

## **Looking for the sources of Reionization at the Edge of the Universe**

A. Grazian<sup>1</sup>, E. Giallongo<sup>1</sup>, F. Fiore<sup>1</sup>

<sup>1</sup> *INAF - Osservatorio Astronomico di Roma, Via Frascati 33, I-00040, Monteporzio, Italy*

### **Abstract**

Establishing the number density of faint AGNs at  $z > 4$  is crucial to understand their role as main contributors to the Reionization of the Universe. We have selected 45 faint ( $H < 27$ ) AGN candidates at  $z > 4$  in the CANDELS GOODS-South, GOODS-North and HUDF fields thanks to the extensive multi-wavelength and ultra-deep data-sets from Chandra, HST, VLT, LBT and Spitzer. We have adopted a relatively novel selection criterion: AGN candidates with robust photometric redshifts at  $z > 4$  are detected in the WFC3 H160-band, which corresponds to the rest frame UV luminosity, and are selected thanks to their unambiguous emission in the ultra-deep X-ray images by Chandra at a level of  $L_X > 10^{43-44}$  erg/s. We have derived the UV-luminosity function of AGNs at  $z > 4$  at  $M_{1450} < -23$ , in the luminosity regime typical of the local Seyfert galaxies. The AGN luminosity function shows a steep slope at the faint end. The selected AGN population can produce at  $z=4-6$  a photoionization rate which is consistent with what is required to keep the inter galactic medium highly ionized, as observed in the Lyman-alpha forest of high- $z$  QSOs. This faint AGN population at high- $z$  can thus provide a significant contribution to the Reionization of the Universe.