bution to the background can not be large enough to significantly affect the overall thermal type spectrum observed. In such a situation, we have to consider new sources of emission peculiar to an earlier epoch and/or diffuse intergalactic emission.

15.08.10 The Cosmic Microwave Background Radiation as a Probe of the Large Scale Structure of the Universe, Paul Boynton, University of Washington.

15.01.09 Production Ratios for Cosmochronology[†] W. M. Howard and P. Möller*, Lawrence Livermore Lab., Livermore, CA 94550 - We study the decay from the r-process path to the actinide region. Employing the macroscopic-microscopic method, with the modified-harmonic oscillator single-particle potential and the droplet model, we calculate the nuclear potential energy surfaces for heavy neutron-rich nuclei in the region $82 \leq Z \leq 110$ and $120 \leq N \leq 184$. Effects of mass-symmetric, mass-asymmetric, and tri-axial distortions are simultaneously included. Odd-particle, odd, as well as even nuclei are included in the calculation by assuming that the odd-particle stays in the lowest possible single-particle orbital during fission. The fission thresholds, particle separation energies, and beta decay energies are used as input into a calculation of multi-chance particle emission and beta-induced fission. Effects of spontaneous fission are also included. A preliminary calculation of the decay from the r-process path to the actinide region indicates that the production of ^{232}Th, ^{235}U, ^{238}U and ^{244}Pu will be significantly effected by beta-induced neutron emission and beta-induced fission. The structure of the beta strength function for these heavy neutron-rich nuclei is found to be of prime importance.

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15.02.10 The Slope of the Faint X-ray Source Counts and Models of Cosmological Evolution. D.A. SCHWARTZ, R. GIACCONI, R.E. GRIFFITHS, T. MACCACARO, S.S. MURRAY, and G. ZAMORANI, Harvard-Smithsonian Center for Astrophysics* - We have developed a method of analysis of small samples by using unbinned measurements. We directly test each data point against a model giving the distribution of the set of points, and adjust parameters of the model to be consistent with the total data set. We apply this technique to estimate the slope of the dN/dS vs S source counts obtained with the imaging proportional counter in the Einstein Observatory deep X-ray source survey. Assuming $dN/dS = KS^{-P}$ and calculating an "effective" detection threshold we find $P_{0.5} = 3.2$, with a 95% confidence interval of 2.1 to 5.4. This applies at a nominal value $S = 3 \times 10^{-14}$ erg/s cm^2, but is really sampled over a decade in S. Since it has been argued that most of these sources are extragalactic, and at cosmological ($Z \gtrsim 0.5$) distances, the slope is significantly steeper than the value $P \lesssim 2.1$, which is predicted assuming no source evolution and therefore provides independent evidence for the cosmic evolution of X-ray source proper densities and/or luminosities. The best value $P = 3.2$ corresponds to density evolution of $(1+Z)^7$; to 95% confidence evolution steeper than $(1+Z)$ is required. If the case $P \gtrsim 3$ proves valid, then we are probably measuring the luminosity distribution of very luminous sources, otherwise the extrapolation to a slightly smaller S would predict too large an X-ray background.

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15.03.10 Low Frequency Spectrum of Cosmic Background Radiation

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A precise measurement of the cosmic backround radiation spectrum at long wavelengths provides information on a number of important problems in cosmology. Various astrophysical processes, including galaxy formation and large scale matter - antimatter annihilation, are expected to distort a Planck spectrum in the Rayleigh-Jeans region. Deviations at higher frequencies have already been reported (Woody and Richards, Phys. Rev. Lett. 42, 925 (1979)). We have built a continuously tunable Dicke-switched radiometer which presently operates at 2-4 GHz and 8-12.4 GHz. We present preliminary measurements of the atmospheric emission and cosmic