43.05

Power Spectrum Calculated from the CfA Redshift Survey: Limits on Cosmological Models

M.S.Vogeley (CfA) & C.Park (CalTech)

We calculate the power spectrum of density fluctuations in volume-limited samples from the CfA redshift survey and compare this result with analytic predictions for several cosmological models and with power spectra calculated from N-body simulations. By combining all of the complete regions of the CfA survey, we obtain limits on the power spectrum on scales $\lesssim 200h^{-1}$ Mpc.

From large-scale ($L_{sim} = 388.8$ or $576h^{-1}$ Mpc) N-body simulations of Cold Dark Matter with biased galaxy formation ($\Omega = 1$), open CDM ($\Omega = 0.4$), and a power law spectrum model with $n = -1$, we extract simulated redshift surveys and calculate their power spectra. Calculation of the power spectrum in redshift space allows direct comparison with the CfA survey. The variation among independent simulation volumes provides an estimate of the error in the power spectrum for the CfA survey.

43.06

The Case Against the Big Bang

T. Van Flandern (Meta Research)

** Observational evidence against the viability of the standard Big Bang model: (1) At typical galaxy relative velocities, the time required for formation of superclusters exceeds the Hubble age of the universe by an order of magnitude. (2) Lerner has shown that the brightness of radio galaxies is sufficiently attenuated at radio wavelengths as compared with infrared wavelengths, that microwave radiation must be absorbed and re-emitted by the intergalactic medium many times, and cannot therefore be a "background" radiation. (3) The smoothness of the microwave radiation is in sharp contrast with the walls and voids of the universe's large scale structure. (4) The observed deuterium abundance is now coming out smaller, and one determination of the Beryllium abundance comes out 1000 times higher, than the Big Bang predicts. (5) The unusual luminous bridge connecting quasar Markarian 205 to a galaxy arm was confirmed in striking detail with computer processing of CCD images, indicating that quasar redshifts may not be cosmological. (6) Quasar absorption lines imply numerous low column density clouds, the survival or regeneration of which over a Hubble time must be questioned.

** Theoretical arguments against the standard Big Bang model: (1) Inconsistencies in the properties of hypothetical gravitational lens systems. (2) Problems with the evolutionary model of radio galaxies, AGN's and quasars. (3) Logical objections to the hypothesis of a beginning of time. (4) Physical objections to the magnitude of gravitational forces in the early Big Bang.

** We conclude that observations should be interpreted in papers and journals with each appropriate cosmological model, not just with the Big Bang, until one model with far fewer problems emerges.

Session 44: HEAD I: Gamma-Ray Astronomy
Oral Session, 10:00–11:30 am
Salon I

44.01

The Preliminary Results from the High-Energy Gamma-Ray Telescope on GRO

C. E. Fichtel* (NASA/GSFC)

The Energetic Gamma Ray Experiment Telescope (EGRET) was one of four instruments carried on the Gamma Ray Observatory (GRO). EGRET is capable of detecting photons in the energy range from approximately 30 MeV to 30 GeV with a sensitivity that is over an order of magnitude greater than earlier high energy gamma ray satellite instruments. After a period of about one month for test and calibration, GRO began a fifteen month all-sky survey. In addition to providing valuable calibration information for the EGRET instrument, the first month yielded significant pulse profile information on two pulsars. Subsequent weeks have permitted the study of several other sources, the Cygnus region, the Large Magellanic Cloud, the Galactic Center region, and other portions of the galactic plane. The quasar 3C 279 was seen in high energy gamma rays and was at the time of the observation by far the most luminous gamma ray source ever seen. It is time varying and had a remarkably strong energy spectrum.

* On behalf of the EGRET collaboration

44.02

First Preliminary Results from COMPTEL

V. Schönfelder, W. Collmar, R. Diehl, G. Lichti, R. Much, H. Steinle, A. Strong, M. Varendorff (MPE), H. Bloemen, H. de Boer, J.W. den Herder, W. Hermsen, L.Kuiper, B. Swanenburg, C. de Vries (ROL), A. Connors, J. Lockwood, J. Macri, M. McConnell, D. Morris, J. Ryan, G. Stacy, W. Webber (UNH), K. Bennett, M. Busetta, C. Winkler (SSD/ESA)

COMPTEL is the first imaging telescope to explore the MeV gamma-ray range. At present, it is performing a complete sky survey. In later phases of the mission selected celestial objects will be studied in more detail. Targets of special interest in the COMPTEL energy range are radio pulsars, X-ray binaries, novae, supernovae, supernovae remnants, molecular clouds, the interstellar medium within the Milky Way, active galactic nuclei, and the diffuse cosmic background radiation in extragalactic space. The first few months of operation have demonsrated that COMPTEL basically performs as expected. The Crab is clearly seen at its proper position in the first images of the anticenter region of the galaxy. The Crab pulsar lightcurve has been measured with unprecedented accuracy. The quasar 3C273 has been seen for the first time at MeV energies. Several cosmic bursts within the COMPTEL field-of-view could be located to an accuracy of about 1°. On June 9, 11 and 15, 1991, COMPTEL observed gamma-ray (continuum and line) emission from three solar flares. Neutrons were also detected from the June 9 flare. At the present state of analysis, COMPTEL achieves the prelaunch predictions of its sensitivity to within a factor of 2. Based on the present performance of COMPTEL, the team is confident that COMPTEL will fulfill its primary mission: to survey and explore the MeV sky.

44.03

Recent Gamma-Ray Observations of the Galactic Center

R. Sunyaev (ISR - Moscow)

Session 45: Low Luminosity Stars and Companions
Oral Session, 10:00–11:30 am
CSA

45.01

Precision Radial Velocities using an Iodine Absorption Cell

G.W.Marcy (UCB/SFSU) and R.P.Butler (U.Maryland)

We use gaseous iodine to superimpose reference lines on echelle spectra to establish both a wavelength scale and the spectral PSF. Wavelength calibration is referred to an FTS io-