A Study of Galaxy Clusters and Large Scale Structures at z~1 in ELAIS-N1 field

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Introduction

Study galaxy overdensities at $z \sim 1$?
: answer to “How did galaxies evolve in early universe”
 & “How has the universe evolved”

Galaxy cluster
• Useful objects to test cosmological model
• Massive Galaxy clusters are found unexpectedly at $z > 1$
• When were red sequence galaxies in local clusters quenched?

Supercluster
• Large scale structure in the universe (size up to 100~200 $\text{Mpc}$)
• Show various galaxy environment, filaments, galaxy clusters and groups
• Very limited number of superclusters known $z \gtrsim 1$
Results

Newly discovered Large scale structure at $z \sim 0.9$
(spectroscopic obs. Hectospec/MMT in 2018A)

Swinbank’s supercluster (5 cluster/groups, 2007)
still star-forming in massive galaxy cluster at $z \gtrsim 1$?
(spectroscopic obs. GMOS-N in 2018A)