



# Observatory Sciences

## Working with ESO



## Overview

- Pre E-ELT
- E-ELT involvement
- Experiences



# VISTA Telescope



ESO's 4.1 m **Visible and Infrared Survey Telescope for Astronomy** (VISTA) is the world's largest wide-field Infra-Red survey telescope.

Built by a UK consortium and accepted by ESO in Dec 2009

67 Mega pixel camera



VISTA telescope enclosure, Paranal, Chile



VISTA telescope installed in enclosure

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## VISTA view of Orion

ESO/J.Emerson/VISTA & R.Gendler

Acknowledgement Cambridge Astronomical Survey Unit



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## VISTA Telescope Primary Mirror Active Optics



Observatory Sciences implemented the control system software for the VISTA primary mirror, using ESO VLT software.

The VISTA primary mirror (M1) active control system hardware consists of 84 axial supports (81 actuators + 3 definers) and 24 lateral supports.

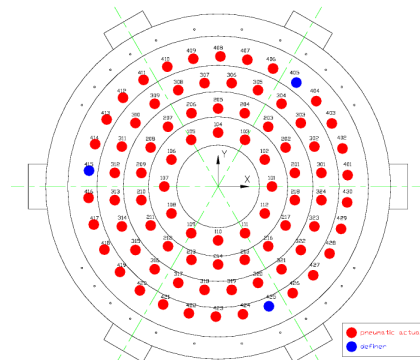


Figure 2: Layout of axial supports.

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## ESO E-ELT. OSL Software Contracts 2007-9



July 2007	Evaluation of the ALMA Common Software as a software framework for the E-ELT TCS
May 2008	Evaluation of the Data Distribution Service in the context of the E-ELT TCS Infrastructure
May 2009	Design of the E-ELT TCS Software Integration Infrastructure

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## ESO E-ELT Software Study I



### E-ELT Software Framework Study comprised

1. Software Framework Requirement Analysis
2. Technical and Programmatic Feasibility of using the existing ALMA Common Software (ACS)
  - Features missing from ACS
  - Unnecessary features of ACS
  - ACS User Survey
3. Technology Evolution assessment
4. Alternative software architectures (including ESO-VLT, EPICS, ATST, PVSS-II, Ice, DDS, TANGO)
5. Cost Estimates for adoption of ACS

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## ESO E-ELT Software Study II - DDS



- A large, distributed software system like the E-ELT Telescope Control System will be composed of many data providers and consumers, often on different computers.
- The DDS (Data Distribution Service) software defines a *Publish/Subscribe* standard for communication of data between software components.
- DDS promotes *loose coupling* between system components. This promotes easy maintenance, enhancement and evolution of a software system over a potentially very long lifetime (~30 years).
- Prototype produced to evaluate product

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## ESO E-ELT Software Study III - Infrastructure



- Three phases
- Analyze update and review requirement specification
- Design of core integration framework
- Development & test plan, schedule and cost proposal to build a prototype integration framework

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## Experiences

- Initially difficult to get a foot in the door (selective tendering)
- Daunting set of documentation
- Bespoke environment with a steep learning curve
- Lack of stage payments

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## Experiences

- Lots of documentation
- Good training courses
- Well defined process for all stages of contract
- Responsiveness to queries
- Engagement of ESO staff
- Prompt payment !