

**The reversal of the activity-density relation during structure formation  
in the distant universe**

David Elbaz<sup>1</sup>

<sup>1</sup> *CEA-Saclay/DAPNIA/SAp & AIM, F-91191 Gif-sur-Yvette Cedex*

**Abstract**

The morphology and color of local galaxies is tightly related to their environment. In particular, the activity-density relation (i.e. the correlation of color or star formation of galaxies with environment) has recently been observed down to very low galaxy densities thanks to the 2dF and SDSS, but its origin remains unclear, being either caused by quenching or triggering of star formation. For the first time, it is possible with the GOODS survey to study in great detail the relation of galaxy activity (unaffected by dust extinction) with environment at the 1 Mpc scale in the distant universe. We present direct evidence for a reversal of the activity-density relation at  $z=1$ , i.e. the characteristic SFR of a galaxy increases with increasing galaxy density and stellar mass. This finding not only reinforces the downsizing scenario of star formation but also allows to quantify it. Together with morphological considerations, this also sets a new issue for galaxy formation/evolution: what is the physical mechanism responsible for an acceleration of their star formation activity during structure formation ?