redesigned so it will be launched on a Delta rocket early in 1989. The current status of the instruments and mission will be described.

43.20

Sky Brightness on Kitt Peak

C. A. Pilachowski, J. L. Africano, B. Goodrich, W. Binkert (KPNO/NOAO)

Despite operation of over 25 years, the Kitt Peak National Observatory has available no comprehensive data on sky brightness. To remedy this, we have begun a long-term program to measure and monitor the brightness of the night sky at Kitt Peak using the photometer on the #2-0.9m telescope and the Automatic Filter Photometer. We plan to obtain sky brightness data for 2 nights every other month for the next two years.

Our preliminary data reveal that, for altitudes above about 30°, the city is detectable above the sky, and at higher elevations, the sky brightness is fairly constant with altitude. The sky over Kitt Peak is still fairly dark, and the conventional wisdom that Kitt Peak skies are already severely brightened from the lights of Tucson is many years premature.

Session 44: Solar System

Display Session, IRC Lobby

Thursday

44.01

THE COLORADO SCALE MODEL SOLAR SYSTEM


We describe the Colorado Scale Model Solar System (CSMSS), a permanent display recently completed on the Boulder campus of the University of Colorado. The display depicts planetary sizes and distances on the same scale, and offers a great deal of educational value in an elegant design. In addition to a physical description, we will present information which will help others wishing to construct similar displays.

CSMSS illustrates, at one ten-billionth scale, the sizes of the planets and the Sun, and the distances between them. The Sun is a 14-cm diameter aluminum sphere (about the size of a grapefruit) housed in a pyramid-shaped monument, constructed out of polished black granite, in front of the campus Planetarium. The nine planets are housed individually in meter-high pedestals, also constructed of the black granite, located at their scaled mean distances from the model Sun. Each of the planet pedestals holds a rectangular plaque (fabricated by a photographic process — cibachrome — which resists fading in sunlight), covered by a half-inch glass plate. Each plaque includes color photographs, a table of planetary information, and a set of “fun” facts concerning the particular planet.

The model planets are hemispheres cut into the underside of the glass cover plates, panned on the insides in order to simulate a 3-dimensional appearance. The orbits of moons are illustrated whenever they fit within the available space.

We believe that CSMSS provides one of the best available means of conveying the concept of astronomical distances, and the excitement of astronomical study, to students and the public.

CSMSS is dedicated to the crew of the Space Shuttle Challenger.

44.02

Investigations of Turbulent and Direct Motions in Solar Flares


A new method for fitting X-ray flare spectra during the impulsive phase in order to determine the parameters of the flare dynamics is presented. The time variation of the plasma electron temperature, emission measure, upflow and random velocities is measured in Ca XIX and Fe XXV spectra obtained with the Bent Crystal Spectrometer on the SMM. A correlation between upflow and random velocities is observed in some flares and is discussed in light of current models for chromospheric evaporation. In past investigations the temperature of the upflowing plasma has not been determined. The possibility of determining the temperature of the evaporated material from the ratio of the calcium to iron fluxes is presented.

44.03

Particle Acceleration by MHD Waves in Solar Flares

J.-F. de La Beaujardière, E. G. Zweibel (U. Colorado)

We are developing a model for the acceleration of particles in solar flares. We model a coronal loop as a magnetic fluxtube, and we postulate a spectrum of compressive magnetohydrodynamic waves in the tube created by a pressure pulse due to the primary energy release in the flare. The dispersion relation for these waves can be solved analytically in the limit of high frequencies ($\omega^2 \gg k^2 V_A^2$) and numerically otherwise. We find in particular that the high frequencies are complex, corresponding to waves which are damped by leakage out of the tube into the surrounding medium.

We examine the acceleration of particles, primarily electrons, by the wave spectrum. When no waves are present, particles travel back and forth along the tube, being reflected at the ends by the magnetic mirror force. A wave spectrum, however, establishes an a.c. electric field component parallel to the tube axis, which leads to acceleration. We calculate numerically the particle energy spectrum resulting from this particle-wave interaction. Our model can lead to particle acceleration throughout the loop instead of merely at the primary energy release site.

44.04

Techniques of Zodiacal-light Modelling

T. Kelzall (NASA/GSFC)

The nature of and findings from new numerical analysis techniques are presented for modelling of the Zodiacal light. The techniques are similar to those used in the development of approximate wavefunctions by atomic physicists. The presentation stresses: (1) the interrelationship between observational procedures and modelling results; (2) the propagation of observational errors into the fitting results; and, (3) the achieving of stable model results re the form of the initial fitting function.

44.05

Solar Maximum Mission (SMM) Coronagraph/Polarimeter (C/P) Observations of Comet Halley

R.J. Oliverson, J.M. Hollis, N.B. Niedner (NASA/GSFC)

In view of the variable nature of cometary plasma tails and the expected increase in cometary activity at small heliocentric distances, an important gap in Comet Halley data was bridged by the cometary observations of