157TH AAS MEETING, ALBUQUERQUE, NEW MEXICO

33.04 Observations of X-Ray Emission from T Tauri Stars. E. Feigelson, M.T.P., W. DeGrypi, CALIFORNIA INSTITUTE OF TECHNOLOGY - Observations of 28 T Tauri stars with the Imaging Proportional Counter on board the Einstein (HETE-2) X-Ray Observatory are reported. Eight are detected with soft X-ray luminosities of $10^{31}$ erg/s in the Taurus cloud and $10^{31}$ erg/s in the Orion cloud. The X-ray spectra indicate emission temperatures in excess of 5 x 10^6 K without strong absorption. One star, IC 410, is found to be highly variable, increasing in brightness by an order of magnitude in 35 minutes with a significant rise within four minutes. Theoretical considerations indicate the X-rays are not produced in the entire envelope emitting the hydrogen Balmer lines, and the rapid variability suggests the emission occurs close to the photosphere rather than far from the star.

33.05 Stellar Contribution to Galactic Component of Diffuse Soft X-Ray Background. J.A. Bookbinder, R. Rosser, and G.S. Vaiiana, Harvard-Smithsonian CFA.

We have used X-ray luminosity functions for main-sequence stars established by the CFA/Einstein Observatory stellar X-ray survey to estimate the integrated stellar contribution to the galactic component of the diffuse soft X-ray background; these calculations are based on simplified models for the galactic stellar space density distribution and interstellar medium absorption. The results show that earlier published evaluations may have substantially underestimated the stellar background contribution; if, as the present survey indicates, in excess of 10% of DM stars have X-ray luminosities $L_x(0.1-4.0$ keV) $>28.5$, then the stellar background contribution can substantially exceed $10^{31}$ erg s$^{-1}$ cm$^{-2}$ s$^{-1}$ in regions of low hydrogen column density.

33.06 The X-Ray Luminosity Function of Normal Stars. D.J. Helpand and J.-P. Callaulu, Columbia U. - Observations with the soft X-ray telescope on board the Einstein Observatory have revealed that stars from throughout the B-R diagram are sources of $\sim 1$ keV emission with luminosities ranging from $10^{31}$ to $10^{33}$ erg s$^{-1}$ (Vaiiana et al. 1980 preprint). Studies reported to date have focused on those stars detected as serendipitous sources in the Einstein Imaging data and on a few specific samples such as early-type stars (Long and White, 1980 Ap.J., 233, L65) or premain sequence objects (Chanan and Ku, 1978, B.A.S.S., 51, 623). We have conducted a systematic survey of more than 1500 stars brighter than $m_0$=9.5 which fall within our sample of -200 imaging proportional counter (IPC) fields. Sixty-five stars ($\sim$2%) were detected at fluxes above the survey limit ($10^{-15}$ erg cm$^{-2}$s$^{-1}$). The distributions of both detections and upper limits for the X-ray to optical flux ratios ($f_x/f_o$) will be presented. These data, along with the known $N$ - $\log S$ relation for soft X-ray sources and the spectral type distribution for a magnitude-limited sample of stars, allow us to derive important constraints on the X-ray luminosity function of normal stars. We show that normal stars do not contribute significantly to the soft X-ray background nor will the integrated emission from halos of low-mass stars provide an important component to the X-ray luminosity of external galaxies. However, we show that normal stars may well constitute the majority of all soft X-ray sources observable above a flux of $10^{-15}$ erg cm$^{-2}$s$^{-1}$.

33.07 The Low Energy X-Ray Spectrum of Sirius B. C. Martin, H. Lambton, S. Kahn, U.C. Berkeley. A reanalysis of the soft X-ray spectrum of the Sirius system observed by the HEAO A-1 Low Energy Detectors has been performed. The low energy proportional counter resolution kernel has been modelled by an incomplete gamma function which accurately reproduces laboratory calibration spectra. Assuming that most of the soft X-ray flux originates in an isothermal, optically thin pure hydrogen corona around Sirius B, an upper limit (99% confidence) to the temperature of 1.5 x 10^5 K is derived (including a conservative estimate of the effects of UV contamination) along with a lower limit to the X-ray emission measure of $10^{57}$ cm$^{-3}$. This emission is shown to violate by one to three orders of magnitude broadband EUV upper limits obtained by the ASPS Experiment (\lambda_\lambda 50-200\AA) and by Cash et al. (Ap. J., 221, L49, 1978) centered at 3000 and 5000. Considerations of possible sources of opacity and additional emission components do not easily resolve this conflict.

33.08 Layered Atmospheres of White Dwarf Stars. D.O. Muchmore, U. Del. Recent studies suggest that hot white dwarf stars with predominantly helium atmospheres may have thin layers of hydrogen "floating" above the helium-rich strata. If stars such as HV21 and HV34 are stratified in this sense, the hydrogen layer is optically thin except in the line and beyond the Lyman limit. Model atmosphere calculations show a temperature inversion at the boundary between the hydrogen and helium layers - a greenhouse effect. Hydrogen lines and helium lines would be formed in regions of very much different density, thus providing a potential observational test for this model.

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33.09 X-Ray Imaging Observations of M 17 and NGC 7538. G. Righini-Cohen and N. Stoy, SUNY-Stony Brook. The imaging proportional counter of the Einstein X-Ray Observatory was used to obtain images of M 17 and NGC 7538. The exposures were centered on the H II region/molecular cloud complexes and were 5000 sec. long. The strongest source in the M 17 region lies in the obscured part of the H II region. It appears to be strongly extinguished and is angularly unresolved by the IPC. A second source of X-ray emission lies just outside the H II region (as delineated by its radio emission) and is extended with $\sim$10' diameter. All the sources in the NGC 7538 region are unresolved by the IPC; one of these