General
NGC
AO wavefront sensor systems
Scientific detector systems delivered to LSP
Scientific detector systems in Europe
Social Activities

ODT and NGC
2008

Photograph courtesy

The daily essence of successful projects

- Soldering
- Testing
- Market monitoring
- Procurement
- Order tracking
- Obsolescence hunting
- Stock keeping
- Incoming quality control
- Repairs
- Preventive maintenance
- Reporting
- Presentations
- Training
- Documentation
- Facilities management
- Hyper-sensitization
- Trouble shooting
- Travel & logistics
- ERP (re-)mastering
- Assembling
- Cabling
- Support of La Silla Paranal
- Planning
- Ultra-cleaning
- Web pages
- Safety
- Debugging
- Meetings
- …

‘The three great essentials to achieve anything worth while are: Hard work, Stick-to-itiveness, and Common sense.’

Thomas A. Edison

Photograph courtesy


Stefan Hötzl left on September 30
Mirko Todorovic joined on December 15 as Electronics Technician

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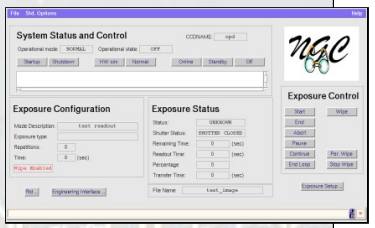
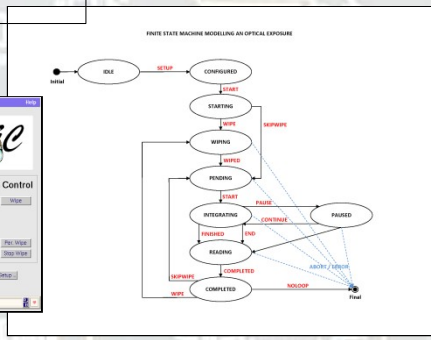
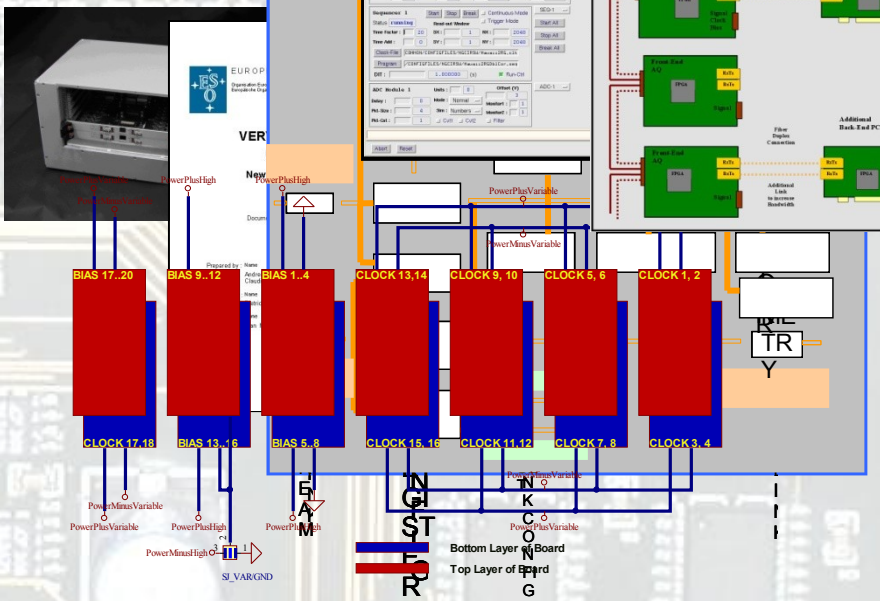
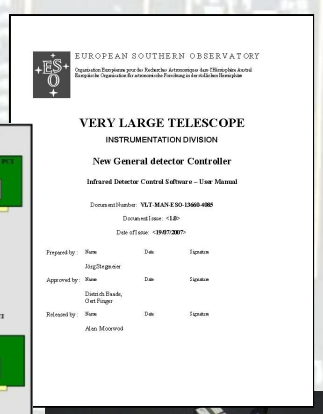
New General detector Controller (NGC)

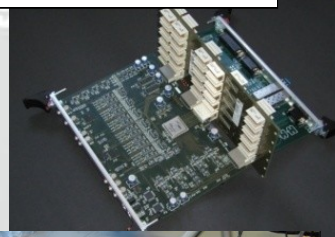
- ESO-wide presentation
- ü Internal Lessons-Learned meeting
- Improved user documentation
- † Maintaining OPT/IR commonalities becoming increasingly difficult
- More effective test procedures
- Clean-up of layouts by contractor
- NGC-owned TWiki with
  - production manual
  - version tracking
  - g lists
  - tory files for each board
  - t repo

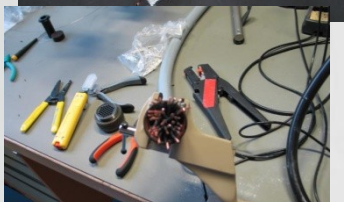






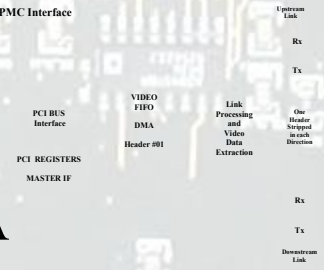






NGC performance

- RON < 3 e- @ 50 kpix/s demonstrated with e2v CCD types 44-82 and 231
- ü MUSE requirements are met
- ü Ditto for KMOS, SPHERE IR T/T WFS, and ZIMPOL
- ü NGC much more immune to pick-up noise than FIERA is
- ü Successfully installed at ODT test benches
- Start-up time of software < 2.5 s
- Standard ADCs run at 1 MHz; on-going developments:
  - 3 MHz version of 32AQ board
  - 40 MHz high-speed board
- Improved over-voltage protection
- New PMC I/F board for VLTI applications not using SPARTA



† With1310-nm fiber link, could place LLCUs in central computer room.

General change request not supported by LSP

➡ Re-consider for every new instrument

NGC deliveries and production in 2008/2009

Systems are due for:
- MUSE (prototype +)
- KMOS
- SPHERE
- ZIMPOL
- Lab usage

All accomplished

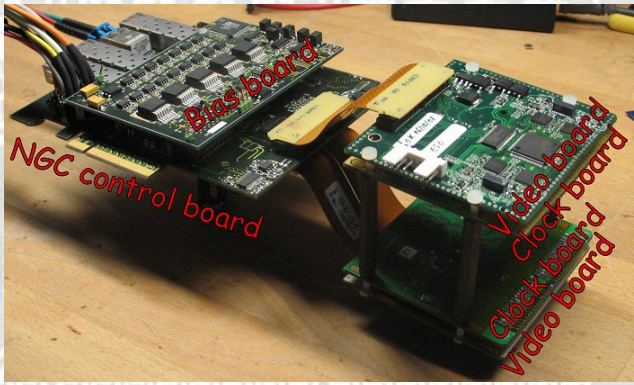
- Two successful revisions of Basic and Transition Board
- 32AQ Board unaltered
- Produced 7 power supply units
- Developed new 2-board housing with fan (for laboratory use only)

Stock ~sufficient for deliveries in 2009 to:
- KMOS
- MUSE
- SPHERE
- ZIMPOL

NGC-AO

Plan:

- Develop standard WFS module for all forthcoming VLT AO systems
- Test controller from Marseille / OHP / Grenoble: OCam
- Combine NGC digital and OCam analog electronics
- General sFPDP I/F to SPARTA at LLCU level



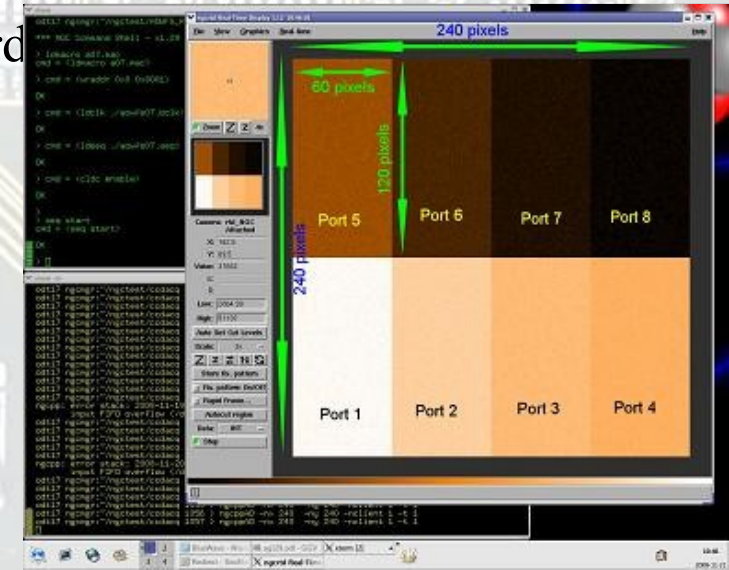
Status:

- Bias and clock-driver boards received from OCam
- NGC sequencer board derived from NGC basic board (Xilinx Virtex-5 instead of II-Pro)
- Firmware prototyped

ü First 'laboratory light' achieved in November

† Waiting for ESO-Ocam

- sFPDP development starting



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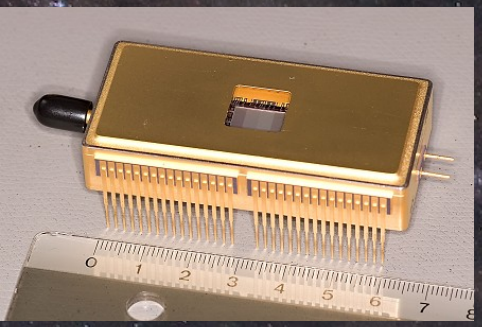
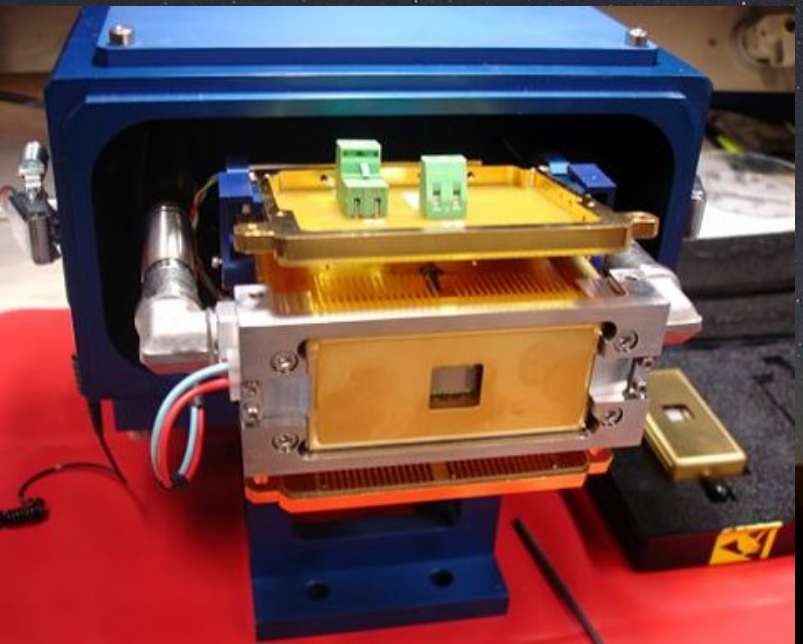
(EM-)CCD220 for wavefront sensing @ VLT

(or: management at a distance)

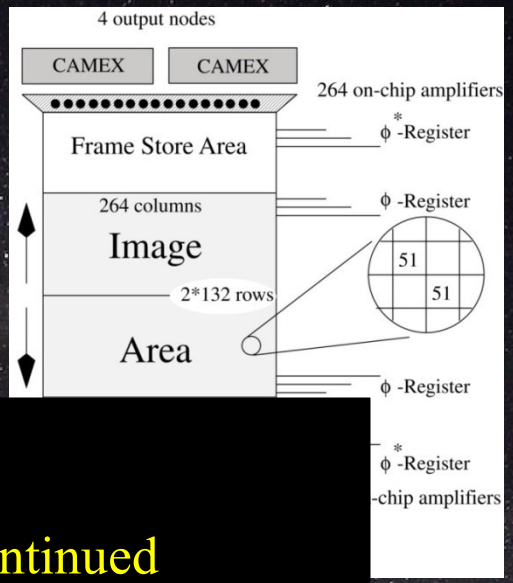


- Standard WFS chip for GALACSI/GRAAL/SPHERE
- OCam test controller needed for CCD220 testing by e2v
- Delivery by Marseille delayed
- Two deliveries to e2v failed; 3rd attempt in 2009 January



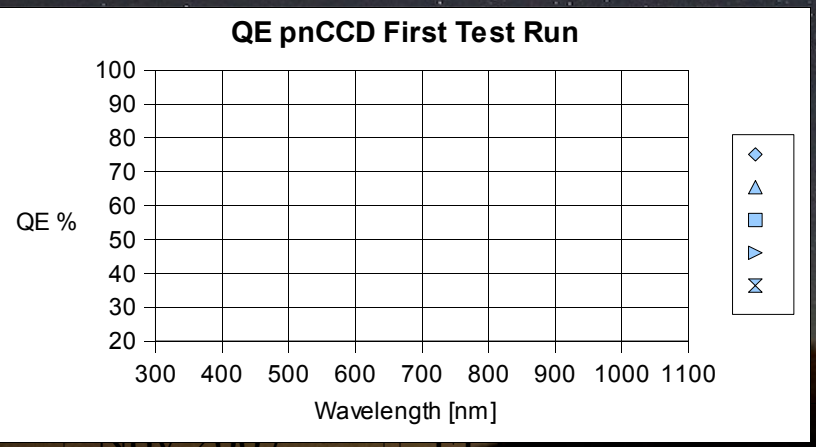
Joint tests of pnCCDs with MPE-HLL

- 264x264 51-µm pixels
- 450 µm thick
- Split frame-transfer device
- 528 amplifiers + CAMEX (ASIC)
- 1000 fps
- RON < 3e



Slide repeated from last year

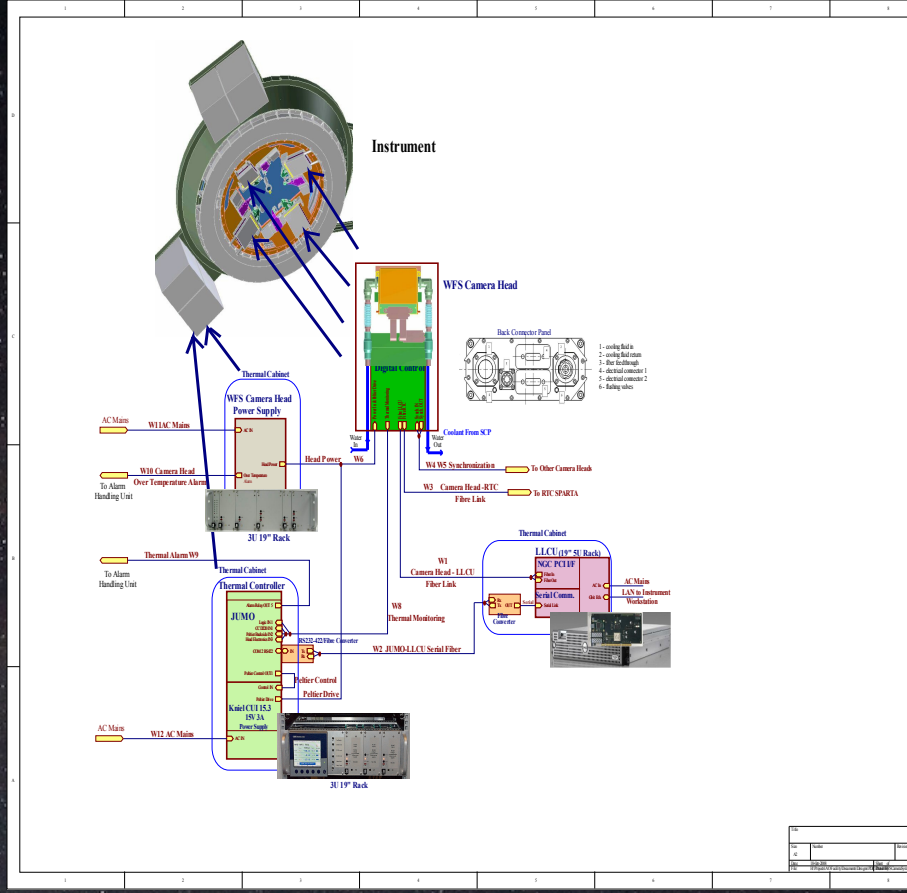
Joint usage of ODT test bench continued
Could help MPE-HLL to make good progress



- Plausible back-up for CCD220
- Device too small for LGS and SH@E-ELT
- But OK for XAO with pyramid WFS?
- XAO needs 3 kfps – AApnCCDs?

Standard VLT AO WFS system

(GALACSI, GRAAL, SPHERE)



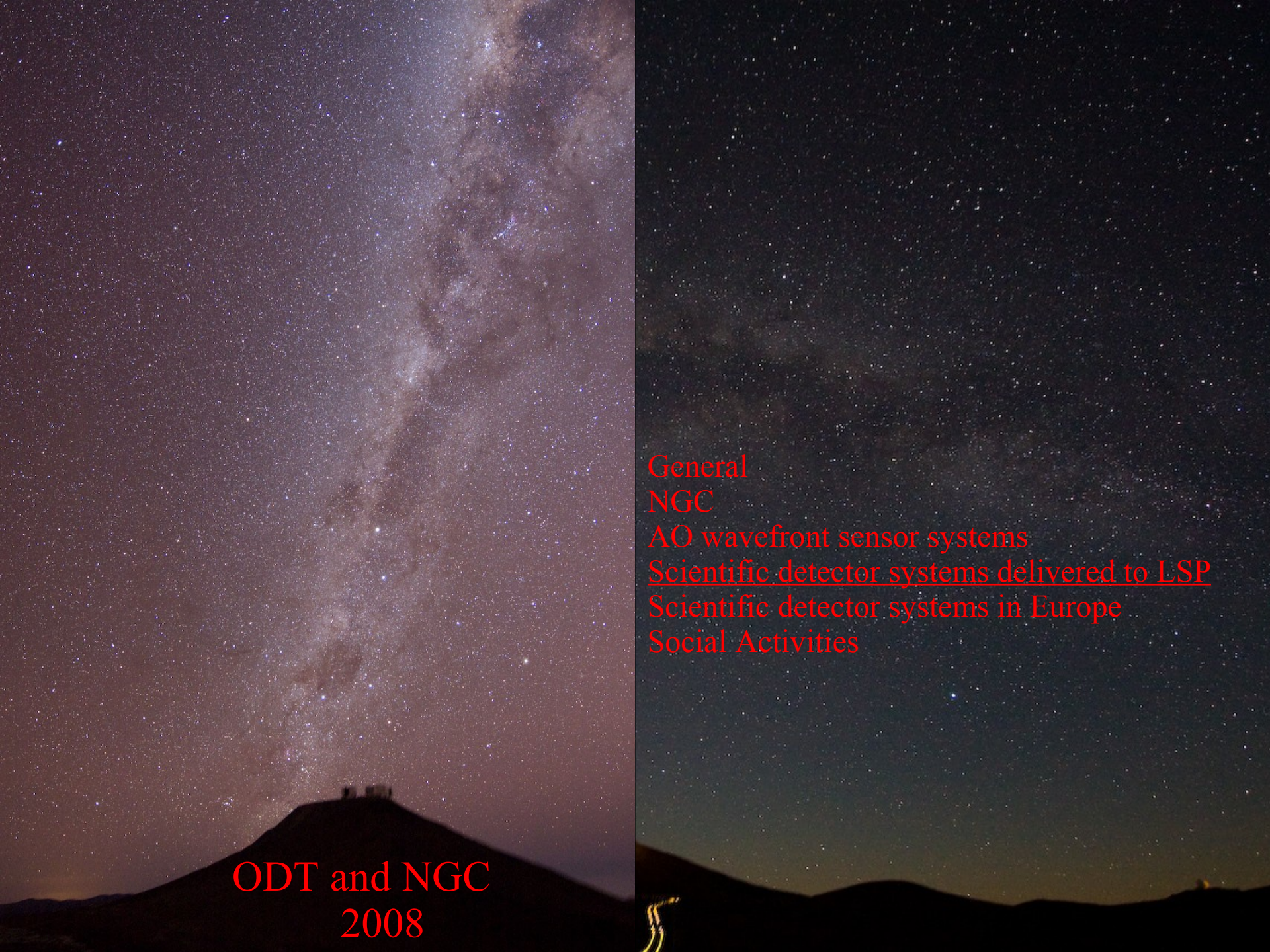
- ü **Prepared very comprehensive FDR documentation**
- † **Waiting for ESO-OCam, NGC-AO, and more detectors**
- • **Baseline detector is CCD 220 from e2v**
- • **Need to build 15 systems in 2009-2011 (AOD want them earlier)**

Detectors for E-ELT AO WFS

- Feasibility-study phase with 4 contractors successfully completed
- Issued new CfT for Technology (Pixel) Demonstrator
- Awarded 3 fixed-price contracts (all CMOS-based)
- Last one is supposed to enter Design Review in January, 2009
- First one has already reached shuttle-run phase
- † Contractors are struggling with combination of speed and read noise (some find it difficult to just read the requirements)
- Continually refined requirements (models, contractors' responses, etc.)
- About mid-2009 issue CfT for Scaled-down Demonstrator

	Front Side	Hybrid	3D	Backside
QE				
Dark Current				
Noise				
100% Operability				
Size/Stitching				
VLSI capability				
Manufacturability				

may not achieve requirements
feasible
demonstrated



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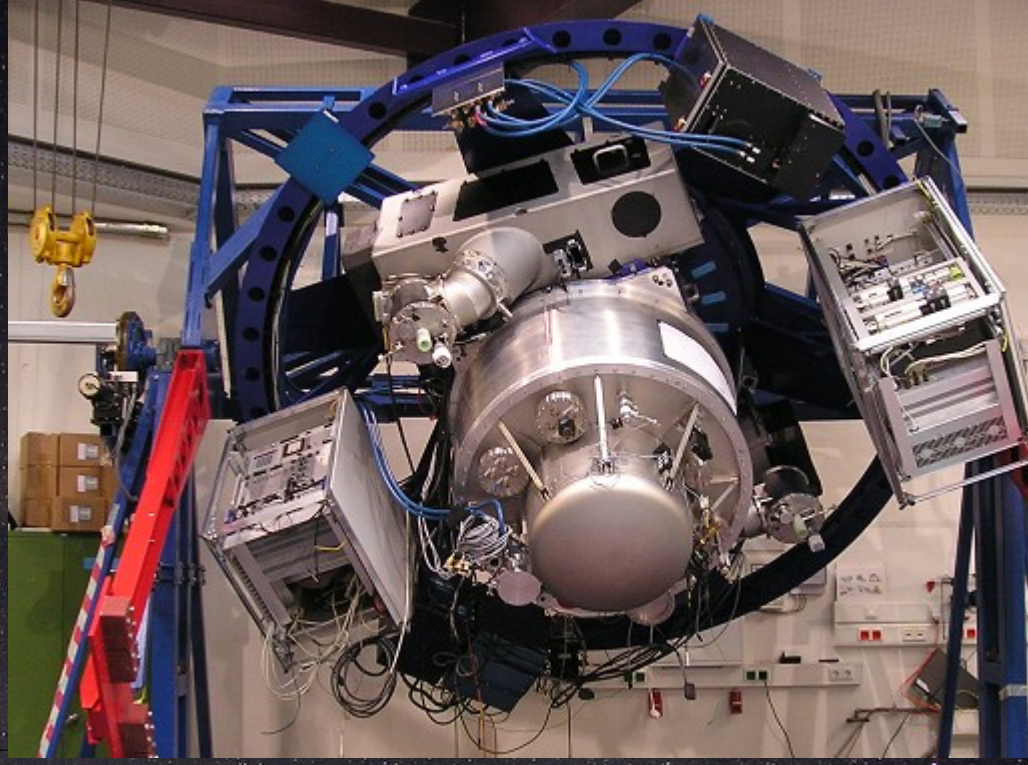
X-shooter

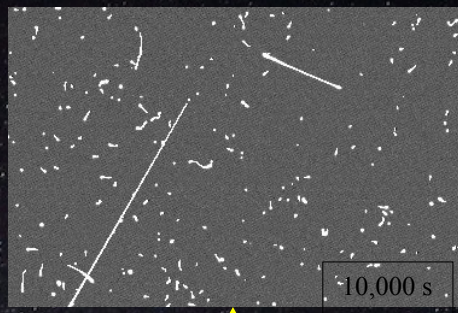


- FIERA software defines 2 nearly fully independent virtual cameras on one common front-end electronics
- VIS system (with MIT/LL CCID-20)
- UVB system (with e2v CCD44-82)
- Requirements-compliant systems delivered to Paranal

Giraffe upgrade

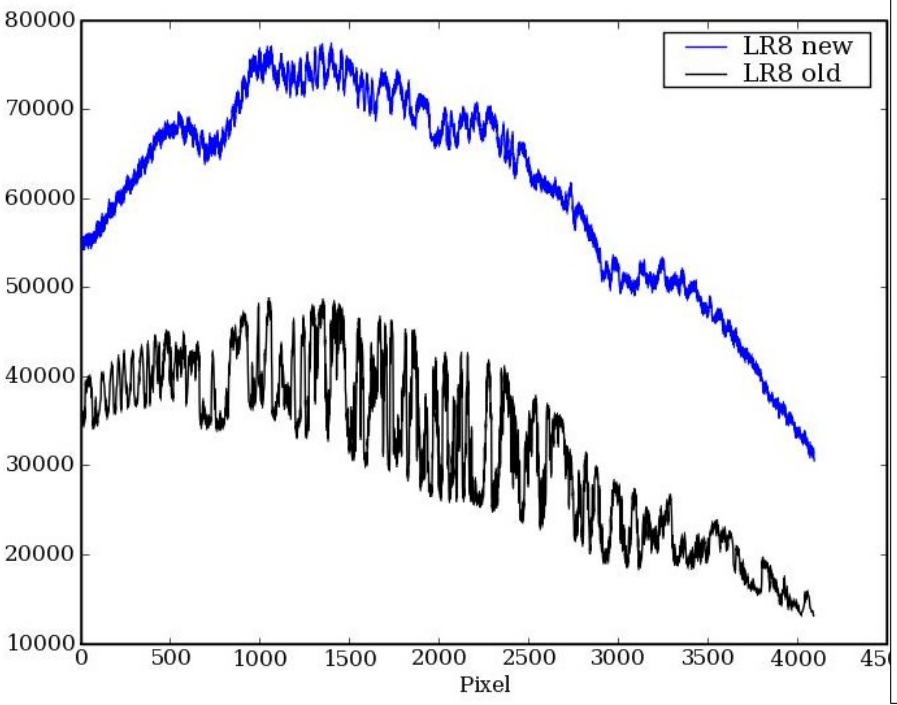
- First deep-depletion device with dual-layer coating (e2v)
- Successfully commissioned in 2008 May
- Prototype for VIMOS red upgrade

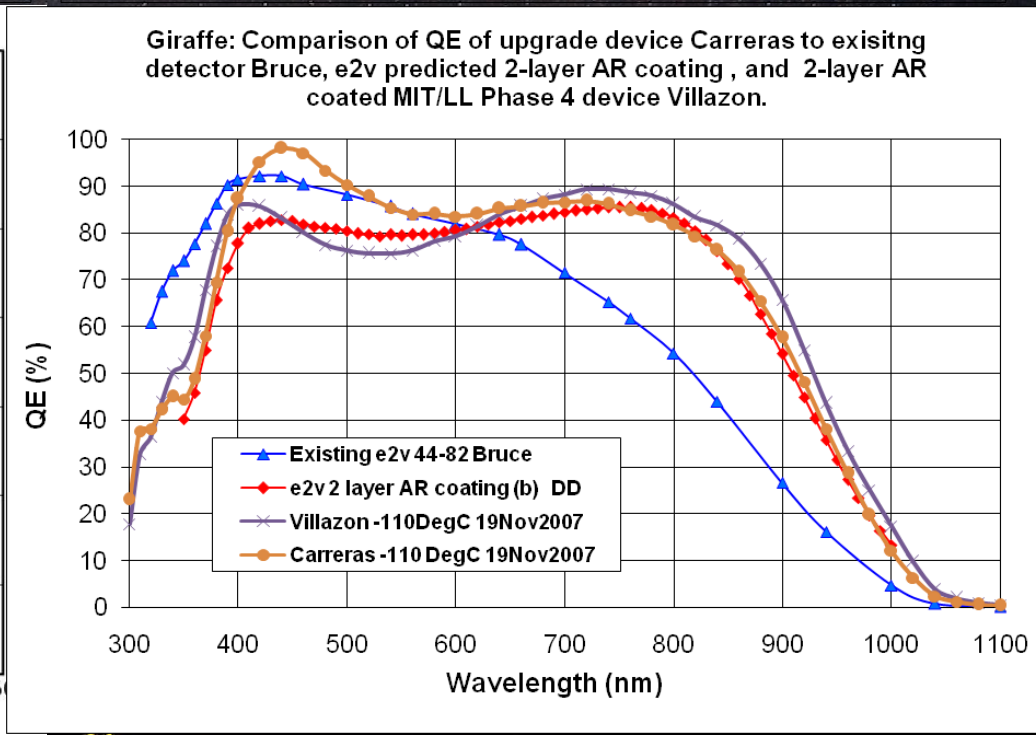
ü Thicker silicon offers decisive advantages - but also suffers more particle hits



Much reduced fringing

Major improvement in red sensitivity





OmegaCAM: from Lagerhalle to Bodega

2008 Bodega Paranal

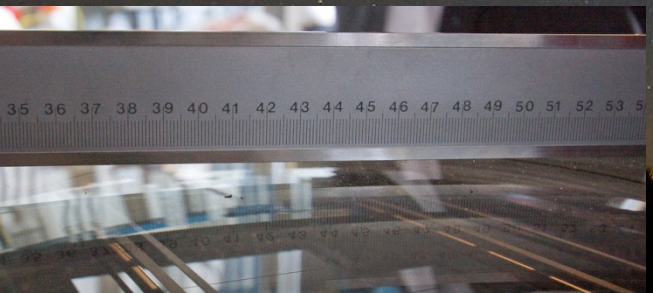
2006 Storage Hall Garching

2005 Assembly Hall Garching

OmegaCAM: between the bodegas

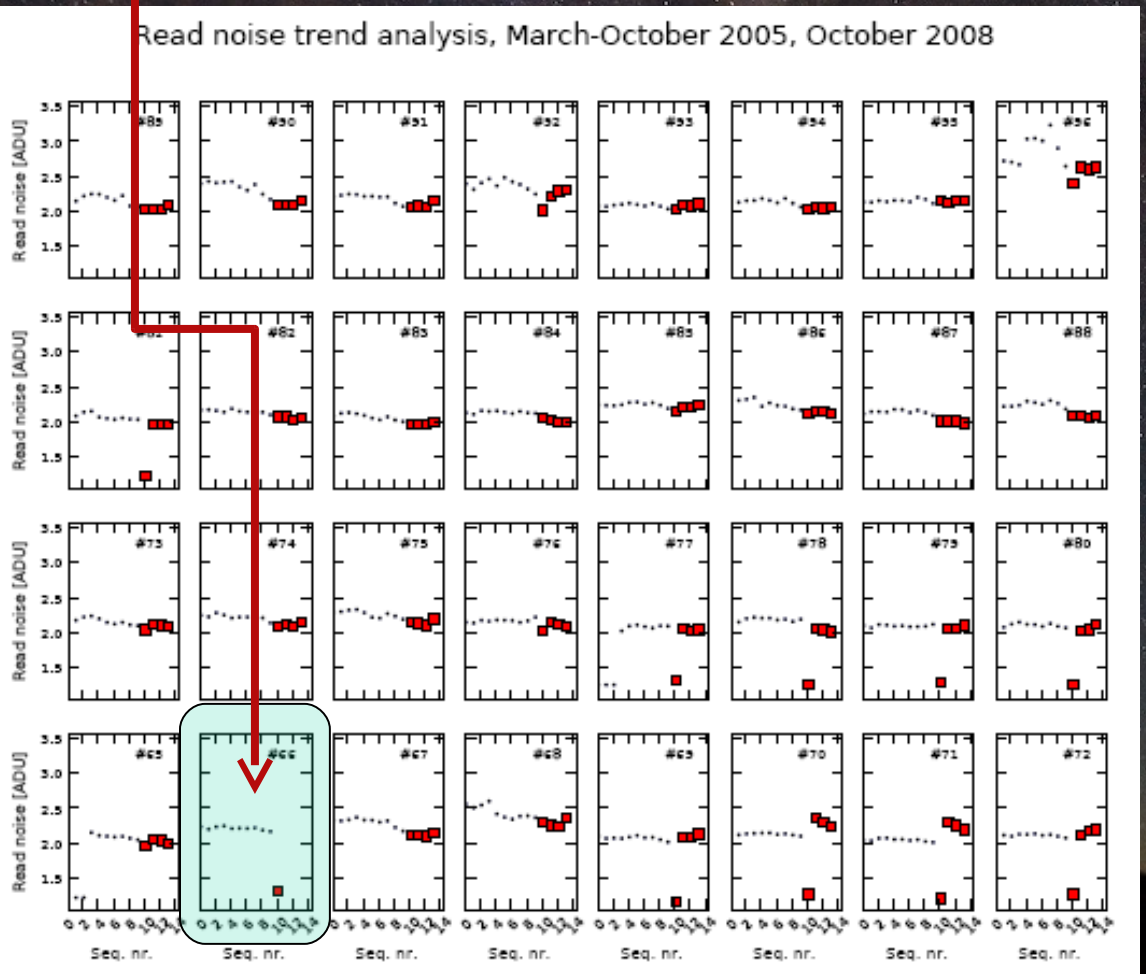
- Shipped to Paranal
- Re-assembled
- ü Fully successfully tested
- ü I/F instrument / detector system verified
- ü Packed and safely stored
- Awaiting VST

† Filters from Barr Ass. broken (again …)



OmegaCAM: one CCD failed

Here it is



Typically asked questions:

How bad is it?

It's very bad

Is damage due to transport?

No, it isn't

(Identical CCD died years ago under similar circumstances)

When will CCD be un-kaputted?

CCD can't be repaired

Can it be replaced?

Yes. At cost and risk

Will it be replaced?

It depends

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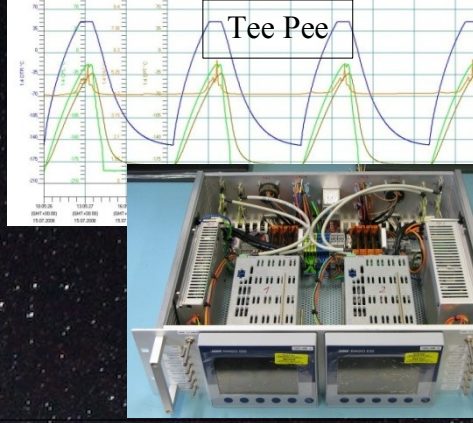
Multi-unit Spectroscopic Explorer (MUSE)

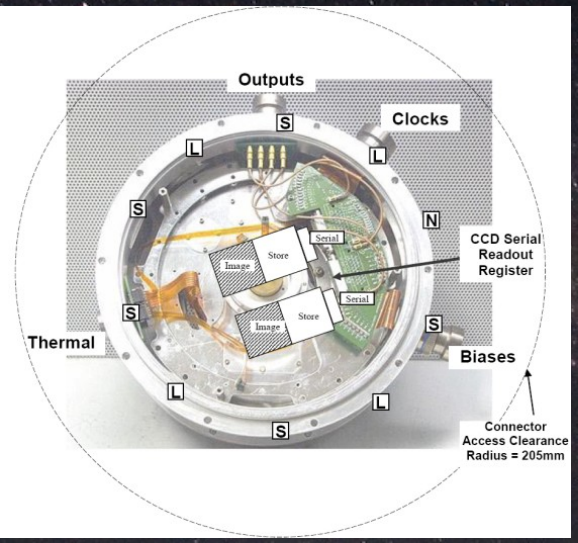
(Multi = 24 = MANY)



- 4k x 4k engineering-grade CCD 231 from e2v extensively tested
- Helped to debug 2nd ODT test bench and NGC
- ü Requirements are met
- Final detector head just manufactured – will install science-grade CCD
- ü Prototype system to be delivered in March
- Agreement reached with AI Potsdam for support of serial production
- † ESO has become part of MUSE Consortium: extra bureaucracy
- TeePee serial production initiated

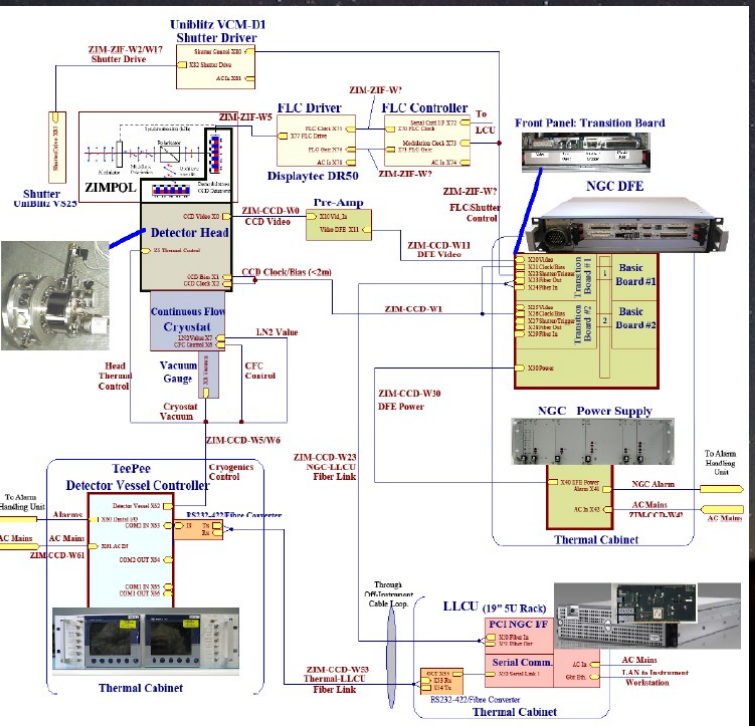
ZIMPOL (SPHERE)

SPHERE
Spectro-Polarimetric High-contrast Exoplanet REsearch

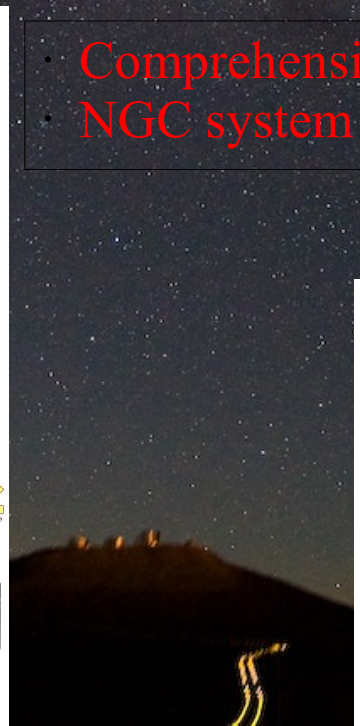


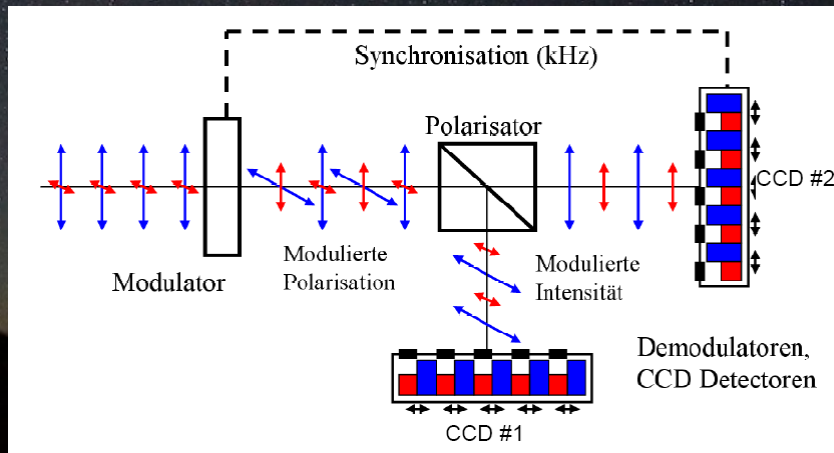
Originally, ZIMPOL was supposed to provide a VLT-compliant detector system

Now, the ODT may more nearly be supplying a ZIMPOL-compliant detector system



- Comprehensive FDR documentation submitted
- NGC system produced





Miscellaneous

UVES red upgrade

- EMMI red released for cannibalism
- Installation in 2009 July

VIMOS red upgrade

- Contract with e2v signed in 2008 (?)
- 5 deep-depletion CCDs due before 2009 August
- Installation in P84

Ultra-stable Cryostat

- Procurement of parts

ESPRESSO Phase A

- Broad survey of detector options

FIERA

- 2009 releases of VLTSW (incl. enhancements)

Pulpo1

- Multiple clean-ups after upgrade attempts on LSP

MIT/LL Phase 4

Have given up on receiving any devices

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Team building efforts

ODT Isar Party

Thank you, Sebastian!

INS SADness

NGC 2264 (WFI@ESO/MPG 2.2-m)
[WFI celebrating 10th anniversary!]