Abstracts of Papers Presented

(Numerals preceding abstract titles indicate session and sequence of presentation.)

20 JUNE 1983
MONDAY MORNING
Session 1: Supernovae, Variable Stars
0900–1200 (East Ballroom)

Invited Talk (0900–0950)
01.01 The Next Decade in Planetary Exploration D. MORRISON, U. HI.

01.02 Cygnus X-1: Optical Counterparts of the 294-day X-ray Period J. KEMP, G. HENSON, D. KRAUS, T. NOLT, J. RADOSTITZ, Physics, U. of Oregon; M. BARBOUR, CFA, Hawaii; W. PRIEDEHORSKY, J. TERRELL, Los Alamos; and E.N. WALKER, NASA. Relative to the newly found 294-day X-ray modulation (1,2,3,4), optical data from up to 15 years' observations show: (a) A direct 294-day light variation of 0.01 peak/peak amplitude in B and U bands. The light and X-ray curves are non-sinusoidal with coincident eclipse-like minima, epoch JD 2440000, +26. (b) Shape changes in the 5th orbital B and U curves, on the 294-day cycle; around orbital phase 0.5 (seen secondary in front) the curves are odd-sheilded from the 294-day process, while at other phases the light varies on that cycle. This again suggests an "inner eclipse" (5) near phase 0.5. And (c) a polarization modulation; the 7-year V-band record shows dip-like excursions coinciding with the 294-day X-ray and light minima.

(1) Priedhorsky and Terrell, BAAS, 14, 618.
(3) Sky & TeI., March 83, News Notes.

01.04 New Optical Identifications of X-ray Sources From the HEAO A-3 Scanning Modulation Collimator J. PATTerson, W. Roberts, D.A. Schwartz, CFA; R. Furlbourn, E. Morgan, H. Brandt, MIT. The modulation collimator experiment on HEAO-A is designed to produce fairly precise (~2 arc-min) multiple error regions for strong X-ray sources. There are still ~100 sources which are detected by this experiment with F(2-6 keV) > 1 - 2 x 10^-8, but remain optically unidentified. From optical photometry and spectroscopy, we have been systematically searching these error regions in an effort to detect the X-ray counterparts. Here we report six new and very likely identifications: H2252+458, a possible BL Lac object; H1520+035, a Type I Seyfert galaxy with a redshift z < 0.02; A1134-18, another Type I Seyfert galaxy with a redshift z < 0.02; H0519+386, a 6th magnitude Be star; H0504+04 (+400504-03), a 7th magnitude B star; and 406514+15, a faint ultraviolet-excess star with possible Hα emission. We will present photometry, spectroscopy, and finding charts for each of these suggested counterparts.

01.03 EINSTEIN OBSERVATIONS OF CYGNIUS X-2 S. DILL ET AL. and S.M. RICH, Columbia U.; R.D. SMYTH and J.F. CROWLACK, CFA. We present observations of Cygnus X-2 (4U 1826+29) obtained simultaneously with the Einstein Objective Grating Spectrometer (OGS) and the Monitor Proportional Counter (MPC). Approximately 1.6 x 10^9 seconds of data, contiguous except for earth occultation, were analyzed. Both the OGS (0.3-2 keV) and the MPC (2-10 keV) data are well fitted by a thermal bremsstrahlung model with kT ~ 5 keV. The data show evidence of quasi-periodic dips in intensity in both the OGS and MPC. These range from 100-700 seconds in duration spaced ~2000 seconds apart. Spectral fits indicate slight increases in absorbing column density during the dip; however, the reduction in intensity is not consistent with absorption by neutral-cosmic-abundance intervening material. Possible implications of these results in terms of the structure of accreting material in the Cyg X-2 system will be discussed.

01.05 Origins and Ages of X-Ray-Luminous M Dwarf Stars, H.M. JOHNSON, Lockheed. The nearby M dwarfs for which published X-ray data are available are assembled and examined for kinematical and other evidence of their age. Those with the highest order of X-ray luminosity are presumably young, but subsets of them fall kinematically into old disk as well as young disk populations. The youthful "old disk" M dwarfs may have formed recently in the interstellar high-velocity clouds or intermediate-velocity clouds from which they derive their kinematical properties.

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