



- Epoch of multi-wavelength large field astronomy
 - + LOFAR
 - Many millions of galaxies
- Formation of large scale structure - galaxies AGN activity go hand in hand
- Universe gets smaller
 - Local $z < 0.5$
 - Nearby: $z \sim 1$
 - Distant $z \sim 2-3$
 - Very distant $z \sim 6$

APERTIF: many objects to study objects beyond the local universe to study formative processes

Some key topics for combined LOFAR/APERTIF continuum surveys - I

- Tracing the relation of AGN activity/LSS/host properties up to $z=3$
 - How does the radio loud fraction + feedback processes evolve?
 - depend on the environment, galaxy mass etc. ?
 - Accretion mode ?
 - Cold accretion / quasar mode / “torus mode”
 - Activity due to a merging event
 - Hot accretion / radio mode
 - Activity due to hot gas cooling
 - UKIDSS/PANNstars surveys
 - XXLS surveys
 - 100 sqr degree, deep
 - Combination: spectral ages/constrains on duty cycle

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- Ultra steep spectrum sources to get $z>6$ radio galaxies
 - Formation of massive galaxies, black holes and clusters
 - “all” sky
 - Spectral selection of the $\alpha < -1.6$ sources

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 - Distant: 10 sqr, very deep degrees on SCUBA-2 areas
 - Refinement radio-IR photometric redshifts
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- Extreme objects to trace radio evolution
 - Onset and end of radio source activity, duty cycles -> AGN feedback
 - Giant radio sources, double-double radio sources, peakers
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- Baryonic oscillations
 - Fundamental probe of LSS formation
 - Uniform sample of galaxies for follow-up spectroscopy
 - ‘many thousand’ sqr degrees
 - Exclude flat spectrum objects

Summary

- Relation of AGN activity/LSS/host properties up to $z=3$
- $z>6$ radio galaxies
- Nearby/far starbursts
- Radio evolution
- Baryonic oscillations