TUESDAY AFTERNOON

Newton Lacy Pierce Prize Lecture

"The Luminosity of Serendipitous X-Ray QSO's: Implications for the Diffuse X-Ray Background Radiation"

B. Margon (University of Washington)

1330–1430 (Main Ballroom)

The Luminosity of Serendipitous X-Ray QSOs: Implications for the Diffuse X-Ray Background Radiation, B. MARGON, Univ. Wash. - We have identified the optical counterparts of 47 serendipitously-discovered Einstein Observatory X-ray sources with previously unreported quasi-stellar objects. The mean ratio of X-ray to optical luminosity of this sample agrees reasonably well with that derived from X-ray observations of previously known QSOs. However, despite the fact that our limiting magnitude V = 18.5 should permit detection of typical QSOs (i.e., $M_V = -26$) to $z = 0.9$, the mean redshift of our sample is only $z = 0.42$. Thus the mean luminosity of these objects, $M_V = -24$, differs significantly from that of previous QSO surveys with similar optical thresholds. The existence of large numbers of these lower luminosity QSOs, which are difficult to discover by previous selection techniques, provides observational confirmation of the steep luminosity function inferred indirectly from optical counts. However, possible explanations of the lack of higher luminosity QSOs in our sample prove even more interesting. If one accepts the global value of the X-ray to optical luminosity ratio proposed by Zamorani et al. and Ku et al., then reconciliation of this ratio with our observations severely constrains the QSO space density and luminosity functions. Alternatively, the "typical" QSO -- a radio quiet, high redshift ($z > 1$), optically luminous but not superluminous ($M_V > -27$) object -- may not be a strong X-ray source. This inference is not in conflict with existing results from Einstein X-ray surveys of preselected QSOs, which also fail to detect such objects. The contribution of QSOs to the diffuse X-ray background radiation is therefore highly uncertain, but may be quite small. Current X-ray data probably do not place significant constraints on the optical number counts of faint QSOs.

This work has been supported by the NSF and the Alfred P. Sloan Foundation.

Session 26: QSO's; AGN; X-Ray Background

1430–1630 (Main Ballroom)

26.01 Interpretation of the Redshift Distribution of X-Ray Selected Active Galactic Nuclei.


The redshift distribution of X-ray selected active galactic nuclei (including quasi-stellar objects and Seyfert galaxies, hereafter AGNs) differs markedly from the distributions of AGNs discovered by other means. Only a small fraction (~20%) of X-ray selected AGNs have redshifts $z > 0.2$, compared to ~63% of AGNs discovered in UV excess surveys. The data indicate that the predominance of low redshift objects in the