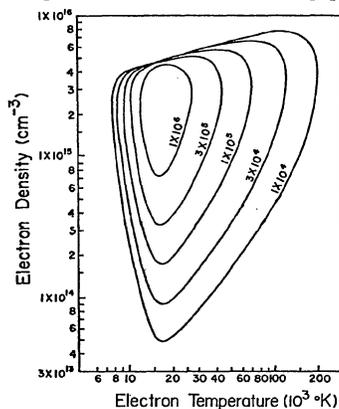


ies. J. H. MAHAFFY, B. A. FRYXELL, and W. D. ARNETT. U. Ill. - We have applied a two dimensional, axially symmetric hydrodynamic code to follow gas, and a many-body calculation neglecting close encounters to follow stars during the early dynamic phase of galactic evolution. We obtain equilibrium configurations for rotating spheroidal galaxies, and by applying a simple model of star formation obtain a prediction for the spatial distribution of metals in these objects.

### WEDNESDAY, 10 DECEMBER

#### Session 29: Classroom 1, 1000-1200

29.01.05 Laser Action in Stellar Envelopes. Y.P. VARSHNI and C.S. LAM, Univ. of Ottawa. - Menzel (1970) has given a clear discussion of the possibility of laser action in non-LTE atmospheres. Gudzenko and Shelepin (1963) and Gudzenko et al. (1966) have proposed that if there is sufficiently rapid cooling of the free electrons when a plasma expands, there can be a population inversion in the lower levels of an atom. It is shown that in high-temperature stars in which high speed mass loss is occurring, the rapidly recombining plasma in the stellar envelope can act as an amplifying medium. Model calculations for laser action in He II  $\lambda 4686$ , using the collisional-radiative model (Bates et al. 1962), are presented. The results are presented in terms of the population inversion



measure  
 $P = N_2/g_2 - N_1/g_1$ .  
 (N is atomic population, and g, statistical weight). P is shown as a function of the electron density and electron temperature in the figure. The numbers by the side of contours represent P values in  $\text{cm}^{-3}$ . The bearing of the results on the spectra of Wolf-Rayet stars and those of planetary nuclei is discussed.

29.02.05 HD 50896 : Evidence For An Extended Continuum

Formation Region. A. V. Holm and J. P. Cassinelli, Washburn Observatory. - The ultraviolet relative flux distribution of HD 50896, WN 5, is derived from OAO-2 Wisconsin filter photometer and scanning spectrometer data. We estimate E(B-V) to be  $0.12 \pm 0.05$  on the basis of the appearance of the continuum in the vicinity of the  $4.6 \mu^{-1}$  interstellar extinction bump. The unreddened relative flux distribution is found to agree reasonably well with an extended model atmosphere for a Wolf-Rayet star (Cassinelli and Hartmann, 1975, Ap.J., in press). HD 50896 does not show the flux excess in the 4 to  $5 \mu^{-1}$  region that was found for the WC8 component of  $\gamma^2$  Velorum by Van der Hucht (1975, Phil. Trans. R. Soc. Lond. A, 279, 451). The present results suggest that the differences between the derived  $\gamma^2$  Velorum flux and the model atmospheres are not due primarily to the helium abundance.

This work was supported in part by NASA NSG-7050.

29.03.05 Apollo 16 Far-Ultraviolet Stellar Photometry. T. L. PAGE & G. R. CARRUTHERS, NRL. - Starfield imagery obtained with the S-201 Far-Ultraviolet Camera/Spectrograph during the Apollo 16 mission has been microdensitometered and analyzed to obtain stellar brightnesses in the 1050-1600 and 1250-1600 Å wavelength ranges. A computer program has been developed to find star images and print out their density volumes. The density volume of an image (measured above sky background) is directly proportional to total brightness of a star as long as the peak density is less than about 1.3; above this density, nonlinearities introduced by the emulsion density/exposure relationship, and the time response of the microdensitometer, must be taken into account. Flux predictions of model atmospheres computed by Kurucz, Peytremann, and Avrett, the average interstellar extinction curve of Bless and Savage, measurements of  $\alpha$  Vir,  $\alpha$  Leo, and  $\eta$  U Ma by Bless, Code, and Fairchild, the pre-flight measured diffuse source sensitivity of the instrument, and the measured star image profiles have all been folded together to yield a relationship between expected density volume and stellar flux. Our plan is to prepare a catalog of stellar brightnesses determined by this procedure; typical results are presented.

29.04.05 OAO-2 UV Photometry of the Alpha Persei Cluster. M. R. MOLNAR & T. C. STEPHENS, U. Toledo - UV photometry from the Wisconsin experiment on OAO-2 covering  $\lambda 1910$  to  $\lambda 4250$  has been analyzed for 18 early-type members of the Alpha Persei cluster. UV color-color diagrams indicate significant line blanketing in the late B stars. Only two stars, HD 21699