

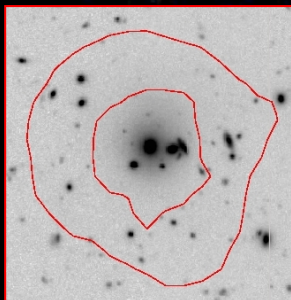
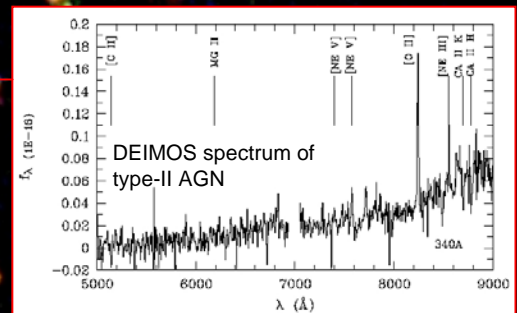
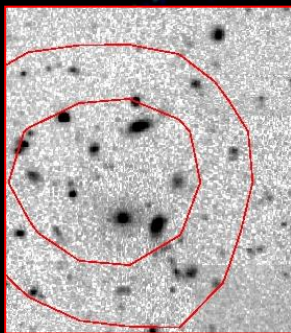
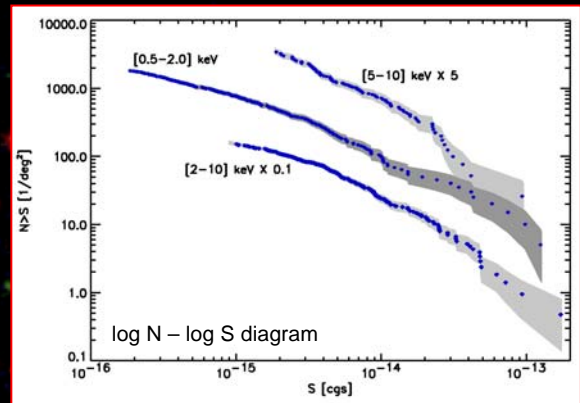


We studied the X-ray source population of the Lockman Hole field, the celestial area of lowest Galactic X-ray absorption in the longest and most sensitive X-ray exposure performed by XMM-Newton. Extensive optical follow-up spectroscopy of the AGN content of the field was obtained using the Keck DEIMOS multi-slit spectrograph.

The field was observed by XMM-Newton in 18 individual pointings for a total of 770 ksec, corresponding to 20 days of XMM-Newton observing time. The 34' x 30' colour composite image of the combined data set, shown below (the energy bands 0.5-2, 2-4.5, and 4.5-10 keV are displayed in red, green, and blue, respectively), contains more than 500 X-ray sources corresponding to ~2000 sources per sq. deg. at the survey limit of 2×10^{-16} erg/cm² s in the 0.5-2 keV band (see the log N–log S diagram, below). The different X-ray colours represent a multitude of spectral shapes, including unabsorbed (type-I AGN/QSOs) and absorbed (type-II AGN/QSOs) power law as well as complex multi-component spectra. Follow-up optical spectroscopy with the Keck DEIMOS multi-slit spectrograph in two observing runs in 2003 and 2004 resulted in a cumulative total of 116 identifications (54 type-I AGN/QSOs, 43 type-II AGN/QSOs, 10 normal galaxies, 3 groups/clusters, 6 stars), equivalent to 41 % of the core X-ray sample within 10' around the field center. Additional optical spectroscopy is planned for 2005. The field also was covered with deep multi-band optical and IR imaging using various 4m and 8m class telescopes. In addition to hundreds of active galactic cores, the field contains a substantial number of X-ray emitting clusters of galaxies. A wavelet analysis identified 20 candidates for which follow-up spectroscopy is intended (see X-ray contours plotted on R band image for two examples) .

See separate poster on double cluster of galaxies RXJ 1053.7+5735

See separate poster on mean rest-frame X-ray spectra of LH AGN



See separate poster on IR emission from X-ray selected sources in the LH

