

ESO Imaging and Spectroscopy

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(ESO)

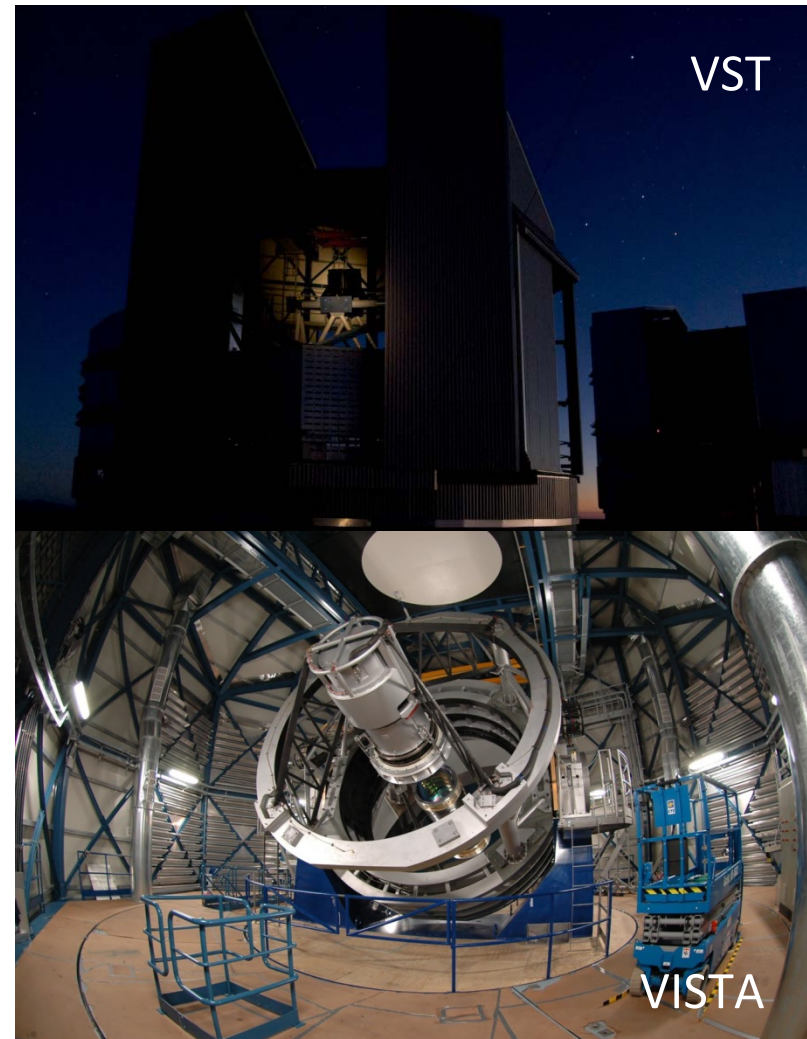
La Silla Paranal



- VLT/I (Paranal)
 - Instrumentation operating, in assembly and planned
 - Covers the available optical infrared wavelengths 300nm to 20 μ m
 - Angular resolution from seeing limit to 50 μ -arcseconds
 - **FORS2**, ISAAC, UVES, FLAMES, NACO, SINFONI, CRIRES, VISIR, **HAWK-I**, **VIMOS**, X-Shooter, laser guide star facility
 - **KMOS**, **MUSE**, SPHERE, Adaptive Optics Facility
 - MIDI, AMBER, PRIMA, GRAVITY, MATISSE
- La Silla
 - Continue operations with long-term programmes
 - HARPS, EFOSC2, SOFI, visitor instruments
- APEX
 - Covers sub-mm and mm wavelengths 0.3 to 3 mm
 - SHFI (Swedish Heterodyne Facility Instrument), **LABOCA**, **SABOCA**, APEX-SZ, CHAMP+, FLASH
- Survey Telescopes
 - **VISTA**, **VST**

The Survey Telescopes

- Under construction
 - VST 2.6m for optical
 - VISTA 4.1m for infrared
- Science
 - Multi-year programs of large public surveys
 - Community surveys
 - Telescopes will be mostly dedicated to surveys



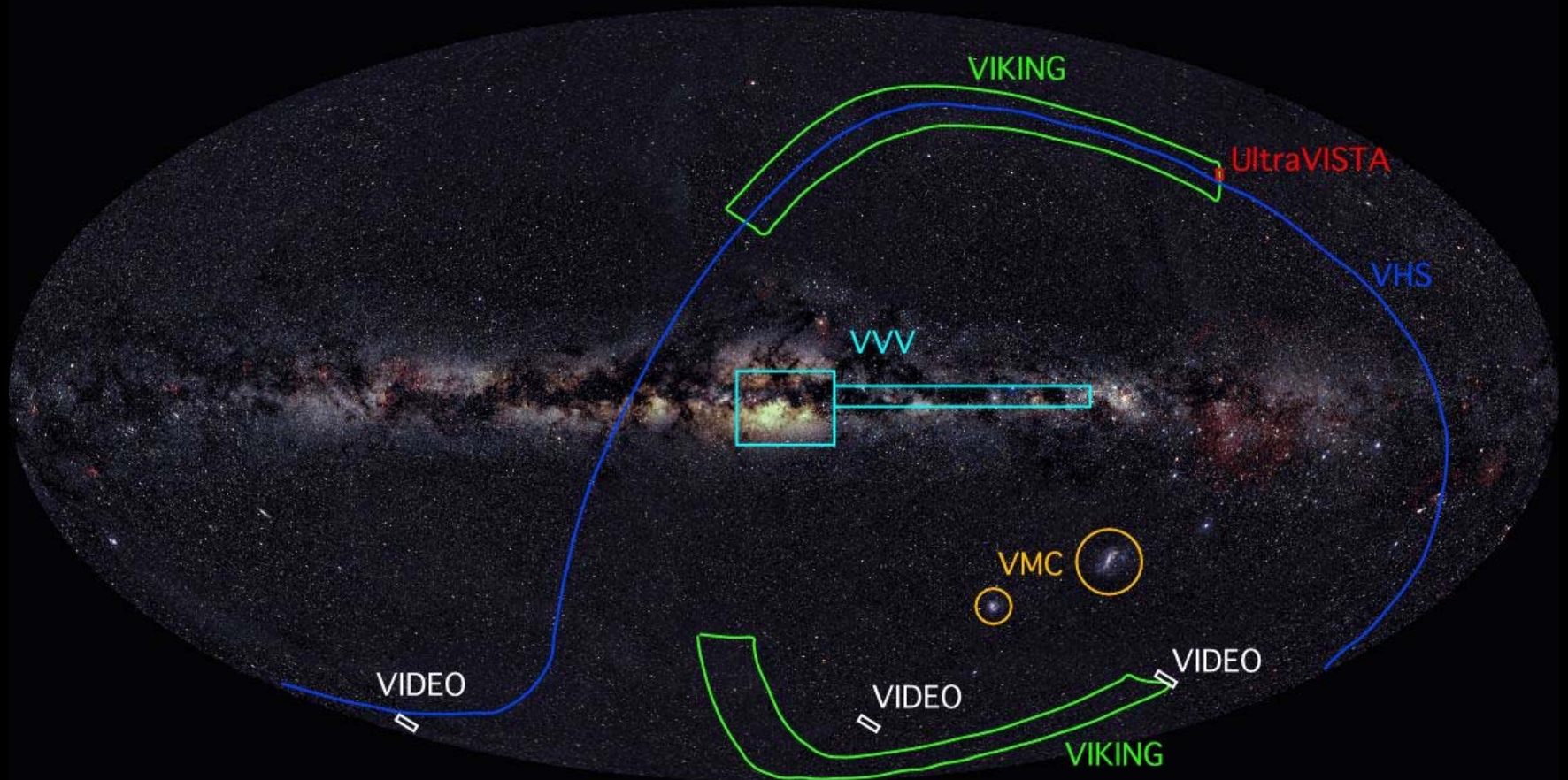
VISTA



- Status
 - Science Verification has finished
 - Telescope needs to be handed over from Queen Mary University/VISTA Consortium to ESO
 - Paranal operations are being implemented
 - Preliminary/test observations of the VISTA surveys
 - Surveys start hopefully by February 2010

VISTA Public Surveys

Six public surveys selected



VISTA Surveys

| Survey | Area (deg ²) | Depth measure | Filters and depth |
|-------------|--------------------------|--------------------|---|
| Ultra-VISTA | 0.73 (ultra-deep) | 5 σ , AB | Y=26.7, J=26.6, H=26.1, K=25.6, NB=26.0 |
| VIKING | 1500 | 5 σ , AB | Z=23.1, Y=22.3, J=22.1, H=21.5, K _s =21.2 |
| VHS | 20000 | 5 σ , AB | Y=21.2, Y=21.2, J=21.2, H=20.6, K _s =20.0 |
| VIDEO | 15 | 5 σ , AB | Z=25.7, Y=24.6, J=24.5, H=24.0, K _s =23.5 |
| VMC | 184 | 10 σ , Vega | Y=21.9, J=21.4, K _s =20.3 |
| VVV | 520 | 5 σ , Vega | Z=21.9, Y=21.2, J=20.2, H=18.2, K _s =18.1 |

Vista Surveys

- Ultra-VISTA
 - ultra-deep field of a single pointing
 - Narrow-band filter tuned for $z=8.8$
- VIKING
 - Infrared part of the KIDS survey
 - Will provide the most complete wavelength coverage of all surveys
- VHS
 - Hemispheric survey of the complete Southern sky

VISTA surveys (2)

- VIDEO
 - Deep images of four well-studied fields
 - CDF-S, XMM LSS survey, ELAIS, VIDEO-field
 - Should provide an interesting comparison of multiple data sets
- VMC
 - VISTA Magellanic Cloud survey
- VVV
 - VISTA Variable in the Via Lactea
 - Galactic strip plus bulge

VST

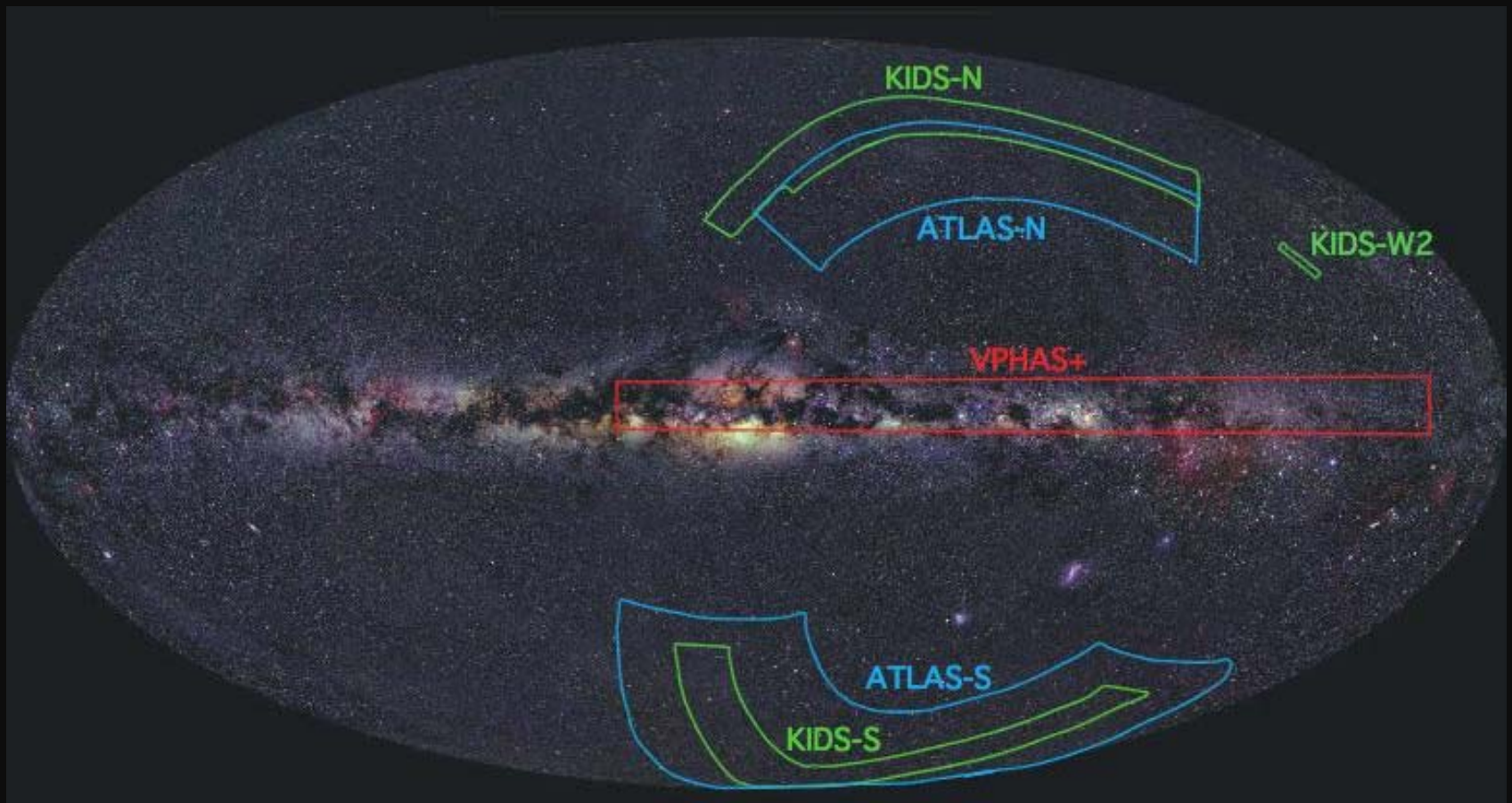
Status:

- Telescope and dome erected and waiting for the M1 cell
- M1 cell had to be returned to Europe due to damages
- Further delay of about 7 months
- No start date of surveys known



VST Public Surveys

Three public surveys
(and several GTO surveys)



VST surveys

| Survey | Area (deg ²) | Filters and depth (10 σ , AB) |
|--------|--------------------------|---|
| KIDS | 1500 | u'=24.8, g'=25.4, r'=25.2, i'=24.2 |
| ATLAS | 4500 | u'=22.0, g'=22.2, r'=22.2, i'=21.3, z'=20.5 |
| VPHAS+ | 1800 | u'=21.8, g'=22.5, H α =21.6, r'=22.5, i'=21.8 |

VST surveys

- Multitude of GTO surveys (INAF, OmegaCam)
- KIDS
 - Image quality important
 - Complemented by VIKING
- ATLAS
 - ‘Southern extension of SDSS’
- VPHAS+
 - Galactic plane survey (complementing the Northern IPHAS)

Spectroscopic Surveys

- Several large surveys with ESO telescopes
 - Exo-planet searches (>500 nights, HARPS)
 - VVDS (> 60 nights, >100000 spectra, VIMOS)
 - zCOSMOS (>60 nights, >20000 redshifts, VIMOS)
 - VIPERS (>40 nights, >100000 redshifts, VIMOS)
 - GOODS (>40 nights, FORS2, VIMOS)

Spectroscopic surveys

- Mandate from the ESO STC to implement spectroscopic surveys
 - Massive time allocations (300+ nights)
 - Implementation between 2010 and 2016 (before other wide-field spectrographs become available)
- Call for public spectroscopic surveys to be issued in the coming months
- No pre-definition of scientific topic

Conclusions

- The epoch of massive surveys is only starting at ESO
- Imaging surveys will be under way in the coming years
 - New call expected about three years after start of the surveys
- Spectroscopic surveys to be implemented in the coming year