The Lockman Hole (+10h 53m, 57° 29'') is a region in the northern sky with the best transparency of galactic material (N_H=5.7×10^{19} cm^{-2}) and thus it is the target of a number of surveys in many wavelengths. An area of ~0.2 deg^2 has been recently observed with XMM-Newton (Brunner et al. 2008, A&A 479, 283) with an effective exposure time of 637 ks, reaching depths of 1.9×10^{-16} erg/cm^2/s in the 0.5-2.0 keV and 9×10^{-16} erg/cm^2/s in the 2.0-10.0 keV bands. In the same area, there is a pool of observations available, including optical (Subaru), infrared (Spitzer) and radio (VLA, MERLIN, GMRT) imaging, as well as optical spectroscopy (HET, see Poster I.3, Burwitz et al. 2008). We are using the Large Binocular Telescope (LBT) in Arizona to obtain deep U and multi-colour images of the Lockman Hole XMM region. When the survey is finished, we will have full optical imaging, helping us to derive spectroscopic redshifts and select distant object using the Lyman-break technique, identify Compton-thick candidates combining the UV with the IR fluxes, and select candidate sources to be observed with LUCIFER.

Compton Thick AGN

Compton thick AGN (N_H>10^{24} cm^{-2}) at redshift z>1 are so faint in X-rays, that they cannot be detected even with the deepest surveys. However, observations in other wavelengths could identify them. One promising method is to compare the (redshifted) UV emission with the infrared emission and look for a MIR excess, which would imply an obscured AGN. Using the LBT U-band image and MIPS imaging (available for the Lockman Hole) one could select Compton-thick source candidates at z>1, in order to test XRB synthesis models predicting a large number of obscured AGN.