terms of the redshift, the curves may be regarded as supplementing the investigations of Sandage and McVittie concerning the change of redshift, with the important difference that whereas the redshift of an object during the expansion of these models is a monotonic, decreasing function of the time of observation, the corresponding luminosity distance is not.

Local Spiral Structure and Kinematic Age Estimates of Stars. THEODOR SCHMIDT-KALER, *David Dunlap Observatory*.—Early-type emission B-stars and large dark cloud complexes are shown to define local spiral features. A picture of the local spiral structure of our Galaxy is presented based on the most reliable individual spiral tracers. The distributions of stars of different groups are used to obtain kinematic age estimates (e.g., 20 million years for dwarf emission B-stars of spectral type B 2, 50 million years for dB3e, 40 million years for Type I cepheids of 10 days period). The dwarf emission B-stars fill a relatively narrow band approximately parallel to and 1^m6 above the zero-age main-sequence where according to theory the stars undergo a short contraction phase connected with the formation of a helium core.

Milky Way surface photometry is studied using an analysis of the distribution of interstellar reddening in the local domain. Widths and thickness of the local and inner arm are estimated (520 resp. 210 pc). N_{HI} (the number of H I atoms summed up over a column of 1 cm² cross section) as a function of galactic longitude is used to reanalyze the neutral-hydrogen spiral structure in the inner region of the Milky Way resulting in substantial coincidence with the optical picture.

An Interferometric Investigation of the Spatial Distribution and Motion of the Neutral Hydrogen in Seven External Galaxies. G. A. SEIELSTAD, J. B. WHITEOAK, V. RADHAKRISHNAN, AND E. B. FOMALONT, *California Institute of Technology-Owens Valley Radio Observatory*.—A preliminary investigation of the spatial distribution and motion of the neutral hydrogen in seven external galaxies has been carried out using the twin-element interferometer of the Owens Valley Radio Observatory with an east-west baseline of 100 ft. A traveling-wave maser, donated by the Bell Telephone Laboratories, was employed in one channel of the interferometer output, and a conventional crystal receiver in the other. The bandwidth in each channel was 100 kc/sec.

The galaxies studied were NGC 55, 300, 2403, 3109, 4214, 4244, and Holmberg II. For most of these galaxies, comparison of the line profiles with single-dish measurements made at Harvard indicates that

resolution effects have already become noticeable. For some of the galaxies, notably NGC 2403, the shape of the line profile changes as the galaxy rotates with respect to the fringe system of the interferometer. These changes have yielded information regarding the distribution of neutral hydrogen with the galaxy.

Phase measurements as a function of frequency have been converted into rotation curves. In Holmberg II there is no evidence of systematic motion. In the other cases, the rotation curves indicate solid-body rotation in the central portions of the galaxies. For a few cases the rotation curve was determined to the point where departures from linearity became evident.

From the rotation curves, estimates of the total masses were obtained.

Three-color Photometry of SX Cassiopeiae. CHENG-YUAN SHAO, *Harvard College Observatory*.—Photoelectric observations of this long-period (36^d57) eclipsing binary (sgA6+gG6) were made on 66 nights at Harvard's Agassiz Station during 1961–1963. These observations, extending over 21 revolutions of the system, define the shape of the light and the color curves in a homogeneous form and reveal various interesting features.

(1) The duration of primary eclipse is about 3^d6 and that of totality about 1^d3. These durations seem to be the same in all three colors. Therefore, the present material does not show variation of width of minimum with wavelength of observation.

(2) Outside eclipse, the light and colors show large scatter due to erratic variations. Considerable fluctuations on shoulders of primary eclipse are observed. The amplitudes of these variations and fluctuations are greater in shorter wavelength regions. But the star appears to be constant at totality in different cycles. Also, the maximum after primary eclipse is higher than that preceding to it.

(3) The observed ellipticity effect is more pronounced in the V than that in the B curve. The U curve is less complete, but it seems to have no observable ellipticity and no definite secondary minimum.

(4) The magnitude and colors of SX Cas in the UB V system are

	V	$B-V$	$U-B$
Maximum	8 ^m 96	+0 ^m 72	+0 ^m 20
Primary minimum	9.83	+1.32	+0.59
Secondary minimum	9.32	+0.56	+0.05

(5) When the observed color indices are corrected for a rough reddening value of $E_y \sim 0^m3$, the unred-