40th User Committee

Report from Paranal Science Operations

Steffen Mieske
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What is SciOps responsible for?

- Produce astronomical data of the highest quality
- Maintain (at minimum) & enhance (desired) instrument scientific capabilities:
  - science modes, performance, calibration plan
- Improve operational efficiency
  - Increase time available for science
  - Offer new operations capabilities
    - Designated VM (implemented)
      - Eavesdropping mode under development
    - Update of Phase 2 tools, jointly with USD (to come this year)
- “Educate” users community to VLT(-I) operational requirements
SciOps staffing

- **Astronomers**
  - 38 members
    - 12 fellows (all are instrument fellows)
      - plus 4 Garching fellows
    - 26 astronomers (most are instrument scientists)

- **Telescope Instrument Operators**
  - 24 members
    - 15 Night-TIOs (Operations of telescopes, instruments, calibration plan, quality control)
    - 9 Operation Specialists (OS) (tasks shared 50/50 between day & night support)
    - Involvement in instrument operation teams (iTIO)

- **Executive assistant**
  - Tasks shared with Director’s Office
Paranal and its instruments

16 instruments in operations, Gravity@VLTI under Commissioning

SPHERE
FORS2
KMOS
GRAVITY

FLAMES
VIMOS
MUSE
VISIR

NACO
HAWKI
PIONIER

CRIRES
Being upgraded

VIRCAM + OMEGACAM

UVES
SINFONI
AMBER
XSHOOTER

PSO - 40th UC meeting. April 18-19, 2016
Paranal and its instruments

Parameter space in angular and spectroscopic resolution
Paranal Instrument Operations

- Highlights: VISIR
  - VISIR upgrade finished, all foreseen modes offered
  - VISIR = VLT imager and spectrometer for the mid—infrared [8-13;17-24 μm]
  - Upgraded to 1kX1k detector in 2011-2014
  - Restarted regular operations in P95 (April 1st, 2015)
  - Successful Science Verification of Burst Mode, Coronagraphy, SAM during Feb. & March 2016
  - For P97 we offer the following modes:
    - Regular Imaging, LR/HR/HRX spectroscopy, coronagraphy
  - For P98 we offer in addition the following modes:
    - Burst mode, SAM, M-band imaging
Paranal Instrument Operations

- **Highlights: VLTI**
  - **VLTI back to operations since P96**
    - Was out of operations during P95 for VLTI facility upgrade: prepare for Gravity & Matisse (AIV foreseen 2017)
      - Upgrade completed successfully in Q4/2015
      - Includes new optical train elements (e.g. STS)
    - Operations with PIONIER and AMBER back to operational smoothness as from before the facility upgrade
  - **Gravity** commissioning with ATs on track, first tests with 4 UTs done in March 2016
  - Major commissioning activities continue during P97
    - CIAO@UTs, Gravity with 4 UTs, Gravity astrometric mode
  - **GRAVITY offered for the community in P98** in spectro-imaging
    - But only during 2 months, due to complete Coude optical train refurbishment during P98
Major upgrade to UT4 during 2016: 4 LGS and Deformable Secondary Mirror

4 Laser Guide Stars
First commissioning on sky in April 2016

DSM
To be installed in Q4/2016
Paranal Instrument Operations

**Outlook of major upcoming activities 2016 / 2017**

- Commissioning of 4LGSF and Deformable Secondary Mirror on UT4
  - Official first light with the 4 lasers foreseen for April 26/27
  - Installation of the DSM to take place during Q4/2016, leaving UT4 out of operations for 3 months.

- Heavy commissioning activities for GALACSI & GRAAL (MUSE and HAWK-I AO modules) planned during 2017
  - Will enable diffraction limited narrow field mode of MUSE (7.5”x7.5”) + seeing enhanced mode with normal 1x1’ FOV
  - Factor of 2 improvement in encircled energy with HAWK-I
Paranal Instrument Operations

Outlook of major upcoming activities 2017 / 2018

- ESPRESSO AIV foreseen to start during P98 (early 2017)
  - First light tentatively during Q2/2017

- MATISSE installation foreseen to start during P100 (end of 2017 / early 2018)

- CRIRES+ to be re-installed on one of the UTs during Q1/Q2 2018 (P101/P102)

PLEASE CHECK ALSO
Section 1.3. in https://www.eso.org/sci/observing/phase1/p98/CfP98.pdf
Paranal Instrument Operations

LGS usage

LGSF Monthly Statistics

Muse @ UT4

- Science with LGSF
- No LGSF science due to LGSF issues

Month since 2013-10

Hours

June 2013 - June 2016
New Atmospheric Site Monitor

- In operation since April 3, 2016
  - Announcement in Science Newsletter from April 6
  - Required due to AOF needs, and hardware and software obsolescence
  - **New DIMM tower** to provide more reliable optical seeing estimate
    - Fits header keywords `TEL.AMBI.FWHM.START/END`
  - New instruments to measure vertical distribution of the atmospheric turbulence: MASS and SLODAR
  - New graphical interface and archive query form
  - Sensors for wind, humidity, temperature remain the same
New Atmospheric Site Monitor

In operation since April 3, 2016
Involvement of Telescope and Instrument Operators in Instrument Operation Teams

- Internal cross-training activities almost completed
- Beyond real-time operating & troubleshooting, towards medium-to-long term improvement in data quality, documentation, operations efficiency
- Basic involvement: participation and contribution to quarterly instrument team meetings on Paranal (‘mini-IOT’)
- Involvement beyond basic level depends on instrument situation and TIO preference
  - Very positive examples already seen for SPHERE, OmegaCAM, VIRCAM
Closing the loop: outlook items from last year's presentation

Involvement of TIOs and OSs in Instrument Operation Teams (IOTs)

 iTIO
Closing the loop: outlook items from last year’s presentation

- Extension of remote access capabilities
  - Deploy Garching Remote Access Facility (G-RAF)
    - In operations since September 2015
    - Frequently used by Garching colleagues, including Gravity consortium members from MPE
    - Typical usage: technical support during interventions, troubleshooting, commissioning
Closing the loop: outlook items from last year’s presentation

- Extension of remote access capabilities
  - Consider Remote Observing
    - Concept being developed for eavesdropping mode for delegated visitor mode (and possibly ToO)
    - Progress report planned for October 2016 internal operations workshop
    - Deployment in operations envisaged during 2017
Streamlined support of visitor mode observations (OB transfer chain, prioritisation)

- Take advantage of ESPRESSO requirements for general overhaul of Phase 2 processes

- Project approved and on track

- Implementation planned to start in P98
  - visitor mode OB transfer via check in
  - execution sequence for vOT
  - p2pp gets an API (Application Programming Interface)
    - interface for external tools for batch processing / submission / real-time update of OBs
Visiting astronomers’ feedback I

EoM Stats History - Astronomer Support

EoM Stats History - TIO Support

SciOps 2.0 deployment
Visiting astronomers’ feedback II

Run completions back to good values after bad weather peak in P93

Large fraction of N/A evaluation for the on-line pipeline

Mostly due to instruments with GTO & Public Surveys (SPHERE, NACO, VIMOS, KMOS, FORS)
Foreseen developments

1) Appointment of an Adaptive Optics Scientist for high level coordination of AO activities, along with a strong team of AO experts

2) Implementation of eavesdropping mode

3) Operations streamlining:
   - Continue moving towards SciOps 2 implementation at the VLTI to free up more time for higher level support activities
   - Evaluate single TIO operations of the survey telescopes
     - Frees up resources for supporting operations of more complex systems (AOF, VLTI)
Thank you!