

210,000 Galaxies

0.54 Square Degrees

2 filters

**127** Galaxies per square arc minute



The background image is a deep-field astronomical observation of the COSMOS-Field. It features a dark, grainy background filled with numerous small, distant galaxies. Overlaid on this are several prominent, bright, red, irregularly shaped regions, likely representing submillimeter galaxies or other high-redshift objects. White contour lines of varying thickness and shape are drawn over the image, highlighting specific areas of interest or intensity. Some contours are solid, while others are dashed. A bright, multi-colored (yellow, orange, red) spiral-like structure is visible in the upper left corner. A thin red line runs diagonally across the upper right portion of the image.

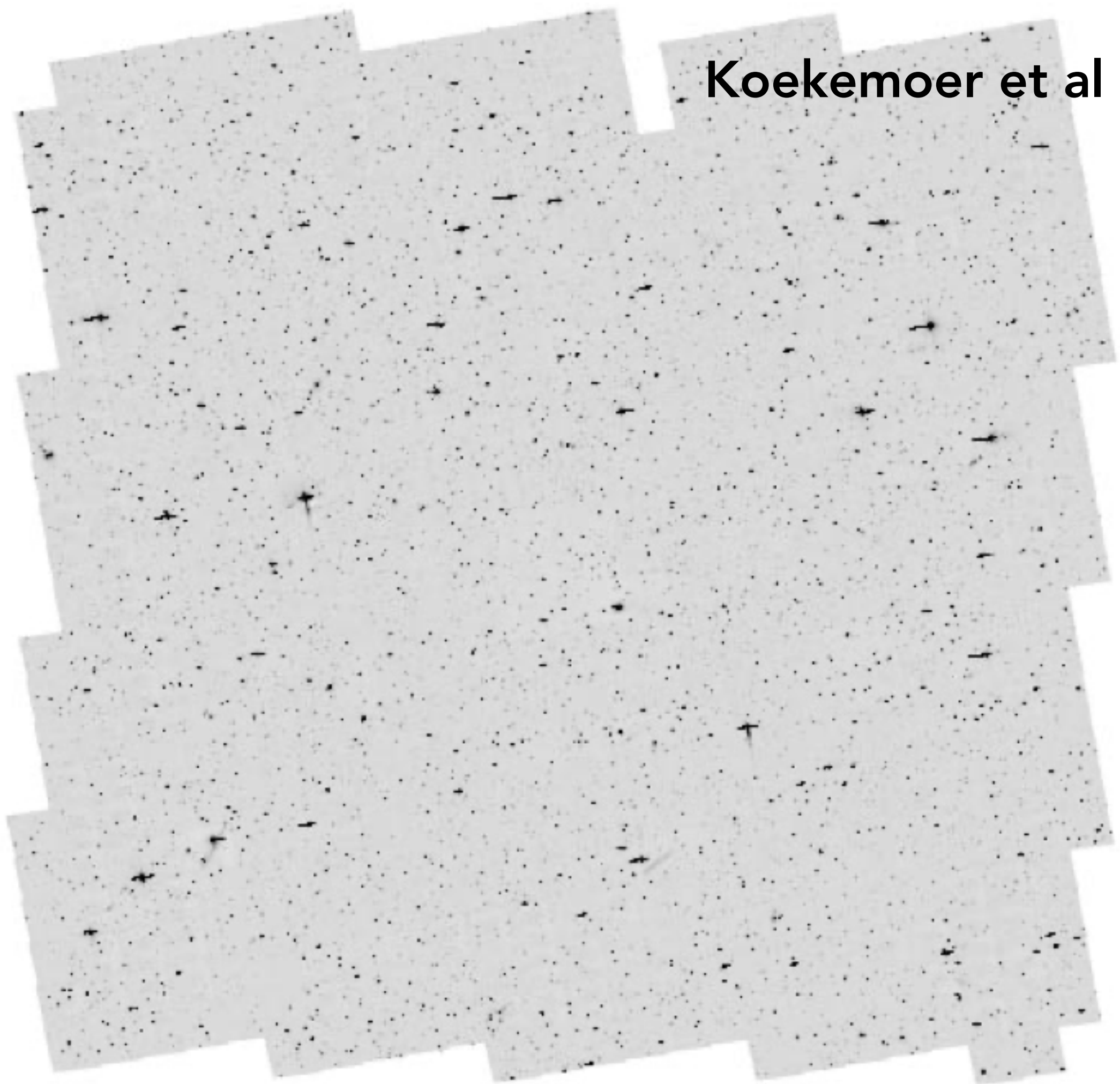
# A James Webb view of the COSMOS-Field

***Dr David Harvey, EPFL, PI DARKSKIES SEFRI FUNDED ERC StG***

*( with help from Diana Scognamiglio, Gavin Leroy, Richard Massey,  
Jason Rhodes and the COSMOS collab )*



**Koekemoer et al 2007**



The background of the slide is a grayscale mosaic of deep-space images, showing a dense field of stars and galaxies. The mosaic is composed of several overlapping rectangular tiles, creating a slightly irregular, hand-cut appearance. The stars appear as small, dark points of light against the lighter gray background, while some galaxies are visible as faint, elongated structures.

Koekemoer et al 2007

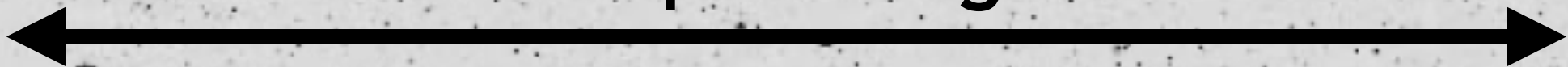
**The OG COSMOS**  
**9 HST BANDS**  
**583 Orbits of Hubble**



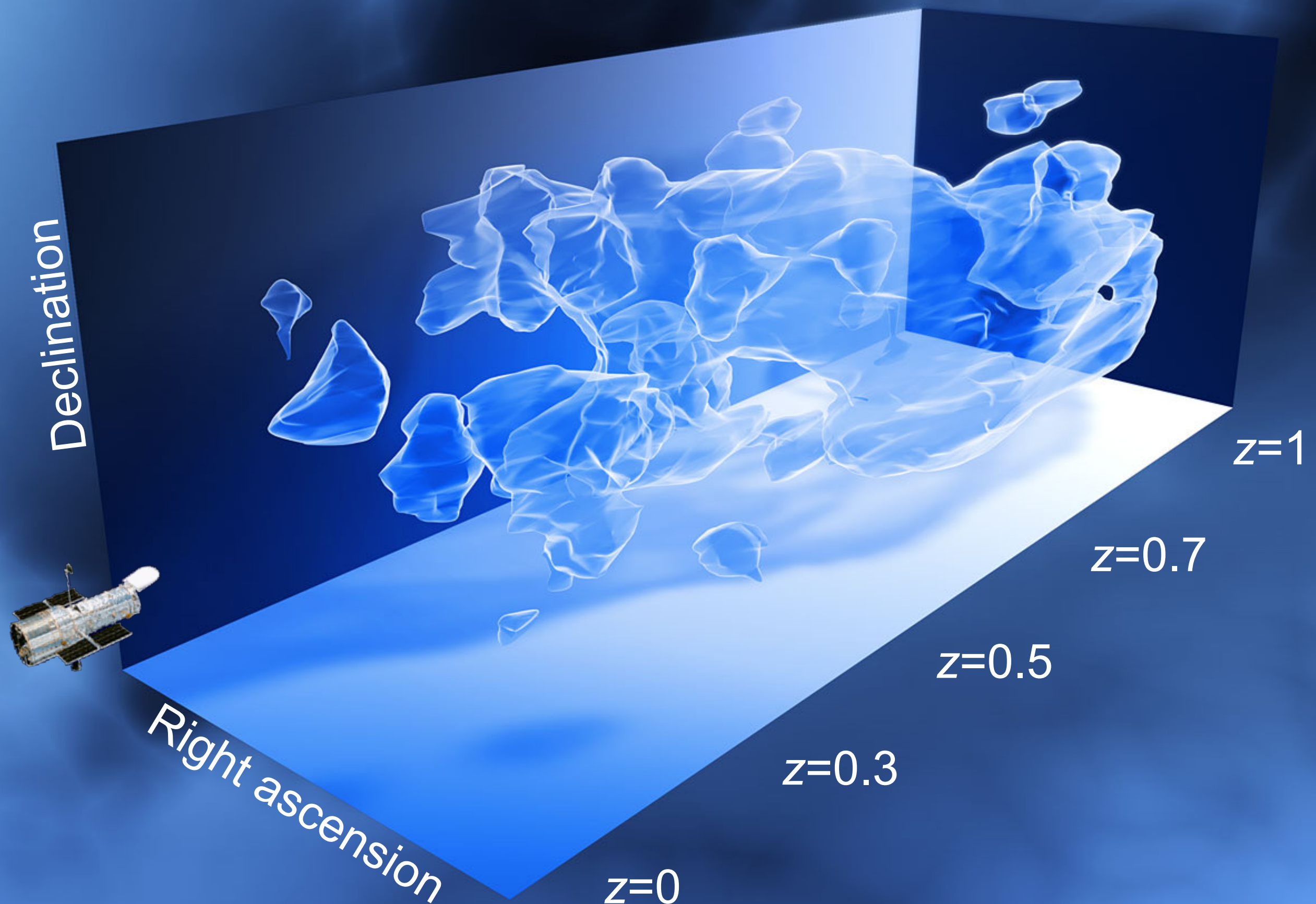
Koekemoer et al 2007

The OG COSMOS  
9 HST BANDS  
583 Orbits of Hubble

1.64 square degrees

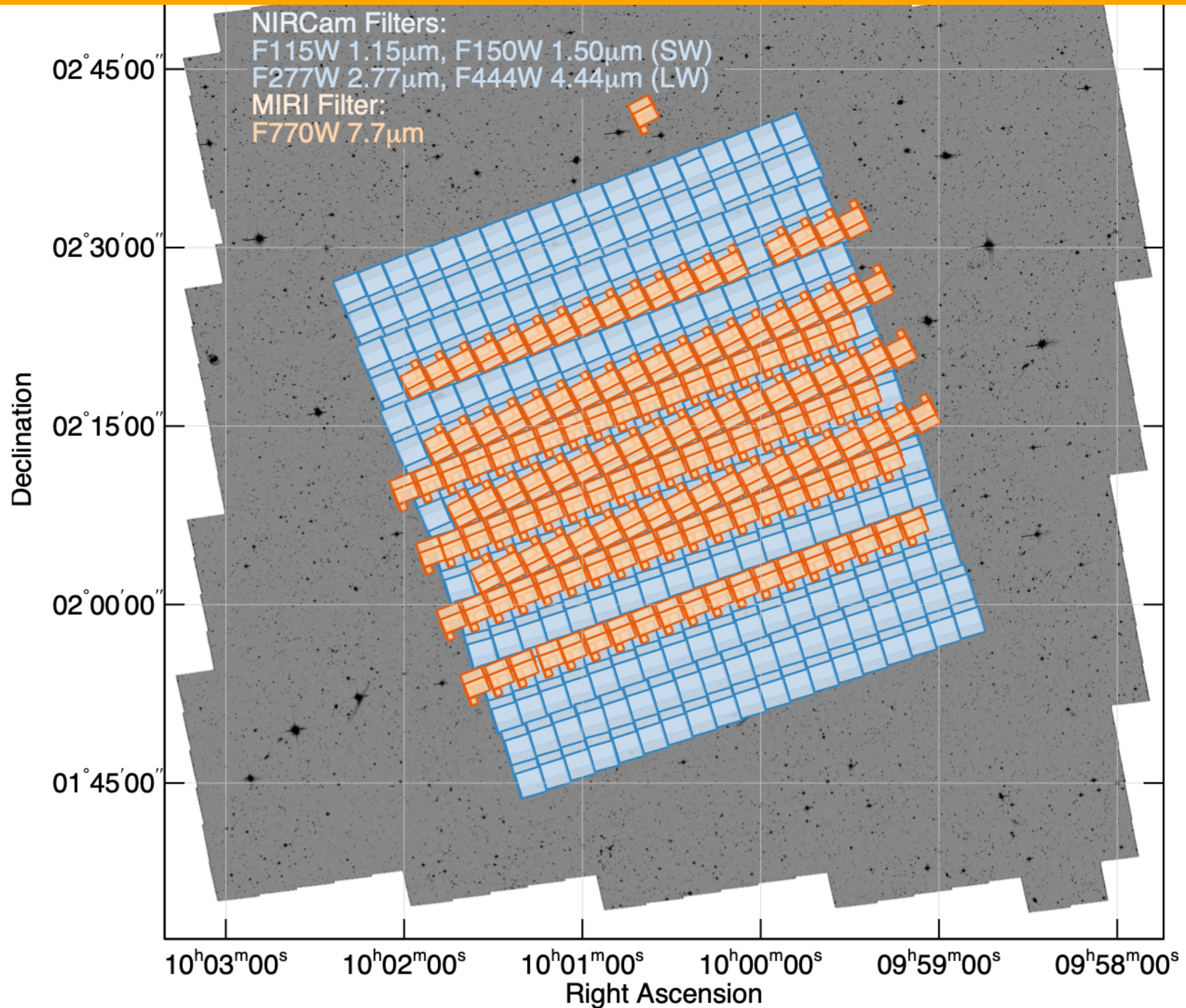


66 galaxies per square arcminute

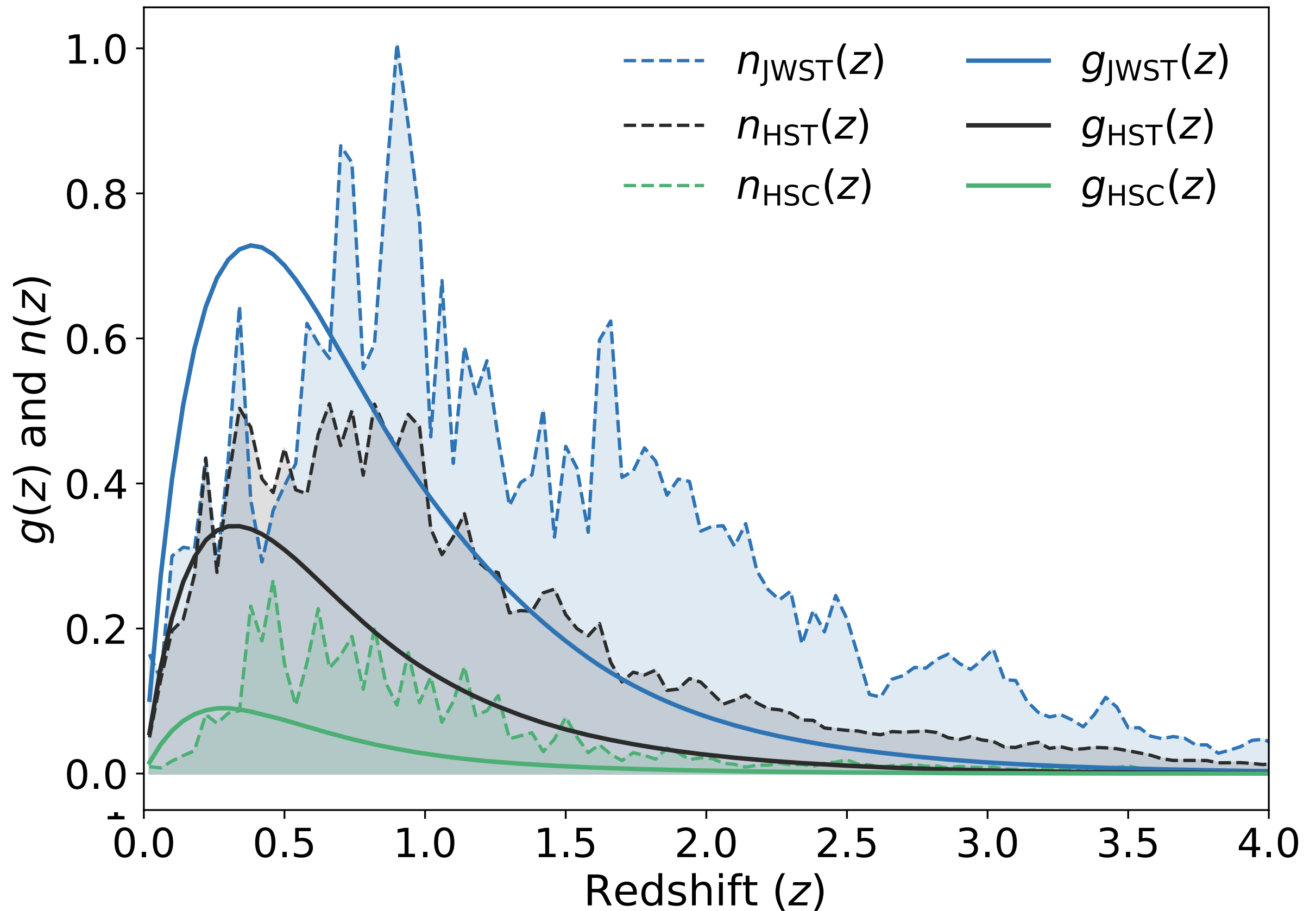




# Fast-forward two decades: Doubling the depth with JWST



# JWST probes a very different age of the Universe



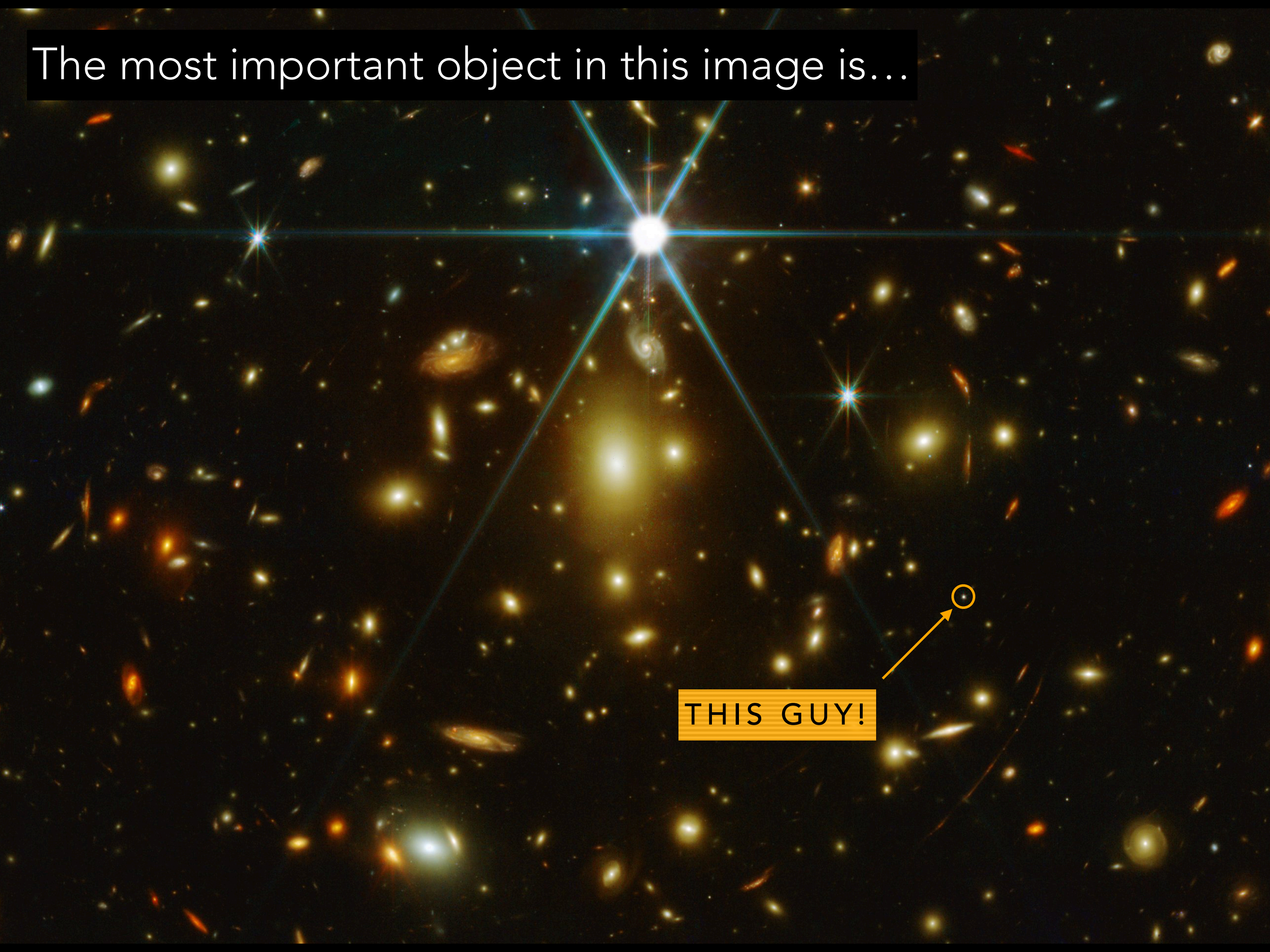


The most important object in this image is...





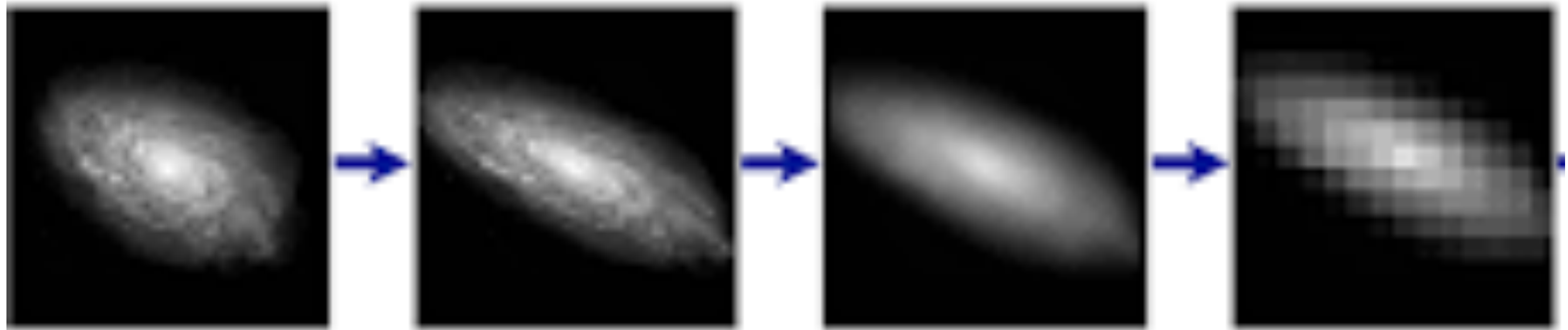
The most important object in this image is...



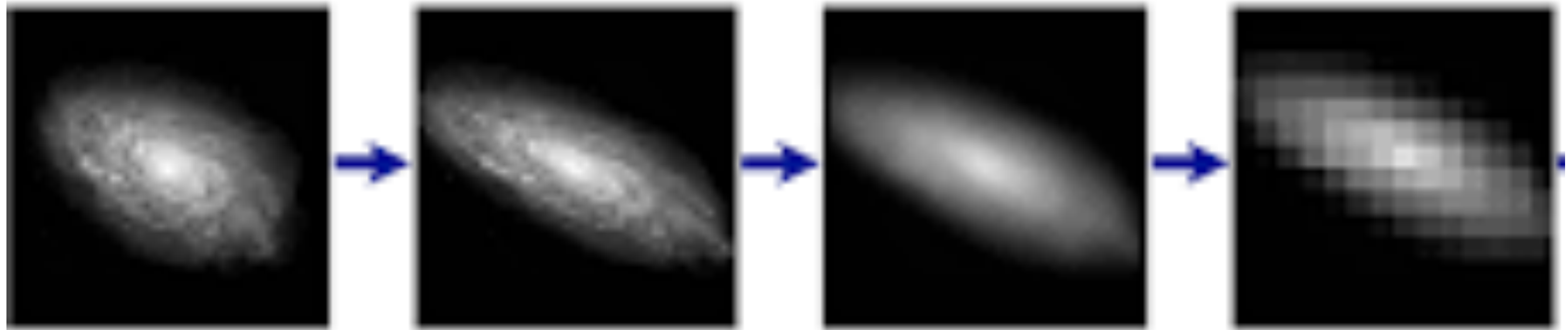
THIS GUY!



# *The weak gravitational lensing myriad*



## *The weak gravitational lensing myriad*

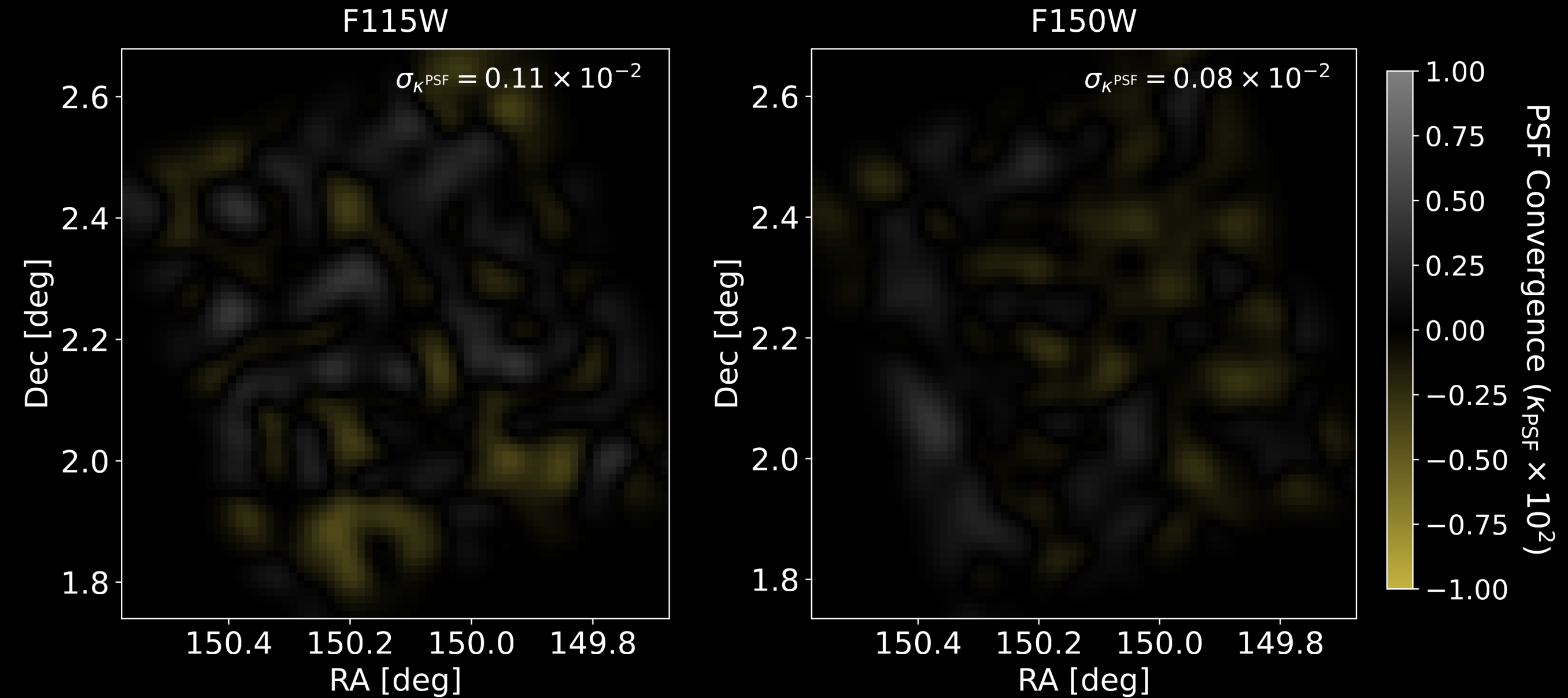


*Relies on how well we can characterise the Point Spread Function*

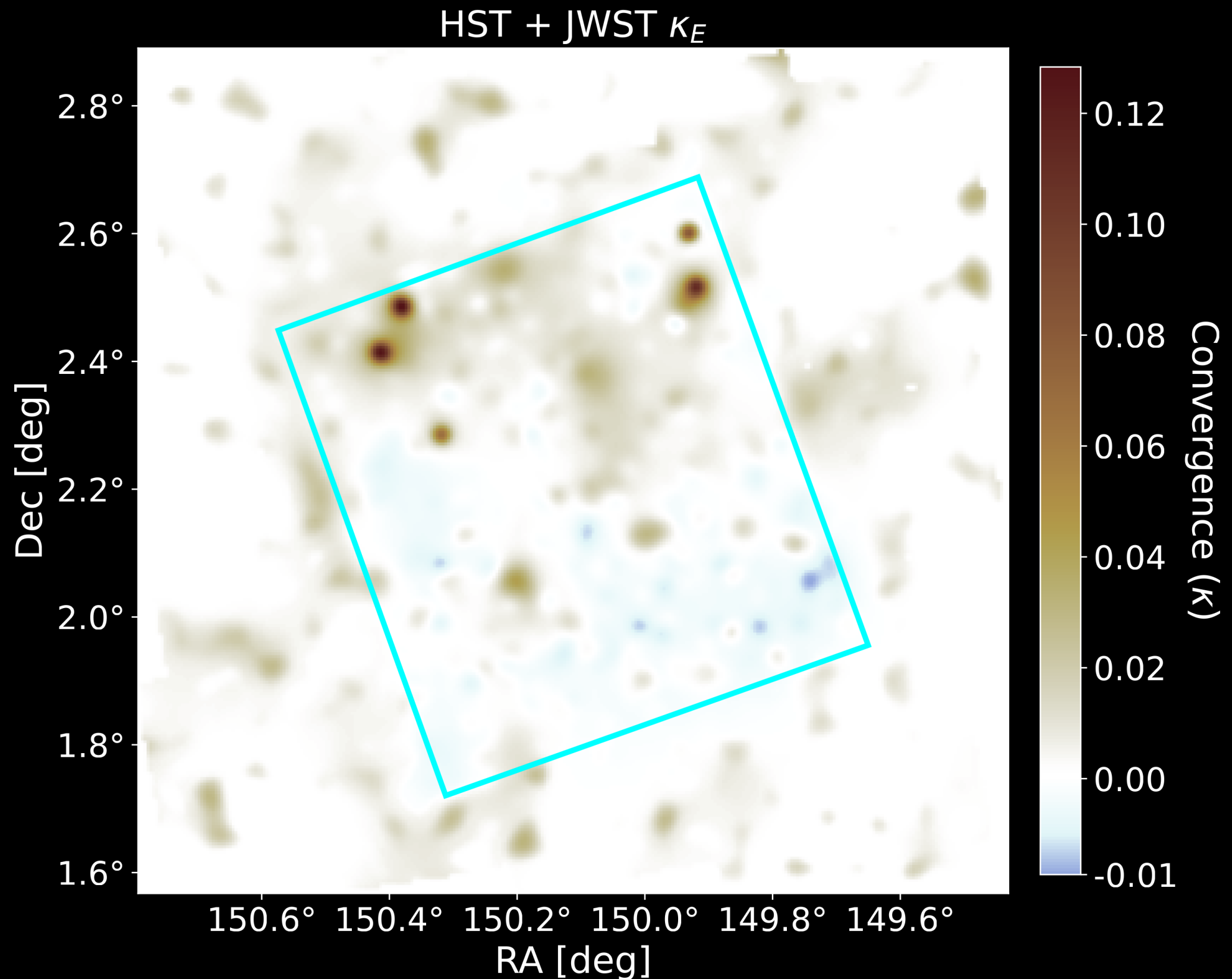




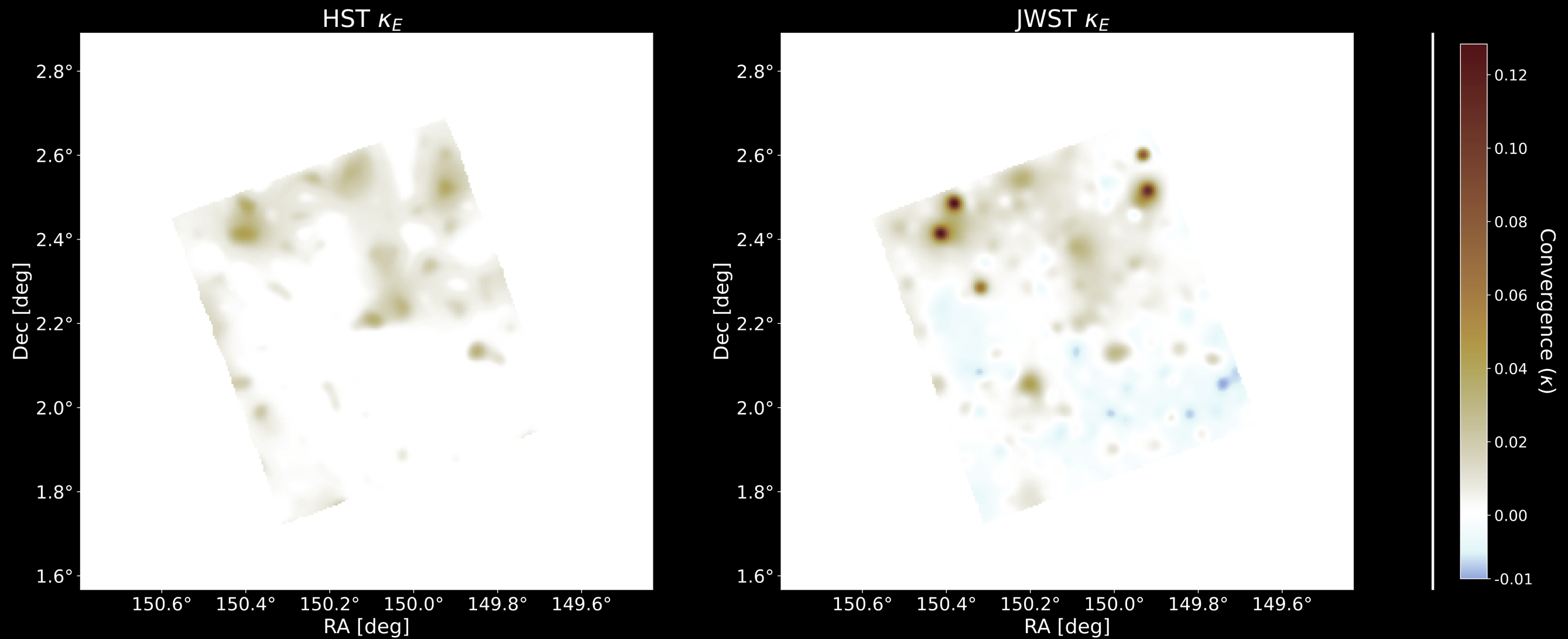
# *Residual PSF “Weak lensing convergence Map”*



***We pad with HST to avoid boundary issues***

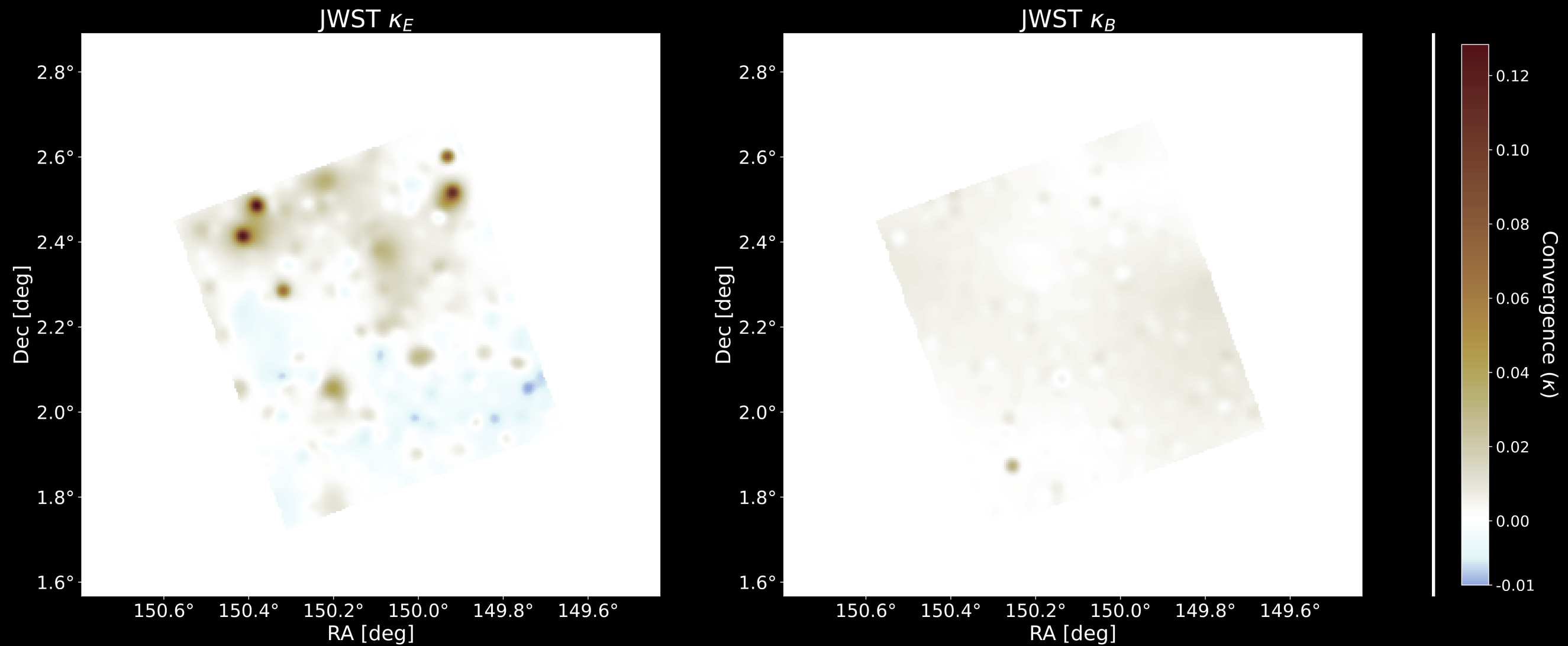


# *A factor of 2 Increased spatial resolution resolution*

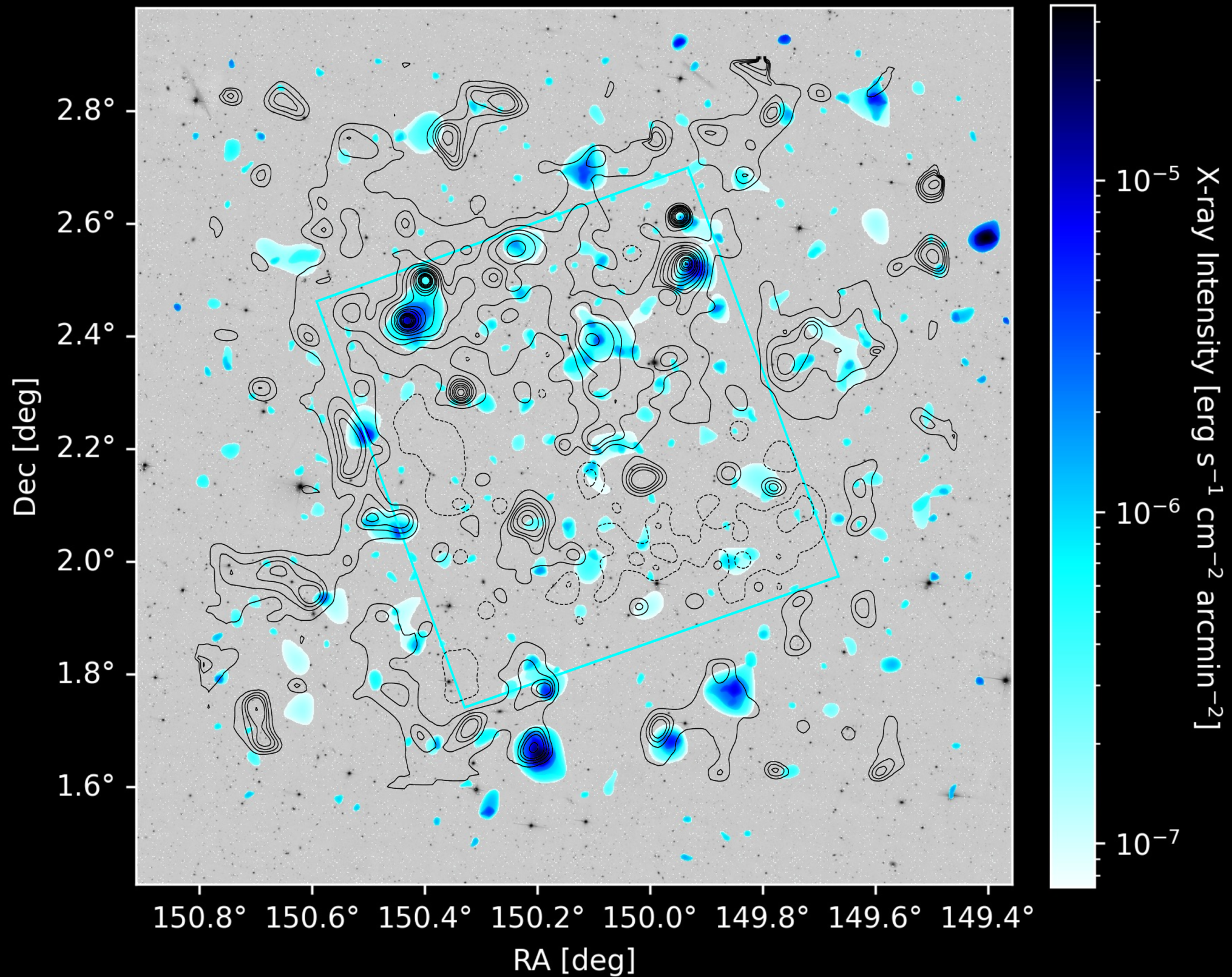




# *B modes are sub-statistical*



# *Strong correlation with X-ray emission*



**127** Galaxies per square arc minute

**The highest resolution large-scale map of  
(dark) matter ever made**

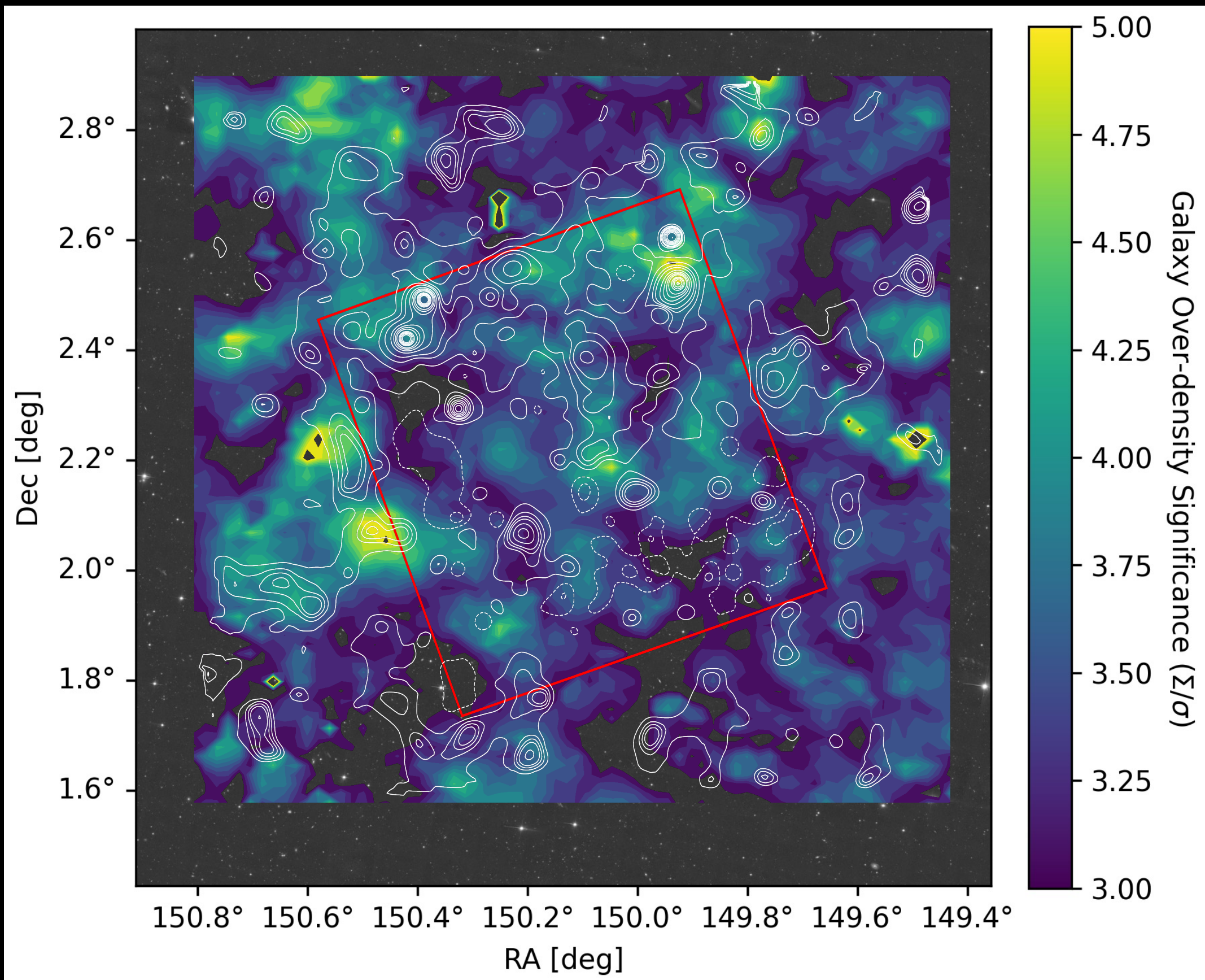


**127** Galaxies per square arc minute

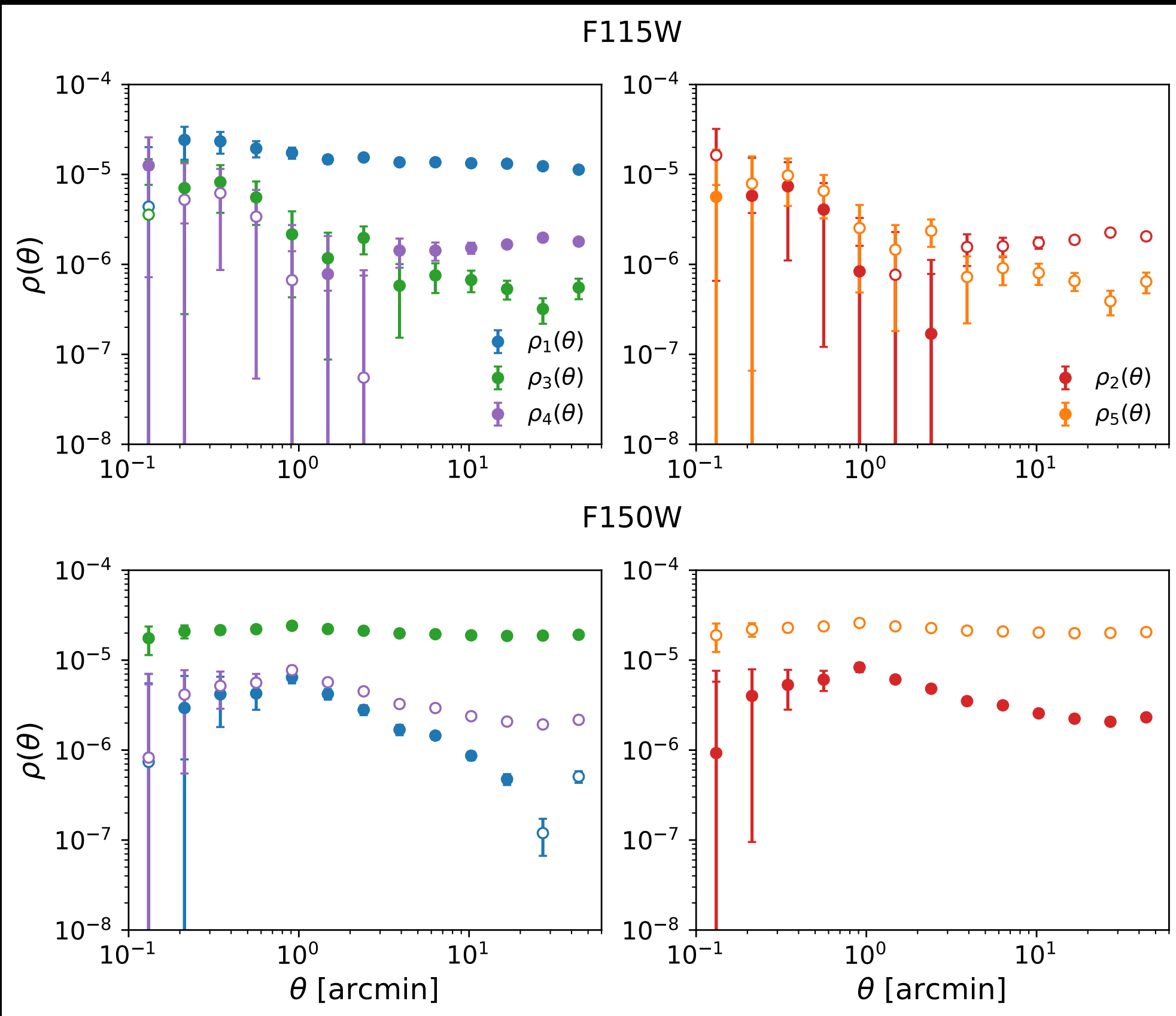
**The highest resolution large-scale map of  
(dark) matter ever made**

**With lots of science to come.**

***Not so much with stellar mass***



# PSF systematics





# *The JWST Point Spread Function with WebbPSF*

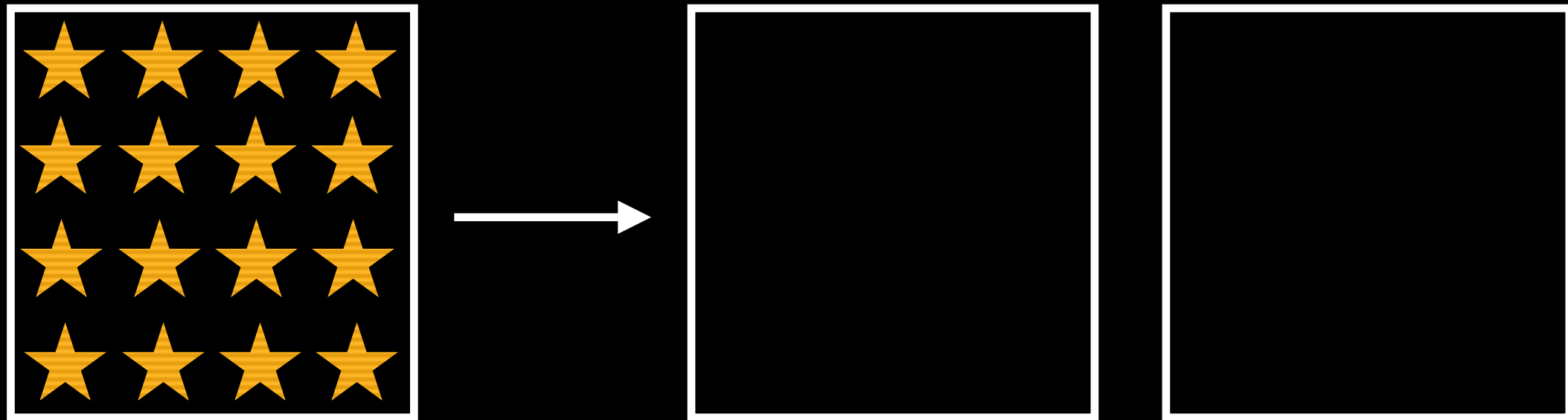


# *The JWST Point Spread Function with WebbPSF*





# *The JWST Point Spread Function with WebbPSF*



# *The JWST Point Spread Function with WebbPSF*

