First results from XILO: 
XMM-Newton Investigations in the Lambda Orionis star forming region

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The $\lambda$ Orionis star formation region ($1 - 6$ Myr, 400 pc) is a complex of star-forming clouds surrounded by a molecular ring with $\sim 5^\circ$ radius which was probably formed by a supernova explosion (Dolan & Mathieu 2002). For a complete picture of star formation, believed to be determined by the supernova blast, the large-scale distribution of the pre-main sequence population in $\lambda$ Ori needs to be examined. We have embarked on a multi-wavelength study (\textit{XMM-Newton}/X-ray, CFHT/optical, \textit{Spitzer}/IR) of selected areas within this intriguing star-forming complex that enables us to identify young stars and brown dwarfs. Our study comprises various areas within the cloud complex as shown in Fig.\textbf{1}. This data set is among the most extended X-ray surveys carried out with \textit{XMM-Newton} in a coherent star-forming environment. The \textit{XMM-Newton} observations combined with optical and IR data reveal the low-mass stellar population down to $\sim 0.4 M_\odot$. For this mass-limited sample, our preliminary analysis confirms the anomalously low disk-fraction of the central star cluster Coll 69, the Eastern extension of its low-mass population pointing towards B 35, and the concentration of young stars in front of B 35. The analysis of the ‘on-cloud field’ of B 35 (white in the figure) will show if the cloud is currently forming stars. This will be crucial for determining the star-forming history in the whole $\lambda$ Ori region.

\textbf{Figure 1.} IRAS 100 $\mu$m map of the $\lambda$ Ori region with \textit{XMM-Newton} pointings from the XILO project overlaid. The observed areas comprise the eastern and western sides of the central star cluster Collinder 69, the dark clouds B 30 & B 35, the ‘bridge’ connecting B 30 with Coll 69, the dark clouds LDN 1603 and LDN 1588 on the molecular ring, and a concentration of B stars near the north-east of the ring. The pointings from the original XILO project are shown in green, one observation yet to be executed is shown in red (field labelled ‘B-stars’), and data added from the \textit{XMM-Newton} archive are shown in white (field labelled ‘B 35 E’).