NIRSS:
the Near-Infrared Sky Surveyo

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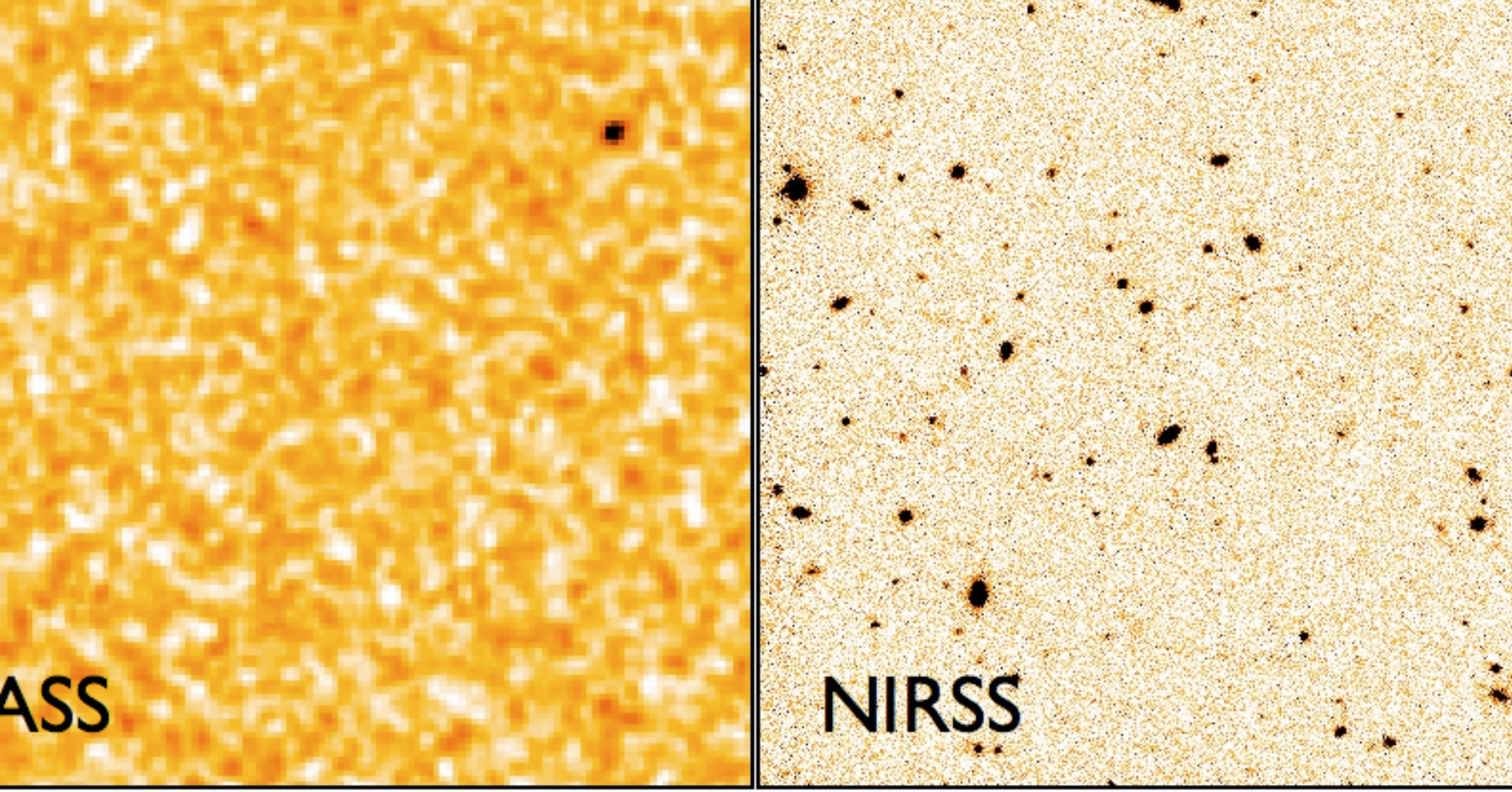


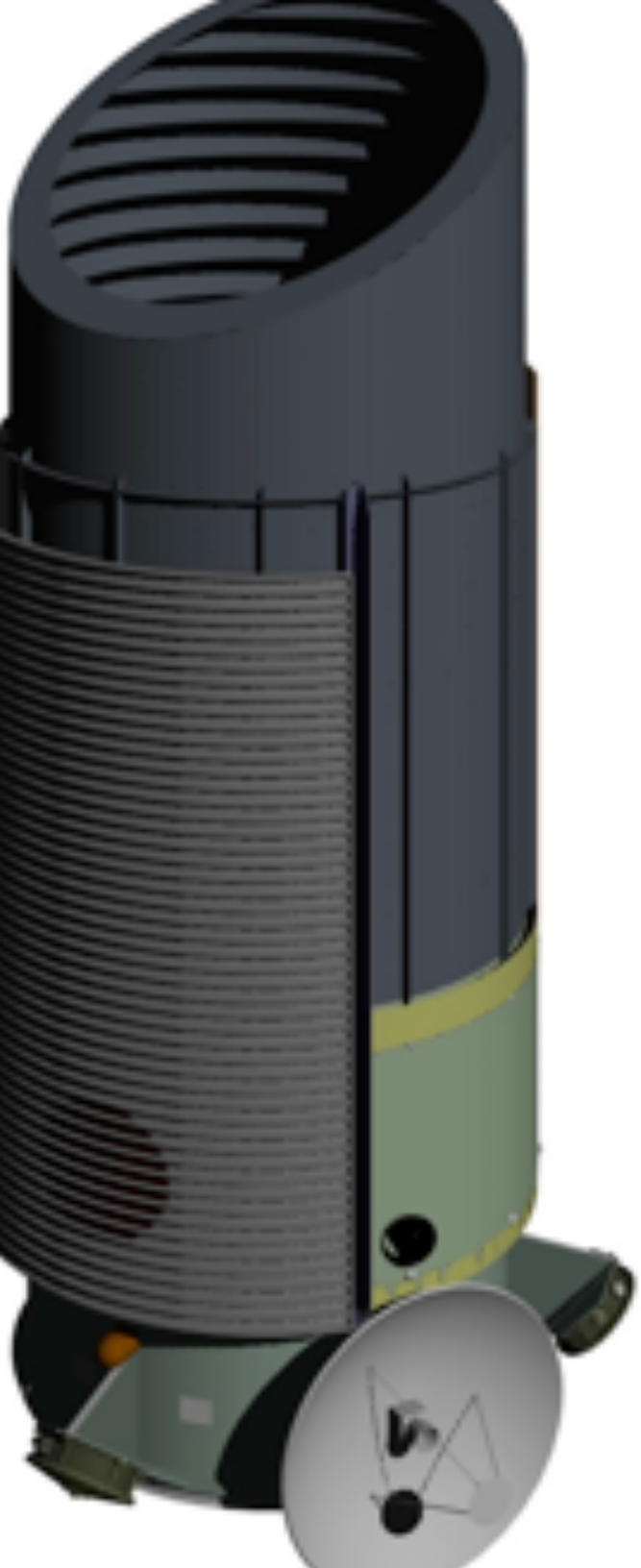
NIRSS would obtain full sky near-infrared images in four bands, reaching 0.2 μJy depths (25.6 mag, AB)

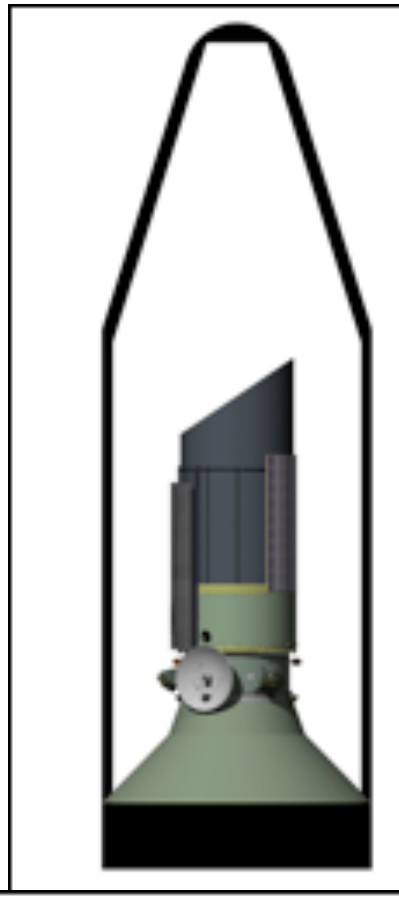
es of GOODS-S field at 2.2 μm (K-band; 2.4 arcmin/side), obtained by 2MASS (left
VLT/ISAAC observations (right). NIRSS will reach five times deeper than the V

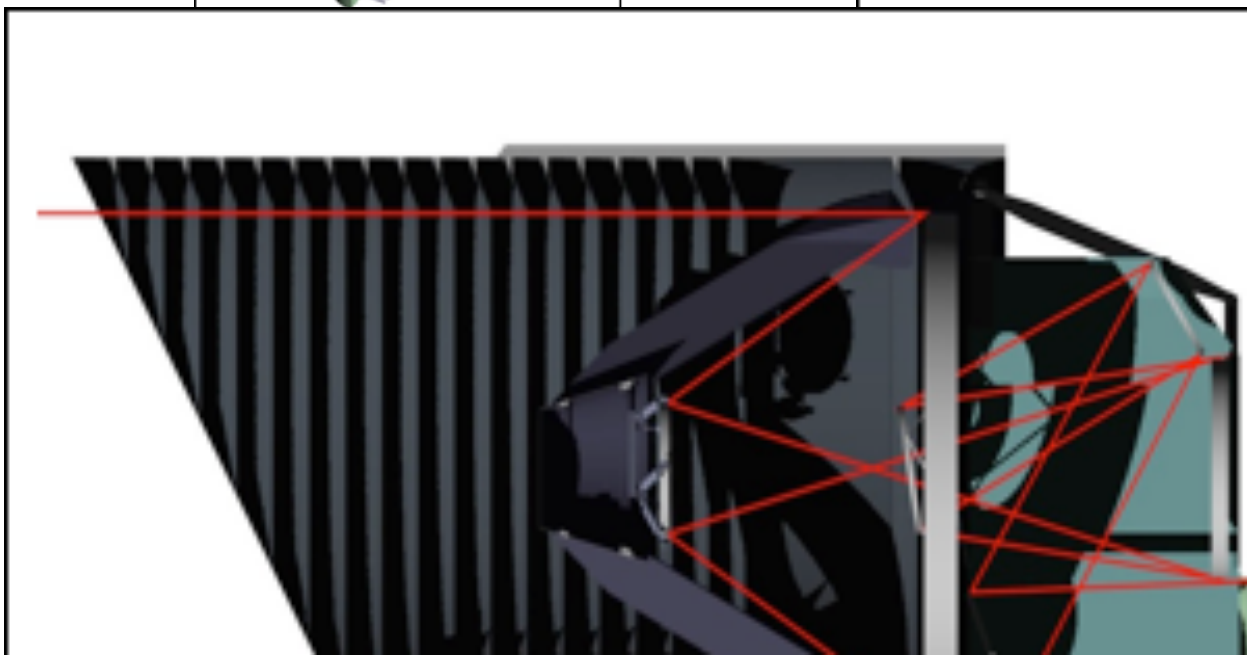
Strawman NIRSS Design

Primary Mirror Diameter:	1.5 meter (0.2” diff. limit at 1.2 μm)
Focal Plane:	36 HgCdTe arrays
Image Scale:	0.25”/pixel
Wavelength Coverage:	4 bands, 1-4.2 μm
Survey Depth:	0.2 μJy, full-sky
Optical Design:	f/10.6 TMA
Launch Vehicle/Orbit:	Delta IV / L2 orbit
Temperature:	65 K (passive cooling)
Mission Duration:	4 yr. core mission

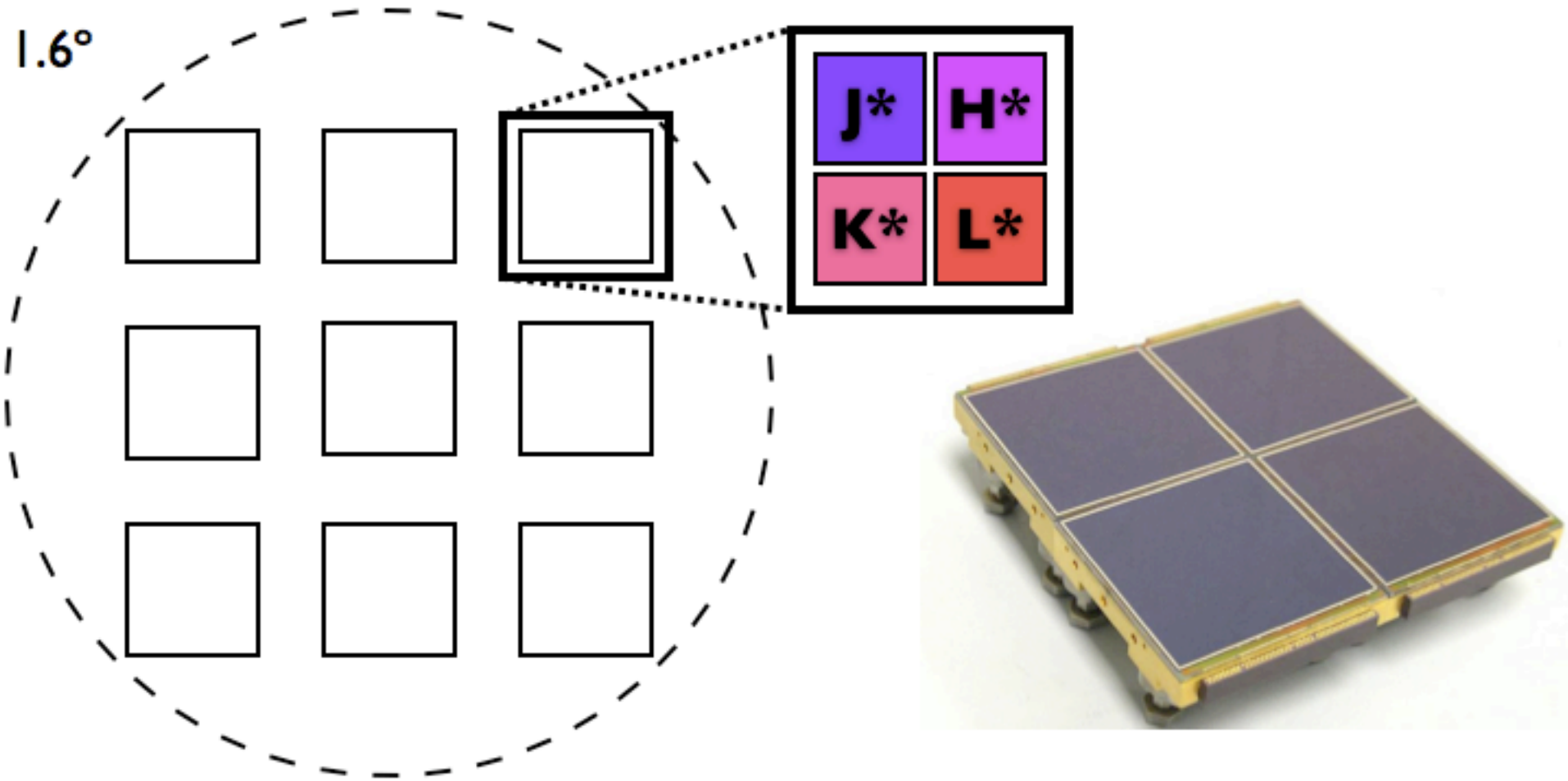
NIRSS Mechanical Design





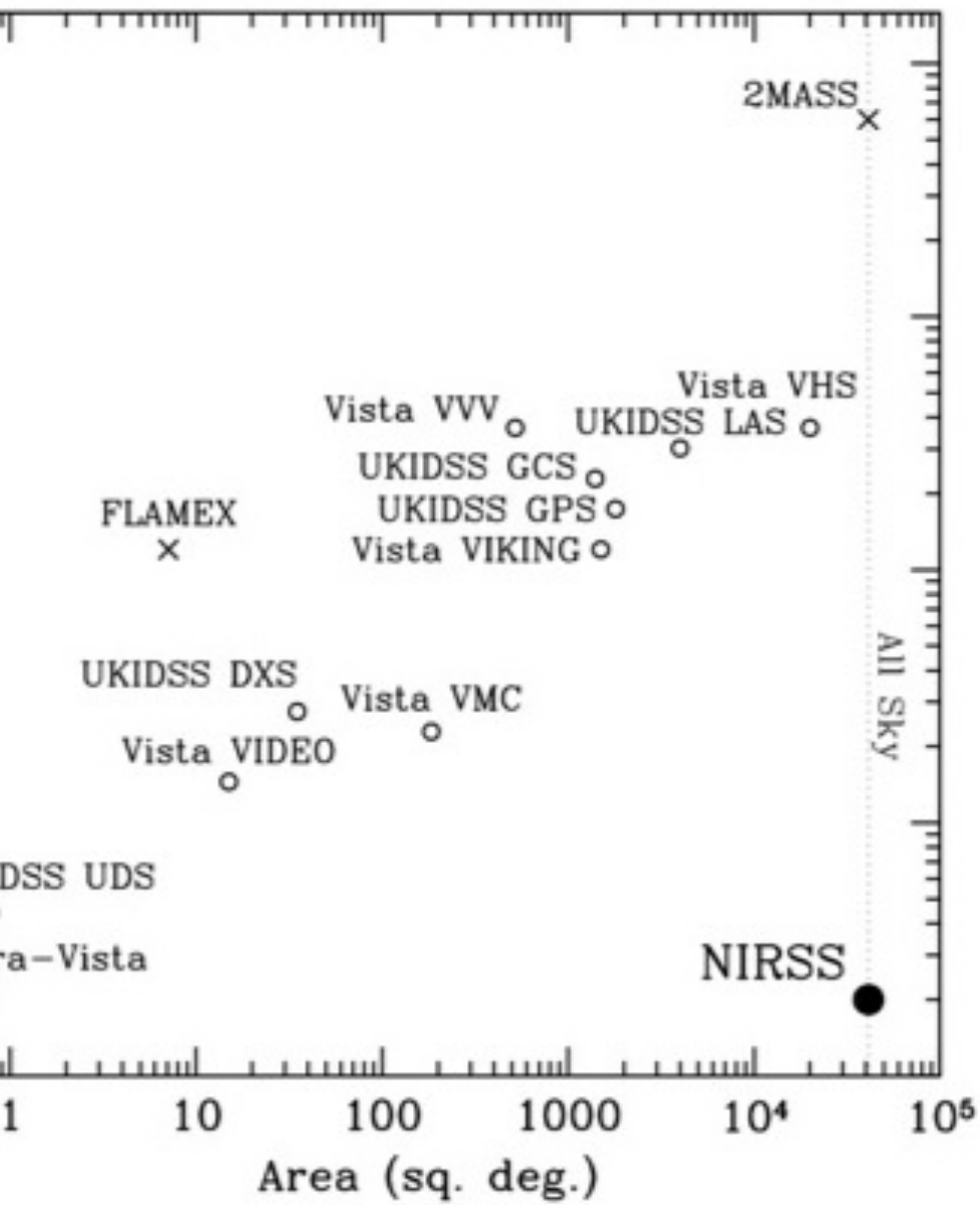


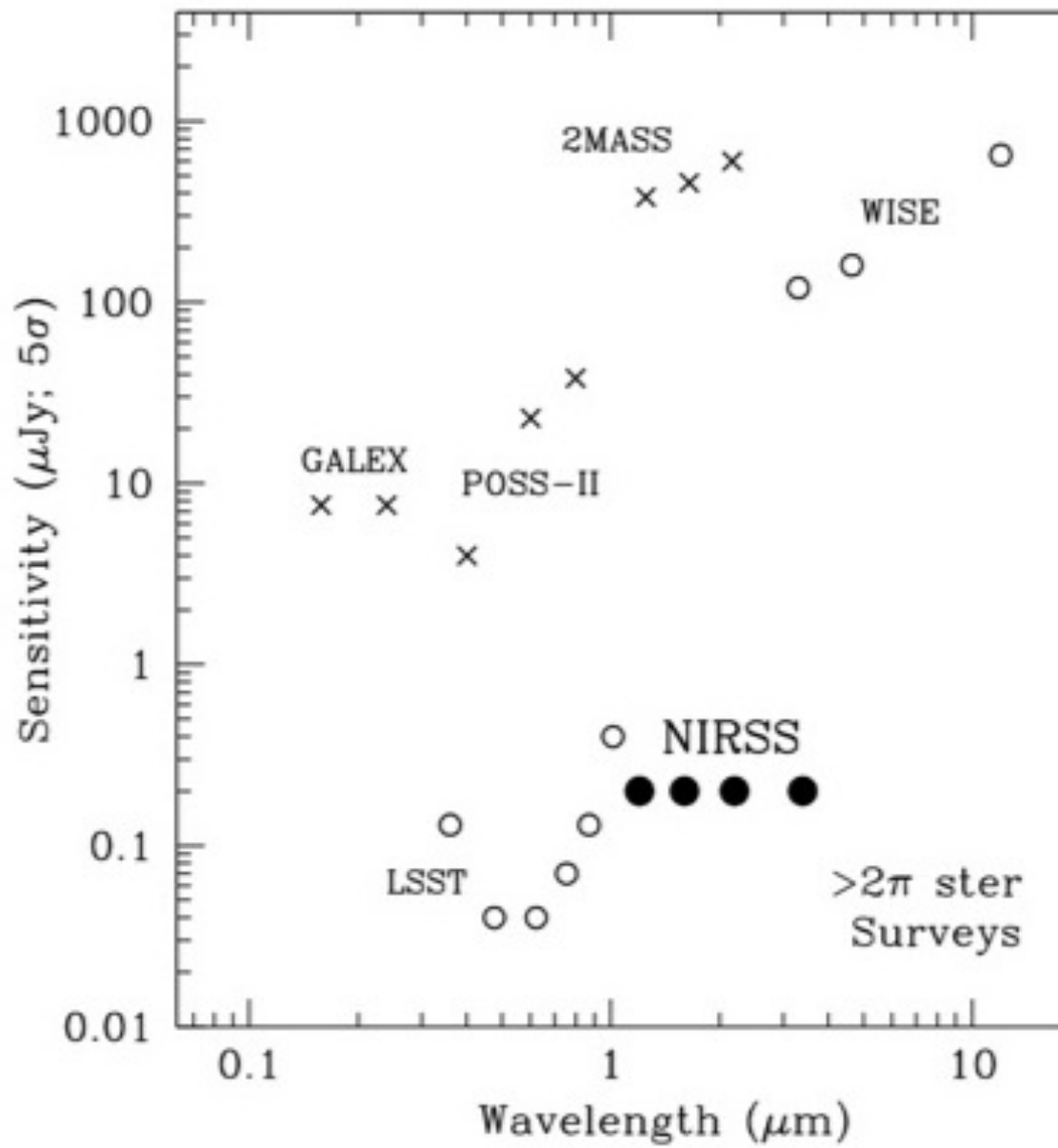
Strawman Focal Plane Array (FPA)



Focal plane populated with nine JWST/NIRCam modules. Each module is comprised of four 2048x2048 Hawaii 2RG HgCdTe arrays, with each quadrant observing a different bandpass. Total FOV is 1.6 deg in diameter. [Requirements on readnoise/dark current reduced from JWST]

Near-Infrared Surveys





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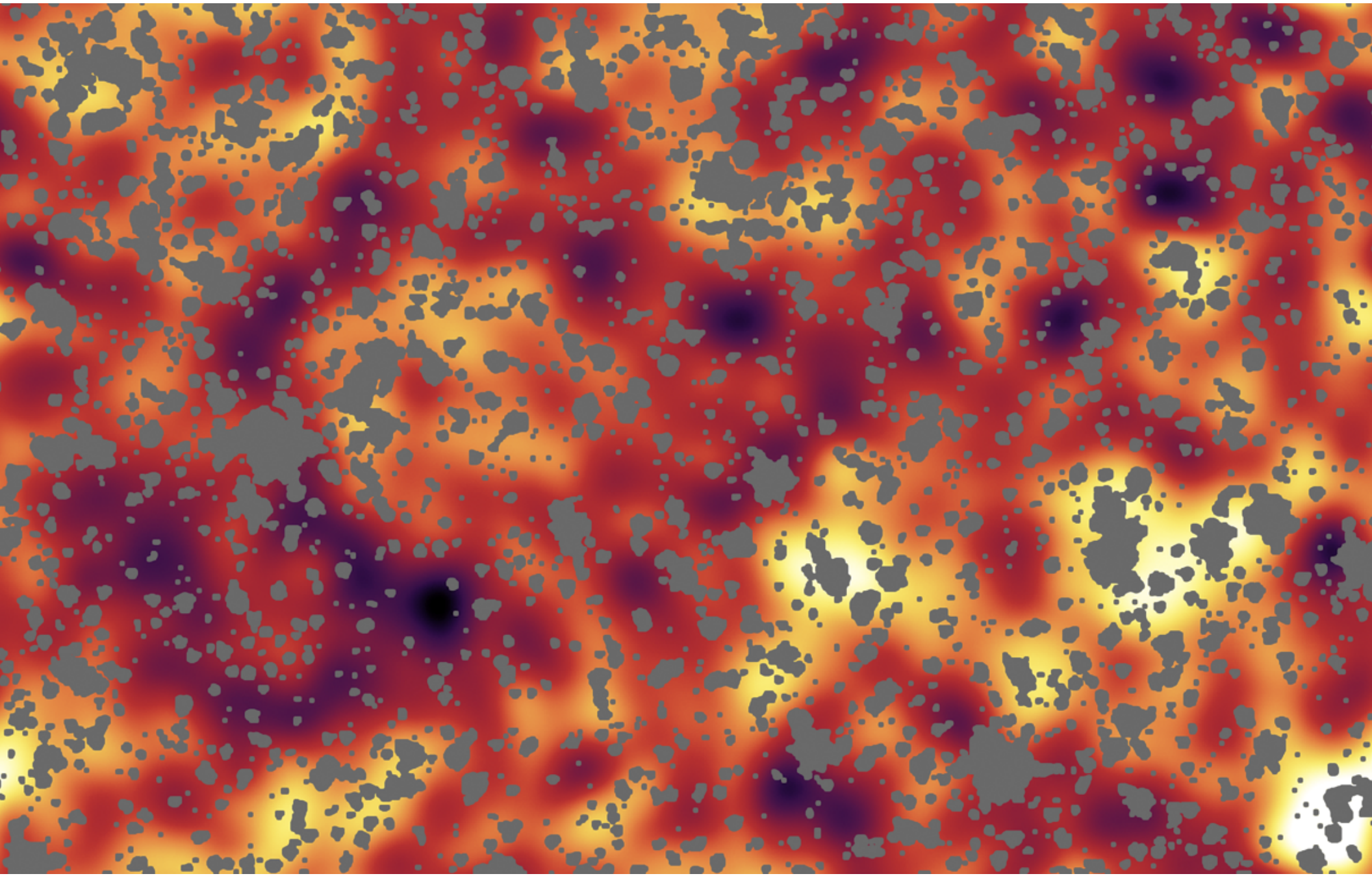
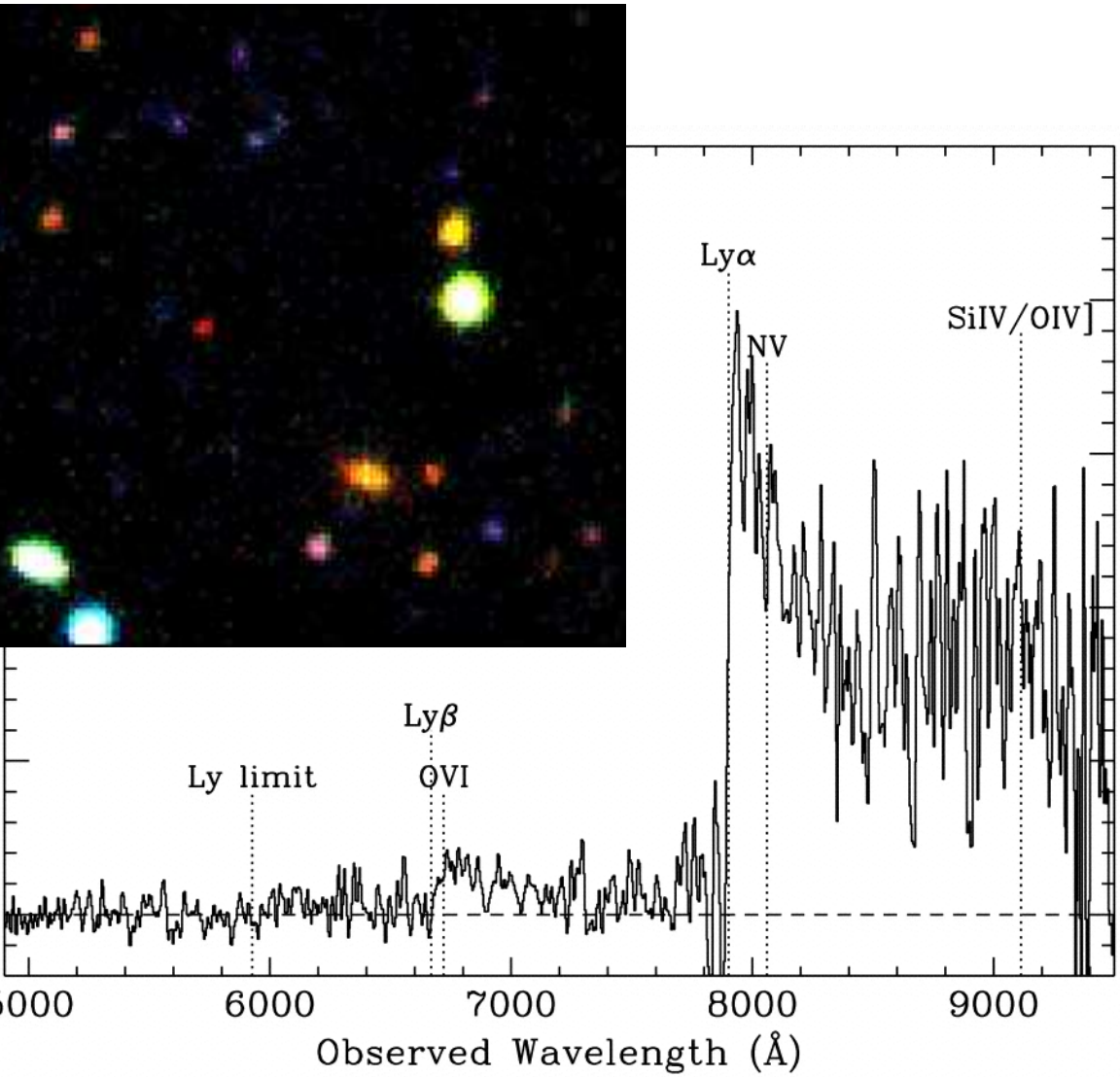


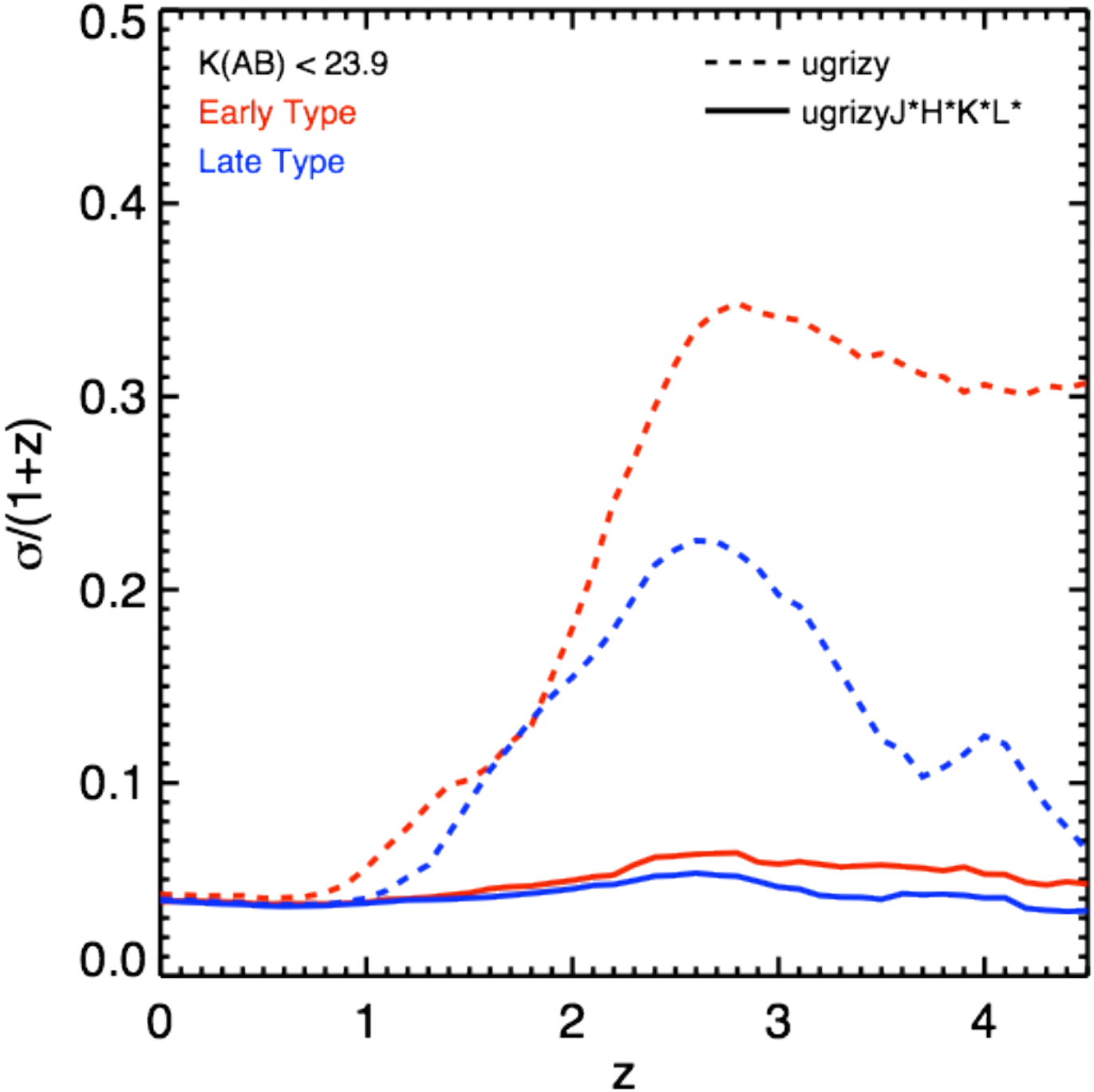
clustered emission from **first** generation of star formation in the Universe;

Goal #2: The Most Distant Quasars



Redshift	UKIDSS	N
6<z<8	70-150	~1
8<z<10	1.3-2.6	~3
z>12	–	~
z>20	–	

#3: Stellar & Dark Matter Content of Gala



LSST alone

LSST + NIRSS

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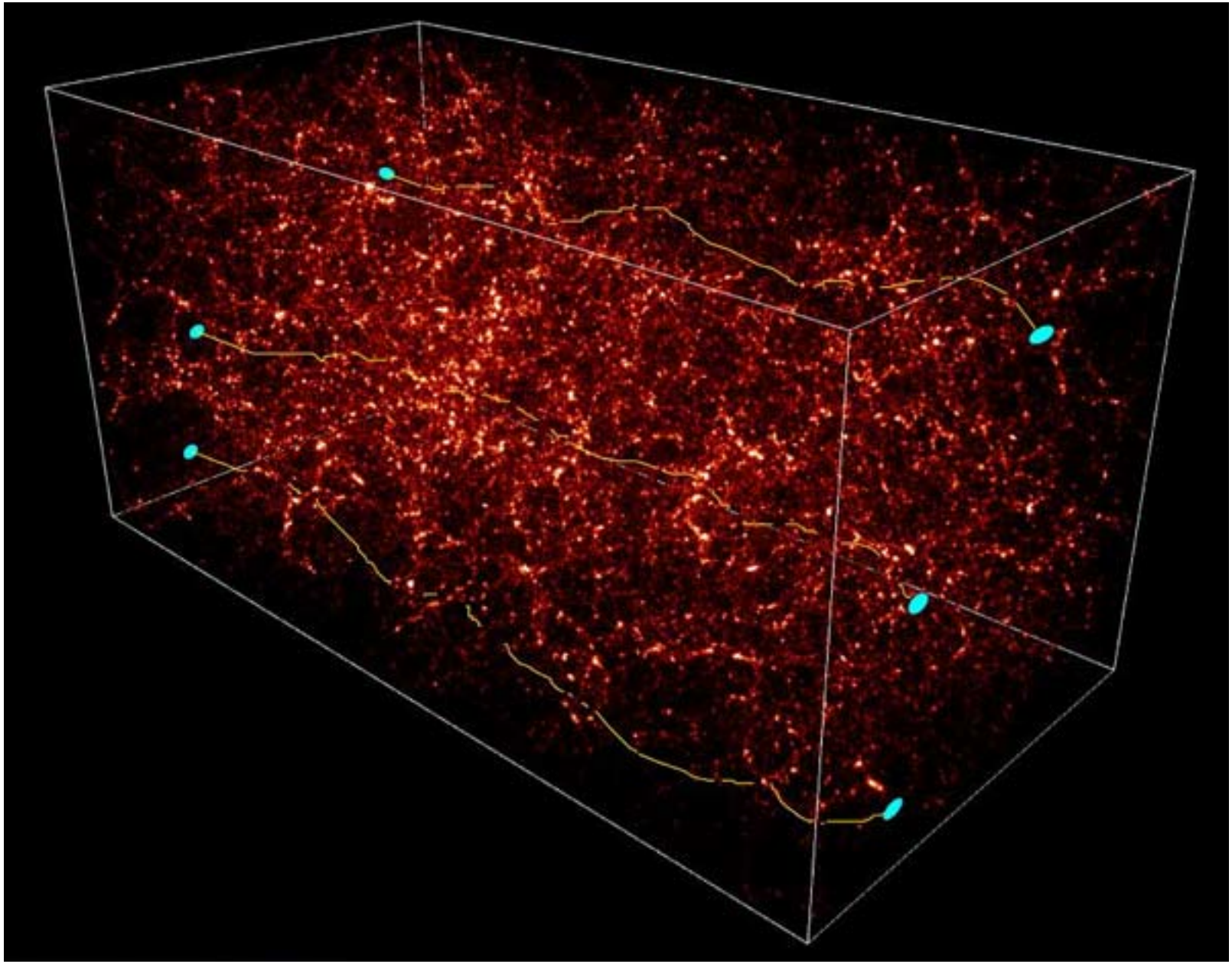
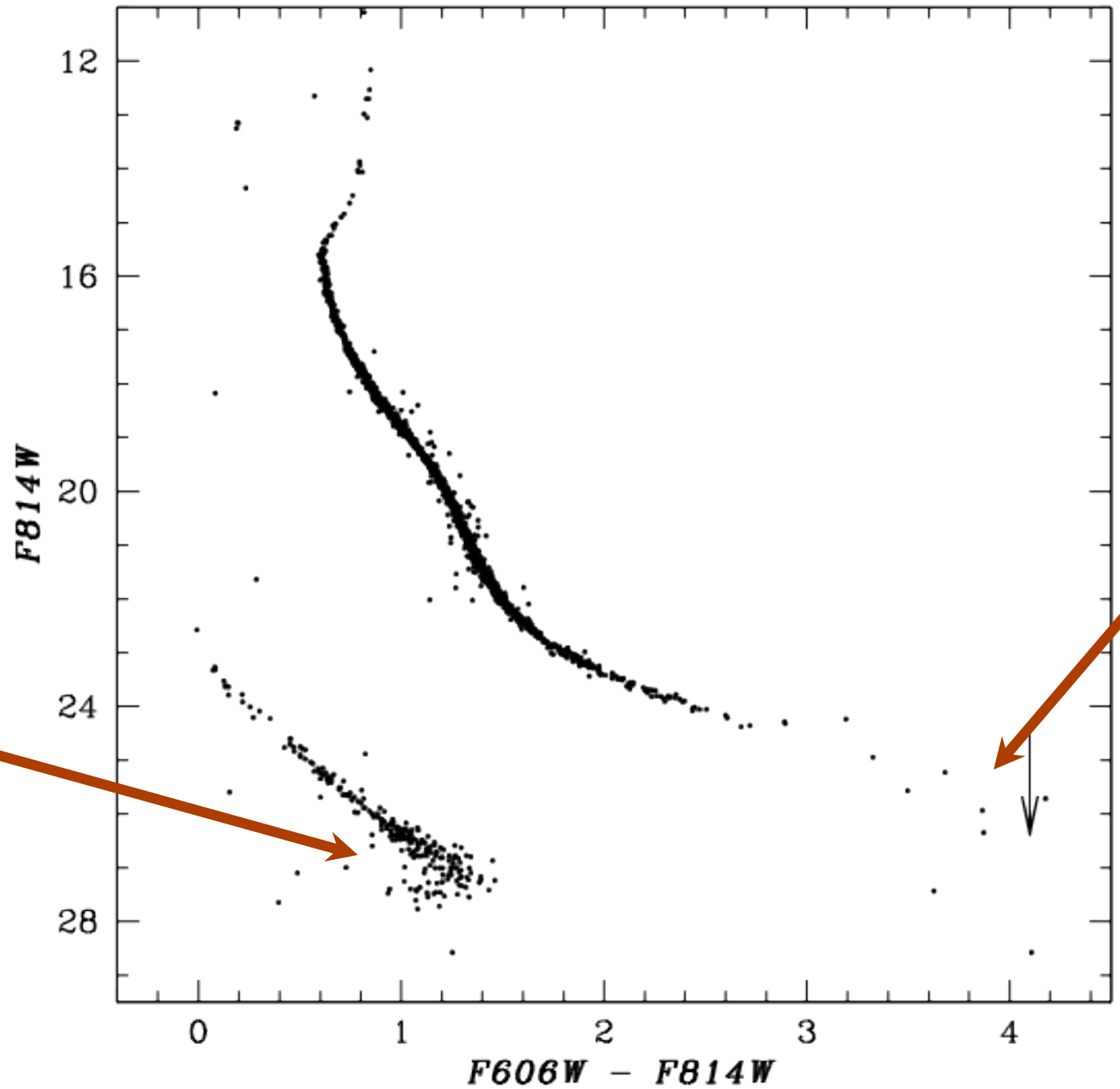


accurate (z>1) photometric redshifts aid **weak lensing** analysis by separating

Goal #4: The Coldest "Stars"



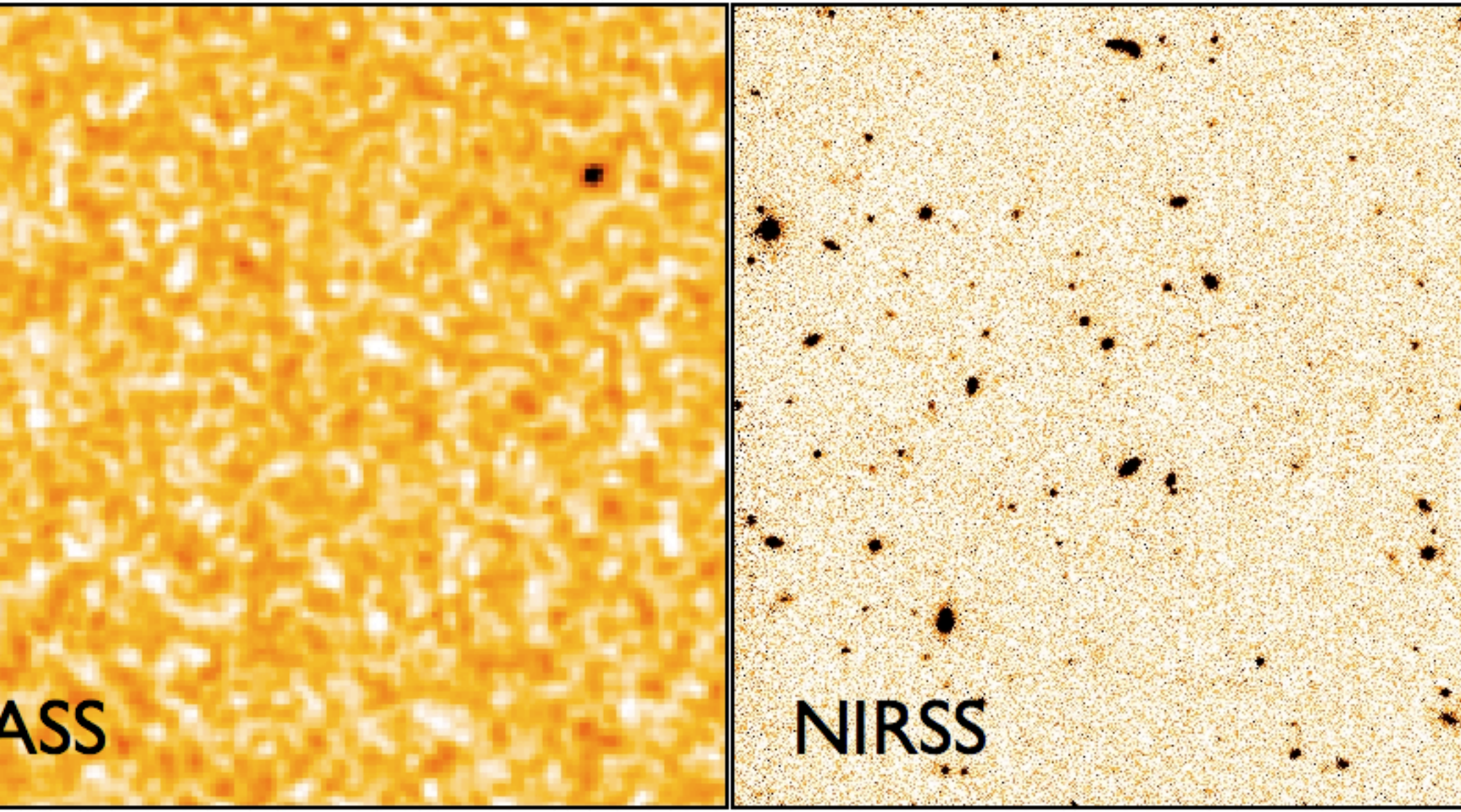
dest
lwarfs

probing be
hydrogen-b
limit (e.g., b
dwarfs) in
of environm

Goal #3: Guest Observer Program

Trust the community to figure out the best use of a flexible, powerful, unique facilit

Summary



Targets for JWST and TMT/ELT's. Compliments Pan-STARRS/LSST + WISE

FOM for an [redacted] IR sky survey

etendue (area x depth)
filters

sampling / pixel scale
imaging + spectroscopy?
extragalactic + Galactic
robust GO program
time domain
uniqueness of space?

• or FOM based on science plans – e.g.
FOM for # of high-z QSO's, other plann
science goals (but then how to weight
them)