

**Spacewatch 0.9m Mosaic Camera Survey, v1.0**

known\_data\_issue\_examples.pdf

Examples of Known Data Issues from the Spacewatch 0.9m Mosaic Camera Survey

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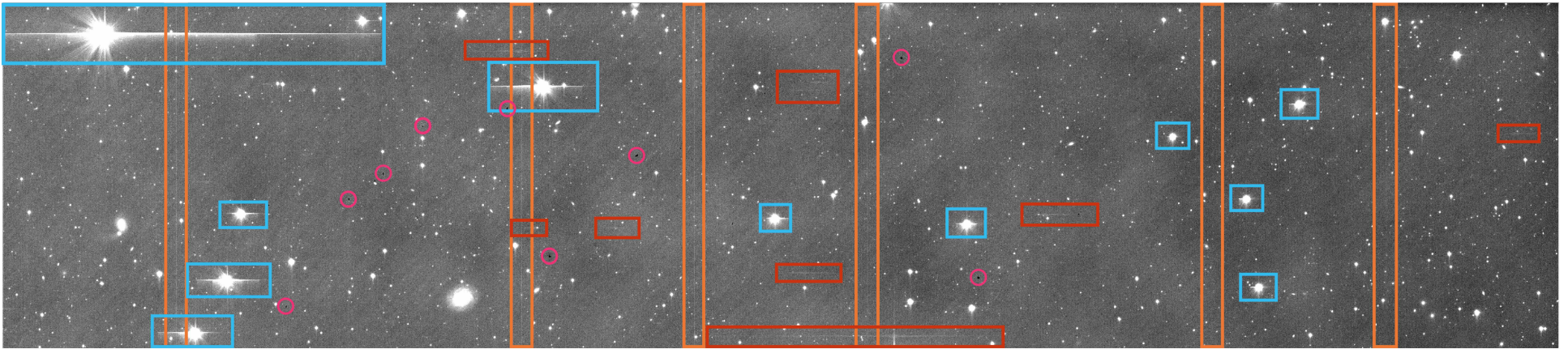


Image sw\_1062\_04.01\_2008\_10\_17\_04\_16\_08.004

**Cyan:** Saturation bleed, diffraction cross from instrument support structure and diffraction rays from mirror cover petals.

**Orange:** Photolithography stamping artifact from detector manufacturing process.

**Magenta:** Dust on the CCD.

**Red:** Amplifier cross-talk.

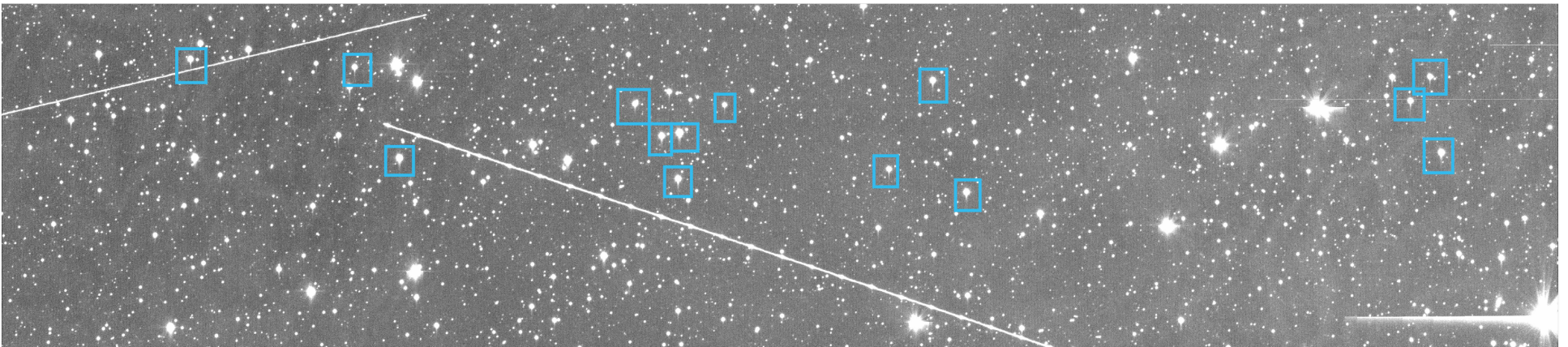


Image sw\_1093\_30.05\_2011\_05\_01\_07\_30\_28.002

The two long diagonal bright streaks are artificial satellites. Satellites also may cross a field-of-view horizontally.

**Cyan:** These common "drip" features are due to either low charge transfer efficiency on the CCD or the incomplete reset of the integration capacitor in the electronics.

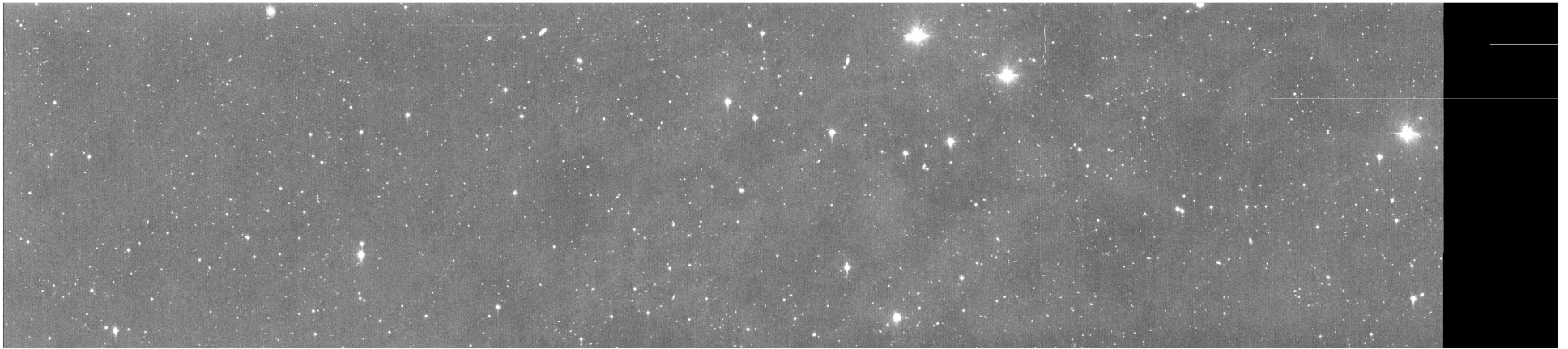


Image sw\_1043\_05.04\_2007\_04\_15\_03\_19\_55.002

This image is incomplete due to a readout error.

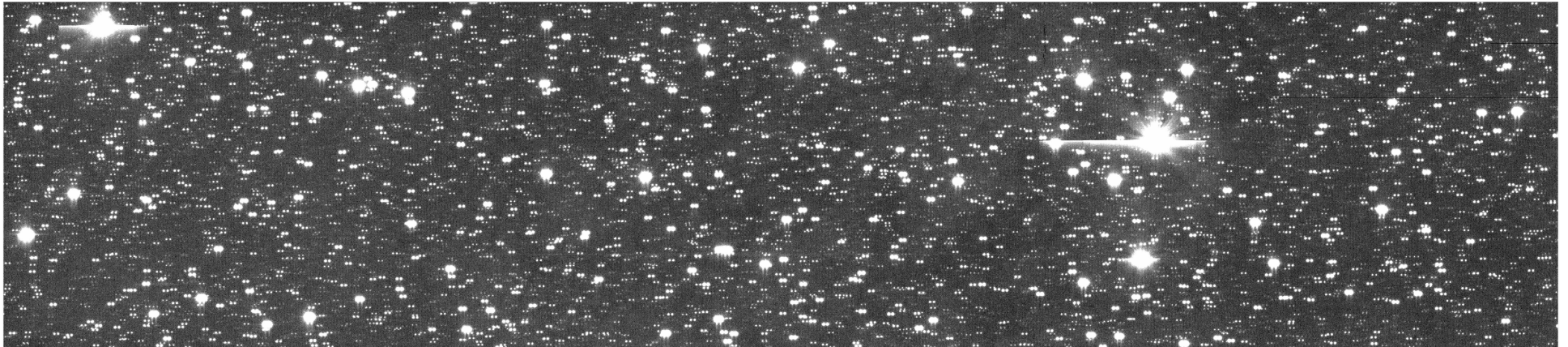


Image sw\_1057\_1.07\_2008\_05\_26\_07\_09\_45.002

The doubled stars are due to an overdamped oscillation in the telescope motion control system.

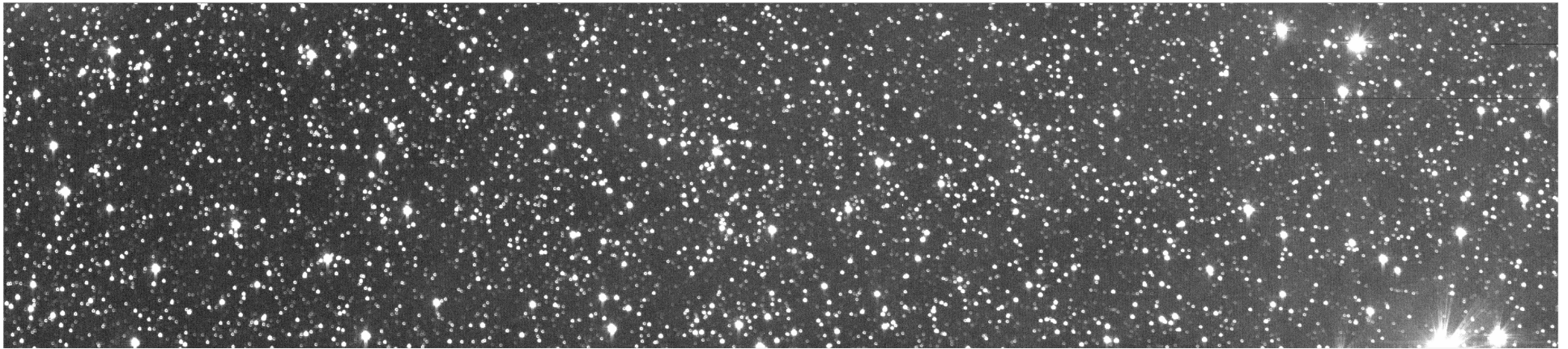


Image sw\_1137\_26.05\_2014\_11\_16\_02\_24\_44.002

This image is out of focus. When magnified, the donuts become apparent.

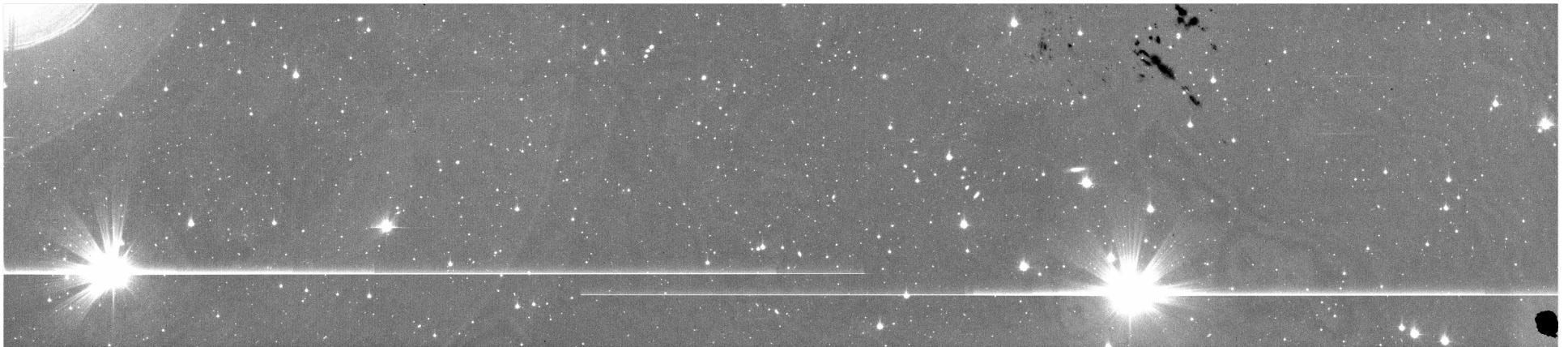


Image sw\_1117\_10.01\_2013\_04\_20\_03\_32\_17.007

This image is an example of the dirt splotches in the optic path superimposed on amplifier 7 near the upper right and in the bottom right corners.

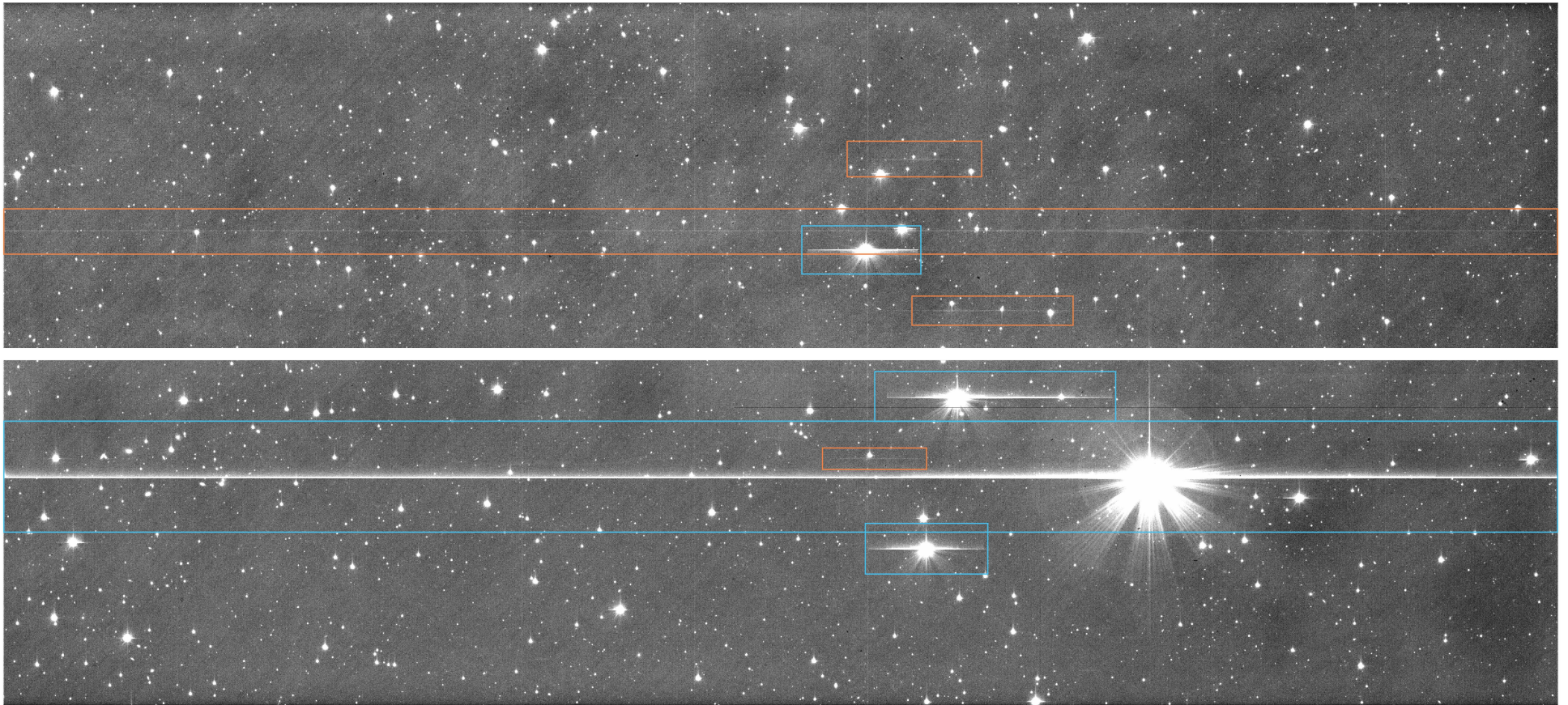


Image sw\_1062\_43.04\_2008\_10\_17\_12\_27\_34.004 (top)

Image sw\_1062\_43.04\_2008\_10\_17\_12\_27\_34.003 (bottom)

This pair of images shows how in one CCD, the video crosstalk between amplifiers creates a ghost image (orange) on one amplifier due to a corresponding saturated star (cyan) on the other amplifier. Spacewatch chose not to implement real-time crosstalk correction into the image pipeline in order to read out multiple amplifiers simultaneously thus reducing total readout time.

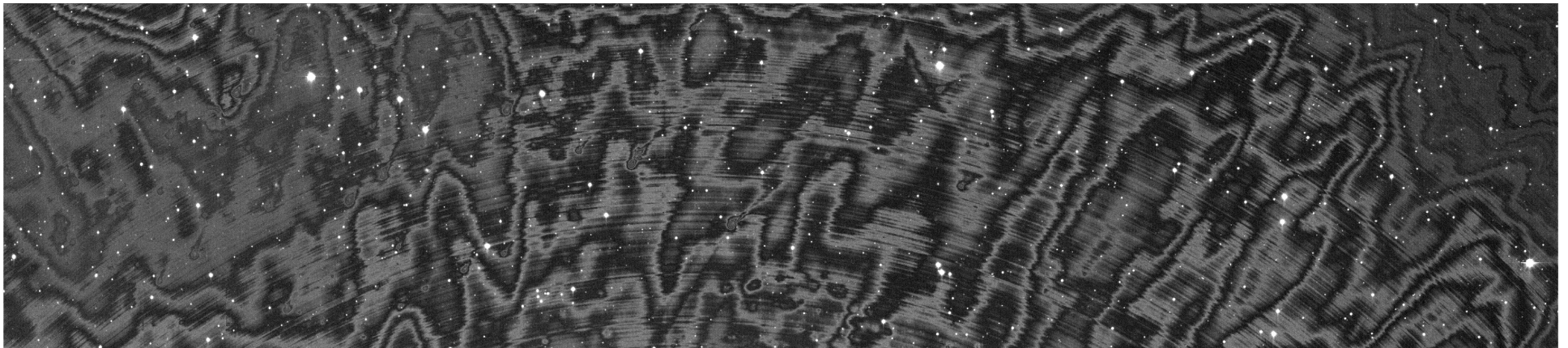
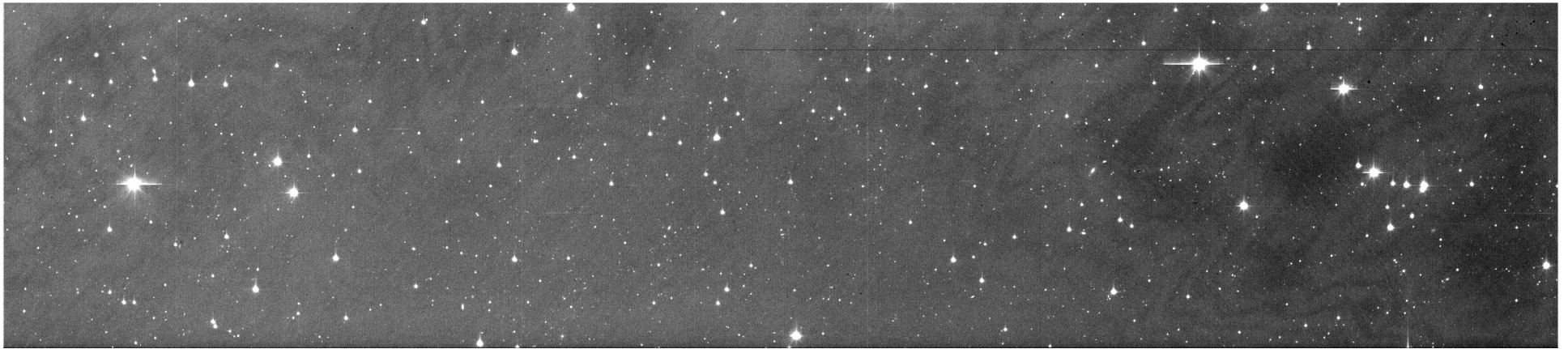


Image sw\_1062\_04.02\_2008\_10\_17\_03\_22\_03.003 (top)

Image sw\_1112\_08.01\_2012\_11\_07\_01\_56\_22.004 (bottom)

These images show mild incomplete fringe correction and extreme incomplete fringe correction due to the use of one master flat and one master fringe per observing run that spans most of the phases of the moon. This choice was made due to the difficulty involved in correcting the fringe pattern for each individual image as the off-axis lunar illumination changed between pointings.

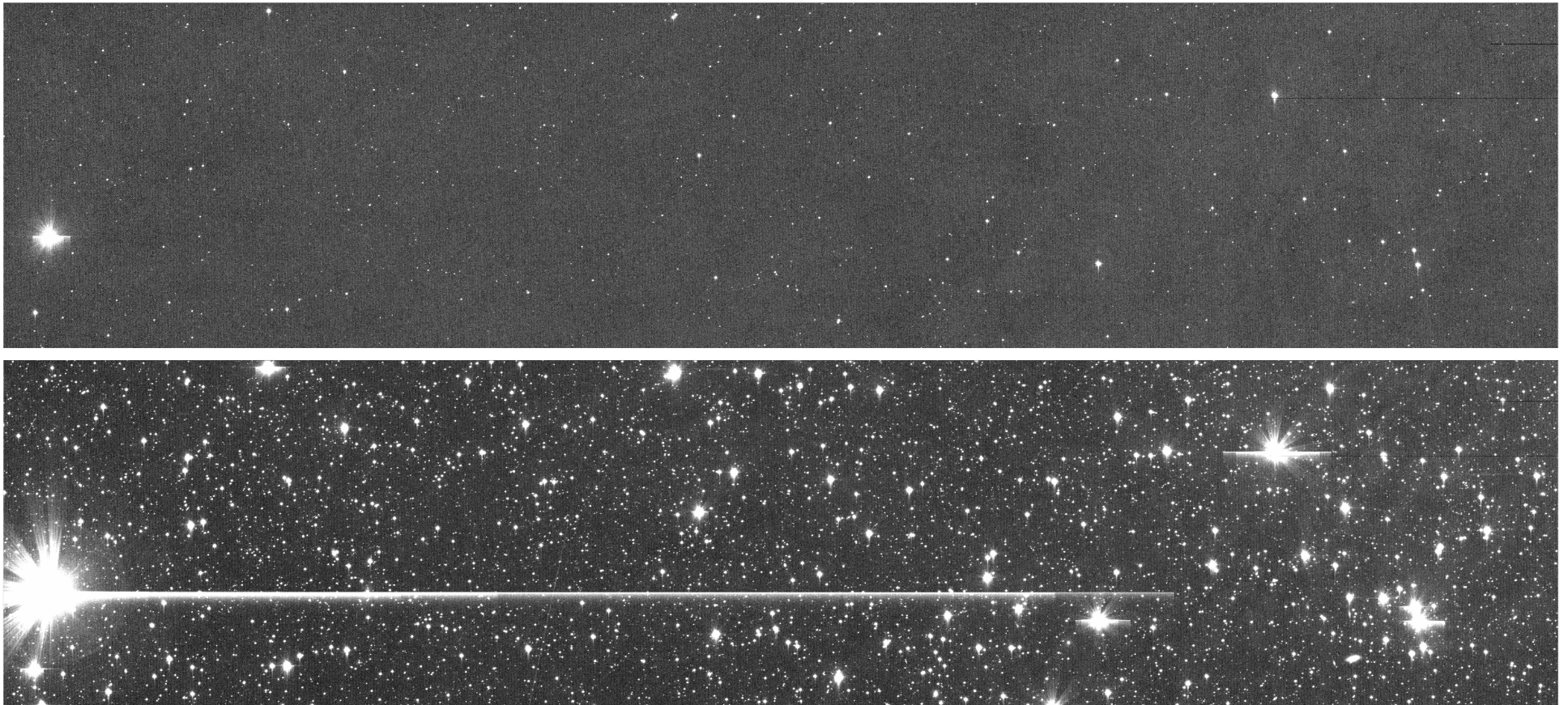


Image sw\_1118\_34.03\_2013\_05\_09\_08\_05\_30.002 (top)

Image sw\_1118\_34.03\_2013\_05\_09\_08\_30\_55.002 (bottom)

These images show the difference between an image with extinction due to a cloud and an image of the same region with clear skies.

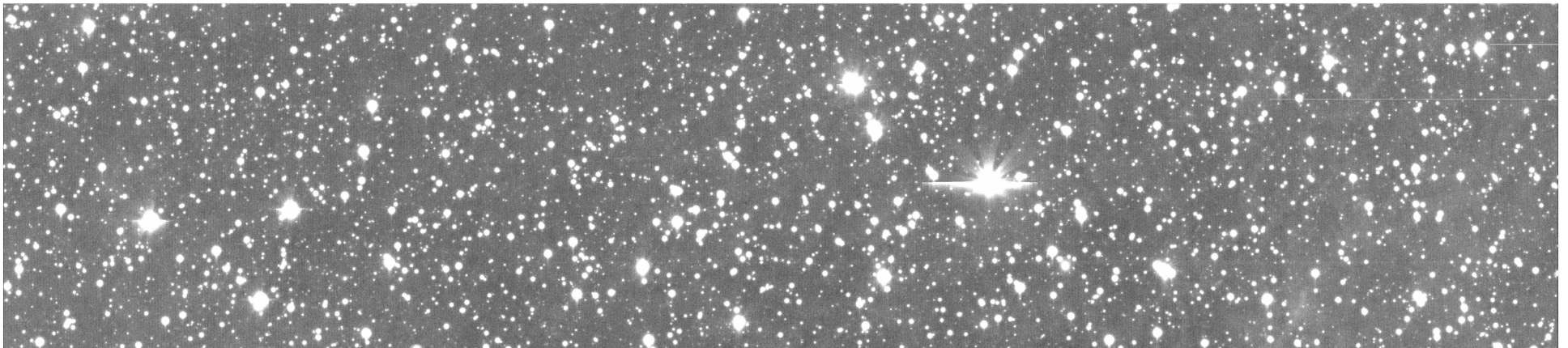
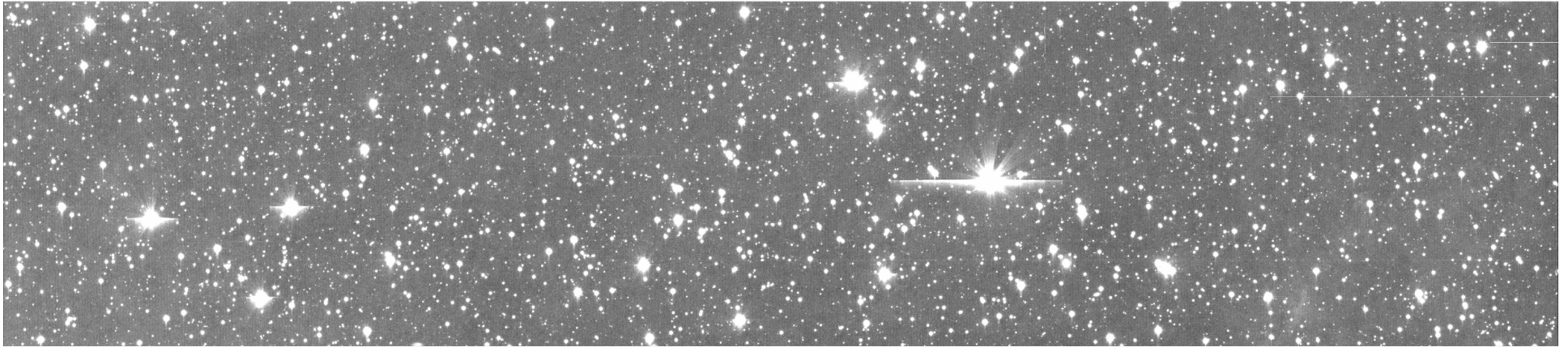


Image sw\_1051\_SW40bP2\_2007\_12\_06\_06\_59\_30.002 (top)

Image sw\_1051\_SW40bP2\_2007\_12\_06\_07\_08\_28.002 (bottom)

These images show the difference in image quality between moderate seeing (top) and poor seeing (bottom).



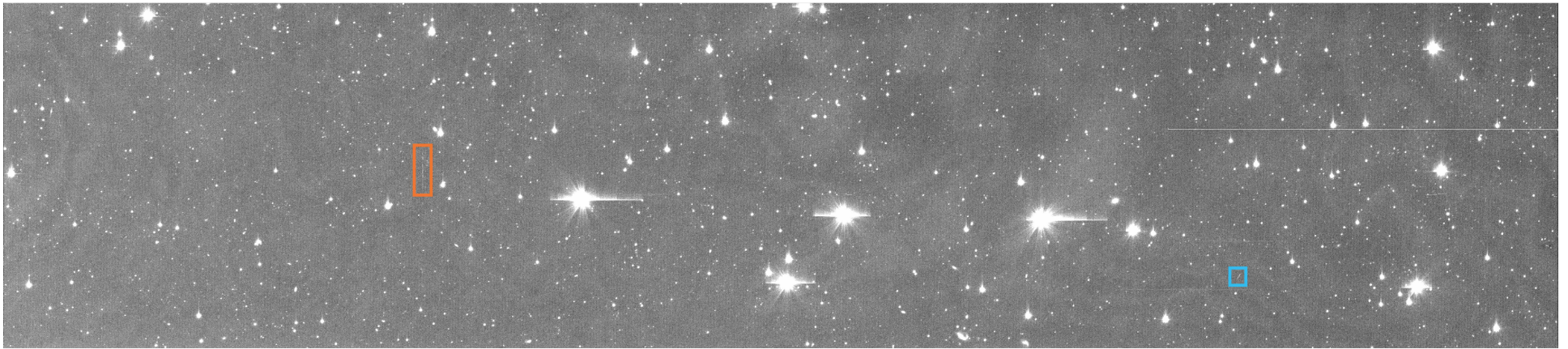


Image sw\_1062\_10.01\_2008\_10\_24\_05\_35\_21.001

**Orange:** An aberration caused by a persistent pattern in the 30 science images used to create the master fringe image for this observing run.

**Cyan:** Cosmic Ray hit.

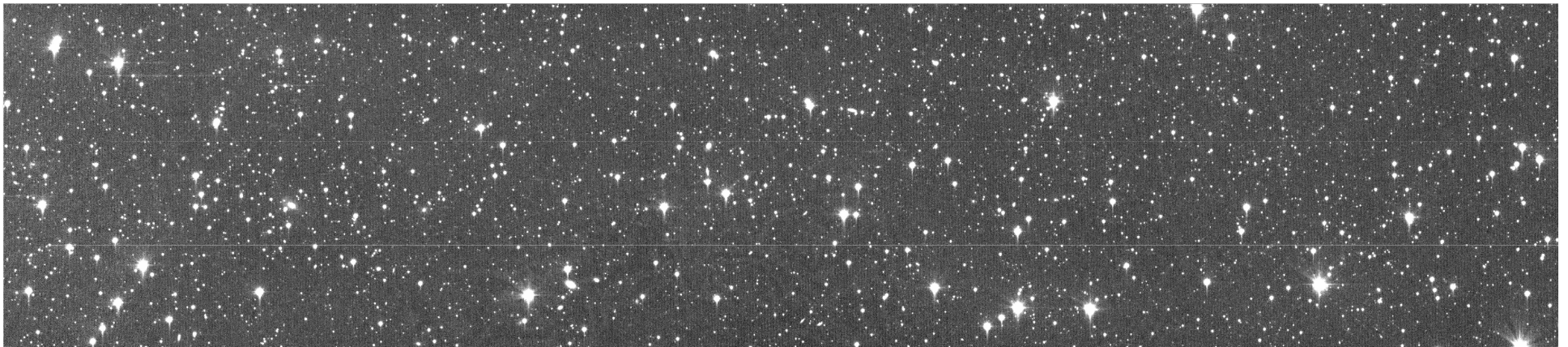


Image sw\_1118\_36.05\_2013\_05\_15\_08\_39\_41.006

The background herringbone pattern is pronounced.

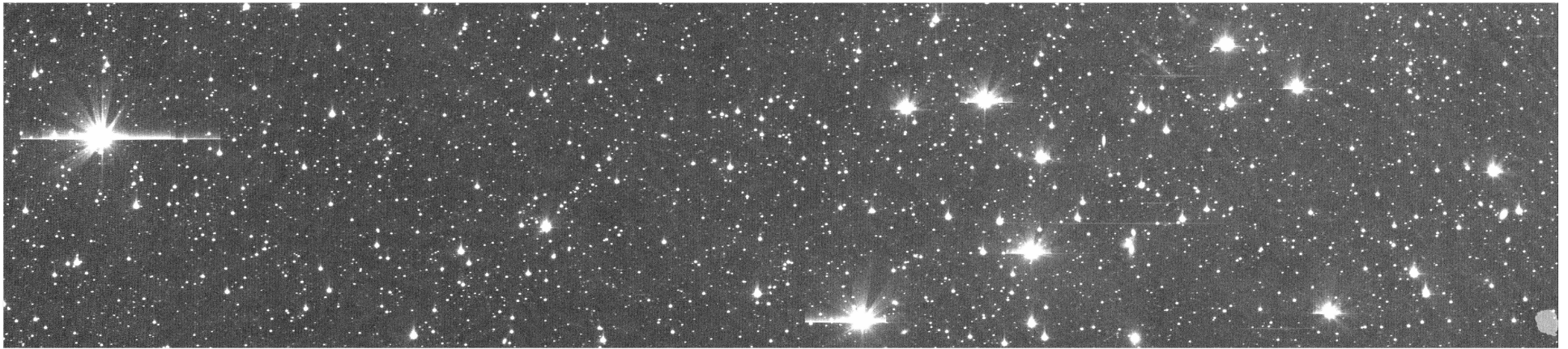


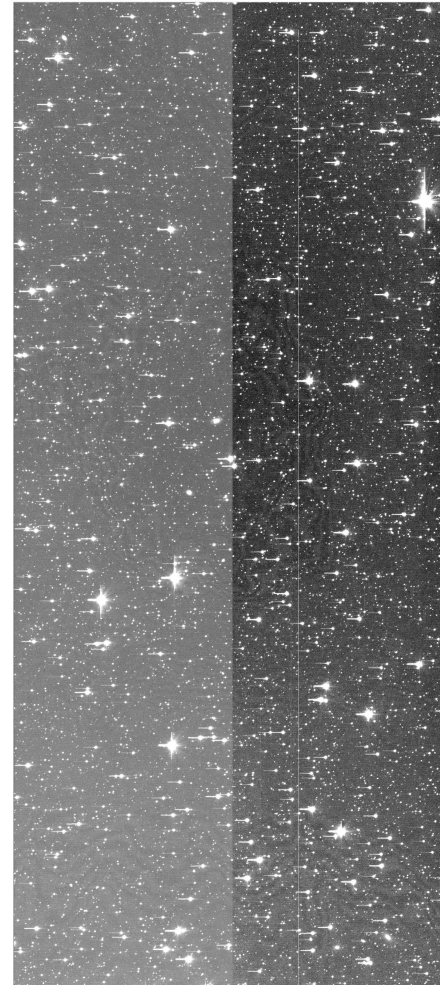
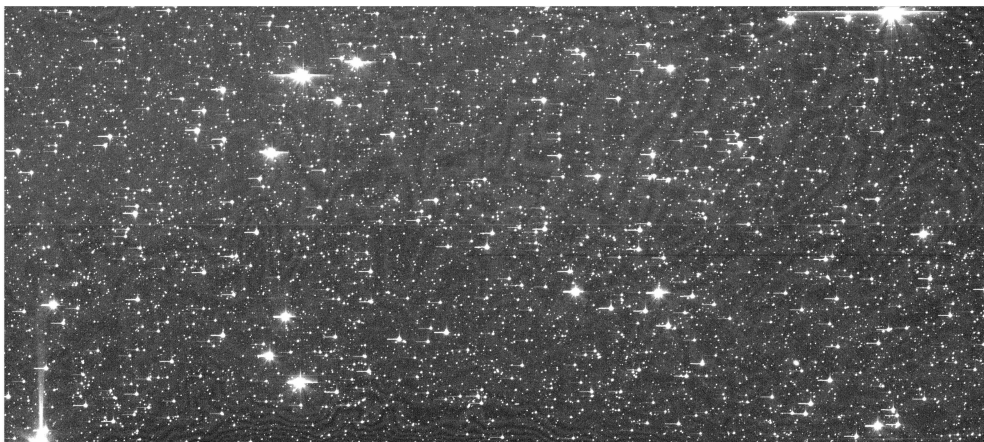
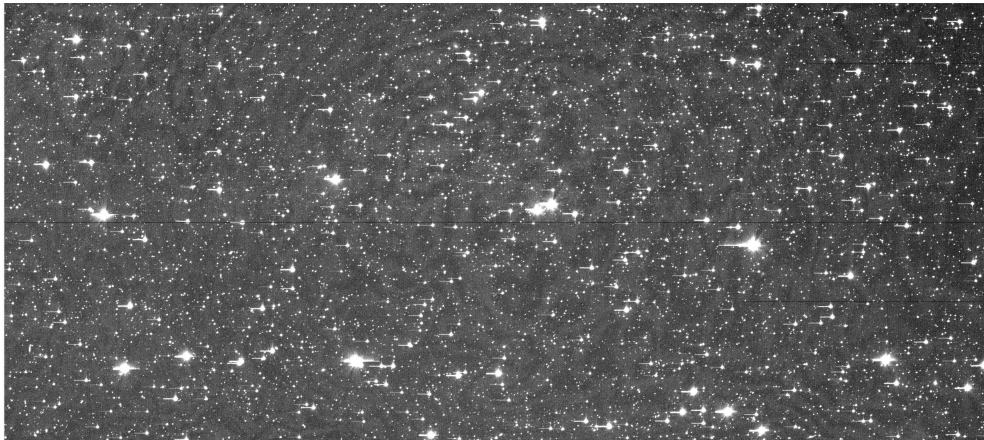
Image sw\_1118\_36.04\_2013\_05\_07\_09\_32\_10.007

Stars are slightly elongated along the Right Ascension axis due to either a jerk in the telescope Hour Angle drive axis or a bounce due to wind.



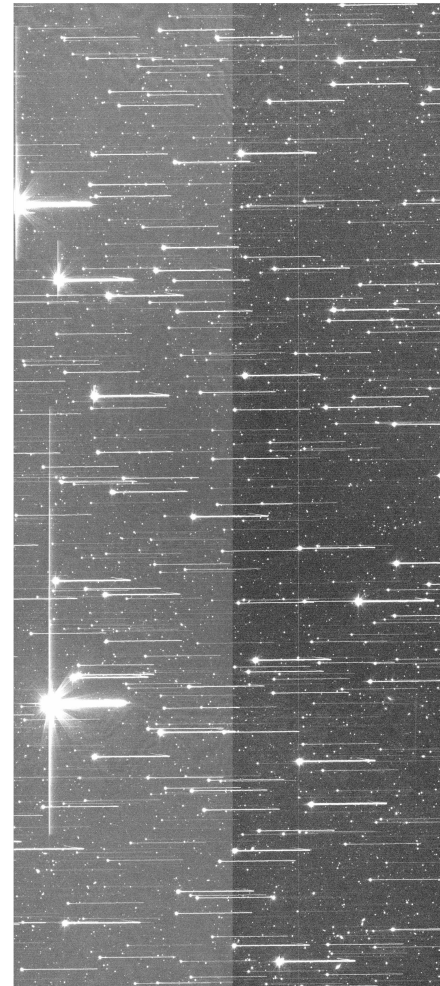
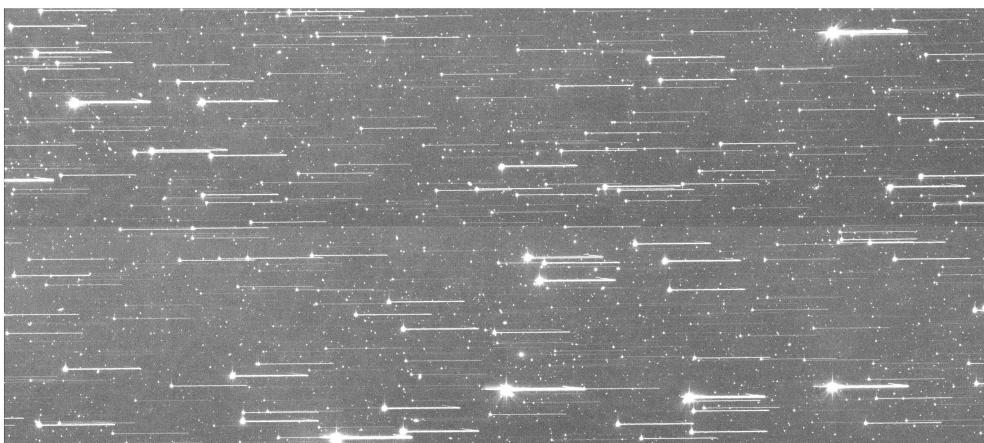
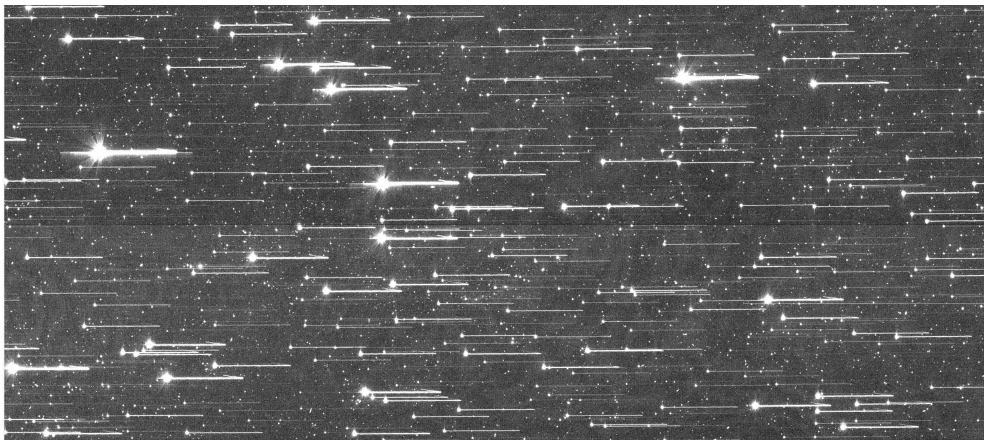
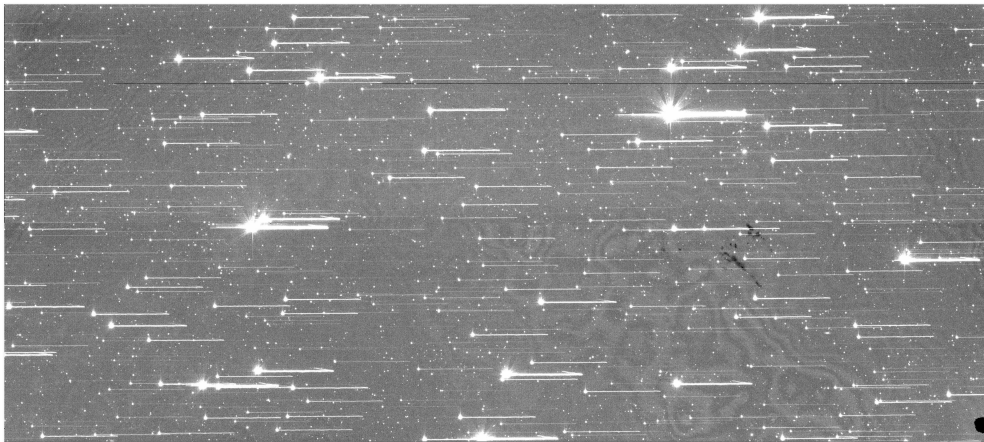
Image sw\_1093\_09.03\_2011\_05\_01\_04\_30\_46.002

The glare regions in this image from bright stars in adjacent amplifiers show the shadows from the instrument support structure.

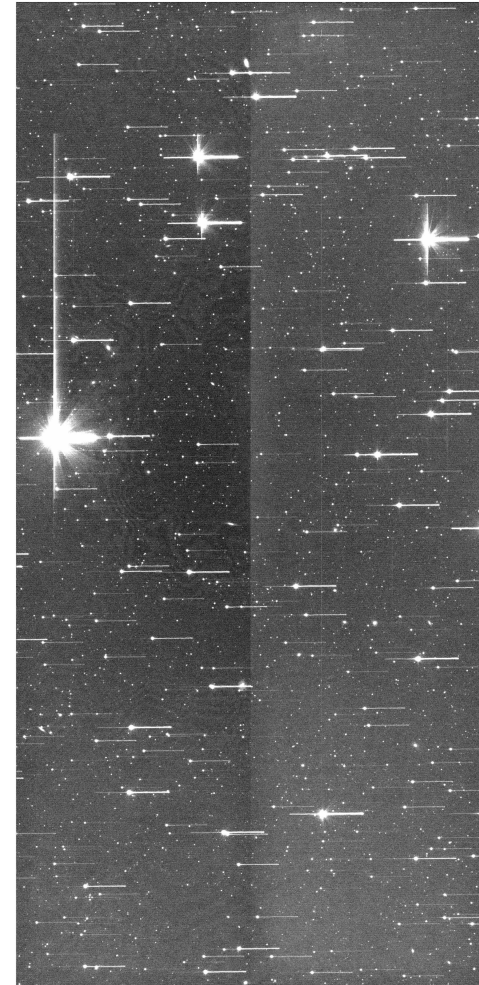
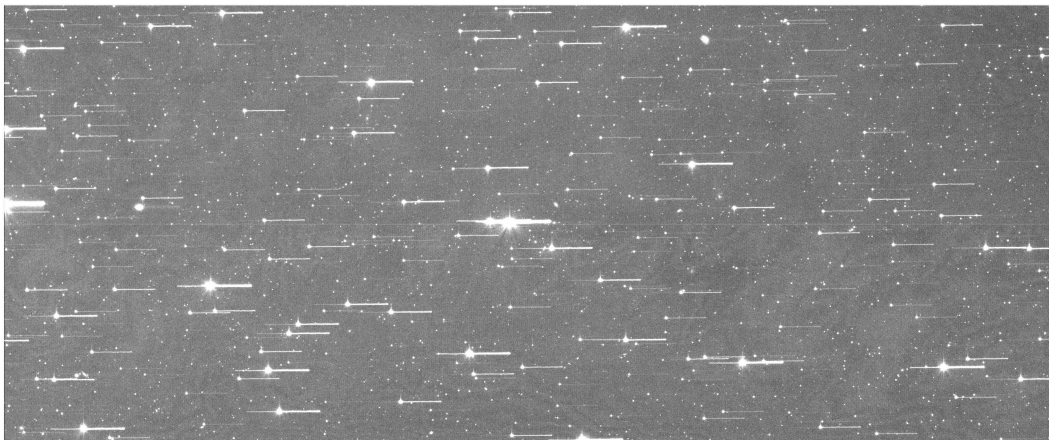
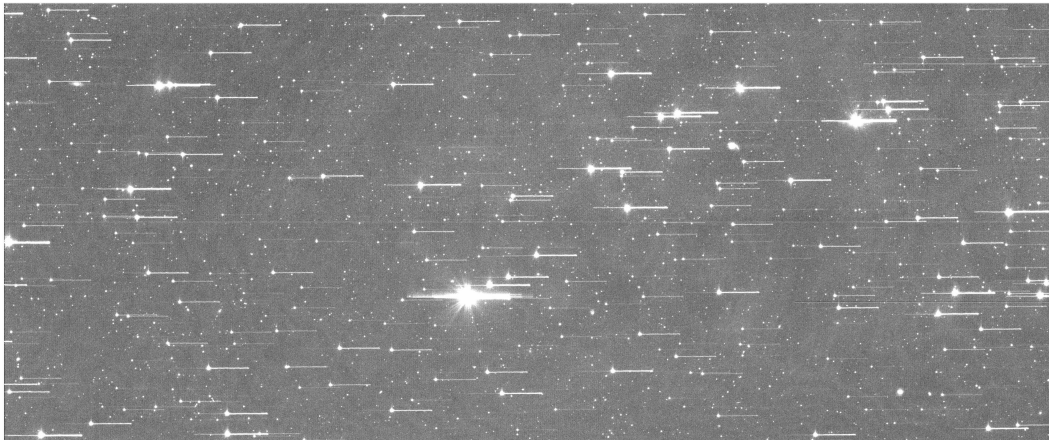
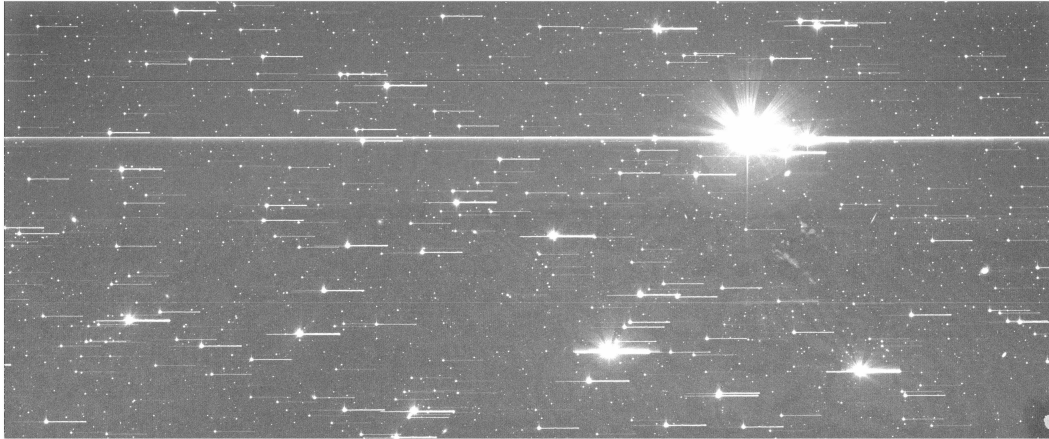


Images sw\_1117\_45.02\_2013\_04\_20\_10\_35\_03.[001 through 008]

These images illustrate the shutter opening before sidereal tracking began (trails to the left of stars).

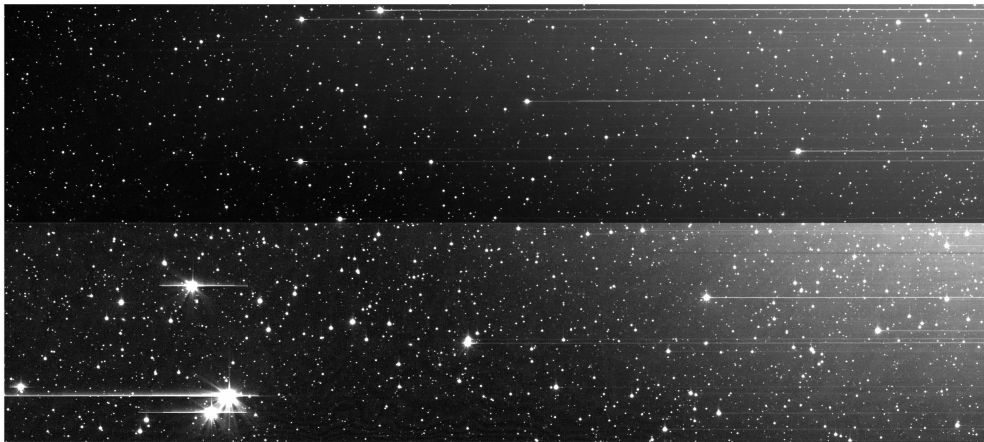
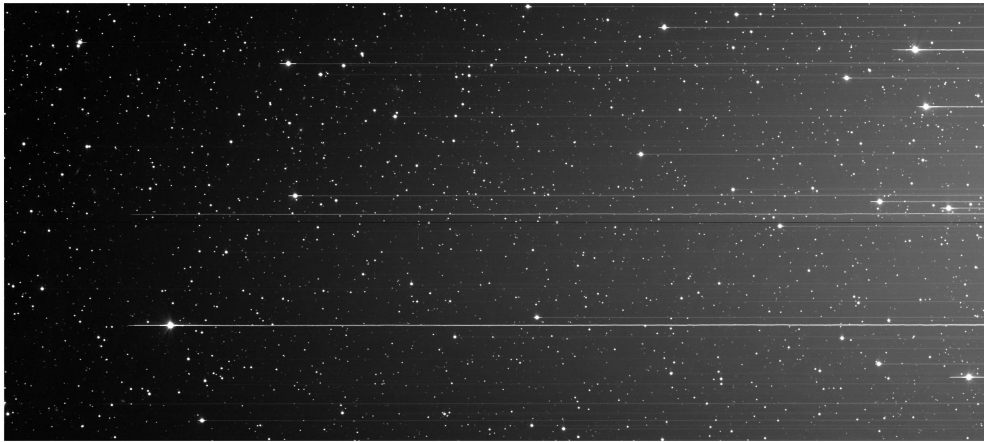
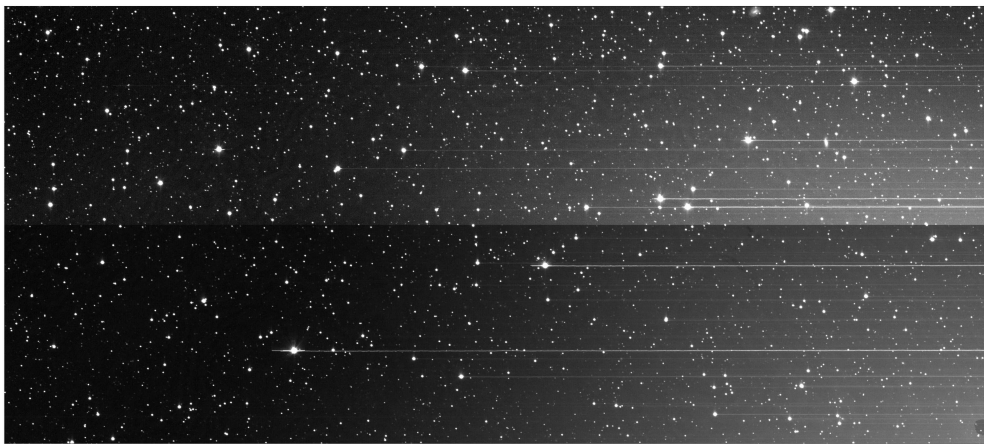


Images sw\_1062\_43.01\_2008\_10\_24\_12\_12\_42.[001 through 008]  
These images illustrate the sidereal tracking ceasing before the shutter closed and before readout began (trails to the right of stars).



Images sw\_1137\_10.02\_2014\_11\_16\_02\_24\_44.[001 through 008]

These images illustrate the shutter opening before sidereal tracking began (trails to the left of stars) and sidereal tracking ceasing before the shutter closed and before readout began (trails to the right of stars).



Images sw\_1093\_39.03\_2011\_05\_11\_15\_49. [001 through 008]

These images illustrate sidereal tracking ceasing before the shutter closed and in the middle of readout. The motion of the stars is horizontal. For amplifiers 1-4 and 7-8, pixels are being read horizontally. For amplifiers 5-6, they are being read vertically, creating diagonal streaks.