
NOTIONAL GENERAL INVESTIGATOR PROGRAMS

Search for Kuiper Belt objects

Open cluster mass functions to $25M_{Jup}$

Stellar populations in nearby galaxy halos

Lower main sequence in globular clusters


F390W
F390W − F606W
F110W
F110W − F160W

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1. Pixels *both* sample and convolve.

2. Oversampling cannot recover resolution lost to convolution.

3. Fat pixels lose information about unknown unknowns.

http://www.arxiv.org/pdf/1108.1374

http://wfirst.gsfc.nasa.gov

SCIENCE DEFINITION TEAM

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