MPI für extraterrestrische Physik

THE XMM-LOCKMAN HOLE SURVEY

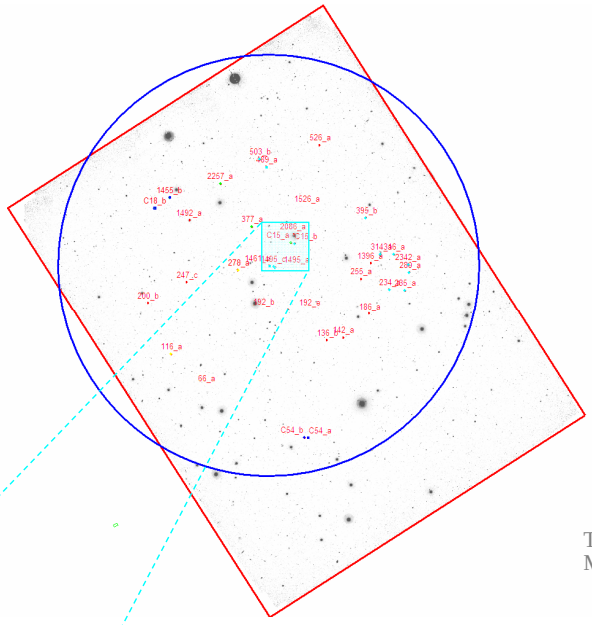
Optical identification of XMM-Newton detected sources in the Lockman Hole

In surveys with low X-ray flux limits, low activity AGN and star forming galaxies begin to constitute a substantial fraction of the X-ray sources. These sources have a high optical to X-ray flux ratio and have not yet been studied in detail. We present the results of spectroscopic optical follow-up survey of faint X-ray sources detected with XMM-Newton. The spectroscopy of these R < 22 mag sources has been obtained with the Low Resolution Resolution Spectrograph (LRS) on the Hobby Eberly Telescope (HET), Texas. This Survey allows us to determine redshifts as well as classify these sources. This work is important for the calibration of the photometric redshifts from a deep photometric survey of the Lockman hole that we are obtaining with Large Binocular Camera (LBC) on the Large Binocular Telescope (LBT), Arizona (see **Poster G. 43** Rovilos et al. 2008) . These results flow into the detailed catalogue of the inner 20 arcmin of Lockman Hole in order to improve the completeness of the sample.

XMM-Newton

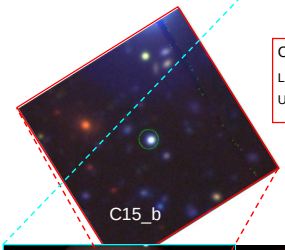
Overlaid on the U_spec image (left) obtained with the LBC on the LBT are the positions of the X-ray sources which have been selected as targets for the LRS on the HET.

To optimise the use of telescope time two objects are placed on the long slit as shown in the example below.



LBT LBC (U_{spec})

The 9.2-m Hobby Eberly Telescope at the McDonald observatory near Fort Davis,Texas

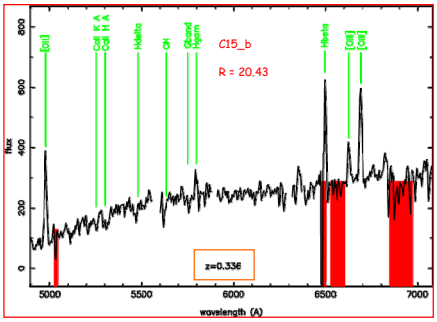


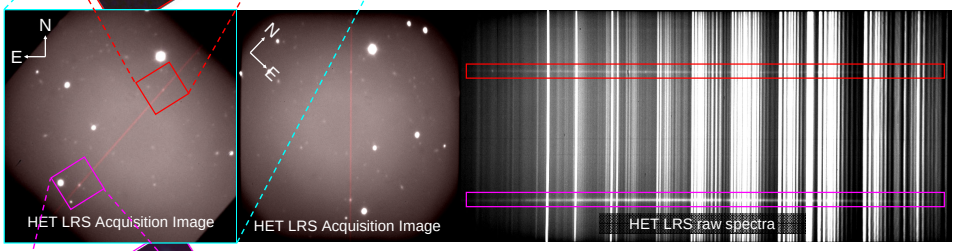
C15_b
LBT-LBC image
U, V, z-sloan

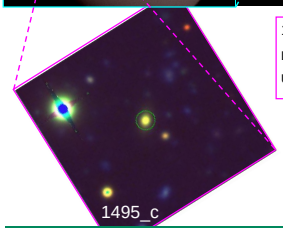
XMMU J105229.9+572947

log L_x ~ 41.7
log f_x/f_{opt} ~ -1.2 (typical for AGN)
no broad lines
soft X-ray spectrum
untypical line ratios for Seyfert

➔ **Galaxy @ z=0.336**





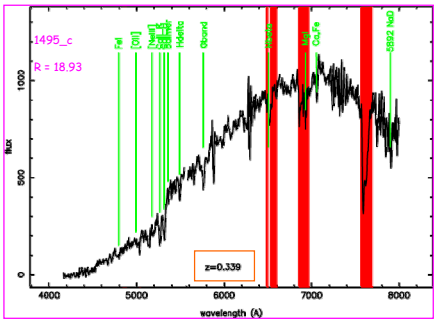


1495_b
LBT-LBC image
U, V, z-sloan

XMMU J105239.4+572842

log L_x ~ 41.44
log f_x/f_{opt} ~ -2
no broad lines
soft X-ray spectrum

➔ **Galaxy @ z=0.339**



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