31.10 The Spectrum of Cygnus X-1 Above 300 keV, J. C. LING, R. C. LAMBA, W. A. MARCH, W. A. WHEATON and A. S. JACOBSON, JPL, Caltech, Pasadena, CA 91109; MRC Sr. Resident Research Assoc. on faculty leave from Iowa St. U. The HEAO-3 High Resolution Gamma-Ray Spectrometer observed Cygnus X-1 for approximately 150 days between 27 September 1979 and 1 June 1980. The long-term intensity and spectral variations of the source in the 50-300 keV range as well as the discovery of a new low state have been previously reported (Ling et al., 1979). The results presented here are of the energy flux from 300 keV to 10 MeV. Our preliminary results indicate that the flux in the 300-600 keV region is consistent with the most recent HEAO-1 results (Nolan et al., 1982). However, the spectrum above 600 keV cannot be interpreted as a simple extension of the lower-energy Compton component.

31.11 A Two Component X-Ray Spectrum from SMC X-1, F. E. MARSHALL, N. E. WHITE, NASA/GSOC and R. H. BECKER, WP165U. Observations of SMC X-1 during a high state with the HEAO 1 A-2 and Einstein Solid State Spectrometer experiments reveal a two component spectrum. An apparent unabsorbed soft component has a blackbody temperature of about 0.16 keV and an emitting area of $10^7$ cm$^2$. The pulsar hard component has a power law spectrum with an energy index of about 0.5 modified by a high energy cutoff above 17 keV. Absorption is usually less than $4 \times 10^{21}$ cm$^{-2}$, which is consistent with a model in which the wind of the companion star SK160 is largely ionized by the x-ray flux. Absorption dips with a timescale of several hundred seconds are seen immediately following an eclipse exit and are probably caused by inhomogeneities in the wind of SK160.

*Now at ESTEC.

31.12 The Nova Ophiuchi Hard X-ray Component, R.E. KOTHS, A. C. F. WILLIAMS and J. R. KAPLAN - We report here on the spectrum and temporal variability of Nova Ophiuchi (B1705-25) in the 10-200 keV range as measured by the UCD/MIT instrument aboard HEAO-1 during the period 1977 August 25 to September 28. A hard (power law photon index ~ 2.4) component is seen to extend to at least 100 keV, and when these data are combined with the contemporaneous GSPC/CIT HEAO-1 data, the composite curve is best-fit by a 1.84 ± 0.08 keV thin thermal bremsstrahlung model with low energy absorption equivalent to ~ $9 \times 10^{21}$ cm$^{-2}$ and a high energy component with photon index 2.19 ± 0.06. The data are equally well fit by a two component thin thermal bremsstrahlung model (kT1 = 2.020.06 keV and kT2 = 32.1±2.4 keV) with the same low energy absorption. No spectral index variability is found on timescales from two days to two weeks. Soft, type I, x-ray transients, such as Nova Ophiuchi and Nova Monocerotis (A0620-00), are thought to be neutron stars in binary systems just like the binary x-ray pulsars, but the transients display a hard component and the pulsars do not (except for X-Per). Hence, another phenomenon in x-ray binaries is available for the study of these brightest of galactic x-ray sources.

31.13 An X-Ray Survey of Contact Binary Stars, R.G. CRUZACCE, H.B., A.K. DOPPEL, S.E. - A Survey of 17 contact binary (W UMa) stars was made using HEAO-2, with the IPC at the telescope focus. Correlations of the x-ray luminosity with period or rotational velocity, and the results of SBS observations of 441 Novo and VV Cep, suggest that the x-ray emission is coronal in origin. The results indicate that there are significant differences between the coronae of these stars and those of longer period systems, and there are indications also of differences between the coronae of W-type and A-type systems.

31.14 The Temperature-Luminosity Dependence of Stellar X-ray Sources by G.S. VAINA, S. SERIO, S. SCIORTINO, Astron. Palermo; L. GOLUB, C. MAXSON and R. ROOSNER, NRAO - We present results from a survey of x-ray emission temperatures for stars throughout the HR diagram. Over three dozen sources with sufficient Einstein IPC counts to perform the temperature fitting have been analyzed. Results on a possible relationship between temperature and luminosity for stellar x-ray sources will be presented. In addition, it appears that single temperature models fail to reproduce the experimental data for many of the sources. Some possible explanations of this result in light of recent work will be presented.

31.15 Variable X-ray Emission from Early-type Stars, by A. COLLURA, U. di Palermo; S. SERIO, S. SCIORTINO and G.S. VAINA, Astron. di Palermo, and F.R. HANNDEN, JR., C.W. MAXSON and R. ROOSNER, Harvard-Smithsonian Center for Astrophysics - We present results on both short- and long-term variability in x-ray emission from early-type stars. Significant variations are seen on time scales as short as hours for some sources. We will discuss in detail observations of γ Sco, the Cyg OB sources, in addition to a general discussion of variability in 0 and B stars. Some possible mechanisms responsible for the variability will be presented.

31.16 X-ray Variability of Late-type Stars, by A. MAGGIO, U. di Palermo; S. SERIO and G.S. VAINA, Astron. di Palermo; and L. GOLUB, NRAO - We present results from the NRAO stellar surveys on the variability of x-ray emission from late-type stars. Variability in these stars is nearly always observed when count rates are high enough for positive detection of the source. In some cases such as UV Cas and HR 1099 a single large event of long duration is observed. Many other stars show short-term variability at levels lower than those seen in obvious flare events. We will also discuss long-term variations over time scales of up to several years. Possible correlations between δL and L, δL and spectral type and short vs. long-term variability will be discussed.

© American Astronomical Society • Provided by the NASA Astrophysics Data System