

# 3C295: Science & Techniques with LOFAR-VLBI



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# Outline

Science work - 3C295

How to determine quality?

Current Image

Future Work

Technical work - Post-Processing Superstation Formation

What does it mean?

What does it entail?

# Science Goals

Immediate aim: image 3C295 with LOFAR-VLBI, achieving trustworthy in-band spectrum.

Difficulties: observation from 2014 (fewer international stations), 3C295 not at phase centre (requiring use of DDFacet).

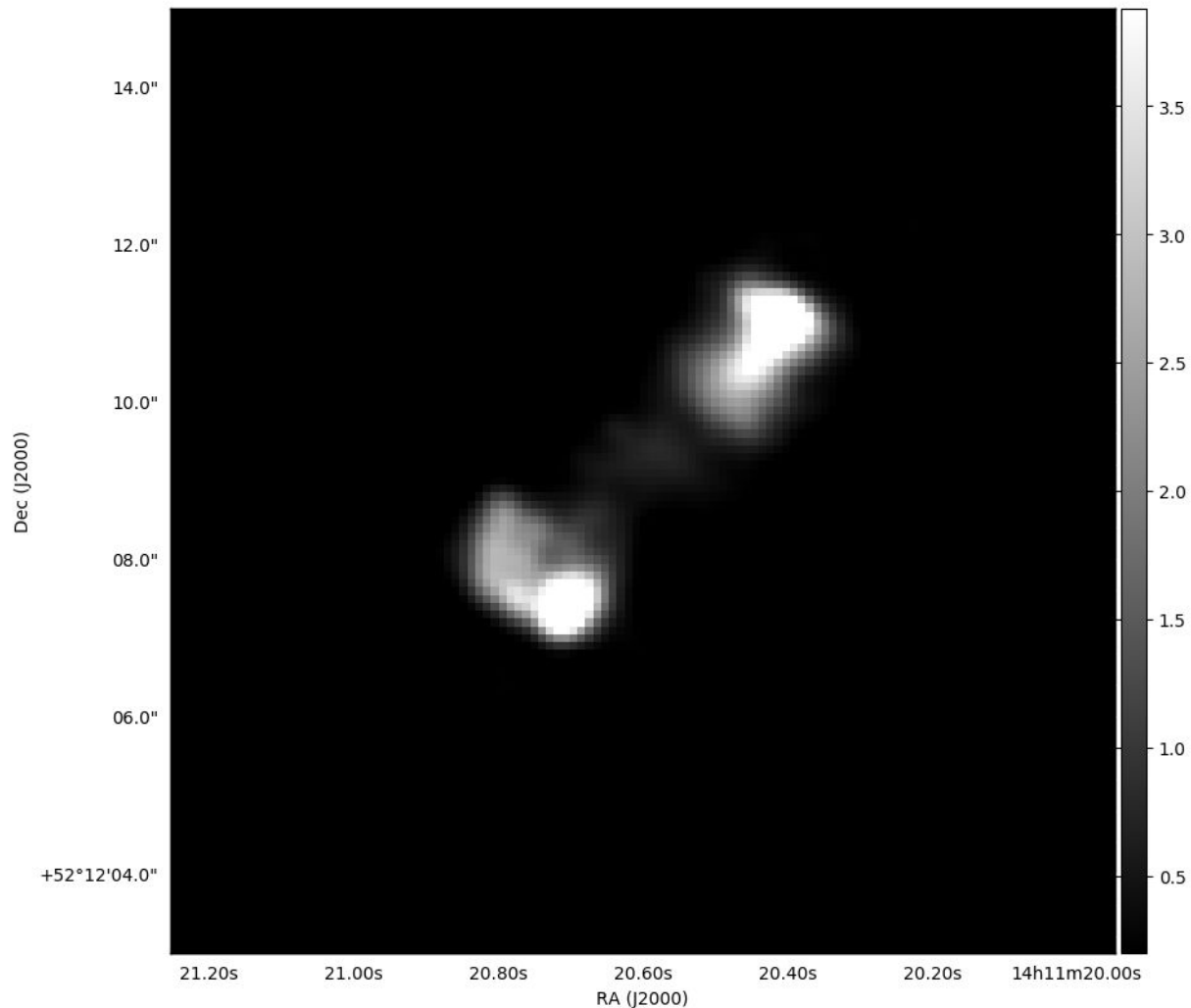
Final aim: get science-quality images with sub-arcsecond resolutions at LOFAR-HBA frequencies, of 3C295, its home galaxy cluster, and nearby Extended Groth Strip.

# 3C295

Current best model at  
LOFAR-HBA frequencies

Still a ways to go (only 1/6th of  
bandwidth used...)

Central emission - fictitious?...

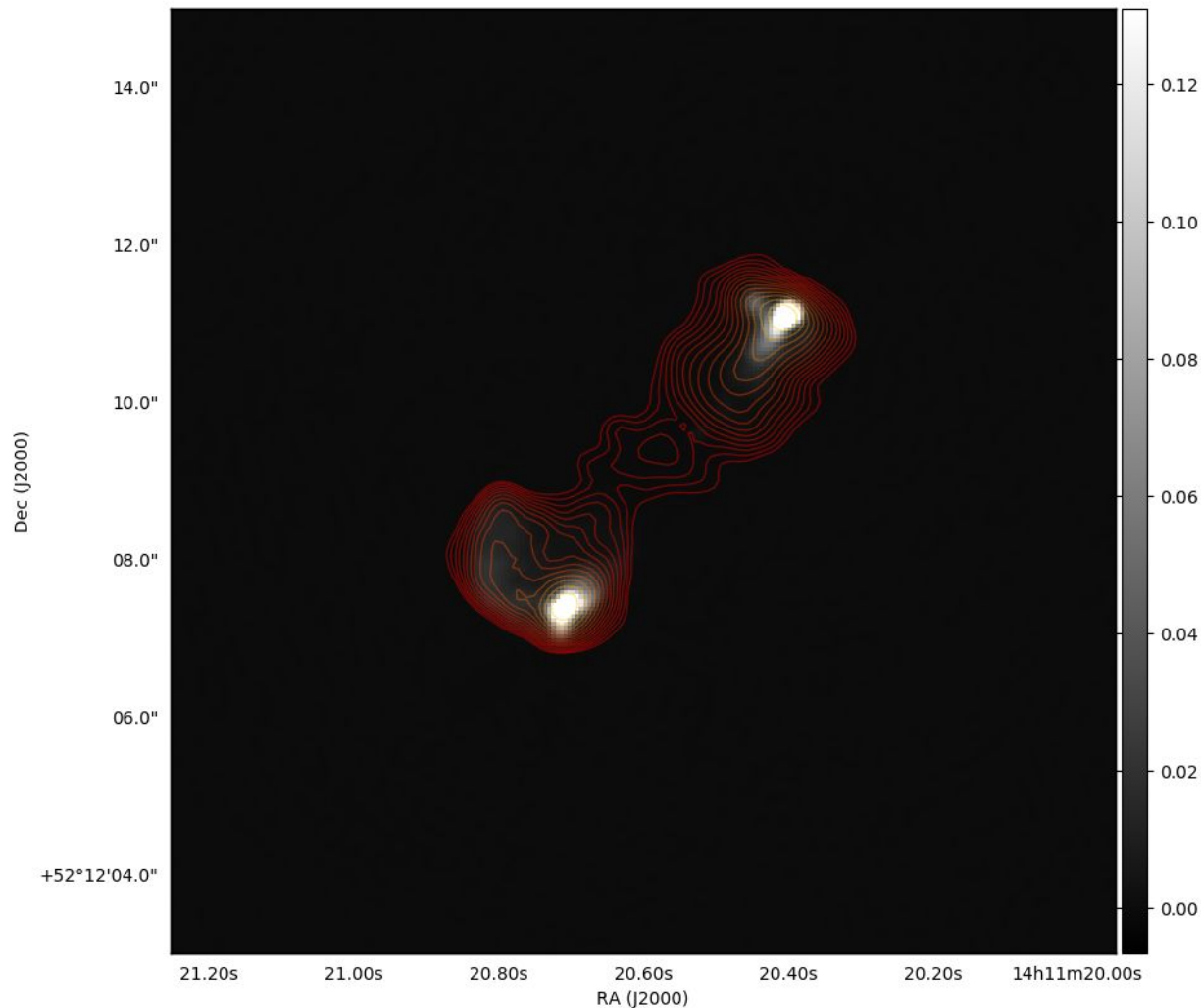


# 3C295

Overlaid last image over image of the starting model, VLA image of 3C295 made by Martin Hardcastle.

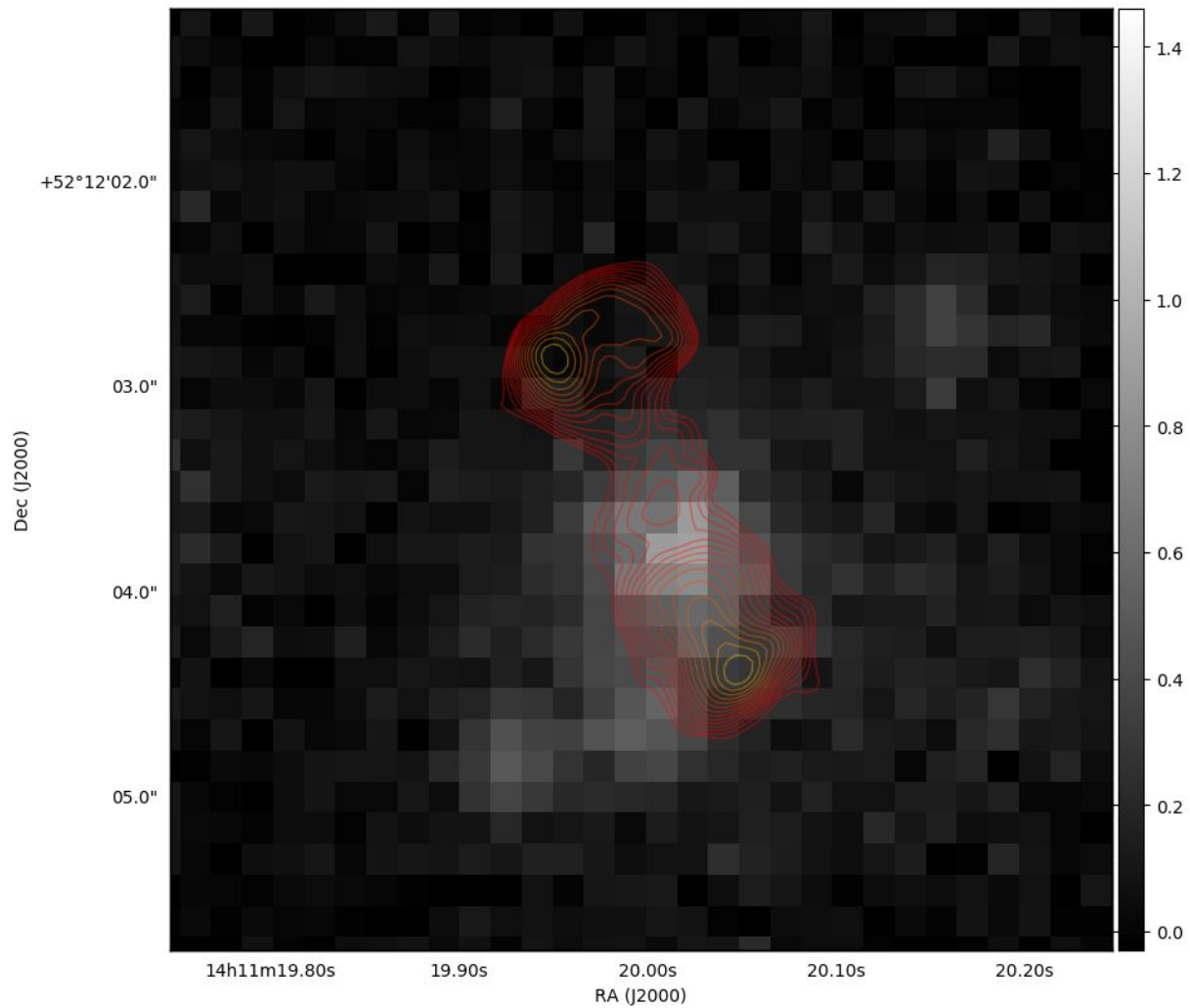
Clearly, main structure is coherent with model: hotspots, tails...

More diffuse emission seems to be picked up for Northern lobe however.



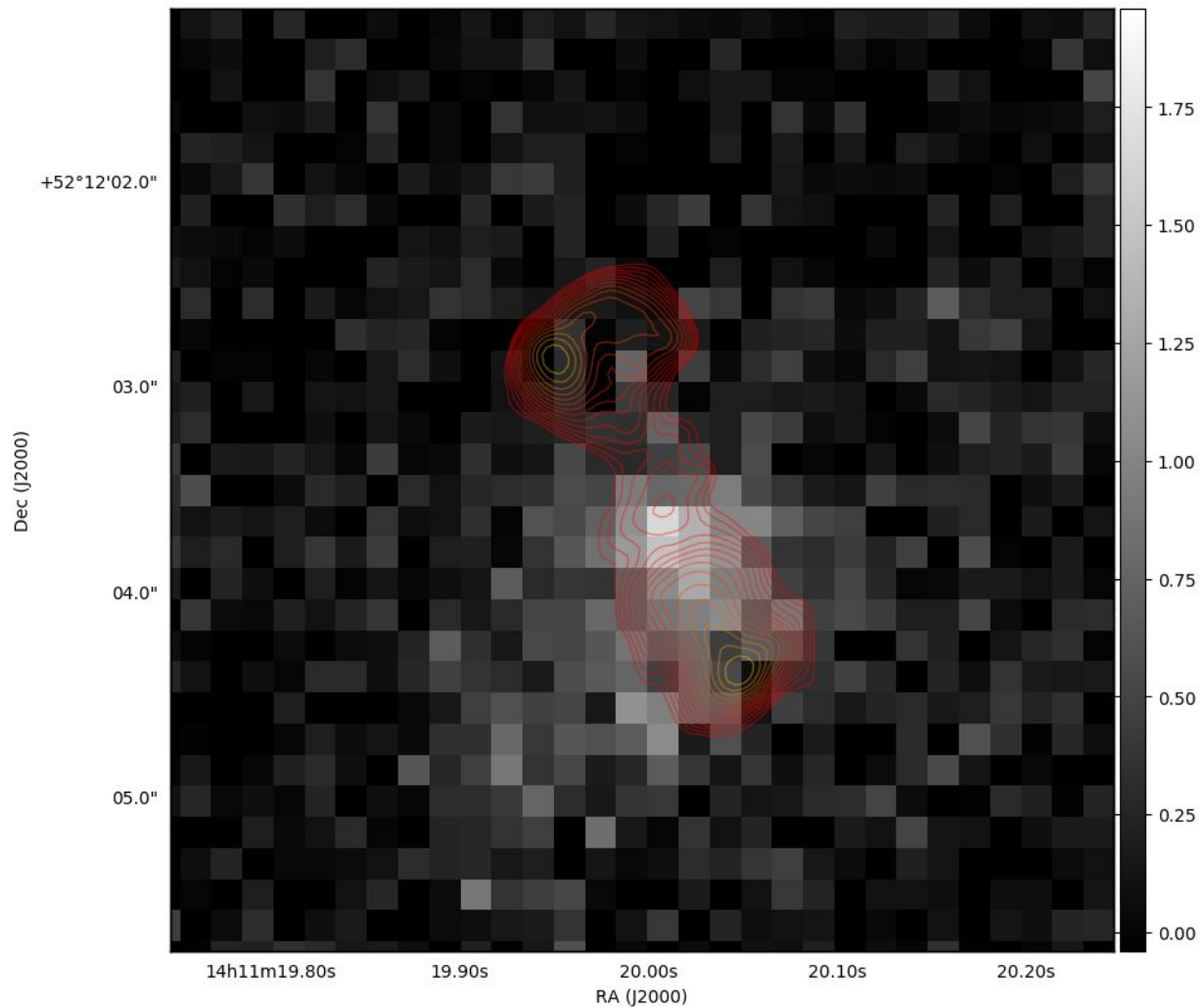
# 3C295

On right: our model of 3C295 overlaid over a region of SDSS in i band.



# 3C295

On right: our model of 3C295 overlaid over a region of SDSS in z band.



# Future Work - Calibration Enhancement & Spectral Modeling

## Calibration

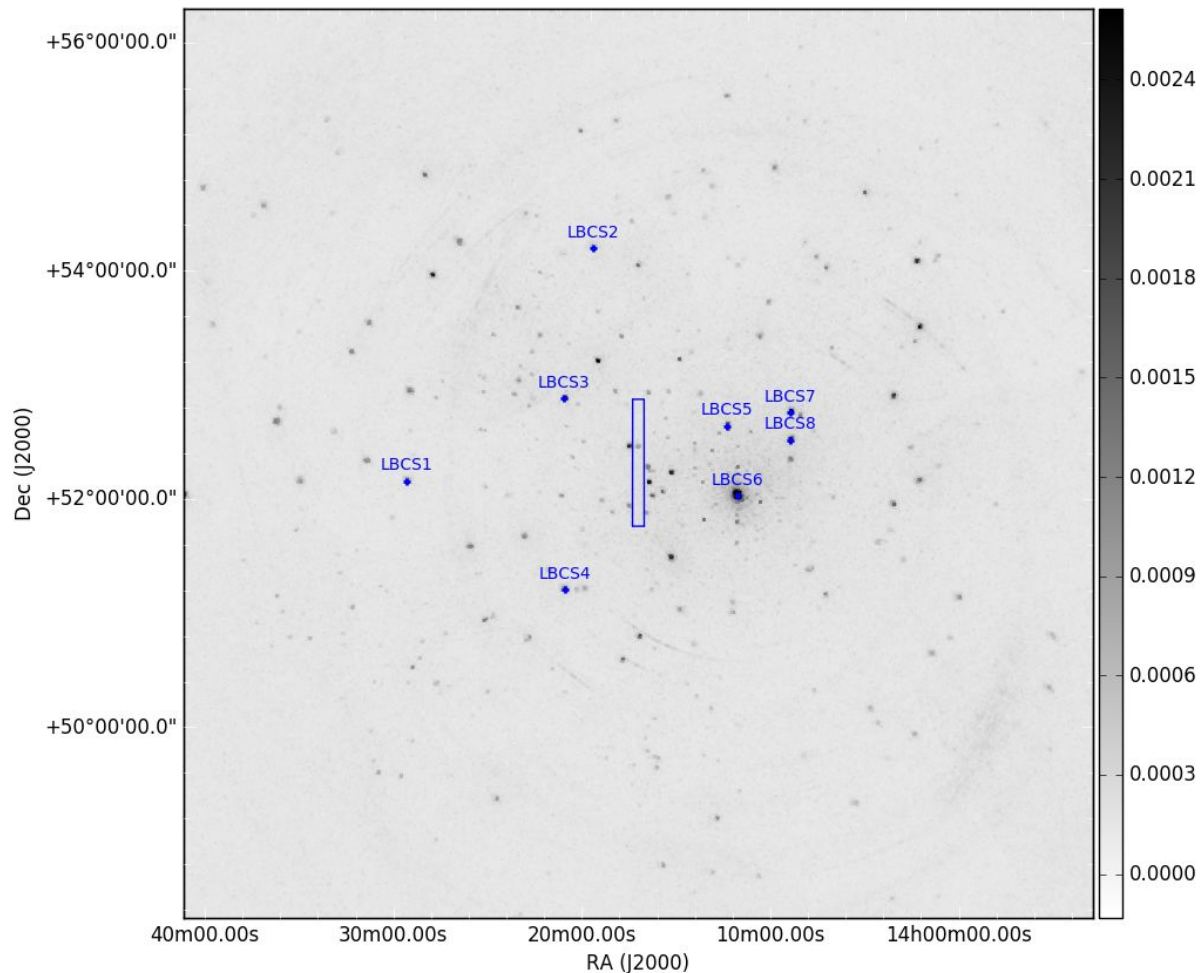
1. Rephase, average, rephase
2. “Halo” artefact still present after self-cal - attempt long-term gain solve

## Science

1. Make spectral injection maps with current images using BRATS.
2. Study 3C295 in context of its host galaxy cluster
3. Make a catalogue from nearby Extended Groth Strip, which lies within the LOFAR-VLBI field of view.



# Future Work - 3C295 in the LOFAR field of view



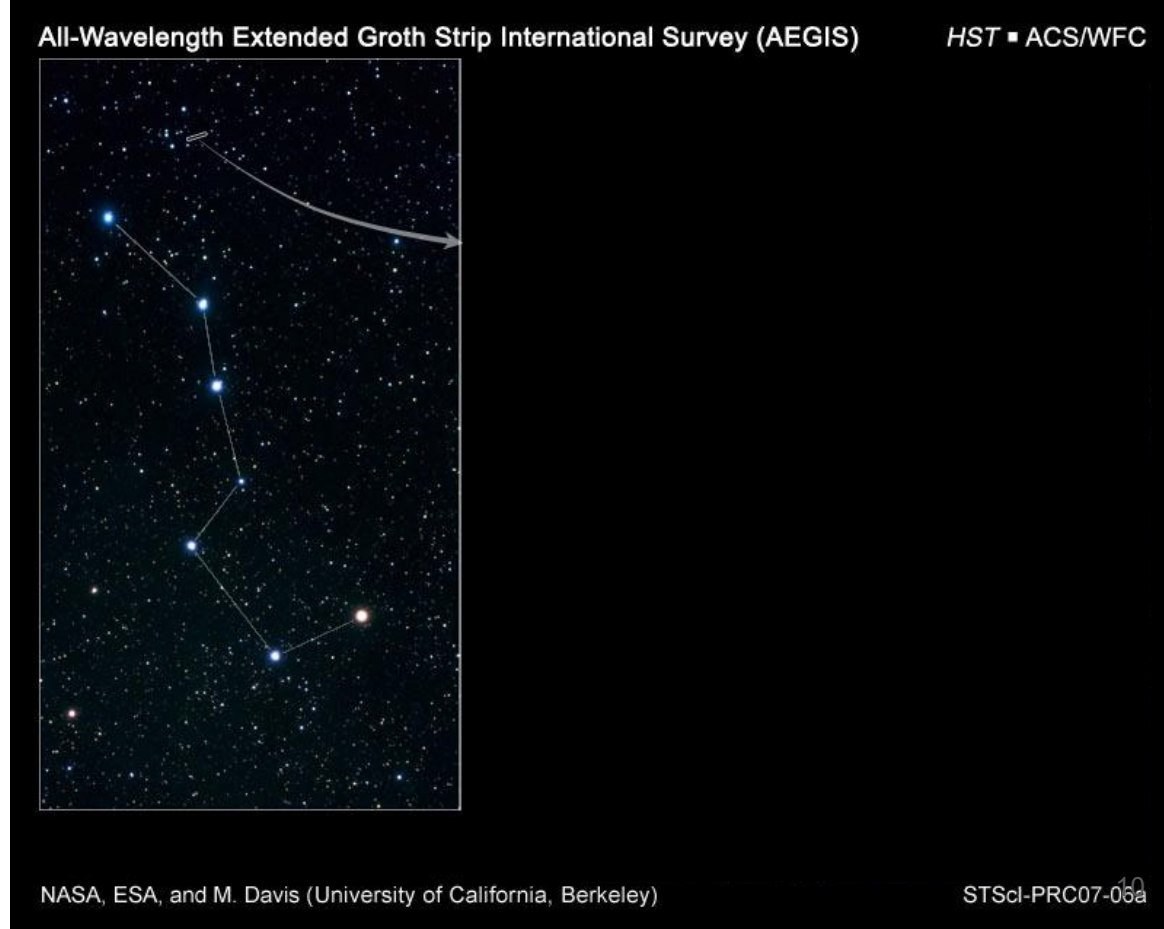
# Future Work - 3C295 & the Extended Groth Strip

The work done here part of the LOFAR Surveys KSP.

Observe large patches of the sky at once.

Multiple famous fields: near 3C295 lies the Extended Groth Strip (EGS), which has large multi-wavelength coverage.

This helps with understanding physics of objects, but also verify associations, positions...



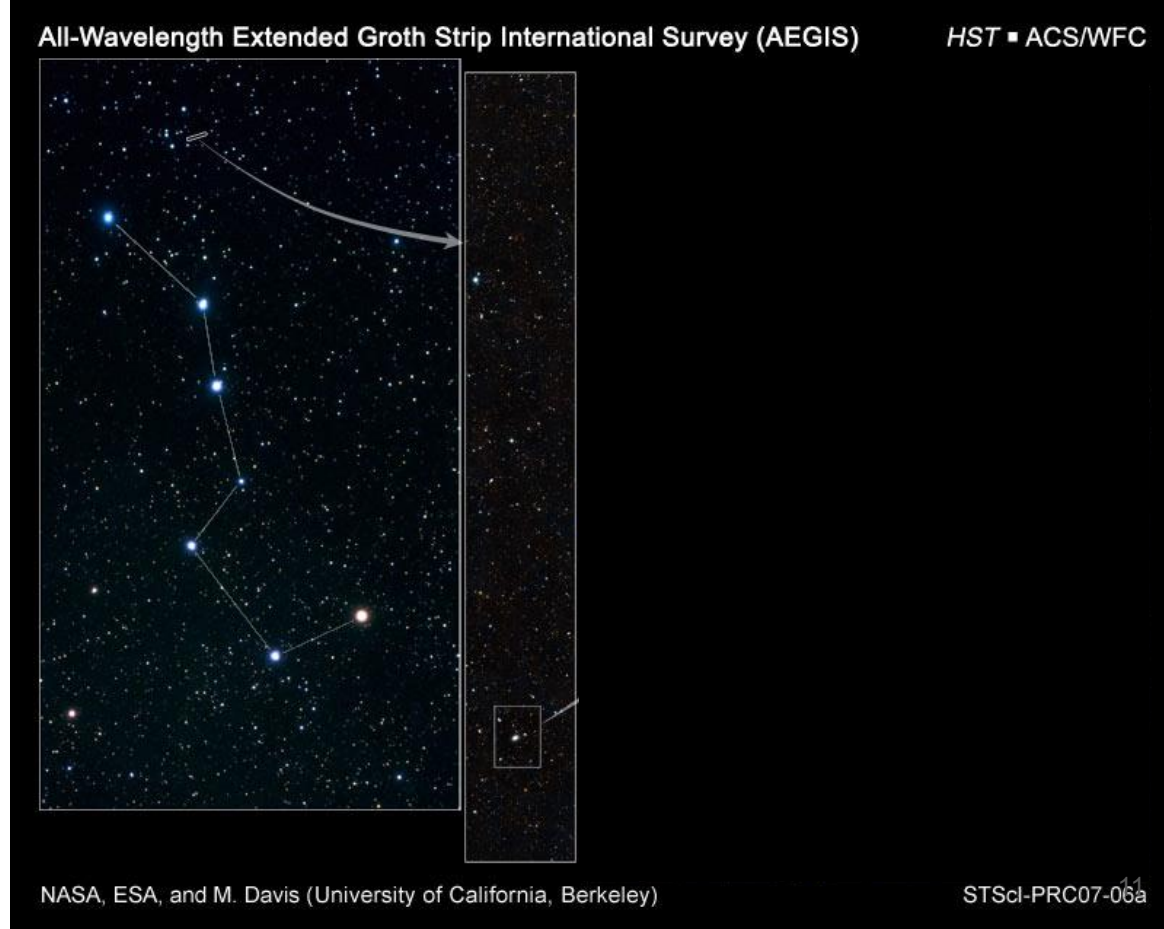
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