1981BAAS...13..795D

06.03 The Effects of Electra on the X-ray Luminosities of Supernova Remnants. A. K.S. Long, Columbia G.; M.A. Dopita and T.R. Tuohy, Australian National U. - Because X-ray luminosities of most SNe are dominated by emission from heavy elements (Z > 3), estimates of the X-ray emitting mass based on cosmic abundances may be incorrect. We investigate the apparent density evolution of a SN when substantial amounts (1 > M_0) of processed material are ejected by the SN. If this material is shocked heated, it will dominate X-ray emission from the remnant long after the SN has swept up the equivalent amount of ISM. Emission from metal-rich ejecta can explain why ISM densities of young remnants far from the galactic plane, deduced from standard analysis, are higher than expected, as well as why larger SNe appear to be lying in regions of lower ISM density.

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We have used HEAO-2, IUE and optical spectrophotometric observations to develop a self-consistent picture for the unusual young supernova remnant (SNR) in the irregular galaxy NGC 4449. The SNR was detected in a 30,000 s HRI exposure with the HEAO-B (Einstein) X-ray Observatory even though its distance is believed to bemodel greater than 6.5 Mpc, but analysis of this data relies heavily on comparison to the galactic SNR Cas A. The optical data cover the region 3500-5500Å and show previously undetected lines of [O II]13727, [S II]14070 and [Ne III]3869,3968 which belong to the SNR. The IUE spectrum can be used to place an upper limit on the abundance of carbon relative to oxygen. Comparison of the rough abundances for this object to the explosive nucleosynthesis models of Weaver and Woosley (1986, Ap.J., 316, 335) indicates that the pre-cursor to this event was a massive star of order 25 M_0. The X-ray and optical data can be combined to imply an age for the remnant of T > 600 years.

06.06 The Evolution of the Infrared Spectrum of the 1980k Supernova in NGC 5946, E. EWREK, NASA/GSFC, M. F. AHEARN, U. of MD, E. E. BECKLIN, R. W. CAPPS, C. M. TELESCO, A. T. TOKUNAGA, G. WYN-WILLIAMS, U. of Hawaii, H. L. DUNERSTEIN, M. W. WERNER, NASA/ARC, and T. GANTRY, UKIRT. The 1980k supernova in NGC 5946 was observed with the IRTP in the near infrared (IR) with a standard set of JHKL filters, and a 1.3-2.5 μm circular variable filter. The observations obtained during the first seven weeks after maximum light show an IR excess (compared to a blackbody spectrum which matches the observations in the visible) with a color temperature of about 4600K. This excess is most likely the result of extended atmospheric effects in the expanding ejecta. About seven months after maximum light (around June 1, 1981) the emission in the 1-4 μm region was dominated by a very red component (Telesco et al. 1981, I.A.U. Circ., No. 361). The spectrum of this component is consistent with thermal emission from 800K dust. Further observations of the infrared spectrum obtained through October showed that while the infrared luminosity decreased, the temperature remained roughly constant. These observations provide strong evidence for the formation of dust in the supernova ejecta. However, the possibility that the emission is an IR echo of the initial visual outburst of the supernova cannot presently be ruled out.

06.07 MSB 15-5(2) - A SNR Containing 2 Compact X-ray Sources. F. SERAUD, Harvard-Smithsonian Center for Astrophysics, and P. MURDIN, Royal Greenwich Observatory - Einstein observations show 2 point-like X-ray sources within the shell of this remnant which also exhibits the usual patchy diffuse x-ray and X-ray emission typical of galactic SNR. There is considerable diffuse emission associated with both sources, and X-ray spectra indicate that both are at least as far away as the diffuse emission from the shell. A search for optical counterparts has turned up nothing brighter than 18 mag within the error box of the stronger source, approximately at the center of the remnant. The second source is close to the NW limb and is associated with the Hα emission region RCW89. There is a high density, high excitation knot of material at the position of the X-ray source which is faint in blue and IR plates but strong in the red. Spectra have been obtained by a consortium of Anglo-Australian observers and show emission lines of H, N, O, S, Ca, and Fe. IR spectra show strong [Fe II] lines at 1.6μ. More details and some interpretation will be presented.

06.08 Radio Supernovae in NGC 4321 and NGC 6946, R.W. Saunders, M.D. Andrews, J.F. Basart, NRAO and IRE and IOWA STATE U. and R.C. EMB, IOWA STATE U. The NRAO Very Large Array has been used to observe the center of the galactic supernova remnant, W28. The purpose of this investigation is to search for a radio counterpart to γ-ray and X-ray sources observed near this region. An area 10' in diameter, centered at α = 17°55'47" and -23°20'20" (J2000), b = -0.095° is mapped at wavelengths of 20, 6, and 2 cm. There is no evidence for point-like emission. The region of most intense emission is within 10' of the map center and is approximately 9' x 10' in size. A 20' tail of