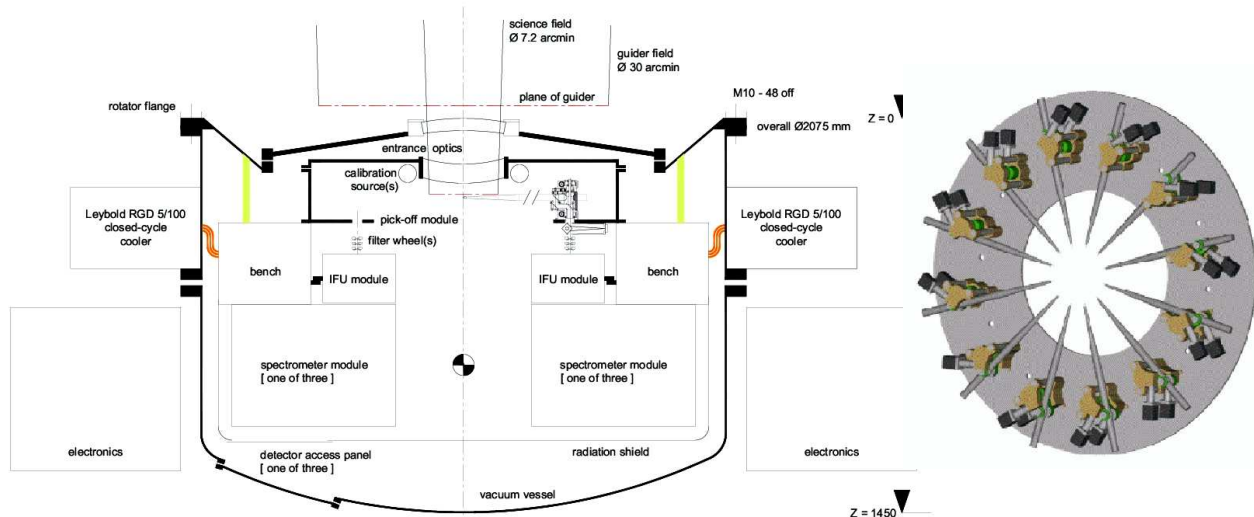




KMOS – a NIR multi IFU spectrograph for the VLT

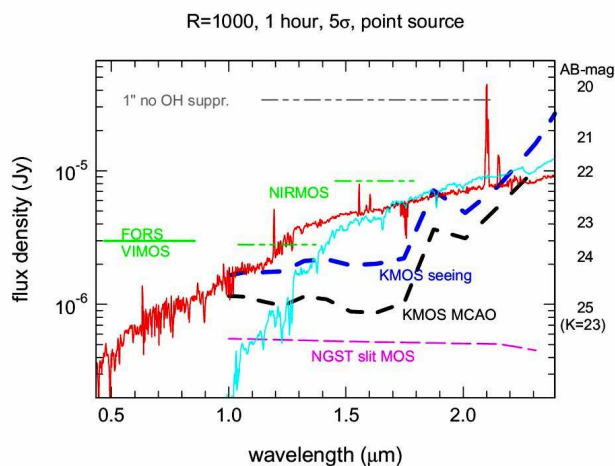


- KMOS is a 2nd generation instrument for the ESO Very Large Telescope that will offer ~24 deployable integral-field units for cryogenic near-infrared multi-object spectroscopy at R~3500.
- Main science drivers for KMOS are: mass assembly of galaxies from moderate to high redshifts, extremely high redshift galaxies and re-ionisation, the connection between galaxy formation and black hole growth, stellar populations and star formation in nearby galaxies.



Left: KMOS baseline design: 2x12 configurable arms (in two layers) position fold prisms at user-specified locations in the Nasmyth plane of the VLT. The 24 sub-fields are then fed to image slicer IFUs that partition each sub-field into 14 identical slices, with 14 pixels along each slice. The 14x14 elements of 8 arms are combined and dispersed in one of three cryogenic spectrometers. Each of the spectrometers employs a 2kx2k HgCdTe detector and provides 1000 Nyquist-sampled spectral resolution elements corresponding to a spectral resolution of ~3500.

Right: Layout of one layer of pick-off arms.



Expected sensitivity of KMOS

Requirement	Baseline Design
Throughput	J=30%, H=40%, K=40%
Sensitivity (5σ,8h)	J=22.0, H=21.0, K=20.5
λ coverage	1.0 μm to 2.45 μm
Spectral resolution	R=3380,3800,3750 (JHK)
Number of IFUs	24
IFU size	2.8"x2.8"
Sampling	0.2"
Patrol field	7.2' diameter
Close packing	>3 within 1 sq.arcmin.

Baseline capabilities of KMOS

KMOS is being built by a consortium of the following institutions: Max-Planck-Institute for Extraterrestrial Physics, University Observatory Munich, Astronomy Technology Center Edinburgh, University of Durham, University of Oxford, and European Southern Observatory.

Reference: Sharples, R.M., Bender, R., Lehnert, M., Ramsay Howat, S.K., Bremer, M., Davies, R.L., Genzel, R., Hofmann, R., Ivison, R.J., Saglia, R.P., Thatte, N.A.: 2005, SPIE, in press; 2003, SPIE 4841, 1562

R. Bender, R. Genzel, R. Hofmann, M. Lehnert, B. Muschelok, R.P. Saglia and the KMOS consortium