WFCAM Science Pipeline Update

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WFCAM processing summary

Semester	05A	05B	06A	06B	07A	07B	08A	08B	09A
Nights	81	166	95	157	50	125	132	75	108

an average of 70% of telescope time

140 TB Raw Data (35 TB compressed)

240 TB processed Data (60 TB compressed)

6 million 2k x 2k science images

08B processing finished end of December *

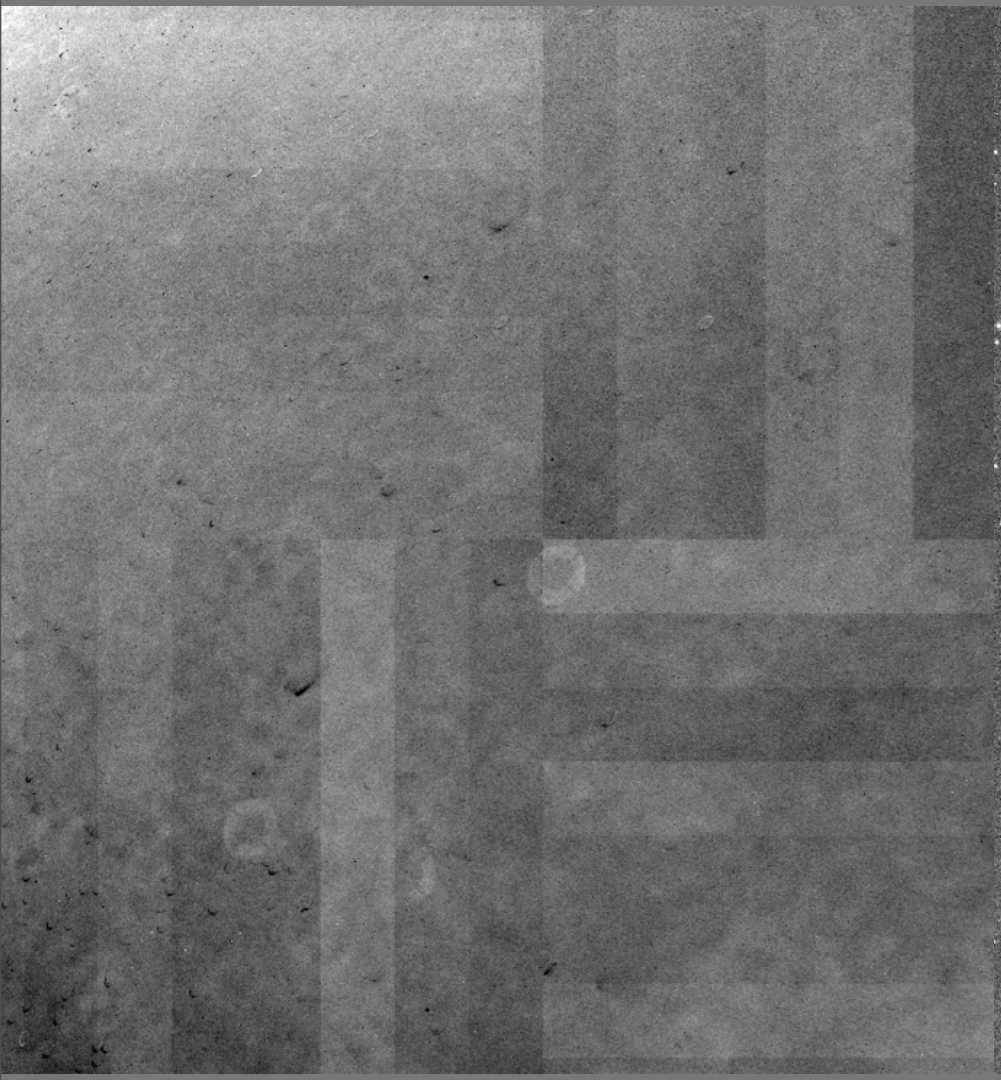
09A processing on track once flats available

Updates since 08A

- extra processing to remove parquet floor pattern
  - now incoporated in pipeline
- monthly photometric recalibration & illumination correction
- MSBTid logs available immediately after 1st pass processing
- nebulosity filtering post-processing option
- optional PSF regularisation via "dribbling"
- new observing and reduction strategies for improved background subtraction for large extended objects
- deployment of object masking pawsky algorithm
- bug fixes/workarounds including a long-standing one

problems with detectors #2,3

K-band sky #3

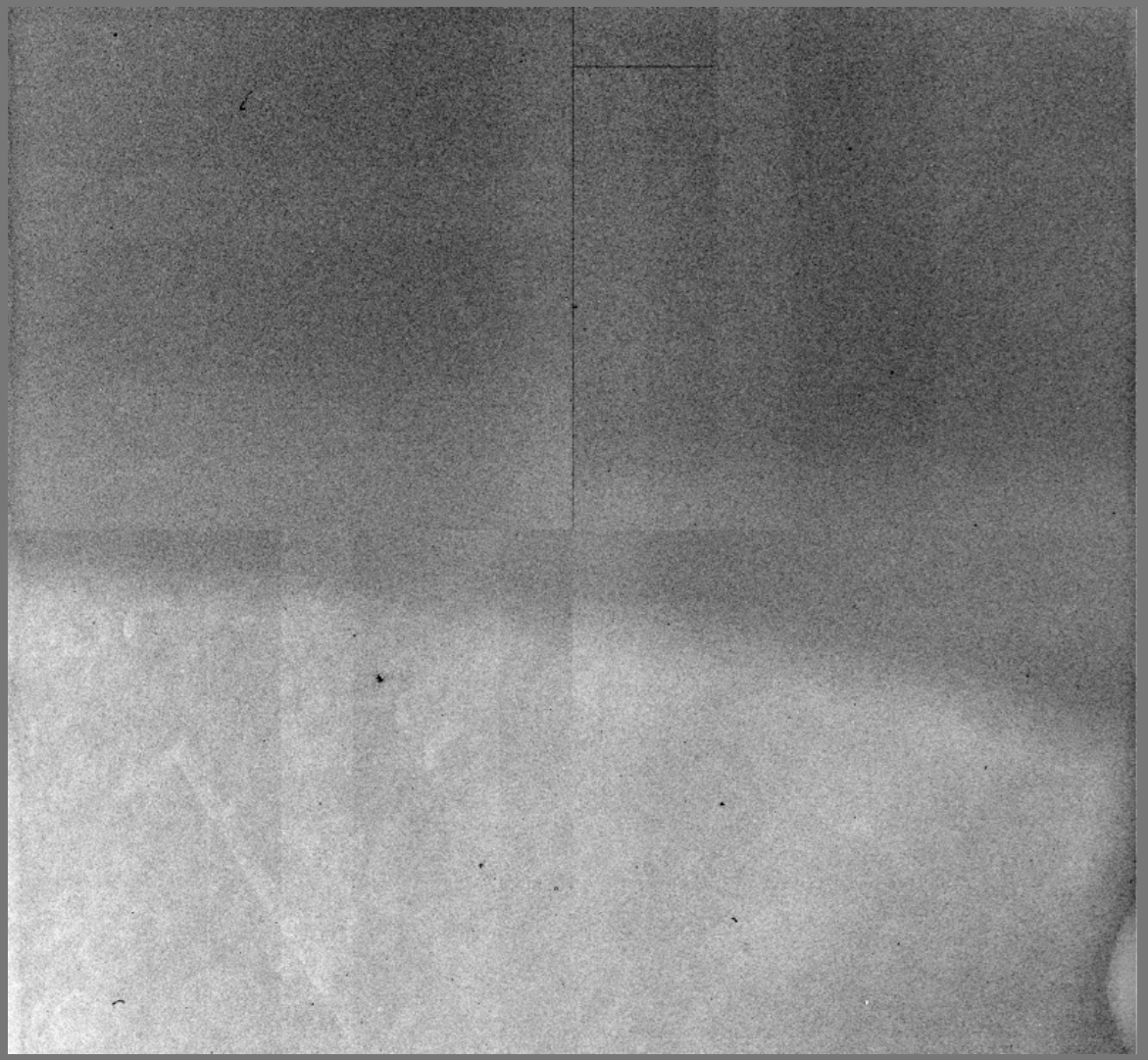


stacked final image

Parquet floor processing

LAS Y-band

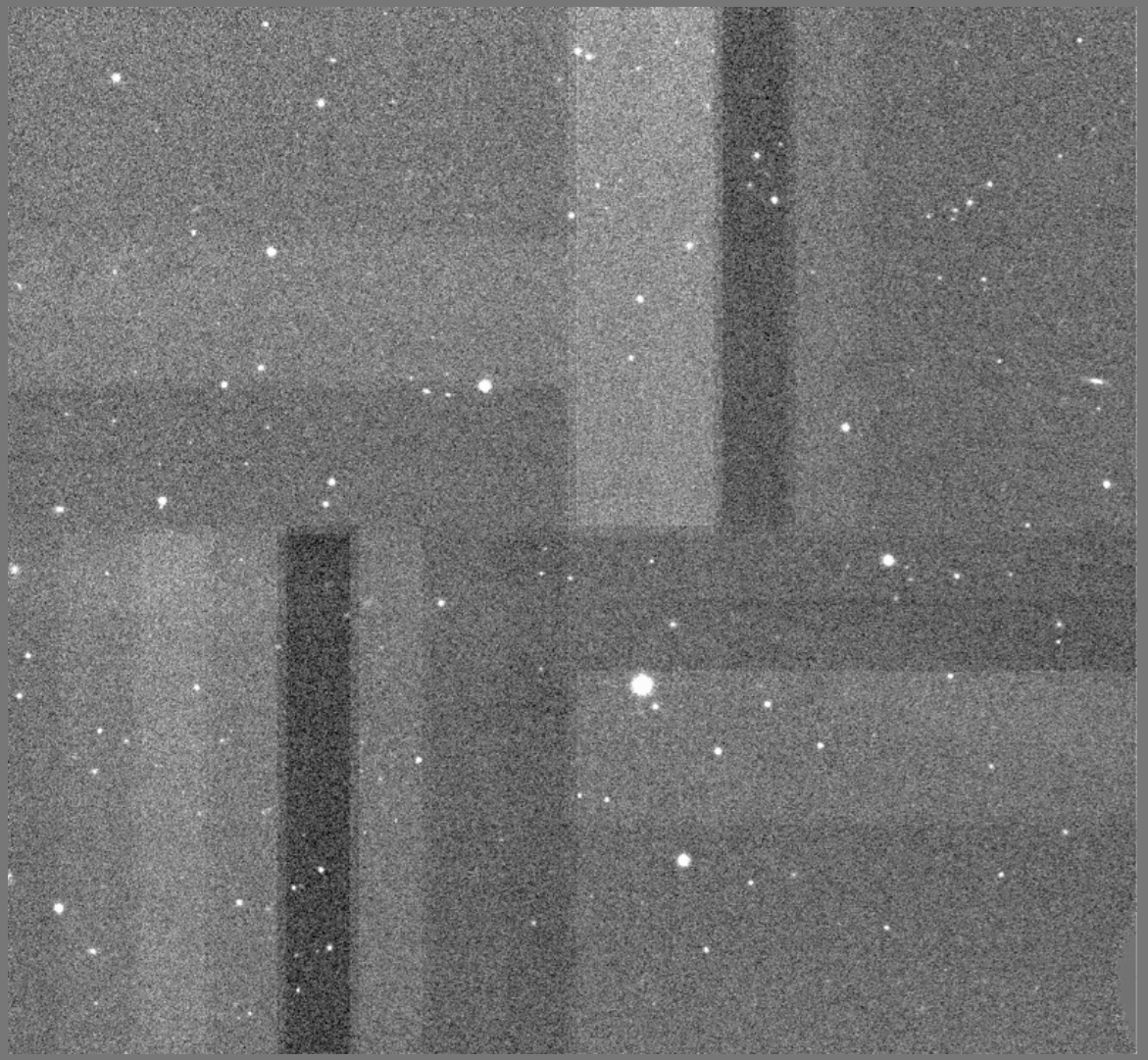
detector #2



Parquet floor processing

LAS Y-band

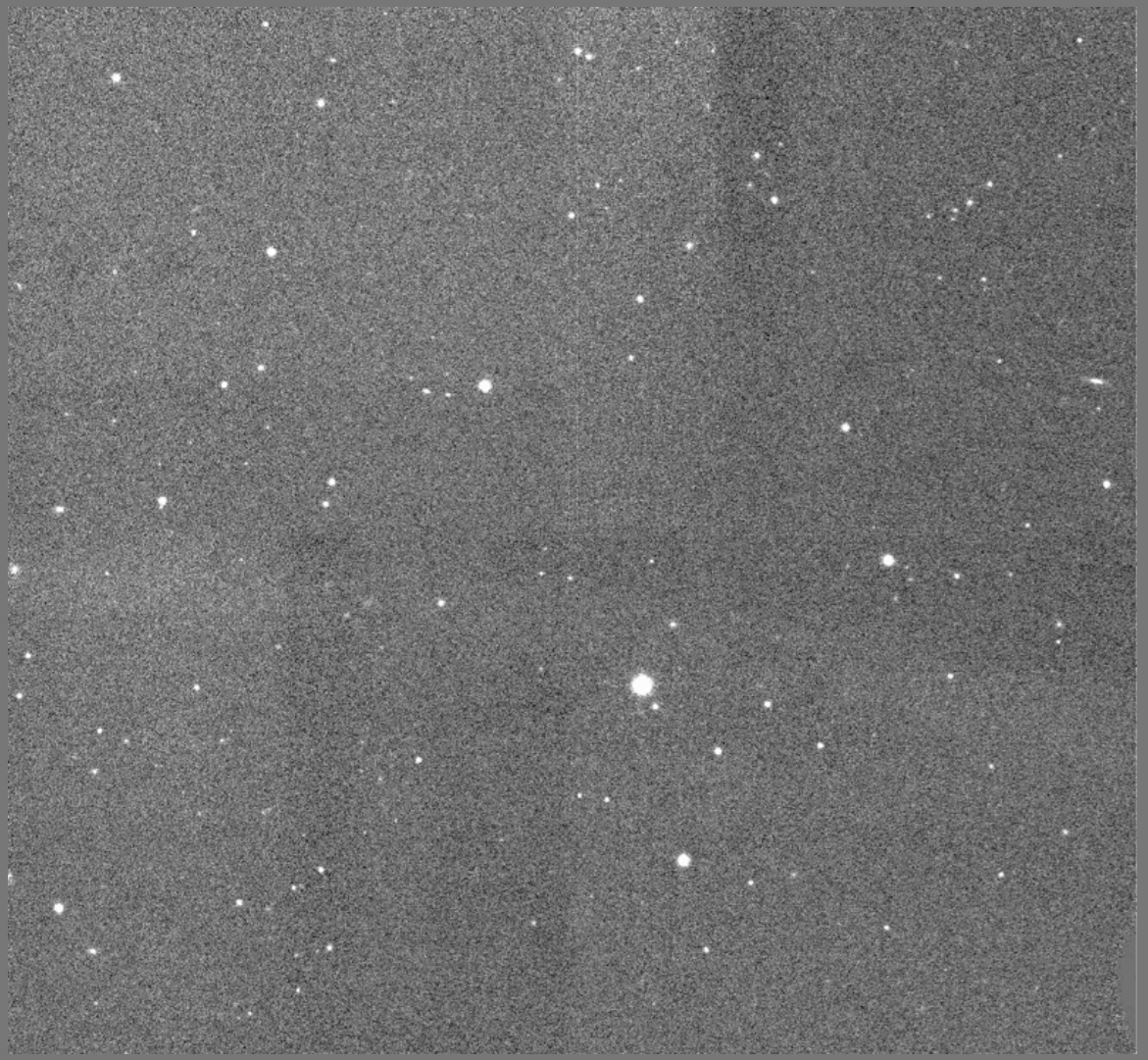
detector #2



Parquet floor processing

LAS Y-band

detector #2



Sky flipping/offsets

- extended objects observed on a given detector
- objects are then 'flipped' to a different detector
- background for 'object' detector in one jitter determined from compliment observation jitter
- objects of interest are observed at all times (albeit on different detectors - advantage over offset sky strategy)
- offset skies only for large objects, e.g. M101, large clusters etc., which cover more than 1 detector

Bugs: deblended objects Petrosian fluxes and radii

- indexing bug in catalogue Petrosian routine
- only affects deblended objects and is now fixed
- fundamental problem with circular apertures
- workaround found that can be applied retrospectively
- all catalogues will eventually be repaired

cataloguing bug affecting 20080312 ->

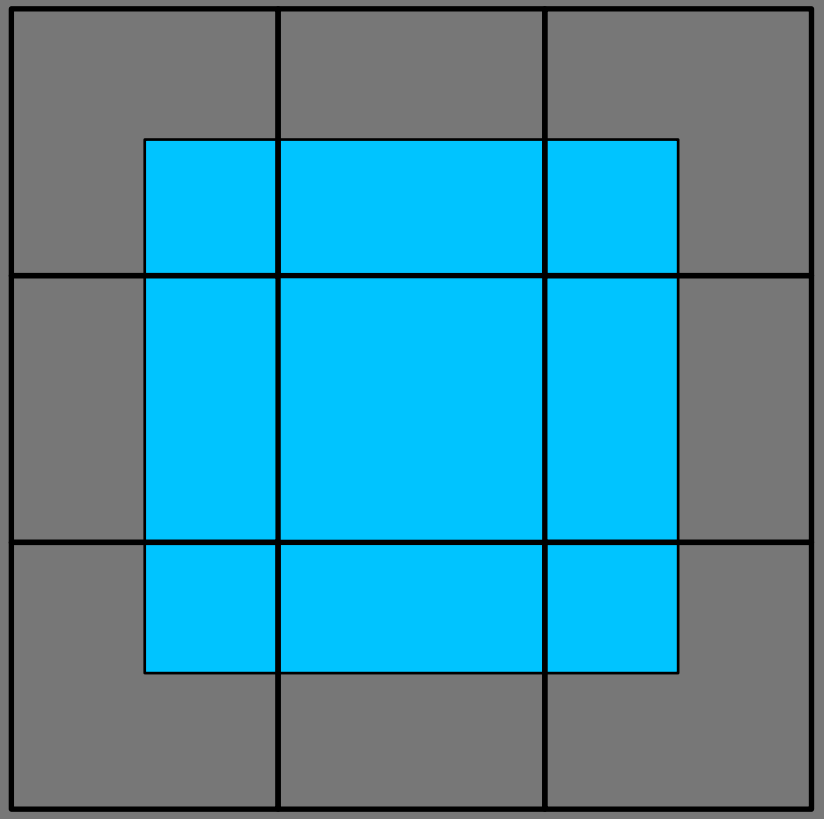
- found by Mike Read during DR5 checking early 2009
- all 08A catalogues from 20080312 -> regenerated
- all 08B catalogues regenerated including Petrosian bug fix
- all 09A ok i.e. free of "known" bugs

Reprocessing status

- UDS K-band data 05B-07B all reprocessed using object masking pawsky method
- UDS J-band and H-band reprocessing on hold until final assessment of deep K-band stack
- Orion U/05A/100 data all reprocessed - tilesky method plus nebulosity filter to improve cataloguing
- nebulosity filtering and recataloguing for (600) selected GPS files completed - still needs checking and assessing
- repairs to Petrosian ..... radii and fluxes for deblended objects for 05A-08A required for DR6 - next in queue

PSF regularisation on interleaved frames – "dribbling"

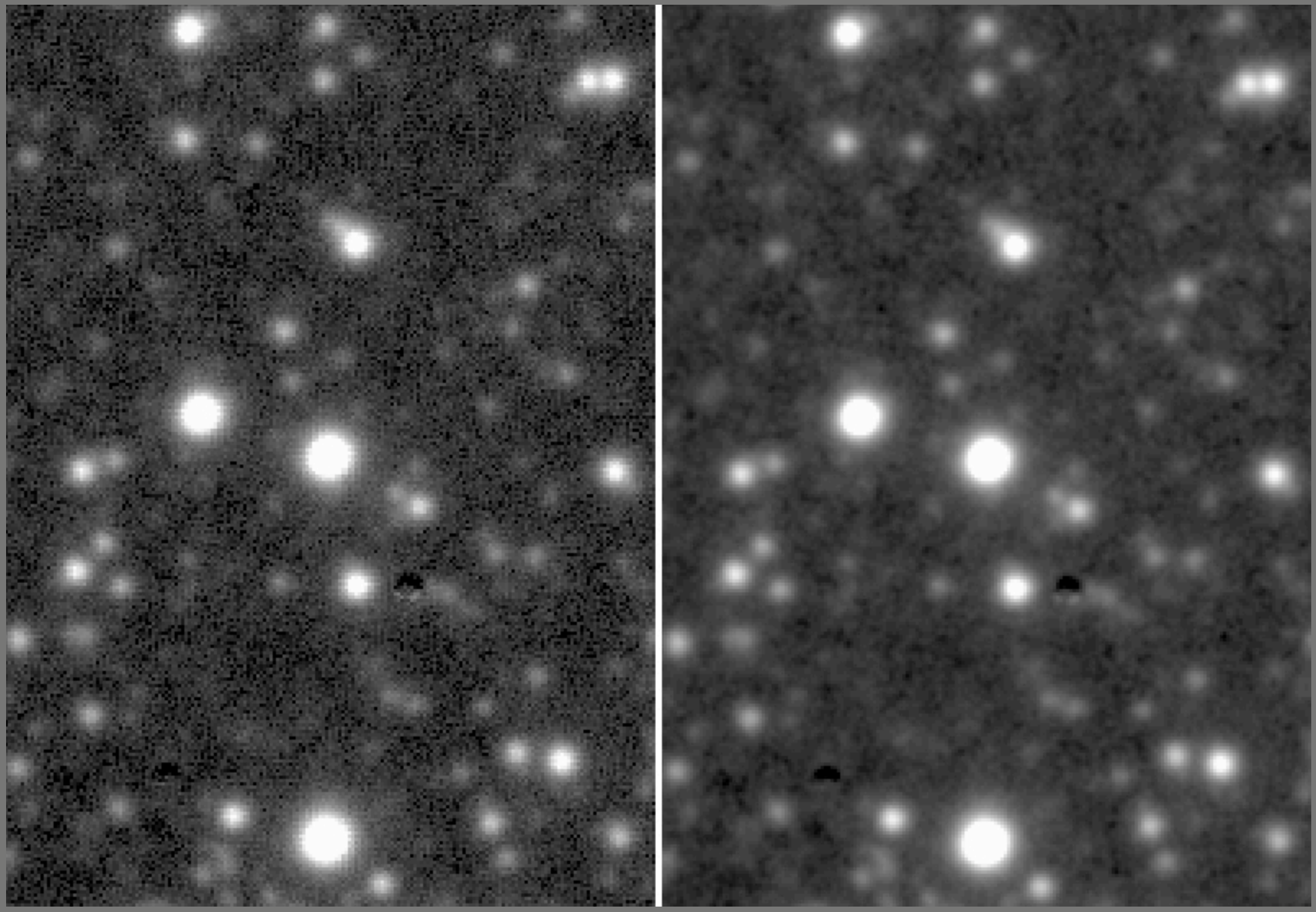
e.g. 2x2 partition 0.4 arcsec pixel over 0.2 arcsec grid



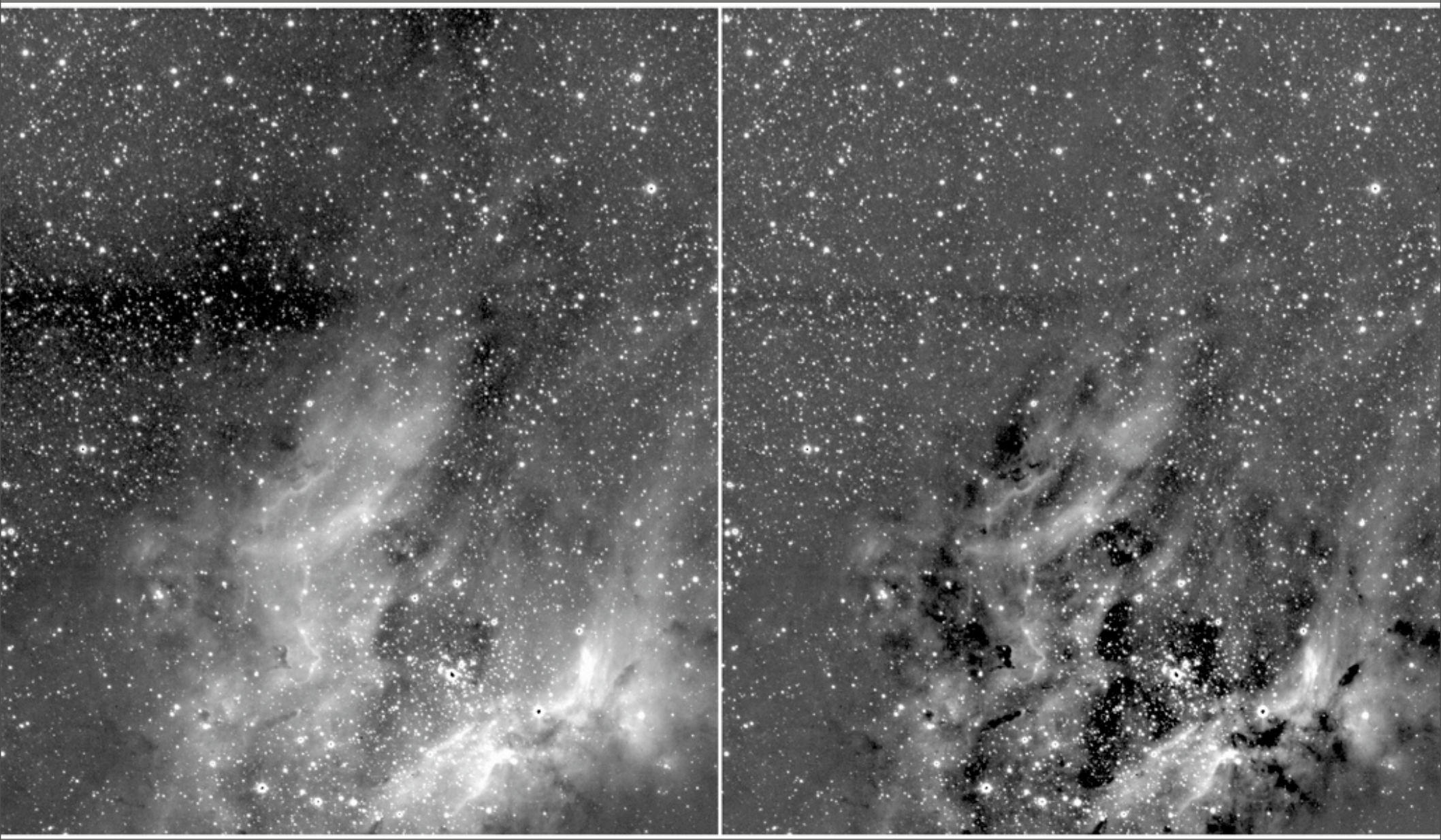
0.0625	0.125	0.0625
0.125	0.25	0.125
0.0625	0.125	0.0625

→ smooth PSF + correlated, but predictable, noise

PSF regularisation on interleaved frames - "dribbling"



Photometry in regions of high nebulosity - M17 K-band WFCAM



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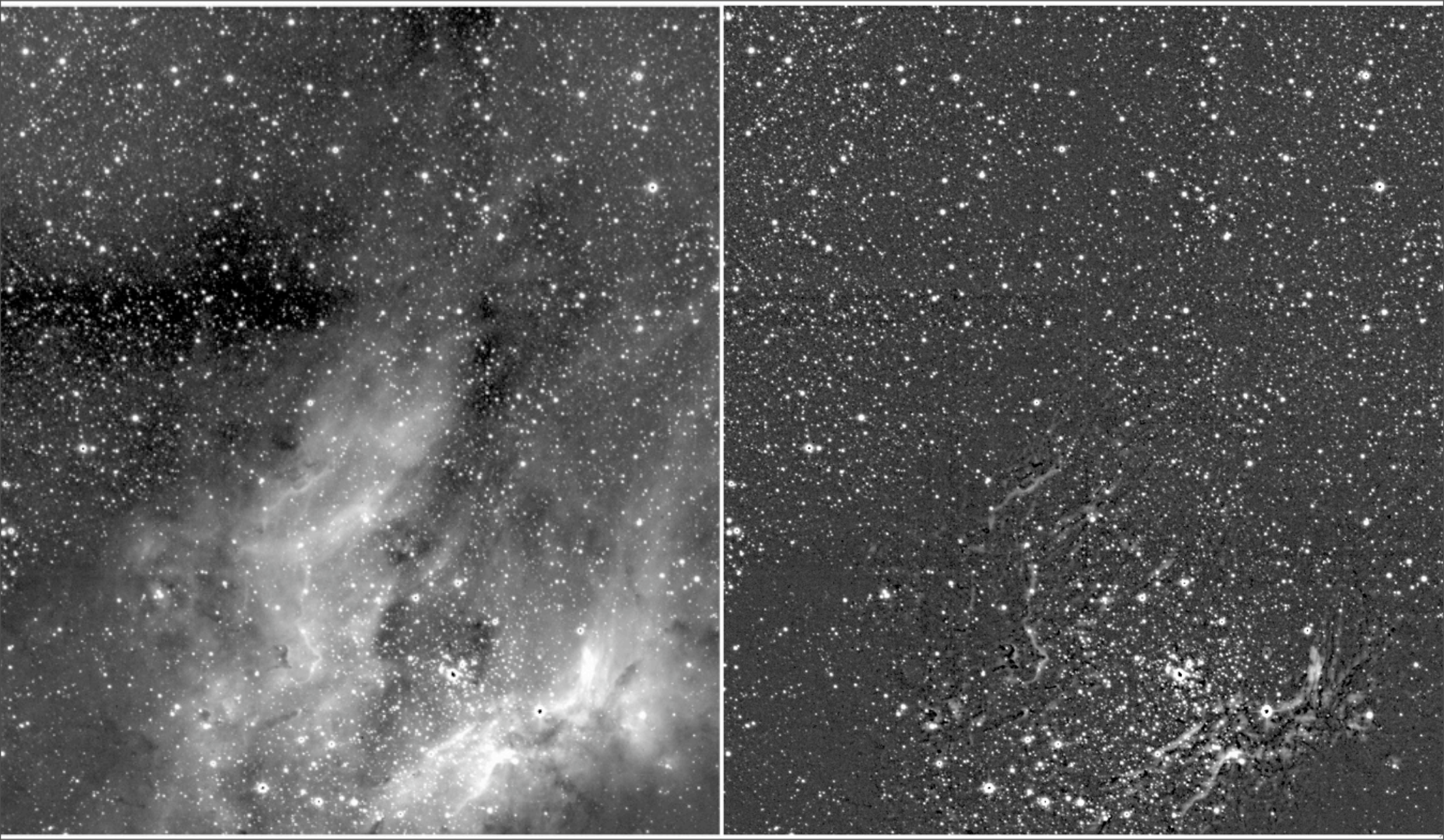

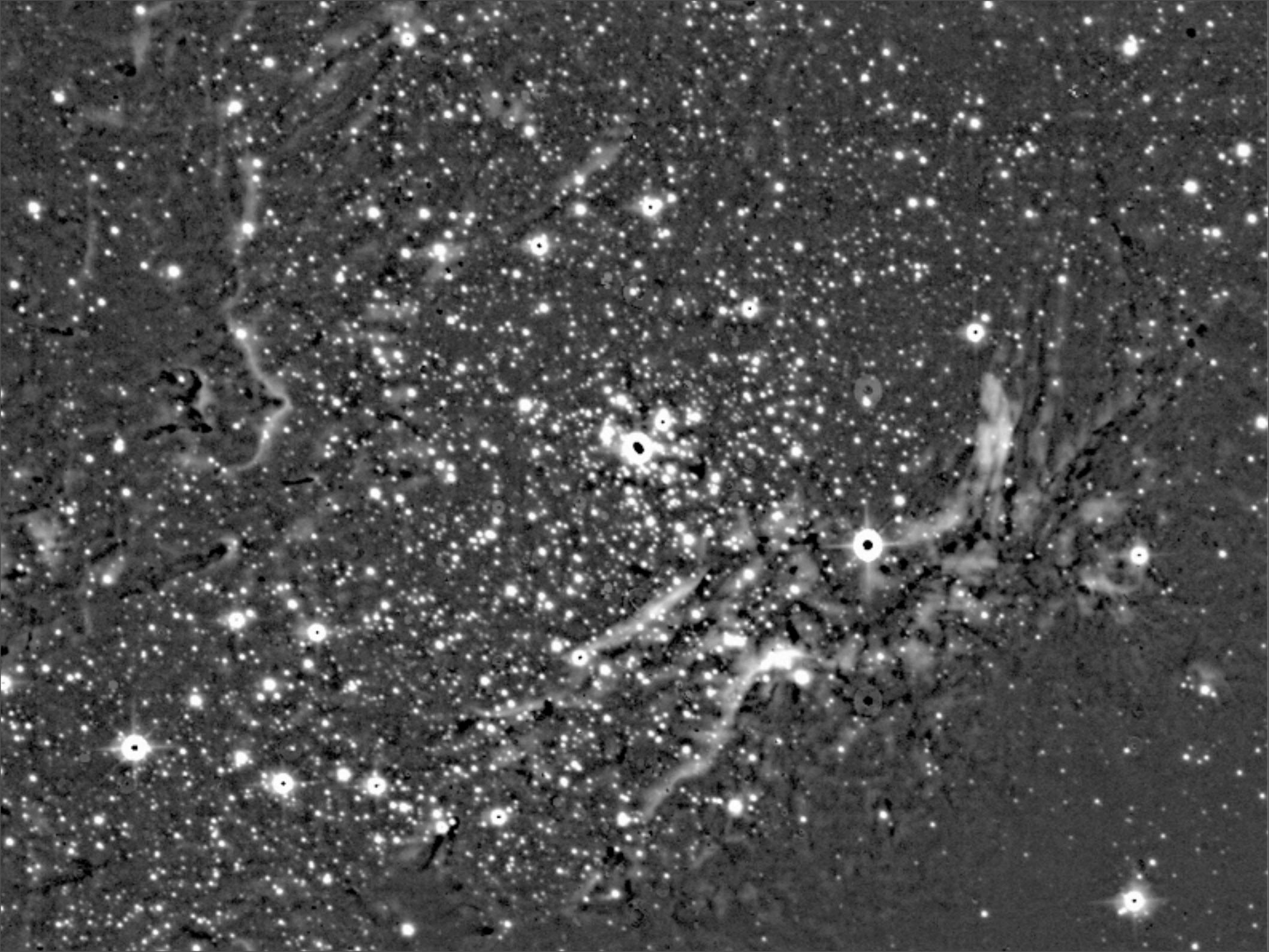

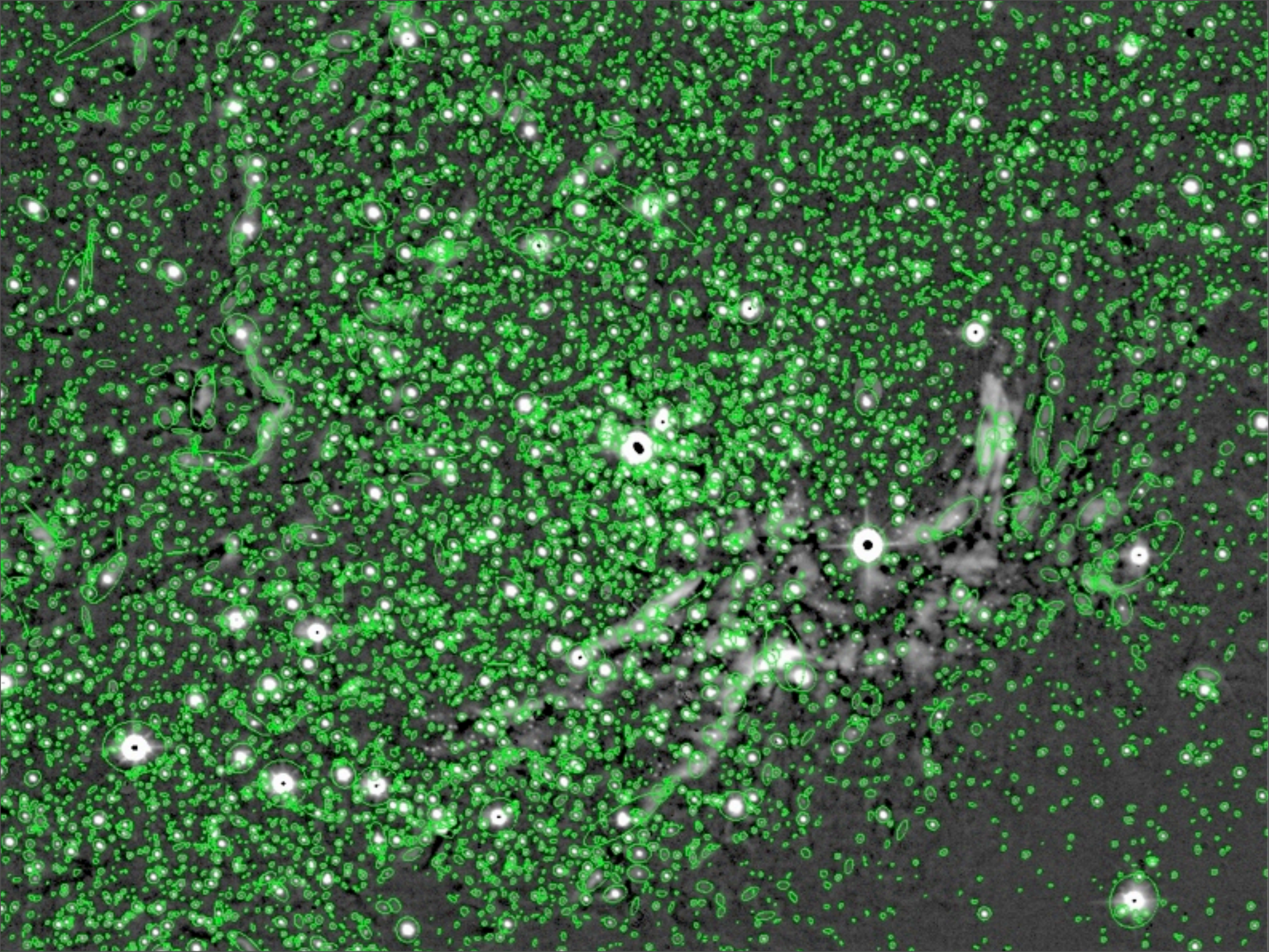

Funding

previous CASU rolling grant 01/04/2005 - 31/03/2010

VEGA VDFS grant + extension 01/10/2002 - 31/03/2008

current grant application submitted late May 2007;

reviewed January 2008; still under disussion;

nominal start rolling grant 01/04/2008

next rolling grant submission due ~April 2010

"the level of resources requested appears to me to be the minimum to deliver the programme. I see no scope for reductions in the manpower or computing facilities requested."