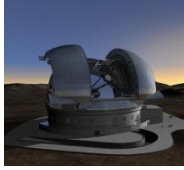
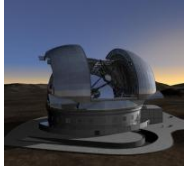


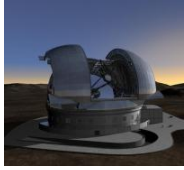
Status of E-ELT Instrumentation Studies



Reminder…

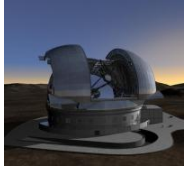
SCOPE of WORK (from E-ELT Ins Study Plan, ESO/STC 430)
Within the telescope Phase B by March 2010 to arrive to the definition of a preliminary *first generation instrument set*, to be included in the E-ELT construction proposal

- *Carry-out a suitable number of instrument studies to verify that instruments can be built at an affordable cost and that they properly address the scientific goals of highest priority*
- *Work with the ESO community in the instrument studies and to prepare for construction*
- *Work with telescope project team to identify requirements to and interfaces with the other subsystems and the observatory infrastructure*



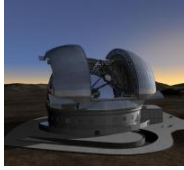
Overview of E-ELT Instrument and Post-focal AO Module Studies as of October 2008 (1)

INSTRUMENT STUDY	PROCUREMENT MODE	STATUS
Multi IFU NIR Spectrograph. +AO EAGLE	Direct negotiation with EAGLE Consortium following FP 6 studies	Review of the first phase in July 2008
High Resolution, High Stability Visual Spectrograph (CODEX)	ESO coordination of Consortium with external Institutes, following a FP6 study	KO in Sep 2008, Phase 1 review in February 2009
MCAO Module (MAORY)	Direct negotiation with Consortium	Phase 1 review in October 2008
MCAO Camera (MICADO)	Open Call for fixed cost study with initial requirements	Phase 1 Review in December 2008
EPICS + AO	ESO coordination of Consortium with external Institutes following a FP6 study	Phase 1 review in September 2008
Single Field, Wide Band Spectrograph (HARMONI)	Open call for fixed cost study with initial requirements	Phase 1 Review in February 2009
LTAO Module ATLAS	Open Call for fixed cost study with initial requirements	KO in September 2008
MIR Instrument + AO (METIS)	Open Call for fixed cost study with initial requirements	Phase 1 Review in January 2009
High Resolution, NIR spectrograph (SIMPLE)	Open Call for a new concept , fixed cost study	Being negotiated, KO foreseen in October 2008
Multi Object Visual to Jband Spectrograph (OPTIMOS)	Open Call for a new concept, fixed cost study	Being negotiated, KO foreseen in October 2008



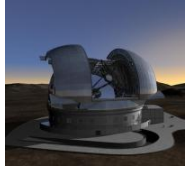
Overview of E-ELT Instrument and Post-focal AO Module Studies as of October 2008 (2)

NAME	PRINCIPAL INVESTIGATOR/INSTITUTES
EAGLE	J.G. Cuby/ LAM, OPM GEPI and LESIA, ONERA, UK-ATC, Univ. Durham
CODEX	L.Pasquini/ ESO, INAF Trieste & Brera, IAC, IoA Cambridge, Obs. Geneve
MICADO	R.Genzel/ MPE, MPIA, US München, INAF Padova, NOVA -Univ. Leiden and Groningen
EPICS	M.Kasper/ ESO, LAOG, LESIA, FIZEAU UNSA-OCA., LAM, ONERA, Univ. Oxford, INAF Padova, ETH Zurich, ASTRON-NOVA, Univ. Amsterdam & Utrecht
HARMONI	N.Thatte/ Oxford University, CRA Lyon, DAMI Madrid, IAC, UK ATC
METIS	B.Brandl/ NOVA-Leiden and ASTRON, MPIfA, CE Saclay DSM/IRFU/Sap, KU Leuven, ATC UK
OPTIMOS	tbd/ Negotiations under way with STCF RAL, Oxford, LAM, IASF-MI, OP-GEPI, NOVA-Univ. of Amsterdam and ASTRON, INAF Oss. Brera and Trieste, Nils Bohr Institute-Copenhagen University
SIMPLE	I.Origlia/ INAF OA Bologna, Arcetri, Roma, UAO, TLS, PUC (Chile)
MAORY	E.Diolaiti/ INAF-OABo, OAA, OAP; Univ.Bo, ONERA
ATLAS	T. Fusco/ ONERA, OPM LESIA, GEPI



MILESTONES IN E-ELT INSTRUMENT STUDIES

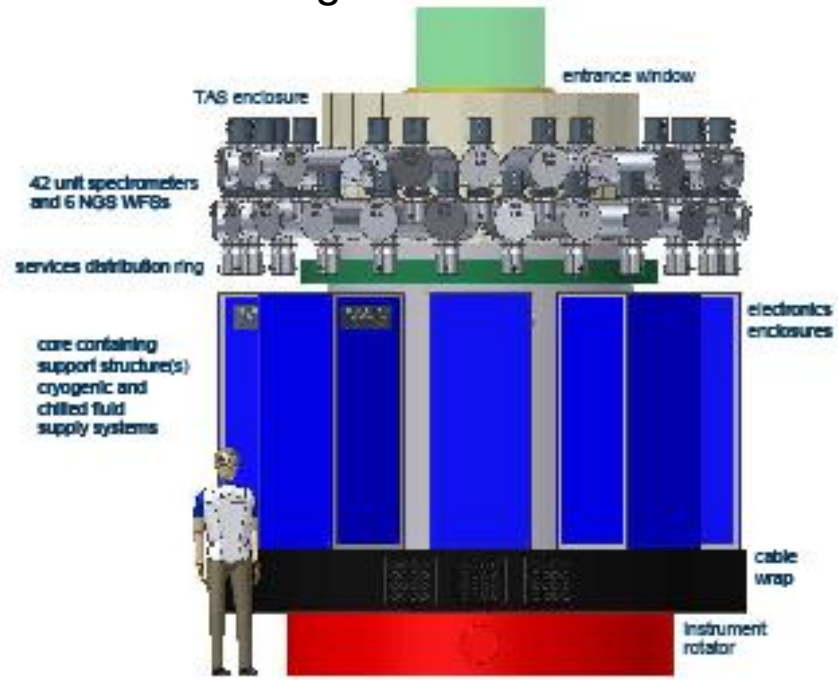
Study	ESO Responsible	K.O. meeting	End Phase I Review	Delivery Final Report[1]	Study Review[2]
EAGLE	Ramsay	27/09/2007	07/07/08	September 2009	October 2009
EPICS	Kasper	24/10/07	24/09/08	January 2010	February 2010
MICADO	Kissler-Patig	20/02/08	11-12/12/08		
HARMONI	Vernet	01/04/08	11/02/2009		
METIS	Siebenmorgen	07/05/08	13/01/09	November 2009	December 2009
CODEX	Pasquini	16/09/08	03/2009	November 2009	December 2009
OPTIMOS	Ramsay	10/2008	05/2009	December 2009	January 2010
SIMPLE	Käufl	10/2008	03/2009	December 2009	January 2010
MAORY	Marchetti	09/11/07	24/10/08	December 2009	January 2010
ATLAS	Paufique	19/09/08	04/09	December 2009	January 2010

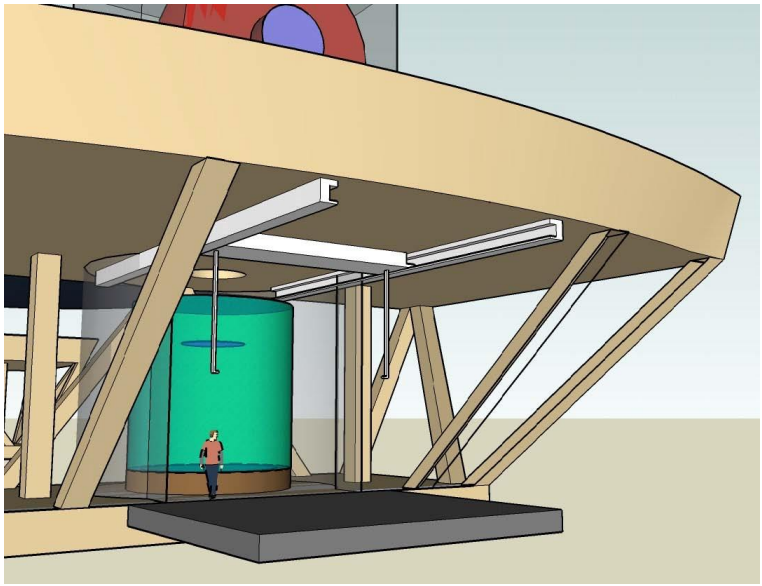


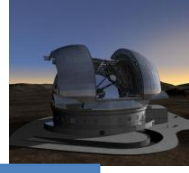
EAGLE concept at the end of the first phase

September 2008 on

- Current baseline with 20 IFU and spectroscopic arms (minimum of SPEC)
- Number of LGSs required to reach the performance under investigation (6 or 9)
- Spectral Range 0.8-2.4 micron, Resolution 3000-4500 + option for 8000-10000
- Total cost too high?





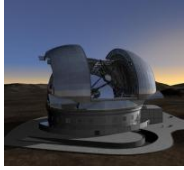


Preliminary limiting magnitudes for Spectroscopy with EAGLE

Band	Wavelength range	Central wavelength	Resolution at λmid	IQ	Limiting magnitude
IZ	0.8-1.05	0.925	≥3800	TBD	25.75
YJ	1.05-1.35	1.2	≥4000	TBD	25.50
H	1.45-1.85	1.65	≥4200	40% EE in 75mas	24.50
K	1.95-2.45	2.20	≥4400	TBD	22.25

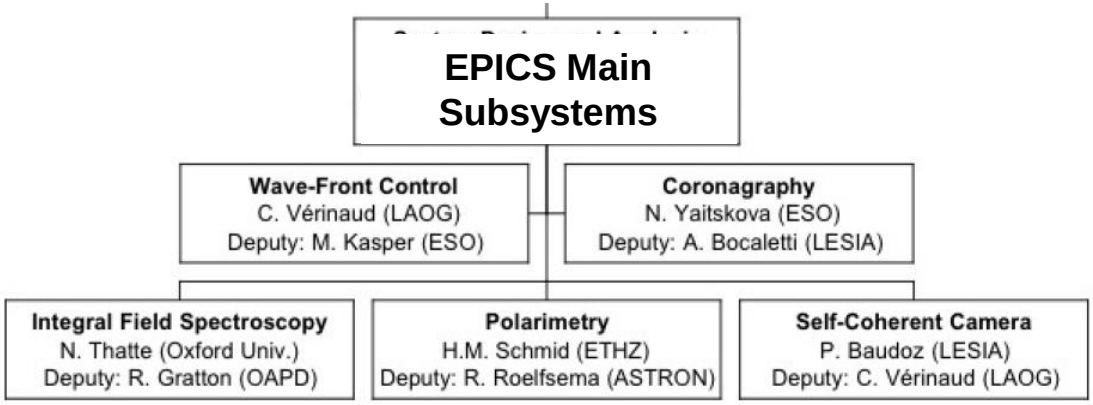
Data from Phase 1 documentation:

5 sigma, 60minutes on a point-like, continuum source, integrated over the PSF. Assuming 0.8” seeing at 550nm and extrapolating the EE values from 40% EE in 75mas at H(spec value)

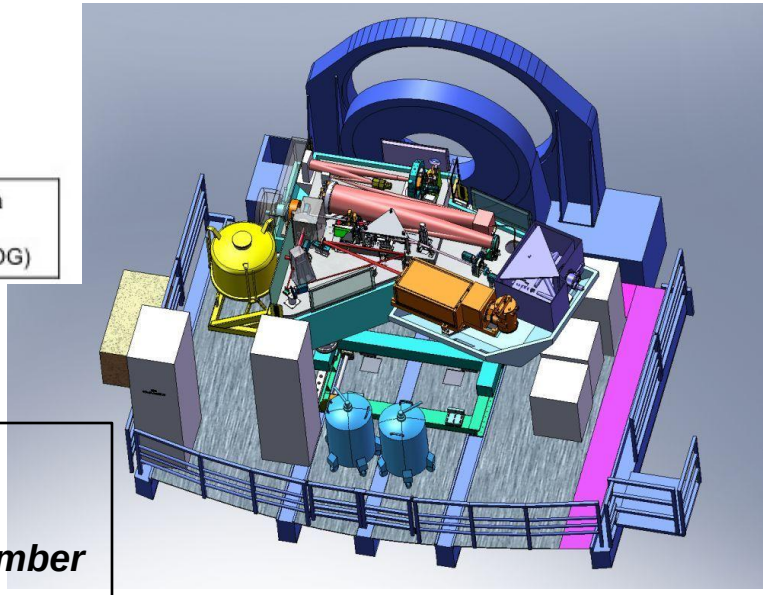


EPICS concept at the end of the the first Phase

October 2008 on

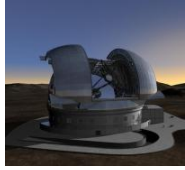


SPHERE on the VLT Nasmyth Platform



Highlights of the work in the first phase :

-Simulations on contrast required to detect significant number of rocky, super Earths and characterize them
- Simulations of the performance using different types of coronographs at the E-ELT
-First order characterization , trade-offs of the various subsystems



INPUT by the SWG on the INSTRUMENT SELECTION: when it can be required?

The scenario

- Study Reviews planned for November 2009-February 2010
- Basic Outputs: Quality of the studies, Performance of the instrument and matching to high priority science cases, Technical Feasibility, Cost, Schedule
- Depending on the above, need for further studies before going to construction?

- Assumptions: Construction Proposal to Council in June 2010. To be written and tuned between March and May 2010
- It will include a budget for 1st generation instruments. 2-3 instruments for first light + a pool of instruments from which others to be operative within the first 5 years will be selected. Number will be based on budget and resources
- Construction Agreements mostly by Open Calls