

SWIFT commissioning

PALM3K interim review
27th February 2009

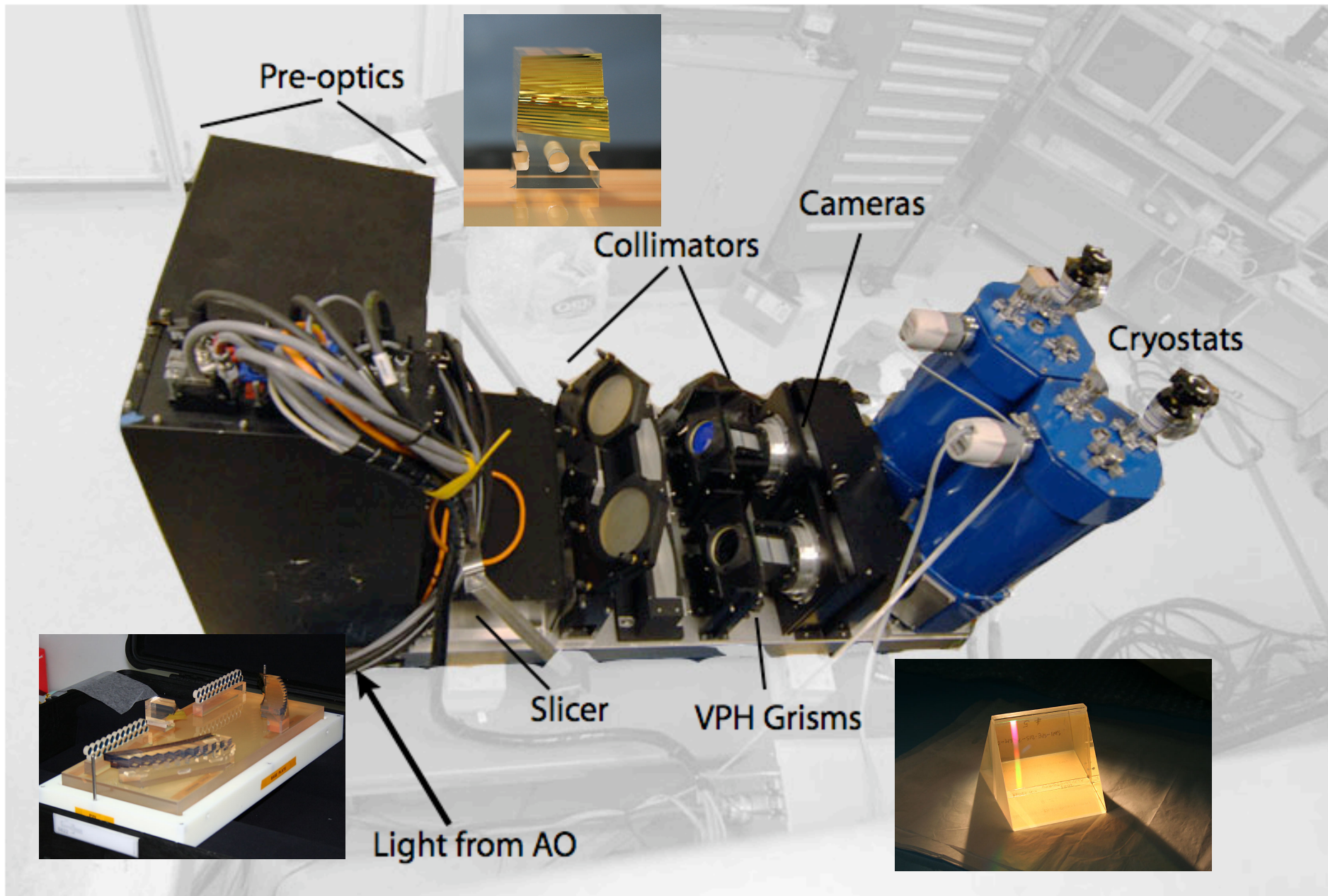
Niranjana Thatte

Fraser Clarke, Matthias Tecza, Tim Goodsall, Lisa
Fogarty, Graeme Salter, Susan Kassin, Ryan
Houghton



Instrument overview

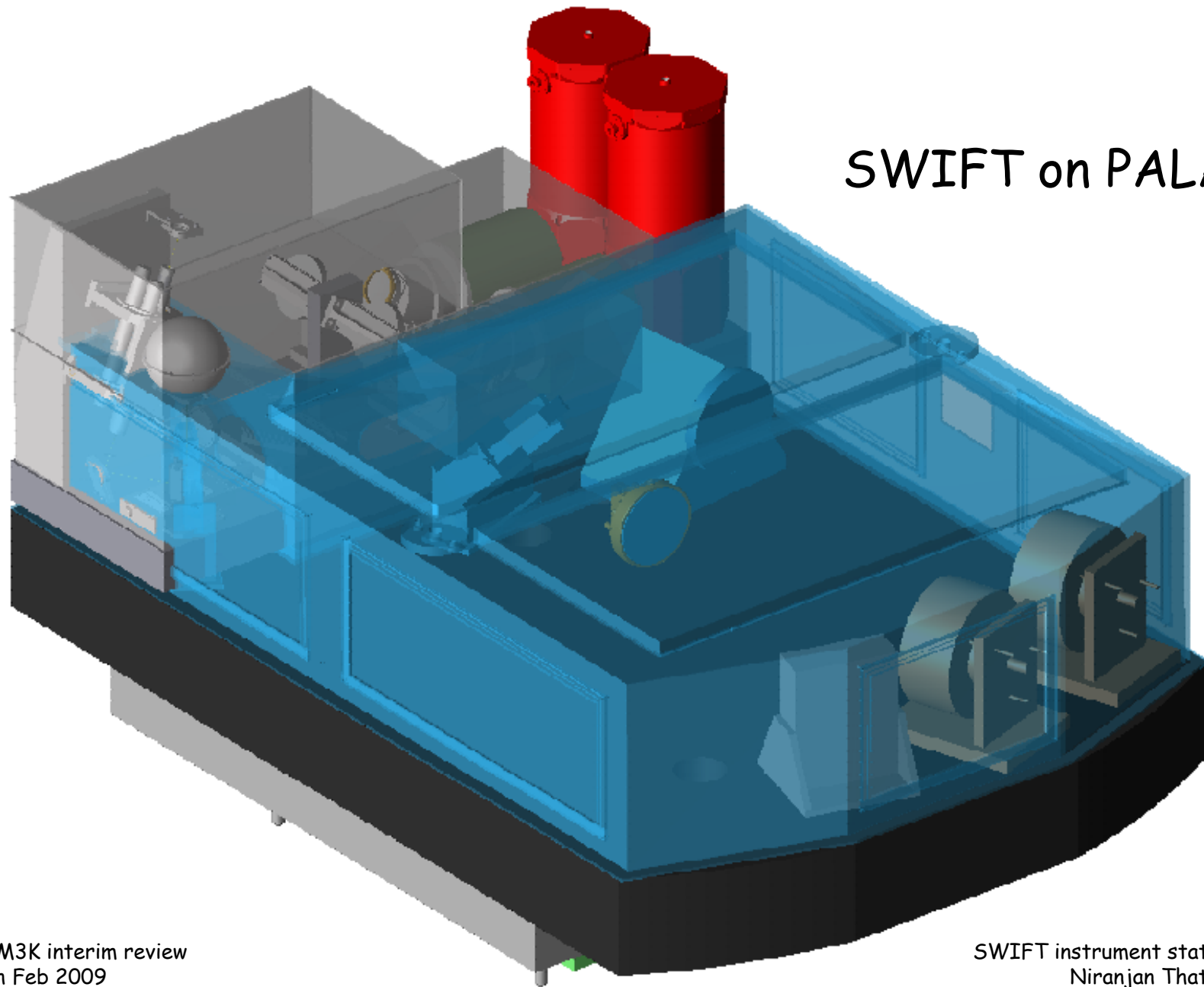
- I/z band integral field spectrograph mounted behind PALAO
 - Image slicer with 44x89 pixels
 - 0.235"/pixel giving 21" x 10" field of view
 - Also 0.160" and 0.080" pixel scales
 - Twin spectrographs after slicer
 - Fixed spectral format, 650-1020nm at R~4000
 - Thick LBNL CCDs (2k x 4k) with QE>80% at 950nm
- Yellow sheet on Palomar webpages



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SWIFT instrument status
Niranjan Thatte



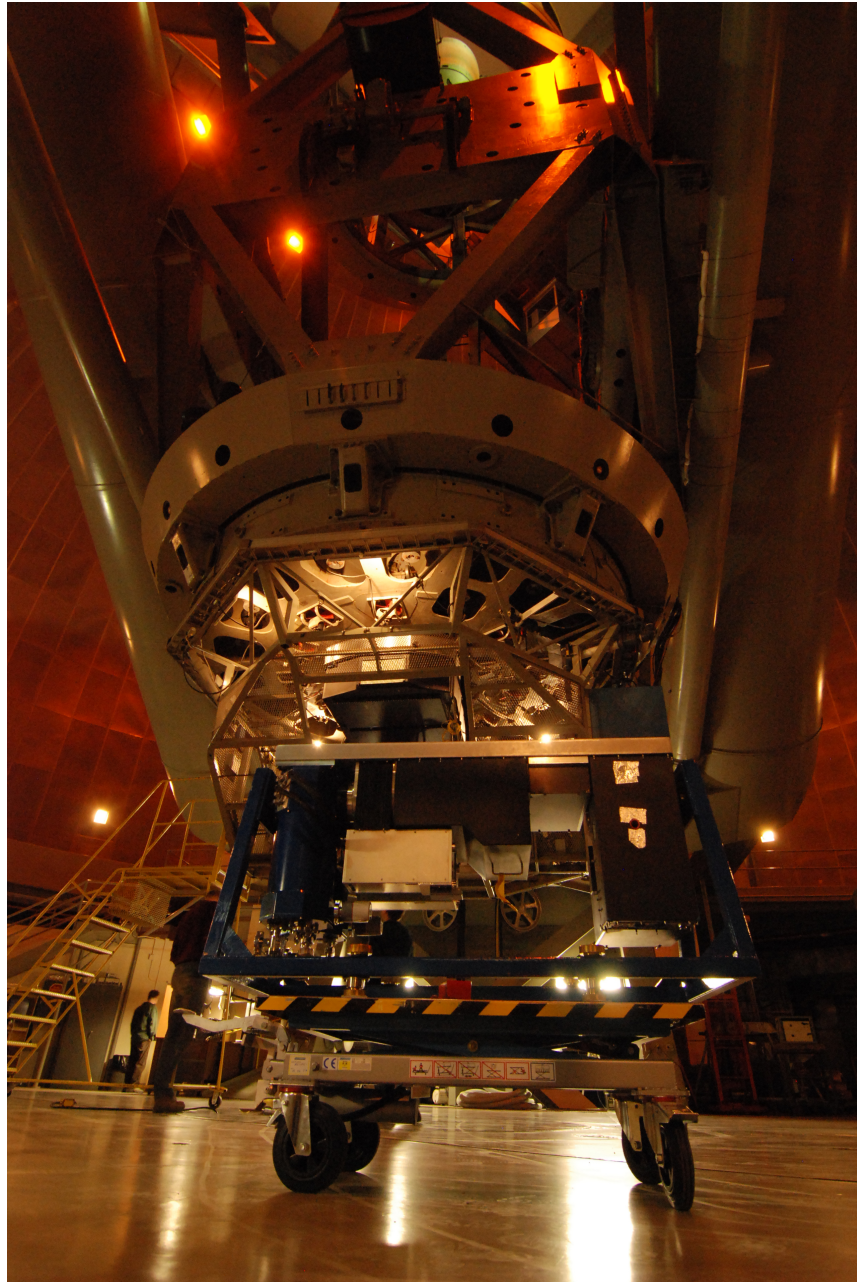
SWIFT on PALAO

Installation and commissioning

- Instrument arrived at Palomar on 17th September
 - Team arrived 22--26th September
- 2 weeks of installation and testing in the AO lab at Palomar
- Commissioning on sky 10-14th October
 - Officially 2 commissioning nights and two science nights
- Four nights each scheduled in December and January for science observations



SWIFT @ 200 inch



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SWIFT instrument status
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SWIFT Weather Summary.

- Weather/Seeing Oct (10th-13th)
 - 4NGS 1/2LGS
 - 1st night, high winds, dome not opened.
 - 2nd night, open all night.
 - 3rd night, dome closed at 10UT due to dust.
 - 4th night, dome closed all night due to dust.
 - 5th (1/2) night (LGS). Dome open.
- Weather/Seeing Dec (10th-13th)
 - 2NGS and 2LGS nights
 - 1st night (NGS), very cloudy. Seeing ~2"
 - 2nd night (LGS but postponed), very thick cloud. Seeing ~2".
 - 3rd night (LGS but LOWFS trouble so only for 1st 1/2 night), closed in second 1/2. Seeing 4-5"(!)
 - 4th night (NGS) not open due to snow.

SWIFT Weather Summary

- Weather/Seeing Jan
 - 2NGS 2.5LGS
 - 1st 1/2 night (LGS) mostly tests.
 - 2nd night (LGS) seeing 2-4" so LGS not run. Light cloud for 1st 1/2 night.
 - 3rd night (LGS) Seeing 3.5" so no LGS.
 - 4th night (LGS but cancelled for FAA) seeing 1.6"-2.4".
 - 5th night (NGS) Seeing 1.6"-1.8". Closed for 4hrs due to dust.

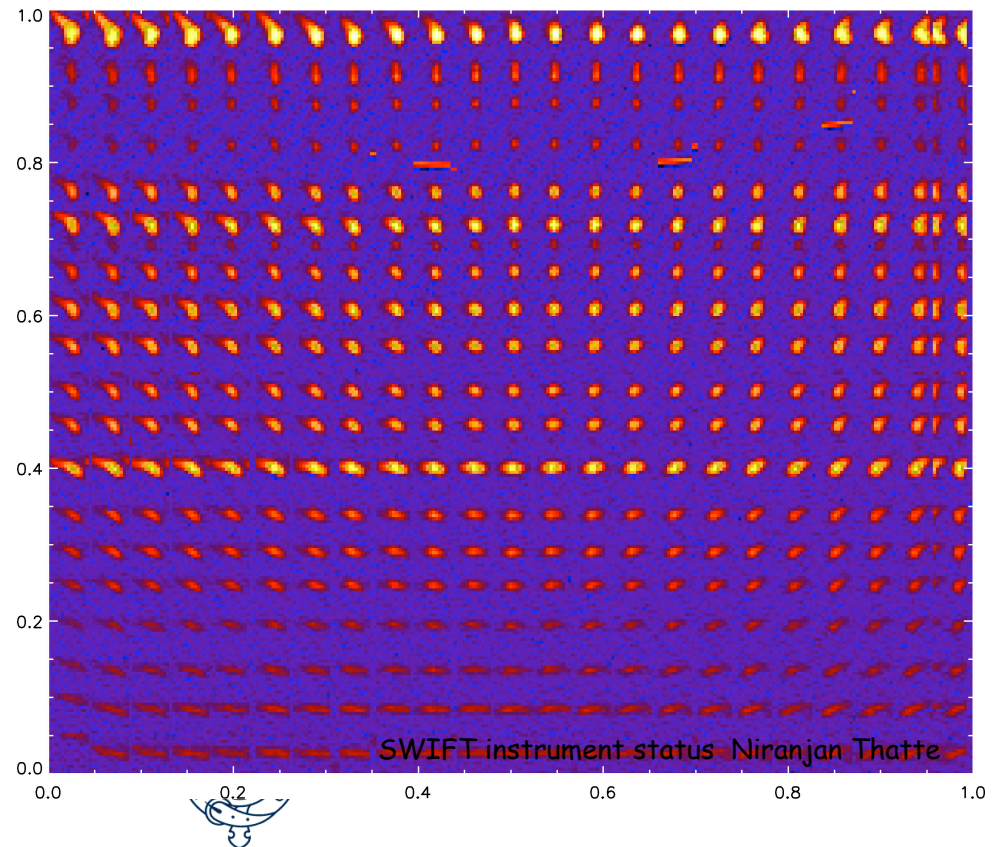
Key Issues

- Detector noise
 - Detector read noise at commissioning run was $30e^-$, significantly higher than goal ($5e^-$)
 - Limited science capability, but did not affect ability to commission instrument on sky
 - Tim Goodsall spent several weeks at Caltech after the commissioning run to work with Roger Smith/detector group on improving performance.
 - Read noise has now been reduced to $5e^-$

Key Issues

- Spectrograph PSF
 - PSF showing unacceptable amount of aberrations, esp. at corners of detector. Acceptable performance within central part, translates to a more limited wavelength range, and smaller FoV (1 strip on each channel)

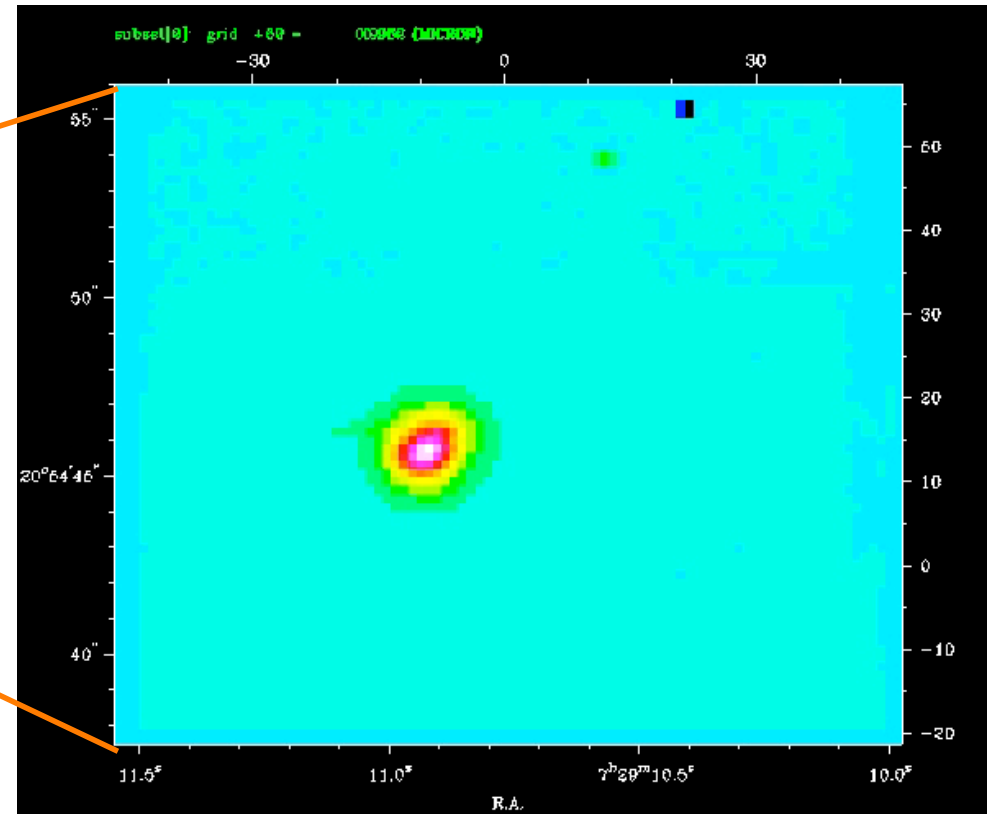
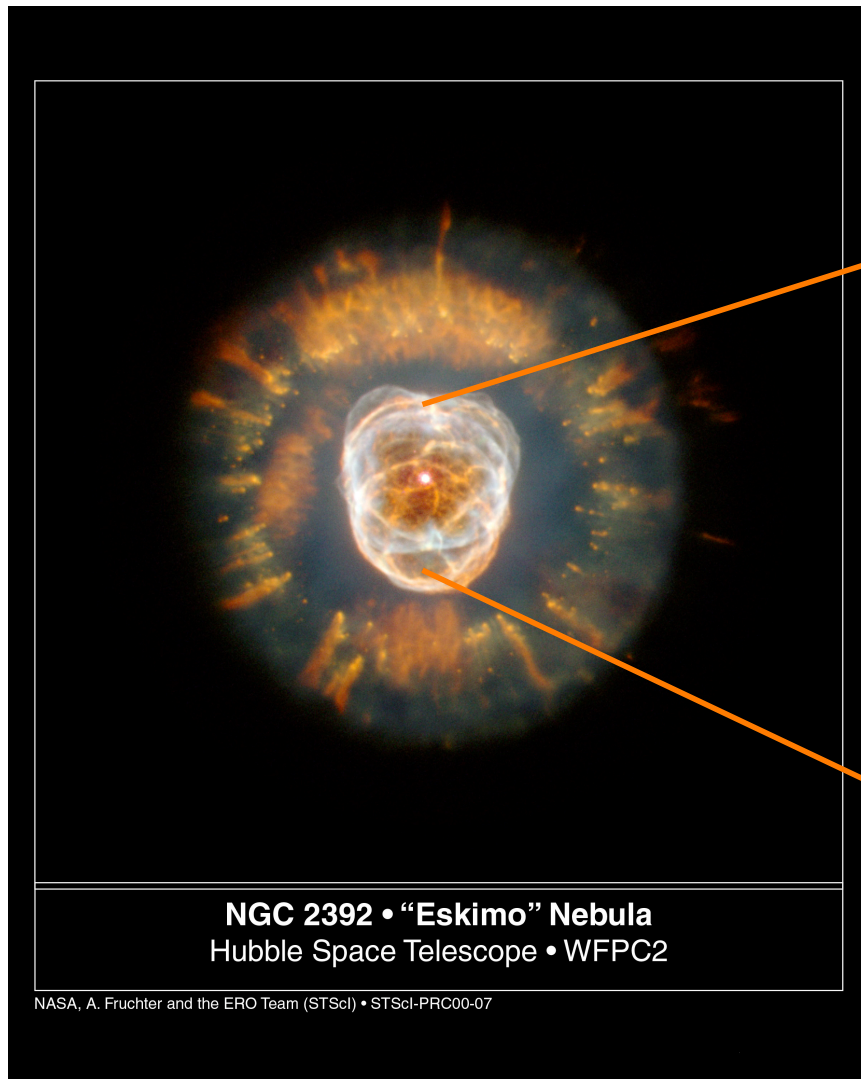
– cameras have now been shipped back to Oxford, will be tested interferometrically, fixed and re-installed prior to the O9A observing run at end of April 09.



Software status

- Software
 - GUI control of all instrument functions
 - Not yet integrated into single OS GUI
 - Able to communicate with AO/TCS via ArcVIEW
 - Dual readout of CCDs possible with two computers
 - Not yet through ArcVIEW, but with development python system.
 - Image reconstruction software takes ~5s to make 2d image for acquisition
 - Still need to optimise reconstruction vectors from lab data
 - Data reduction pipeline based on SINFONI pipeline
 - Running almost automatically (including cosmic ray rejection)
 - Ryan Houghton has done most work on pipeline
 - Automated version capable of at least "quality assessment" data reduction
 - ETC to be released in near future

First results, the Eskimo Nebula



SWIFT instrument status
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Summary

- Commissioning progressed smoothly, but on-sky time in O8B mostly weathered out.
- Operation with LGS successfully demonstrated
- Few critical issues, some closed, some being addressed now
 - Read out noise reduced to normal operating levels
 - Spectrograph PSF issue being addressed now
- First regular science use in O9A (end-Apr to early-May)
- LGS operation crucial for PALM3K science.