Combo 17+4

OMEGA2k, O2k pipeline, MPIAPHOT
and what can we learn on Abell?

Marie-Hélène Nicol
MPIA students workshop 2007
Lago di Como, Italy

- Master Degree in Université de Montréal, Québec, Canada
  - Mass Distribution for SINGS galaxies
  - Study the kinematics with Halpha emission line
  - Supervisor Claude Carignan
  -
  -
  - Ph.D student since September 2005
  - International Max-Planck Research School student (IMPRS)
  - Supervisor:Klaus Meisenheimer
  -

COMBO-17+4

- COMBO-17+4 is a deep NIR-optical survey which will combine the existing optical data set of COMBO-17 with near infrared observation in three medium bands (Y,J1,J2) and one broad band (H). The NIR bands extend the photometric redshift range to z~2.1. COMBO 17+4 will provide the first large sample of galaxies (>5000) at $1<z<2$ with a redshifts accuracy of $\Delta z<0.03(1+z)$.

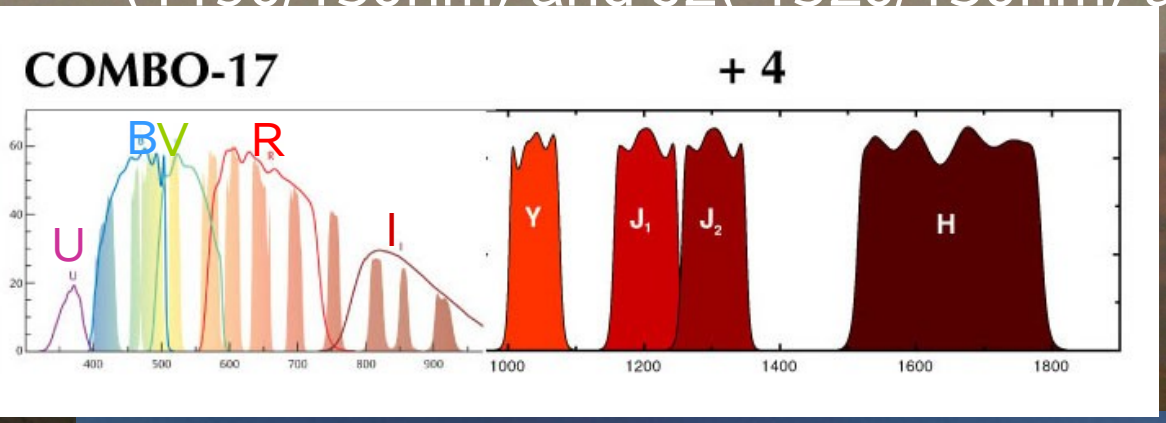
- The goal of COMBO-17 was to to explore the galaxy evolution through the look back time up to z=1.1

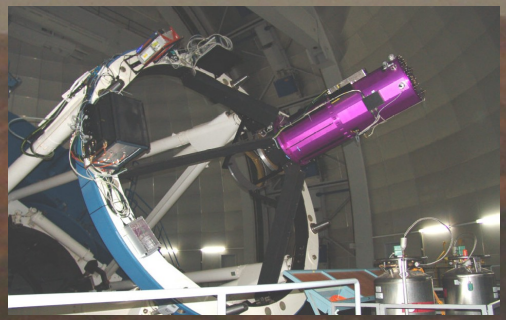
- The goal of COMBO-17+4 is to extend the knowledge to z=2.1

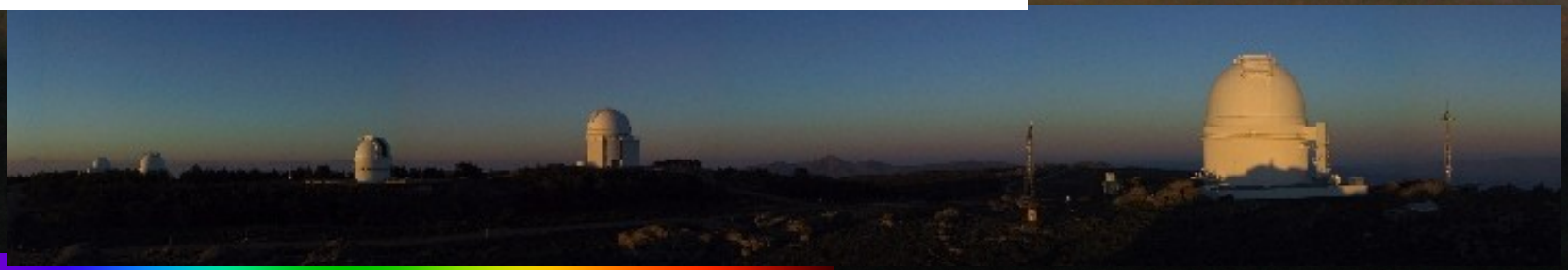
- Three fields are observed: Abell 901, Abell 226 and the COMBO 11h-field, for a total coverage of 0.77□˚of the sky (area ~4 time moon)

Observational data

- Data have been taken (and continue to be taken) at Calar Alto Observatory in Spain with the 3.5m telescope.
- Intrument used is OMEGA2000: a near-infrared, wide-field camera sensitive from z to K band.
- 4 IR filters: 3 medium bands Y ($\lambda/\Delta\lambda$=1040/80nm), J1 (1190/130nm) and J2(1320/130nm) and one broad





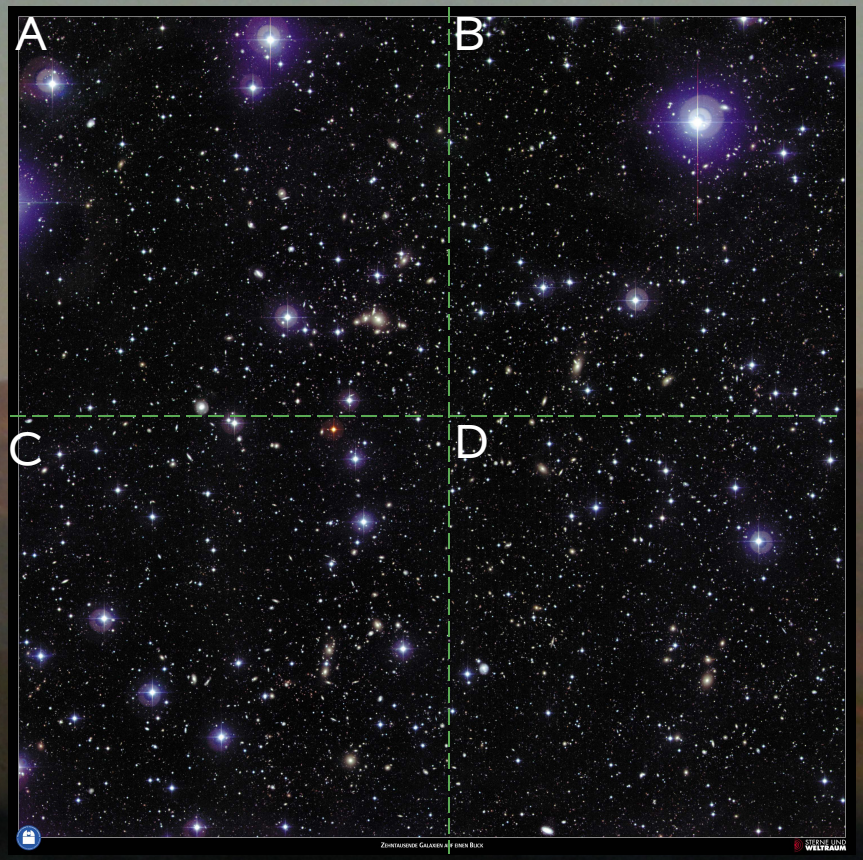


About the supercluster A901/A902

- One of the Combo-17 field is the A901 field which containt 3 clusters A901a, A901b and A902 and associated groups
- Z=0.165 photometric z accuracy of 0.01
- Contain ~ 1000 galaxies
- In a projected Area of 3.5 × 3.5 Mpc/h

A901 field size comparison

A901 field in optical

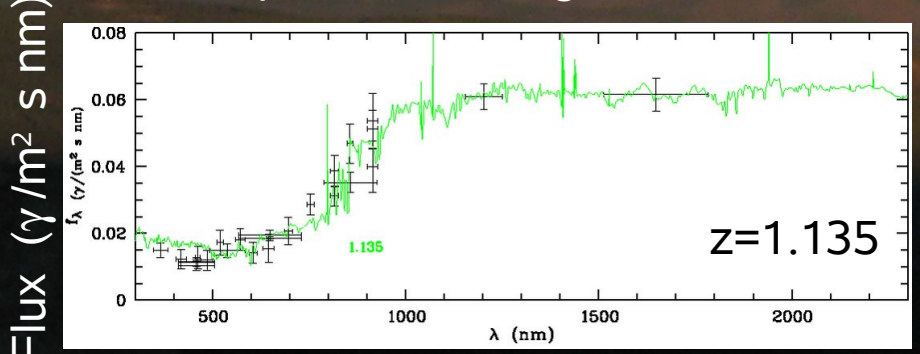


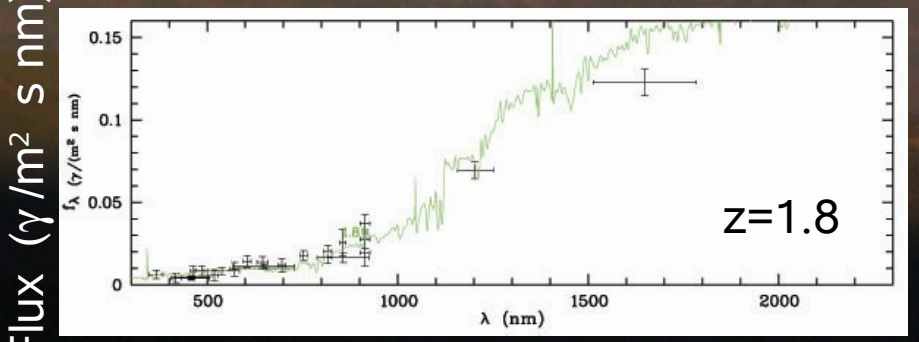
The moon

Data reduction steps

- ✓ Raw data coming from the telescope must be treated: bad pixels and flatfielding correction made with O2k pipeline
- ✓ and cosmic removal with MPIAPHOT under MIDAS
- ✓ Photometry is obtained for each object in the field A901 in each filter using MPIAPHOT.
- By SED (Spectral Energy Distribution) template fitting I will get the photometric redshift and the SED for each galaxy in the field.
- The mass for each object can then be derive. The mass function and the luminosity function can be derive too.

Example SED for 2 galaxies in S11-field (S. Kovacs thesis)





Summary

- Combo17+4 is a multiwavelength survey which has as main goal to investigate the evolution and formation history of galaxies out to high redshift z=2.