

Supernova Research at Lancaster

April 2016
Isobel Hook



Observational Astrophysics group

New Group, started 2015

- 3 permanent staff (Isobel Hook, Andreas Koch, David Sobral)
- 1 PDRA (Steve Williams)
- 2 students

Expanding...

- New lecturer advertised ~ now
- 1 new short-term RA on E-ELT starting ~June
- 2 new students (1 in 2016, 1 in 2017)
- Possibly more (depends on grants)



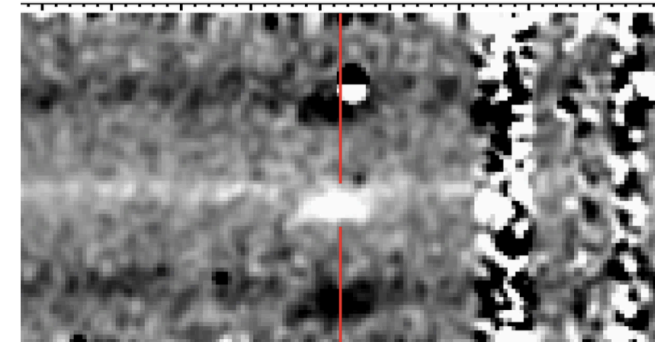
Supernova research projects

- VLT follow up of HST survey
- Euclid
- LSST
- 4MOST
- E-ELT

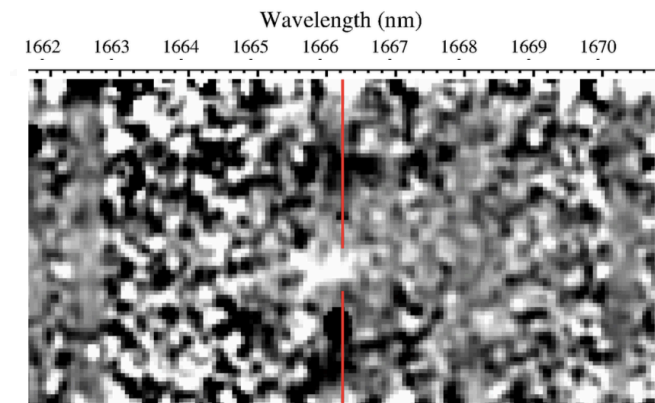


VLT follow up of HST survey

- See Change – see Jakob’s presentation
- FORS & XSHOOTER spectroscopy, mostly host galaxies
- 87hrs allocated over 3 periods (so far) + 2 DDT runs since 2015
- Ongoing work
 - Planning observations, data reduction
 - optimisation of spectroscopic reduction
 - analysis for final redshifts and classification
- Scientific interests in cosmology, SN rates, host properties and possibly environments




H-alpha at $z = 1.539$



[O III] (500.7nm) at $z = 1.539$

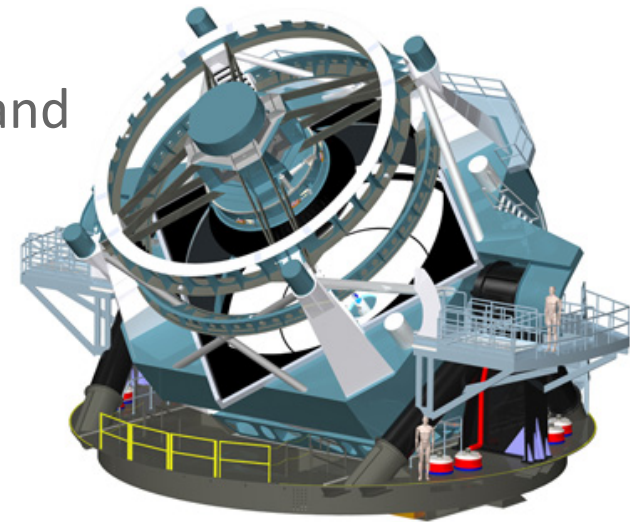
Xshooter spectrum of host galaxy
of SCP16H01 at $z=1.54$

Euclid

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- SN & Transients SWG (IH joint chair w Charling Tao)
 - SWG is proposing a dedicated SN survey (Astier et al 2014)
 - Deep NIR imaging, Y,J,H over 10 sq deg
 - Coordinated optical observations (with LSST?)
 - Outcome: 1700 well-measured SNe with $0.75 < z < 1.5$
 - Status
 - Internal EC Document prepared July 2013
 - Euclid overall survey design is being optimised
 - White paper on additional surveys now expected November 2016
 - Other transient science
 - Linked to final design of Euclid deep field
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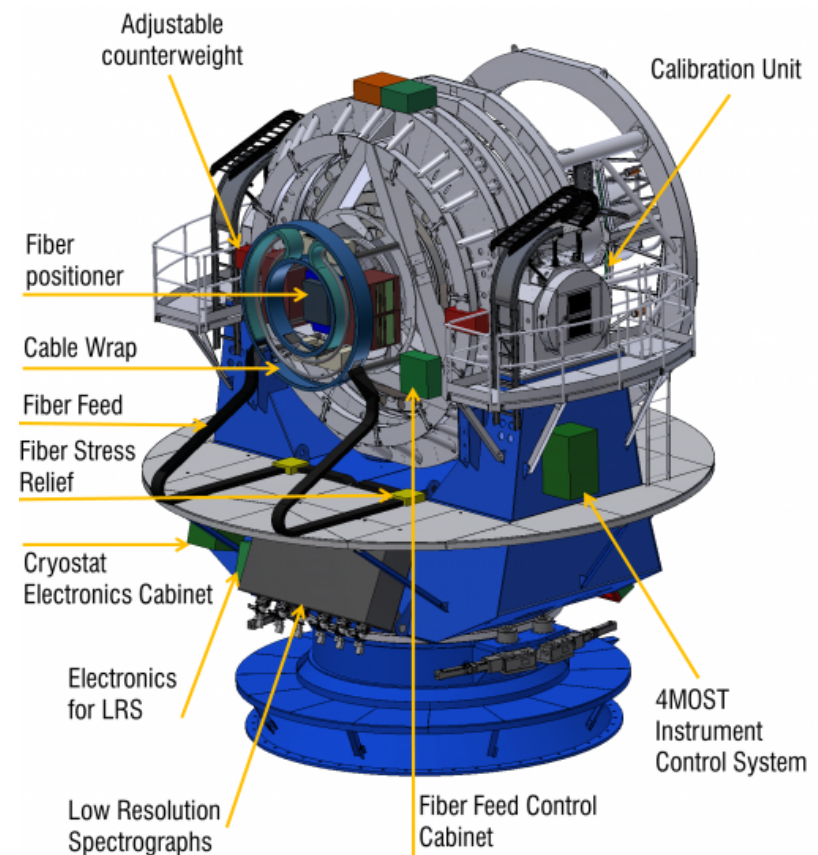
LSST

- UK has joined LSST (Oxford + other institutes joined earlier)
- Also joined DESC
- Lancaster scientific interests in SNe Ia Cosmology
 - LSST-Euclid overlap (dedicated survey and baseline surveys)
 - Spectroscopy requirements
- Offering Lancaster Mphys projects on these topics



4MOST

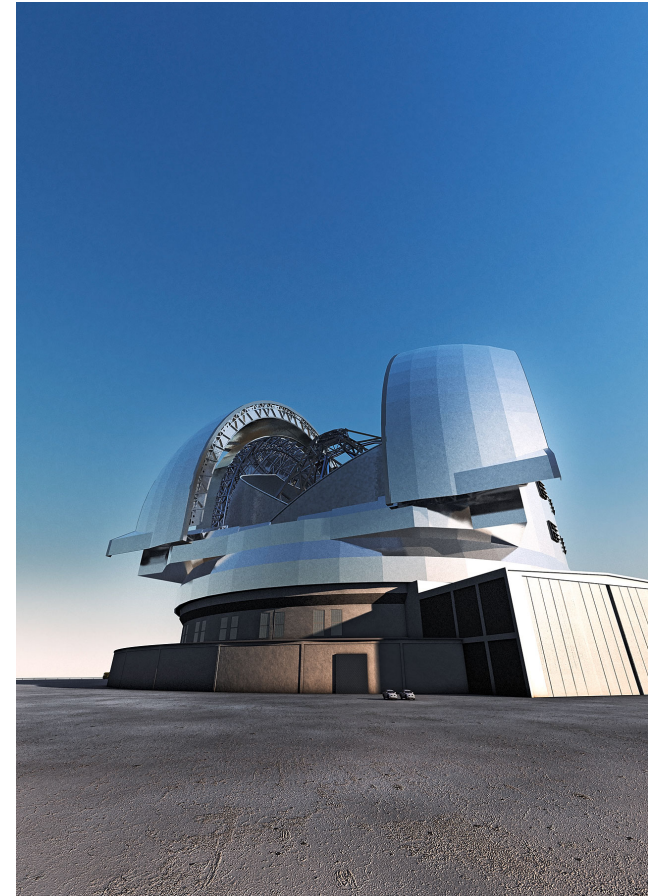
- Lancaster interest in joining
- Scientific aim- spectroscopy of LSST transients / hosts
- Also stellar populations



4MOST mounted on the VISTA telescope

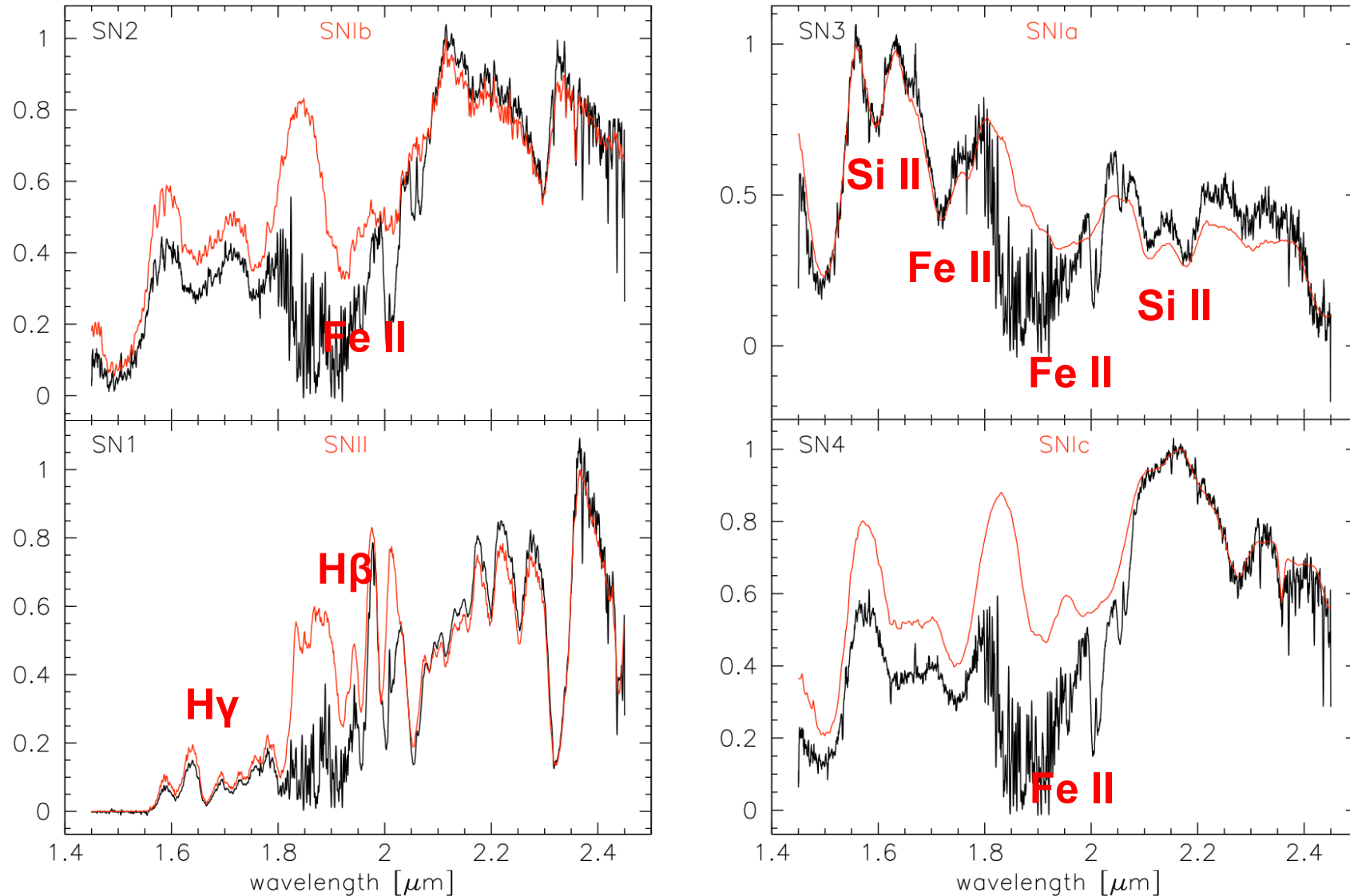
European ELT

- IH on Project Science Team
- E-ELT is under construction
- Simulation of SN observations done with HARMONI team
- Synergy with JWST



z=3 E-ELT+HARMONI

H&K band, 8 hours on source



Simulations by the HARMONI team + IH

The end

