N-S. The reflector surface has been made of graded earth covered with sheets of asphalt liner for erosion control; on top of this is a galvanized steel wire mesh. The focal length is 155 ft and the focal line runs along the underside of a catwalk 4 ft wide and 10 ft high which is supported on four wooden towers. The reflector, towers, and catwalk are complete. The feed elements consist of 276 conical log-spirals which are spaced along the underside of the catwalk. The operating frequency is 611 Mc and the beam-width is 20 minutes of arc. Mechanical rotation of the feed-elements about their axes is used to alter the electrical phasing and thus to change the direction of the beam in the meridian plane. The scanning capability is estimated to be 30° on each side of the zenith. The first program will consist of a survey of all radio sources in the accessible region of the sky. The survey will give the positions and the flux densities of the sources.

Structure and Evolution of Globular Clusters.

RICHARD W. MICHIE, *Berkeley Astronomical Department, University of California*.—A three-parameter distribution function in terms of energy and angular momentum and with a cutoff at the energy of escape is used to describe the structure of a spherical stellar system. The corresponding density distribution for a specific set of parameter values is obtained numerically and the result agrees very well with observations of 47 Tuc from one to 50 parsecs by Gascoigne and Burr.

In obtaining the evolution of a spherical cluster, the basic assumption is that the continuous evolutionary process can be approximated by a series of successive equilibrium states. Therefore, the distribution function is assumed invariant in form and the problem is the calculation of the changes in the three parameters after a time interval. This is done by taking three moments of the Boltzmann equation with the assumption of dynamical equilibrium during the interval of time. These moments are mass, the sum over all stars of the kinetic energy, and the sum over all stars of the angular momentum squared.

An evolutionary time step of three quarters of a billion years is obtained numerically with an IBM 650. The results show a flow of stars inward within one parsec from the center and an expansion beyond twenty parsecs. The core of the cluster (within 1.6 parsecs from the center) contracts. In the inner regions the mean-square velocity decreases, and beyond twenty parsecs the mean-square velocity increases. The isotropy of the distribution in velocity space increases in the inner regions and decreases for the outer sections. This result can be explained by a few stars suffering encounters and being thrown into orbits of high energy and low angular momentum.

X Rays from Collisions of Stars. S. N. MILFORD, *St. John's University, Jamaica, New York*.—Collisions of stars can occur with high relative velocity during the collision of two galaxies. At relative velocities of order 2000 km/sec the kinetic energy dominates the gravitational energy and the two stars can slice through each other without much distortion, giving two partial stars A, B, and a collision complex C. For simplicity, the case of a star sliced exactly into two hemispheres is considered. The radiation from the surface of one half of a model star is integrated to give the total radiation. The calculated luminosities range from 10^{10} suns (K dwarf) to 10^{14} suns (B star), while the wavelength of maximum photon emission is in the range 2.0 to 6.5 Å. It may be possible to observe this x radiation from satellites; for example, a half B star at 3 billion parsecs would give a flux of 10^{-2} reddened photons $\text{cm}^{-2} \text{sec}^{-1}$ above the earth's atmosphere. It is probable that the collision complex C will radiate much more strongly than the partial stars A and B. Also, the radiation will rapidly shift to longer wavelengths as A, B, C expand and cool.

The frequency of such energetic B-star collisions is difficult to estimate; by assuming a stellar population similar to that of our galaxy, it is estimated that such energetic B star collisions may occur about once per thousand years in a sphere of radius 3 billion parsecs. Collisions of stars in single galaxies within the same volume occur much more frequently, but most of these are not energetic enough to release comparable amounts of energy.

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The Structure of Virgo A. ALAN T. MOFFET, *California Institute of Technology, Pasadena, California*.—The Caltech variable baseline interferometer has been used to measure the east-west brightness distribution of Virgo A at a frequency of 958 Mc. The source is found to be complex, consisting of a core with a diameter of 0.6, contributing 50% of the total flux, surrounded by a halo with a diameter of 6.5. This confirms the recent observations made at 1420 Mc by F. Biraud, J. Lequeux, and E. LeRoux (*Observatory* 80, 116, 1960), except that at the higher frequency they find the contribution of the core to be 60% and the halo to be somewhat larger in diameter. Observations of B. Y. Mills (*Australian J. Phys.* 6, 452, 1953) are consistent with a small-diameter component contributing not more than 25% at 101 Mc. This suggests that between 101 and 1420 Mc the flux density from the core varies less steeply than $f^{-0.35}$, while that from the halo varies approximately as $f^{-1.0}$.