

WEAVE

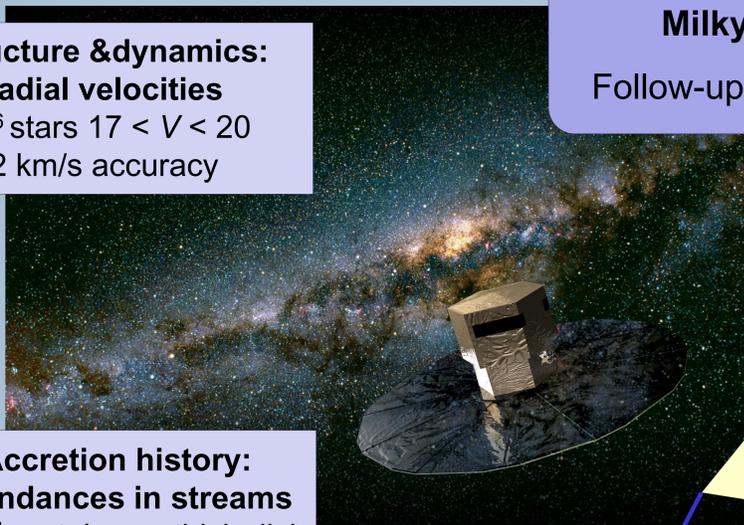


A New Wide-Field Multi-Object Spectrograph for the William Herschel Telescope



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Structure & dynamics: radial velocities
 10^6 stars $17 < V < 20$
 2 km/s accuracy



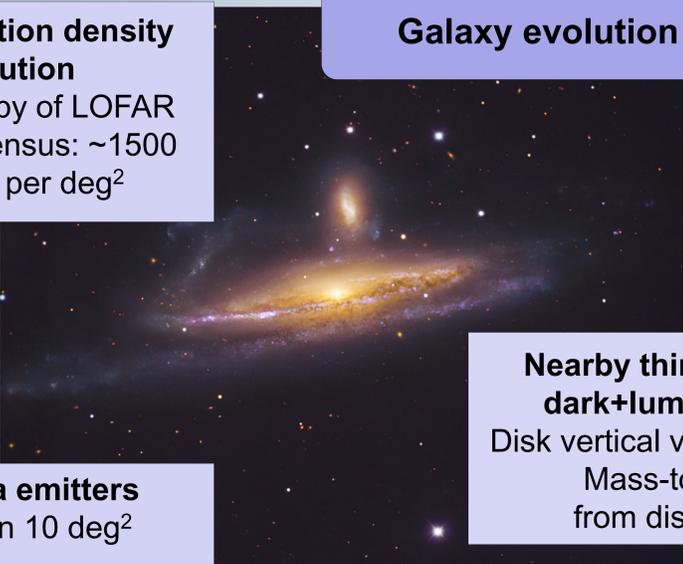
Milky Way archaeology
 Follow-up of ESA's GAIA mission.

Summary
 WEAVE is a new multi-object spectrograph (1000 fibres, 2-deg field) planned for the 4.2-m William Herschel Telescope on La Palma. First light is expected in 2017. WHT/WEAVE will powerfully complement the 10.4-m GTC.

Accretion history: abundances in streams
 $5 \cdot 10^4$ metal-poor thick-disk and halo stars $17 < V < 18$

Star-formation density evolution
 Spectroscopy of LOFAR complete census: ~ 1500 sources per deg^2

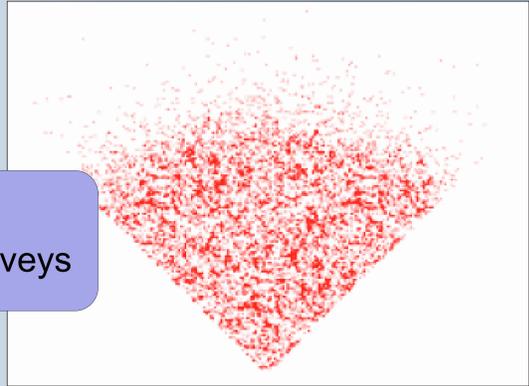
Lyman-alpha emitters
 10^4 emitters in 10 deg^2



Galaxy evolution

Nearby thin galaxy disks dark+luminous matter
 Disk vertical velocity dispersion
 Mass-to-light ratio from disk dynamics

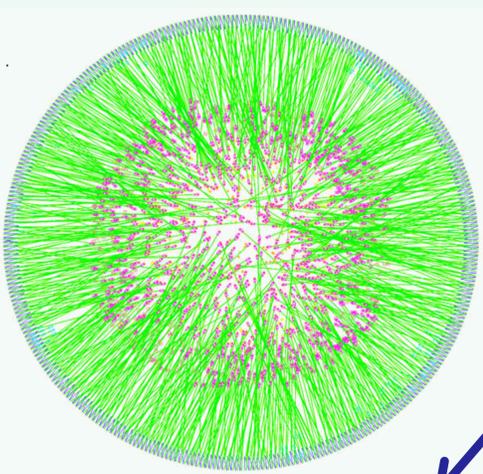
Nature of dark energy: Baryonic Acoustic Oscillations
 Redshift-Space distortions 10^7 spectra over 10^4 deg^2 , redshifts $z \sim 0.6-1.4$



Cosmology
 Galaxy redshift surveys

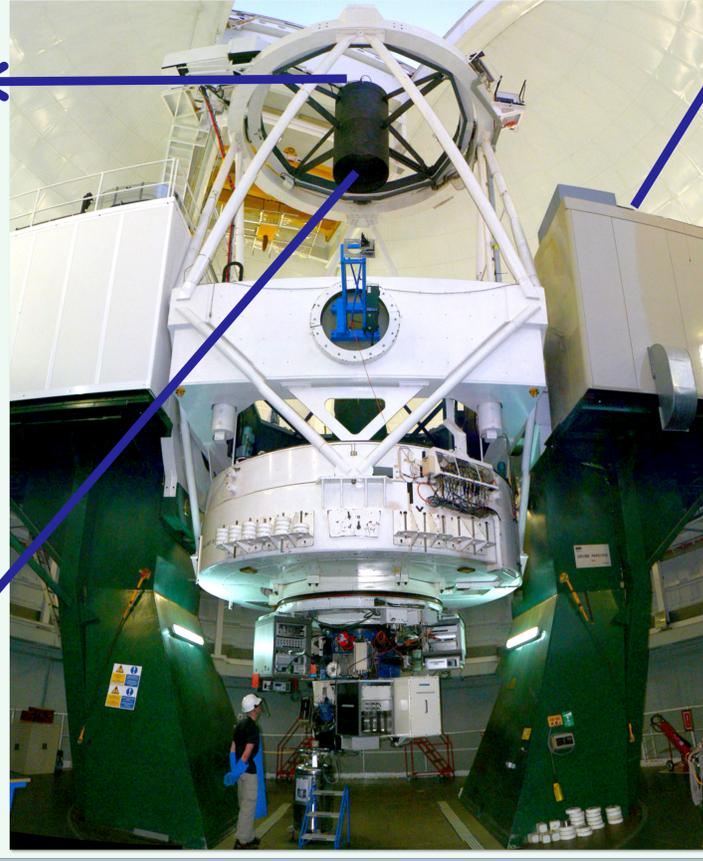
Science Requirements
 2 deg field of view.
 MOS (multiplex 1000), IFU, mini-IFU front ends.
 Spectroscopic resolution:
 $R = 5000$ (380 - 980nm) for velocities,
 $R = 20000$ (480 - 680nm) for element abundances.
 Throughput $\sim 20\%$.

Fibre module
 Design based on AAT's successful 2dF. This computer simulation shows the complexity of weaving 920 fibres to the required positions in the focal plane.

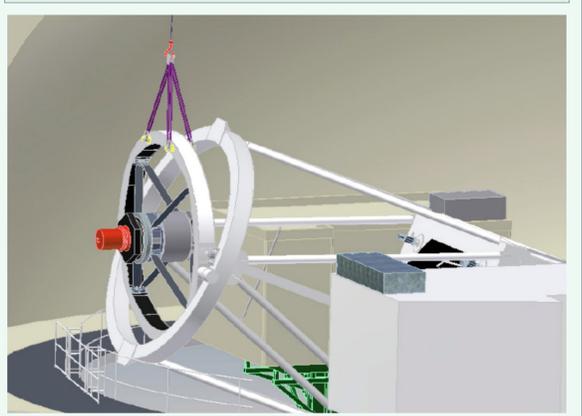


New prime-focus corrector
 Enlarged field of view 2 deg (currently 40 arcmin).

Instrument Concept



Spectrograph (in Nasmyth enclosure)
 2-arm concept
 VPH dispersers
 $R = 5000$, $R = 20000$



New top-end ring
 Model of new exchangeable top-end ring (with new corrector + fibre module) being craned into position.

For further information:
<http://www.ing.iac.es/weave/>

WEAVE Design, Construction and Exploitation

WEAVE is being designed and built by a European consortium led by the ING partner countries. The preliminary design review is expected at the end of 2012, and science observations should start in 2017. The total cost of design and construction, including the new prime focus corrector for the WHT, is €12M.

It's expected that a large fraction of WHT time will be devoted to surveys with WEAVE. Surveys spanning a large range in apparent magnitude can be carried out via coordinated exploitation of the large FOV/multiplex offered by WHT/WEAVE, and the greater depth of observations with GTC OSIRIS, MEGARA and MIRADAS.

