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. MORISON 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. PRIEDHORSKY, J. TERRELL, Los Alamos; and E.N. WALKER, ACO. Relative to the newly found 294d X-ray modulation (1,2,3,4), optical data from up to 15 years' observations show: (a) A direct 294d 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±25. (b) Shape changes in the 566 orbital B and U curves, on the 294d cycle; around orbital phase 0.5 (unseen secondary in front) the curves are oddly shielded from the 294d 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 294d X-ray and light minima.

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

01.03 *EINSTEIN* OGS/MPC OBSERVATIONS OF CYGNI X-2.* S. DIL WYTHE and J.M. RYAN, Columbia U. V.G. SMART and J.E. CUMINLAY, CFA — We present observations of Cygnus X-2 (4U 2124+38) obtained simultaneously with the EINSTEIN Objective Grating Spectrometer (OGS) and the Monitor Proportional Counter (MPC). Approximately 1.6 × 10^5 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.

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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. REMLIARD, E. MORGAN, H. BRADY, MIT. — The modulation collimator experiment on HEAO-A is designed to produce fairly precise (~ 2 arc-min²) multiple error regions for strong X-ray sources. These are still ~ 100 sources which are detected by this experiment with F(2–6 keV) 1–2 μJy, but remain optically unidentified. From optical photometry and spectroscopy, we have been systematically searching these error regions in an effort to detect the optical counterparts. Here we report 6 new and very likely identifications:

H2252+458, a possible BL Lac object; H502+035, a Type I Seyfert galaxy with a redshift z = 0.02; 11143–18, another Type I Seyfert galaxy with a redshift z = 0.02; H515+286, a 6th magnitude Be star; H504+04 (+400504–03), a 7th magnitude B star; and 40061+15, a faint ultraviolet-excess star with possible Hα emission. We will present photometry, spectroscopy, and finding charts for each of these suggested counterparts.

01.05 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 disc 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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