6,000°K and 12,000°K, the number density of the gas must be between $10^6 cm^{-3}$ and $10^{12} cm^{-3}$, and the relative density of superthermal protons to gas atoms must be less than 10^{-6}. The gas may also be cooled by the superthermal atoms themselves through absorption of the trapped line photons and re-emission into the broad wings. This process, which we call optical reverberation, can greatly enhance the broad component of the hydrogen lines and can have a large effect on the relative intensities. This research has been supported by NASA grant NSG-7022.

21.04.10 A Quasar Model Revisited. M.F.BARNOTHY & J.M.BARNOTHY, Evanston,Ill.- Ten years ago (A.J.70,666, 1965) we suggested that quasars are gravitational lens intensified images of nuclei of Seyfert galaxies. This model removed the severe energy requirements associated with quasars, and the size restrictions imposed through the rapid brightness variations (A.J. 71,155,1966). It predicted (Observatory 86,115,1966) the simulation of an increase in the space density of quasars with increasing redshift, later discovered by M.Schmidt. Explained the rapid (v>c) proper motion of components of compact radio sources (BAAS 3,474,1971), and why quasars are scarce above z=2.3 (BAAS 4,339,1972).While in our opinion there were adequate number of potential gravitational lenses aligned with nuclei of Seyfert galaxies to explain the spatial density of quasars (Science 162,348,1968; Ap.J. 174,477,1972),others (M.Schmidt,Science Journ.Oct.1966; D.Sadeh, Science 158,1176,1967;R.J.Weymann, A.J.73,841 1968;L.N.K.de Silva,Nature 228,1180,1970;N.Sanitt,Nature 234,199,1971) have questioned this conclusion.A significant change has occurred in this situation through the discovery that spiral galaxies may intensify background objects hundred times more efficiently when they act not as compact mass lenses,but as distributed mass lenses (BAAS 5,448,1973); that the very numerous globular clusters may brighten background objects up to 4 mag (BAAS 6,212,1974);moreover that nuclei of Markarian and compact blue galaxies can also serve as background objects for lenses producing quasars; and finally, that the mean cosmological mass density in the universe, forming the basis of all estimations of the number of potential gravitational lenses,is much higher than hitherto believed (J.P.Ostriker et al.Ap.J.193,L1,1974).These new types of lenses (without even considering among them dead galaxies or black holes),and new more luminous objects,raise the expected density of gravitational lens quasars many times above the previously quoted values.

21.05.10 On the Significance of Periodicities in the Observed Quasar Redshifts and in the Intrinsic Redshift Components as Computed from Bell and Fort's Quasar Model. - G.J.CORSO, Dearborn Obs. & J.M.BARNOTHY, Evanston,Ill. - Power spectrum analysis was performed on the total sample of about 400 known quasar emission line redshifts, the subsets of the radio and the optical quasars, and the set of "intrinsic redshift components" (z_x) computed by Bell and Fort (Ap.J.,1973,186,1) from their quasar model. No significant periodicities were found in the distribution of observed emission line redshifts for the total sample, the radio sample, or the optical sample. The high peaks occurring at T=0.1 in Bell and Fort's samples of computed "intrinsic redshift components" were found to lose their significance when a normal distribution of the z_x uncertainties was imposed on the calculated values of z_x.

21.06.10 3C 273 as a Galactic Object. Y.P. VARSHNI, Univ. of Ottawa. - (The term "galactic" here includes the galactic halo.) Available observational material on 3C 273 is critically examined with reference to the redshift hypothesis and the plasma-laser star (PLS) model of Varshni (1974 Bull. A.A.S. 6, 213,308, 449). (a) Emission lines. Large uncertainties in the reported wavelengths (Schmidt 1963, Oke 1963, Greenstein and Schmidt 1964, Andrillat and Andrillat 1964, Oke 1965, Divan 1965, Wampler and Oke 1967, Wampler 1969) are pointed out. In the redshift interpretation, [O III] λ5007 is present, but λ4959 is not, which is clearly unsatisfactory. In the PLS model, the following identifications are proposed: λ3239 is due to O III, λ7598 is due to C III (Edlen 1956). Astronomers are urged to obtain more accurate wavelengths of the emission lines. It would also be of interest to obtain the spectrum of the jet (3C 273A) alone. (b) Interstellar K and H absorption lines have been observed in the spectrum of 3C 273 (Williams 1965). High resolution studies of the profiles and intensities of these lines in 3C 273 and in other QSOs are expected to throw light on the distances of QSOs. (c) Divan (1965) has shown that the absolute energy distribution in the continuum is like that of a black body with a color temperature of 11,300°K. (d) Latest radio observations (Kellermann 1974) on the angular size find a natural explanation if 3C 273 is a galactic object. (e) Optical variability. (f) Similarities between the spectra of 3C 273, NAB 0205+02 and 4C 39.25 are pointed out. It is concluded that the available evidence favours the view that 3C 273 is a galactic star.

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Session 22: Room M45, 1400–1700

22.01.01 A Quantum Limited Near Infrared Vidicon Camera System. M. T. Sandford II, Univ. of Calif. Los Alamos Scientific Laboratory and J.

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