

**ACS/WFC Mosaic of M51**  
[Data Link](#) | [PI/AGIS/IRIS](#) | [Browse page](#)

In January 2005, the Hubble Heritage Team obtained a large 4-color mosaic image of the Whirlpool Galaxy NGC 5194 (M51), and its companion NGC 5195, with the Advanced Camera for Surveys (ACS) onboard the Hubble Space Telescope (HST). See [ACS Observations of M51](#) (PI: Steven V. W. Beckwith) for details.

A six-pointing ACS/WFC mosaic of the galaxy and M51 was obtained in four filters: B, V, I, and H $\alpha$ .

To the right is the six-pointing ACS mosaic overlaid on the DDO image of M51 from the [Digitized Sky Survey](#).

The resulting color composite image was released to the community on April 28, 2005 to celebrate Hubble's 15th anniversary. Since the M51 mosaic produced by the Hubble Heritage Team represents a long-fought investment of expert processing beyond the standard archival products, three AGIS-combined FITS files have been released simultaneously as a High-Level Science Product via the Multisession Archive at Space Telescope Science Institute.

We provide a [list of the FITS files](#) and other archival products for your use. We also provide a [browser page](#) with another set of links to [browse](#). The browser option is not directly related to the FITS files. For a few weeks, we provide the "HST pipeline products for each filter" [LARGE CLASSIC SCIENCE archive](#).

A very complete README file has been provided which describes key aspects of the observing program, the standard pipeline processing, and the post-observational combination of these images into complete mosaics. The details of the data processing will be also be presented as a poster ["HST 15th"](#) and a large-format display of the color composite image at the AGS Meeting in Minneapolis, May 28 to June 2, 2005.

**M51 ACS/WFC Orient 270° Prop. 10452**

High-Level Science Products (HLSP):

data processed well beyond standard pipeline processing

**Approved follow-up proposals for M51**

GO proposal 10501, PI Rupali Chandar  
*Extending the Heritage: Clusters, Dust, and Star Formation in M51*  
 (will add WFC2 U-band and NICMOS H-band, parallel Paschen- $\alpha$  data)

AR proposal 10662, PI Benne Holwerda  
*An dust extinction map of M51 from counts of distant galaxies*

AR proposal 10666, PI Chris Impey  
*The ACS Mosaic of M51 and the Intersection of Research and Education*

AR proposal 10669, PI Roy Kilgard  
*A Comparative X-ray and Optical Study of M51*

AR proposal 10684, PI Paul Scowen  
*Multiwavelength Analysis of the Star Formation Process in M51*

**Observations**

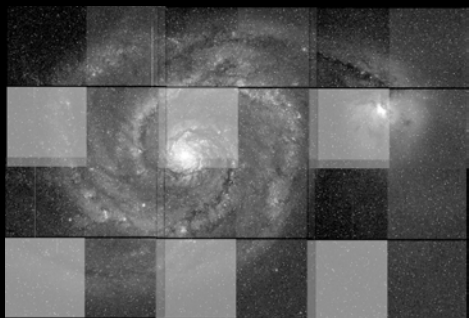
**M51 ACS/WFC Orient 270° Prop. 10452**

- 24 orbits (DD)
- Filters: B, V, I, H $\alpha$
- 6 pointings, 2x3 mosaic
- Dithers: gap, 2-point sub-pixel
- 96 total exposures

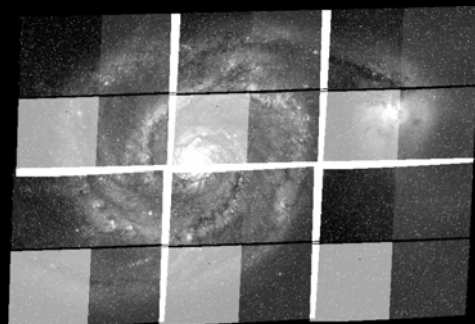
**Data reduction**

- Pipeline calibration with "best" reference files
- Registration with imexam/geomap (tinkered with tweakshifts): intertile only
- Masking: satellite trail, high background
- MultiDrizzle: final combination with rejection of cosmic rays and detector artifacts
- Output mosaics ~420 MB each; but ~26 MB block-averaged versions also available

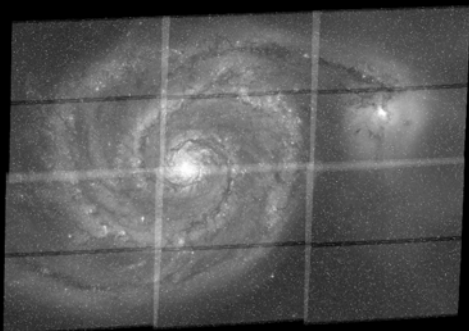
Raw



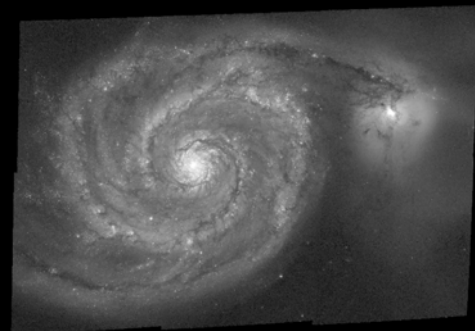
Distortion



Calibrate



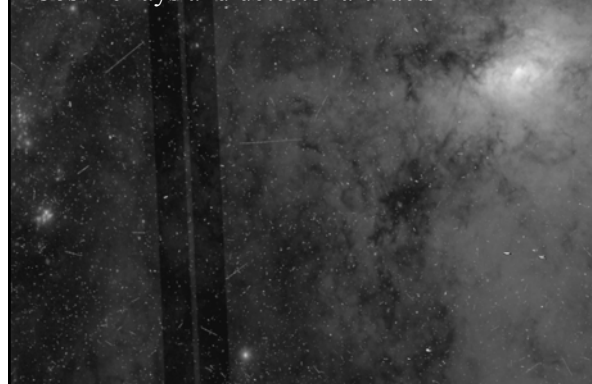
Drizzle



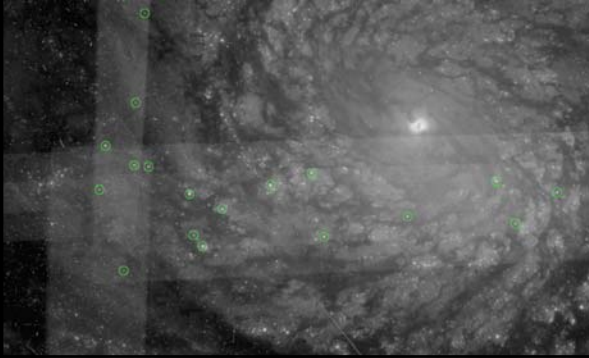
Color composite



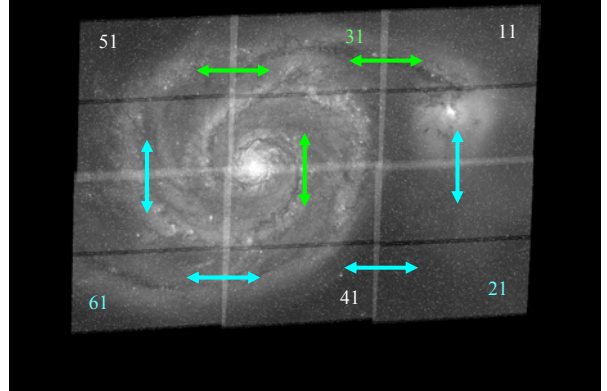
Cosmic rays and detector artifacts



## Registration objects in tile overlaps



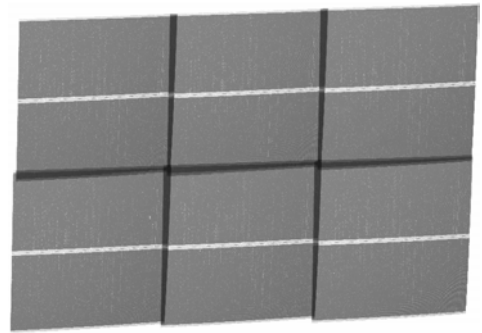
## Mosaic registration (intertile)



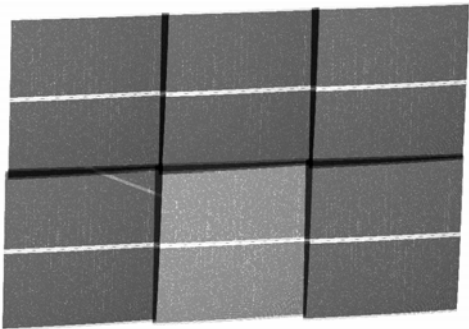
## Data quality

- Optimal registration: tweakshifts, align/superalign?
- Optimal scale, pixfrac (sub-pixel resolution)?
- Optimal drizzle kernel, CR rejection, bits?
- Cosmic ray contamination in H $\alpha$  tile 4 gap, due to excluded high-background frame
- Inspection of weight maps
- Make version 2.0 mosaics?

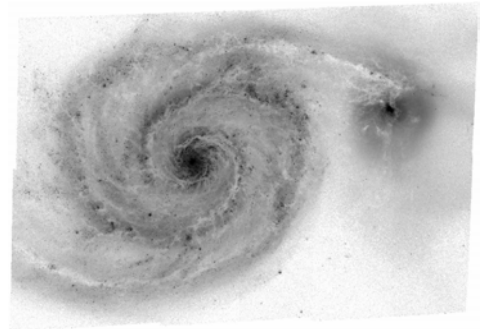
## Weight map



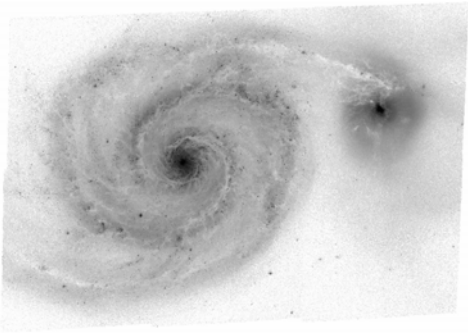
## Weight map for H $\alpha$



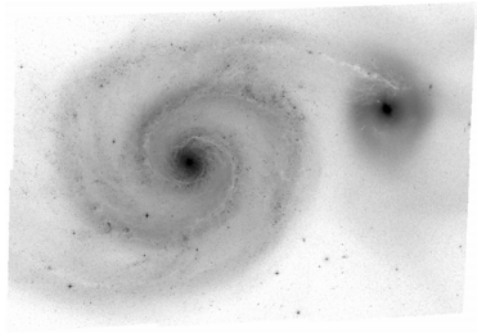
## B mosaic



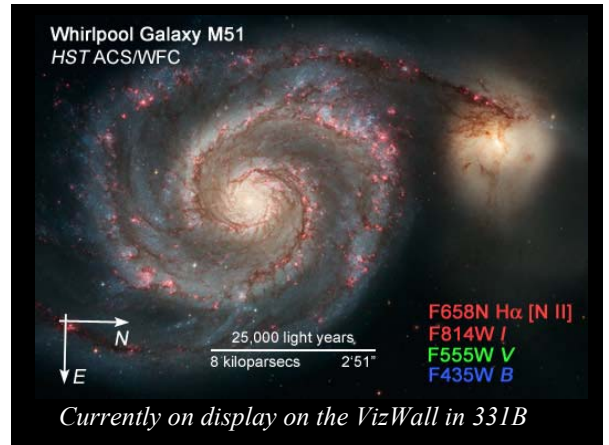
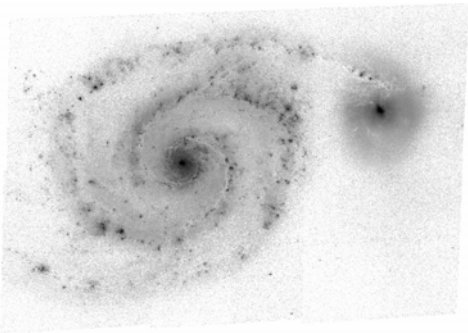
V mosaic



I mosaic



H $\alpha$  mosaic



Hubble Space Telescope Multi-Color ACS Mosaic of M51

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