



FORCAST: FIRST LIGHT

FORCAST: A Mid/Far-Infrared Camera for SOFIA



George Gull and Charlie Kaminski installing FORCAST

Key FORCAST Parameters

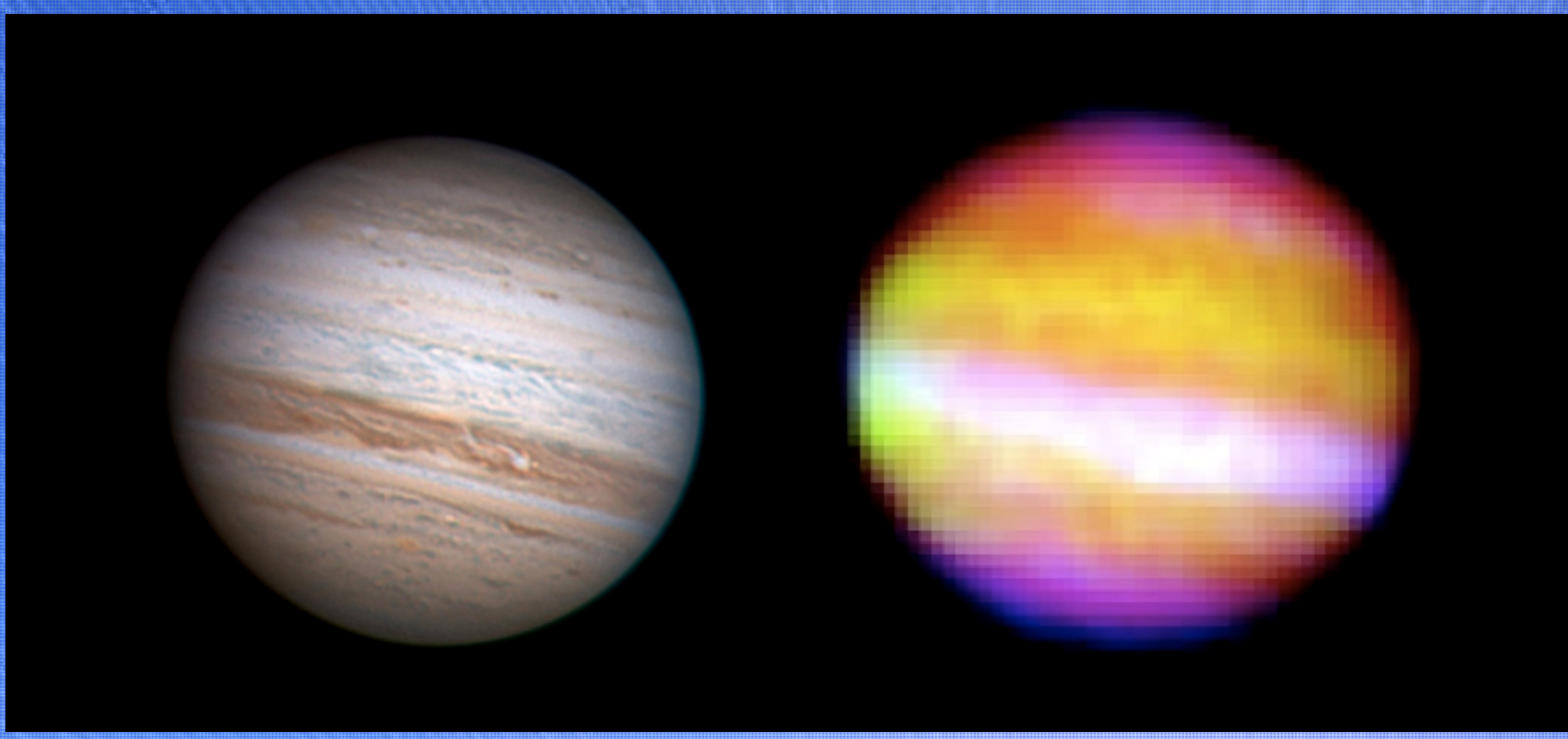
- 5 – 37 μm imaging
- 0.75" per pixel with a 3.2' x 3.2' FoV
- Selectable between short wavelength channel (SWC), long wavelength channel (LWC), or both
- SWC filters: 5.4, 6.4, 6.6, 7.7, 8.6, 11.1, 11.3, 19.7, and 24.2 μm
- LWC filters: 31.6, 33.6, 34.8, 37.1 μm

FORCAST Team

- Terry Herter, Joe Adams, George Gull, Justin Schoenwald, Chuck Henderson (Cornell), and Luke Keller (Ithaca College)

SOFIA First Light

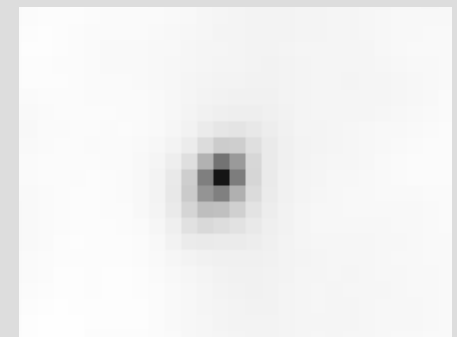
- FORCAST participated in the SOFIA first light observations on May 25, 2010 as part of a telescope characterization flight.
- The goals of this flight were to:
 - Measure and provide high-time-resolution jitter data during the flight
 - Measure the short term and long term point spread function (PSF) of the telescope
 - Obtain at least one first light astronomical image, time permitting
 - Determine the telescope emissivity using background data
- The FORCAST first light observing team: Terry, Justin, Joe, and Jim De Buizer (USRA)



SOFIA First Light Image

Left: Optical image of Jupiter. **Right:** Composite color image made with FORCAST combining observations made at 5.4 (blue), 24 (green) and 37 microns (red)

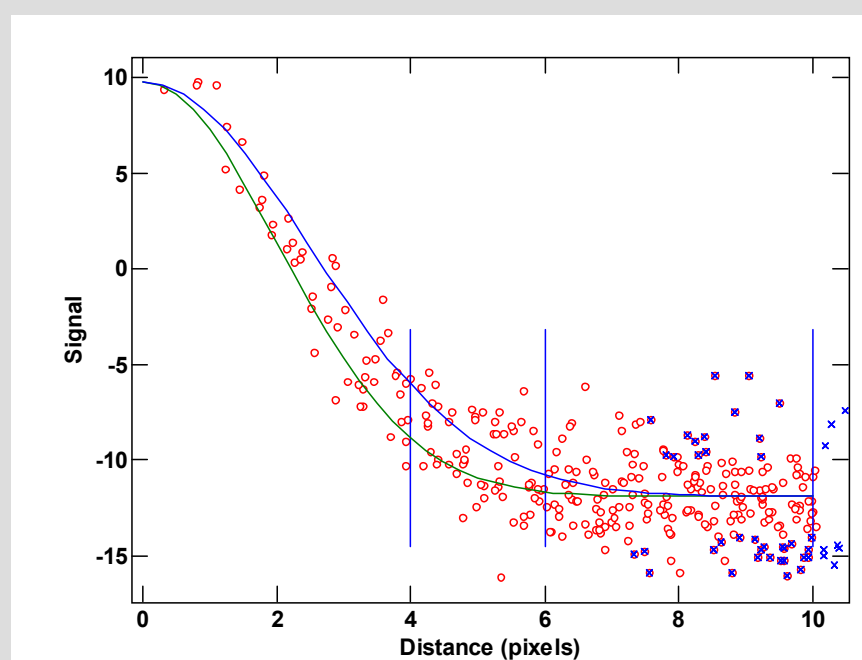
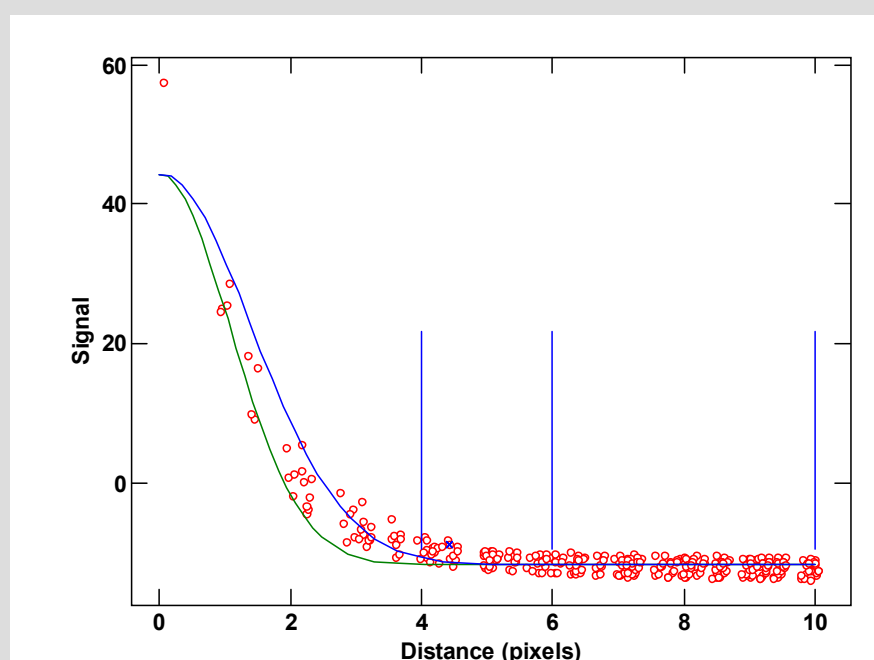
Short term



Long term

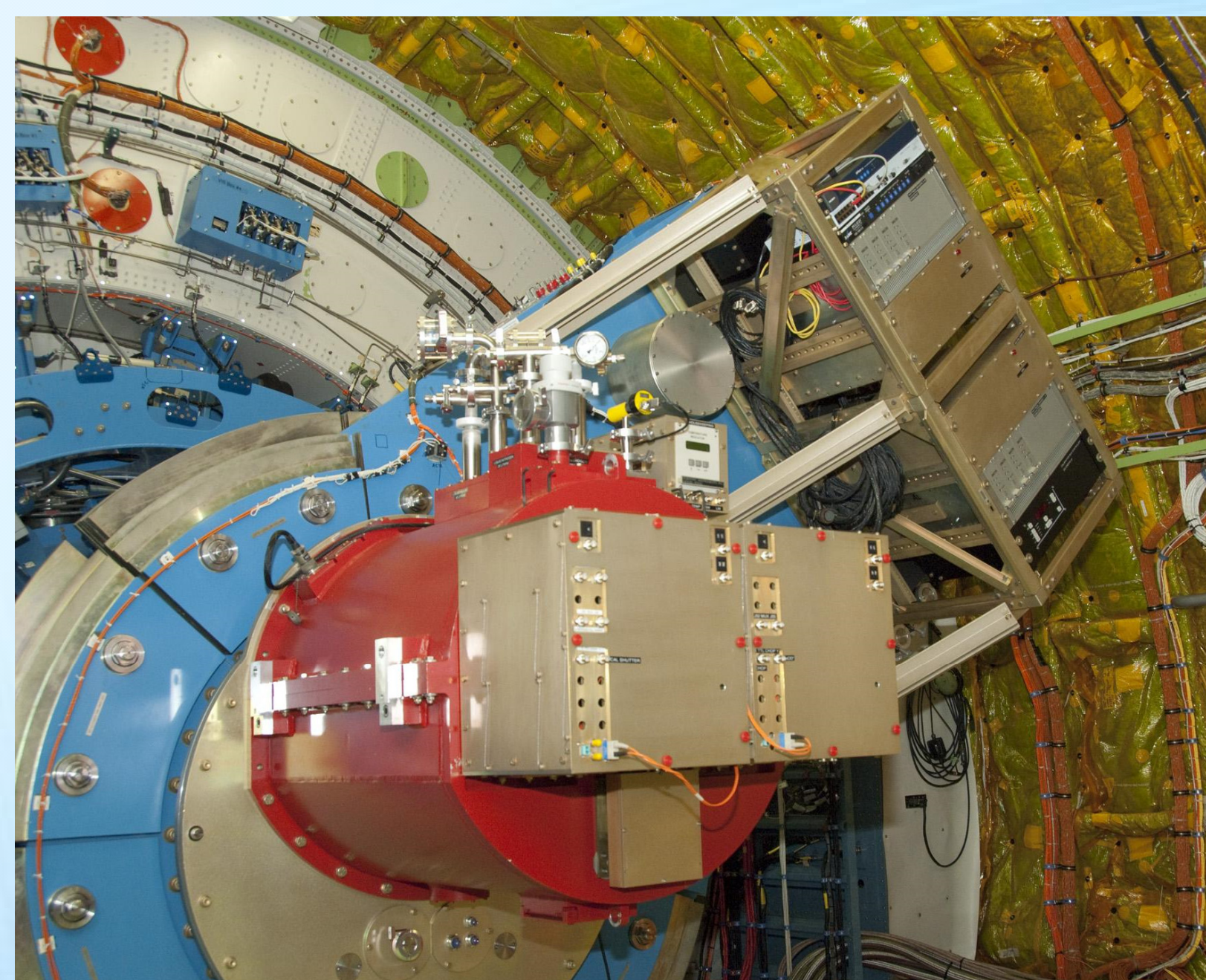


Scale same as short term



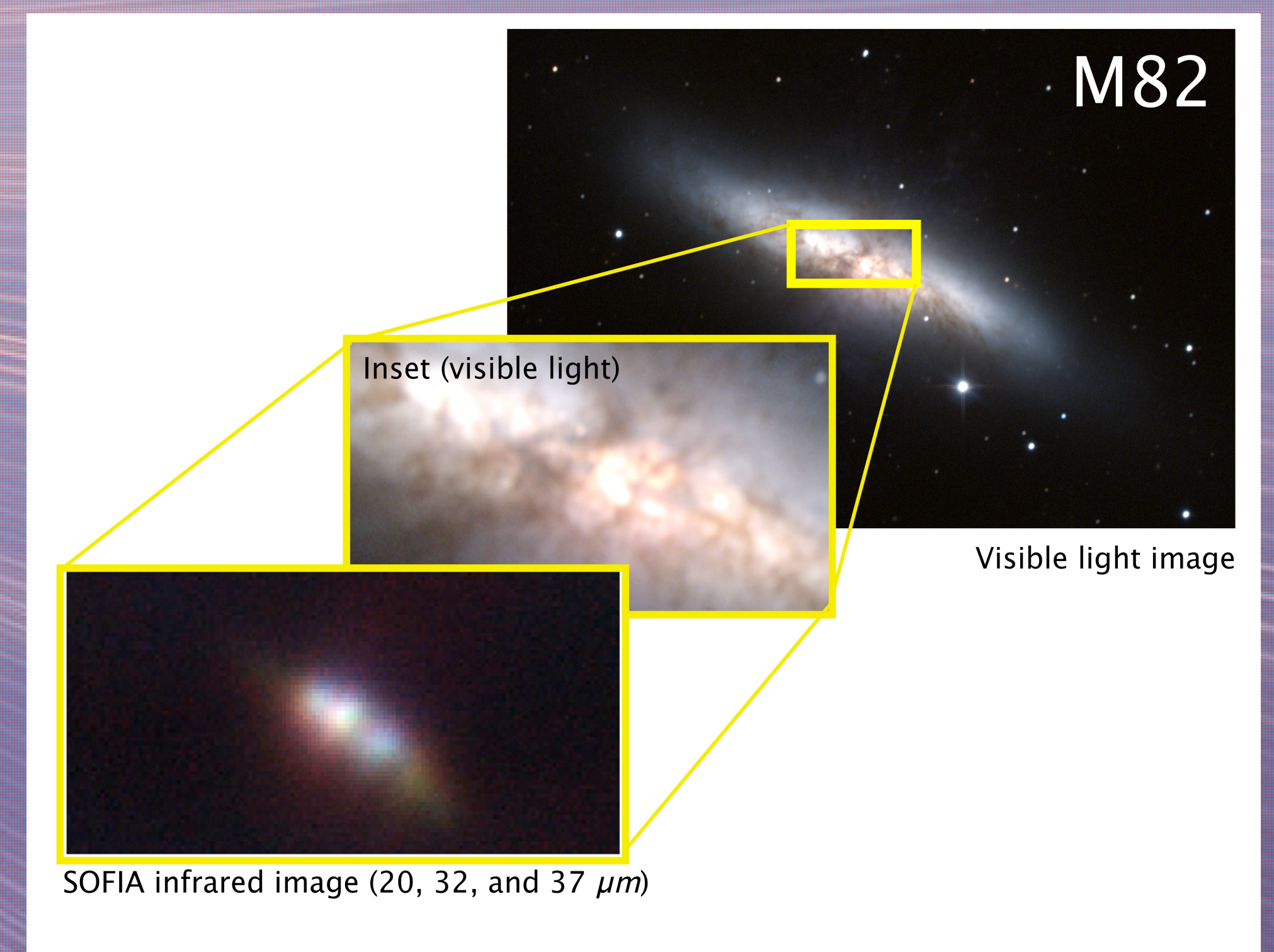
Point Spread Function (PSF)

- **Left:** the short term (2.5 msec) PSF of SOFIA at 5.4 microns
- **Right:** the long term (7.5 sec) PSF
- These measurements were made by FORCAST on the SOFIA first light flight
- These plots are illustrative and the telescope team is presently evaluating the in-flight performance.



FORCAST on Telescope

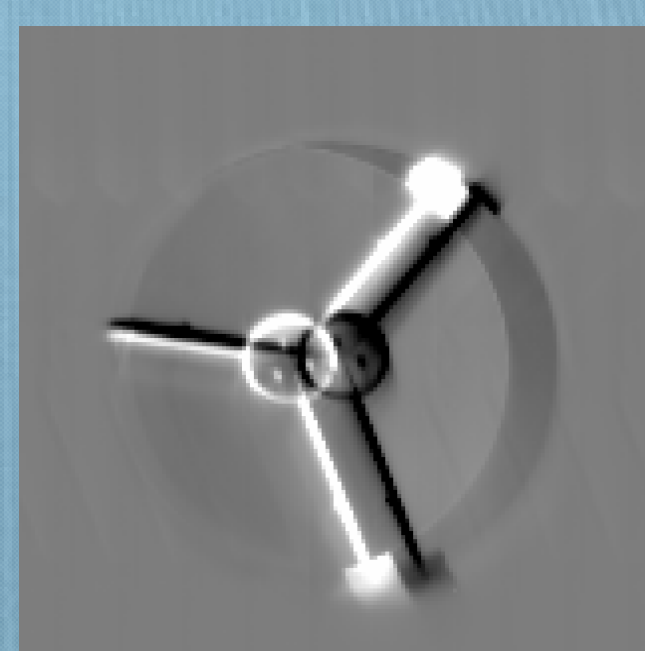
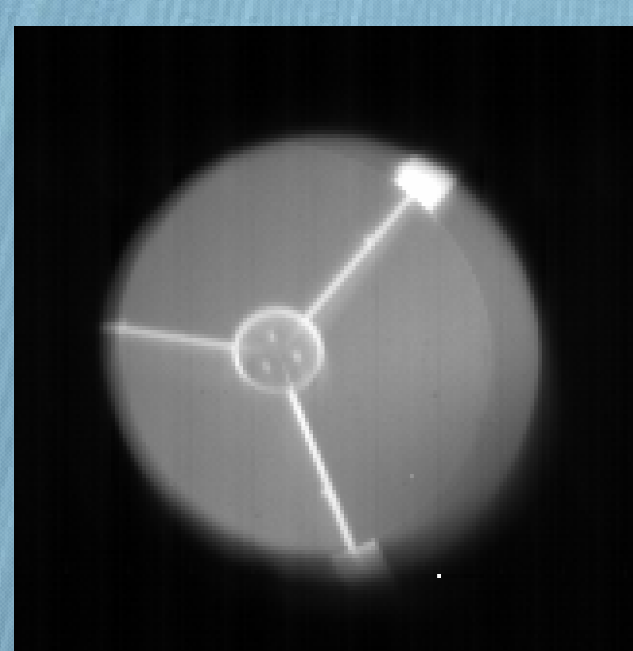
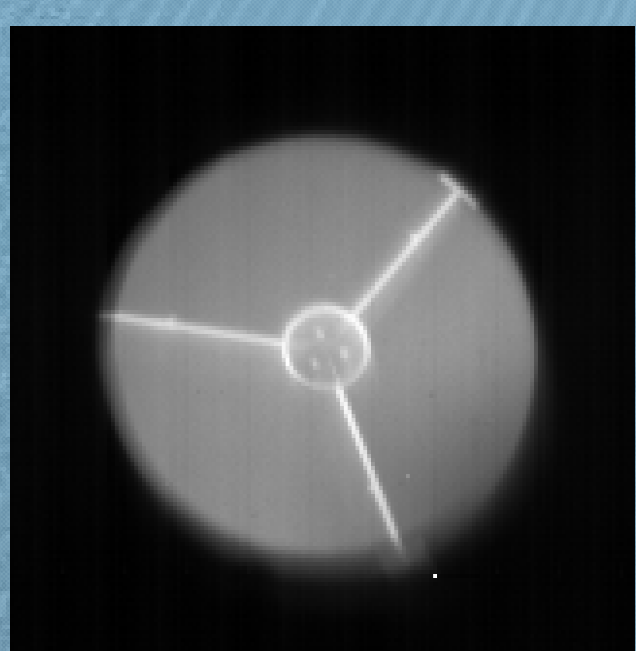
- Red surface is outer vacuum shell
- Electronics for running the two blocked-impurity band (BIB) arrays are in the foreground
- The FORCAST counterweight rack is located on the upper right



SOFIA First Light Image

- Inner region of M82 observed at 20 (blue), 32 (green) and 37 microns (red) with FORCAST
- The reduction and alignment of the FORCAST images are very preliminary

FORCAST Pupil Images



- **Left:** Centered pupil image at 11.3 microns. Features are secondary support struts, secondary button and mounting screws.
- **Center:** Offset pupil image. Direct sky and secondary strut support are now evident.
- **Right:** Difference of offset and centered pupil images

The Team

- with FORCAST on telescope

Left to Right

- Joe Adams
- Luke Keller
- Terry Herter
- George Gull
- Chuck Henderson
- Justin Schoenwald

