three second-order differential equations $G_1^1=0$, $G_2^2=0$, and $G_4^4=0$, of which only two are actually independent. Examples are given of using these integrals to derive expressions for the interval ds which have definite postulated properties and yet satisfy $G_\mu^\nu=0$; the integrals are more convenient for this purpose than the differential equations. They are also serviceable for obtaining certain physical quantities which are independent of the choice of coordinate system. The identical relation between G_1^1 , G_2^2 , and G_4^4 is given explicitly, and it is shown that by the same derivation the known equation for a perfect fluid, $dp_0/dr + \frac{1}{2}\tau'(p_0 + \rho_0 c^2) = 0$ can be obtained without the usual appeal to the explicit forms of G_1^1 , G_2^2 , and G_4^4 .

On Light Tracks Near a very Massive Star.

ROBERT D'E. ATKINSON, *Indiana University*.—The equations of motion for a material particle, and for a photon, in spherically symmetrical non-Euclidean space, are given in a general form, not necessarily relativistic and not restricted to any particular choice of r coordinate; they are applied to the case of a photon moving in a circle around the origin. The conditions $G_\mu^\nu=0$ are then added, still leaving the choice of coordinate system free, to facilitate drawing the distinction between relativistic results dependent on the system and those independent of it. The radius of the photon circle ($3m$ in the Schwarzschild system) depends on the system; the redshift for an atom momentarily at rest on that circle does not; it is $z=\sqrt{3}-1$. The period of a photon revolving in the circle is $6\sqrt{3}\pi m/c$, independent of the system. Every apse on a photon's path, outside the circle, is a periastron, and vice versa, so that no photon can cross the circumference twice; thus if a photon moving in the circle is infinitesimally perturbed outward or inward, it will spiral out and go to infinity, or will plunge in toward the star. The perpendicular distance from the origin to its asymptotic path at infinity is $3\sqrt{3}m$, independent of the system, and a star which is as small as the photon circle will thus appear, to a distant observer, as a disk of radius $3\sqrt{3}m$. (If the star's mass is $10^8 M_\odot$, this apparent radius is about $5\frac{1}{2}$ a.u.) The star cannot appear any smaller, however small it actually is; it will, however, appear more redshifted and less limb-darkened if it is smaller. The fact that any of the admissible coordinate systems can be regarded as rigorously Euclidean is discussed, and the derivation on this basis of the relativistic equations of motion, given previously (Atkinson, 1963) for the isotropic system, is extended to all others.

Effect of Radiation Pressure on Stellar Models.

J. R. AUMAN AND J. BAHNG, *Dearborn Observatory*.—A study has been made of the effect of including radiation pressure in the calculation of interior models for main sequence stars in the mass range from 2 to 5 solar masses. The inclusion of radiation pressure reduces the total luminosity slightly, but the radius remains practically unchanged. The largest effect is found in the size of the convective core; it is increased substantially when the radiation pressure is taken into account. Although the resulting changes on the structure of main sequence stars are quite small, the reduced luminosity and increased convective core will appreciably lengthen the time scale of subsequent evolution of these stars.

The Bright Stars in the Region of NGC 6871.

A. H. BATTEN, *Dominion Astrophysical Observatory*.—Spectroscopic observations have been made at the Dominion Astrophysical Observatory of 11 bright stars believed to be associated with the galactic cluster NGC 6871. The spectrograms have been measured for radial velocity and also used to determine spectroscopic absolute magnitudes from the equivalent width of H_γ . The spectral types all lie in the range O4.5–B2. At least seven of the stars vary in radial velocity, so that radial velocity is not a good criterion of membership in the cluster. Photoelectric colors and magnitudes are available for all the stars, so it is possible to determine individual distances. A plot of the apparent visual magnitude corrected for absorption against the spectroscopic absolute magnitude is useful in the separation of members and nonmembers of the cluster, and also in the determination of the distance of the cluster. The cluster NGC 6871 is estimated to be at a distance of 1.2 kpc. Six of the stars can reasonably be considered to be cluster members, and a good case exists for a seventh. Three stars, which are not close to the cluster in the sky, do not appear to be members. The eleventh star, BD +35° 3955, is puzzling. Apparently right in the cluster, as projected on the sky, its absolute magnitude indicates it is nearly three times as far away. The intensity of the interstellar K line for BD +35° 3955 is identical with the mean for the cluster. On the other hand, the $\lambda 4430$ interstellar band is stronger in BD 35° 3955 than in the other stars. The spectrum of BD +35° 3955 shows unusually strong lines of ionized oxygen.

Astrometric-Spectroscopic Triple System ω

PISCUM. WALLACE R. BEARDSLEY, *Allegheny Observatory*.—This star was announced as a spectroscopic binary by Spencer-Jones (*Cape Ann.* 10, 129, 1928) on the basis of five plates taken at the Cape