Werk

Titel: Astronomie und Astrophysik (s. a. Mechanik; s. a. Relativitätstheorie; s. a. Quan...

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Polynoms bestimmt sich aus der Forderung, daß eine vorgegebene Anzahl stabiler Bahnen möglich sein soll. Der Verf. glaubt, auf Grund dieser Hypothese das Auftreten von Heaviside-Schichten erklären zu können. *A. Klose* (Berlin).

Swings, P., and S. Chandrasekhar: On the distribution of the absorbing atoms in the reversing layers of stars and the formation of blended absorption lines. Monthly Not. Roy. Astron. Soc. **97**, 24—37 (1936).

In this paper a study is made of the distribution of absorbing atoms of specified ionization and excitation as a function of the optical thickness of the stellar atmosphere. A numerical investigation of the cases of H and O^+ in *B*-type stars and of Ca^+ and H in *A*-type stars is given. The differences of distribution are very conspicuous, and the effect of surface gravity turns out to be important. — The authors then study the conditions for radiative equilibrium in a sharply stratified atmosphere, and develop a formula for the corresponding absorption line intensities. This formula is then applied to the explanation of the measurements by Swings and Struve who found, that absorption lines appearing in the wings of other lines have peculiar intensities which cannot be accounted for by the usual formulae. The new formula successfully interpretes these measurements when certain assumptions are introduced which roughly speaking would mean that the distribution of absorbing atoms is similar to that of a sharp stratification. — The problem discussed in this paper is of importance in connection with problems of spectral classification and dissociative equilibria of molecular compounds. *Steensholt* (Princeton, N. J.).

Minkowski, R.: Note on the motion of masses of gas near novae. Astrophys. J. **85**, 18—25 (1937).

Some of the spectral changes in a nova are usually interpreted on the hypothesis of a thin expanding shell of gas thrown off by the star, its initial acceleration being supposed due to radiation pressure, and its subsequent retardation to the star's gravitational attraction. The author examines these explanations quantitatively. On the simplifying assumption that the shell consists of hydrogen only, and estimating the total absorption produced by it, he gets for its mass in a typical case 10^{-8} to 10^{-6} solar masses. He then finds that a mass of this order could in fact experience an outward acceleration of the order observed, due to radiation pressure from radiation above the limit of the Lyman series, with a reasonable value of the surface temperature of the central star producing this radiation. However, in order to produce the retardation that has been observed in later stages in the case of a number of novae, he finds that the star would have to have an improbably high mass. If therefore the hypothesis of the expanding shell is to be retained, some force other than gravity must be effective at this stage. Electrostatic forces are shown to be improbable. Magnetic forces could have an effect only if the atoms are electrically charged and have sufficiently long free paths. The author estimates, from the low pressures required for the appearance of forbidden lines, as observed, that a magnetic field of about 10^{-3} gauss would have an appreciable effect on the motions of the gases. But the difficulties may have to be resolved by supposing the observed motions to take place in an extended atmosphere, and not to belong to a thin shell. *McCrea.*

Sevin, Émile: Sur le rayonnement cosmique et les étoiles de la série principale. C. R. Acad. Sci., Paris **204**, 230—233 (1937).

The author finds that the frequencies associated with electron spin in his theory (this Zbl. **4**, 420) correspond to the energies of particles at temperatures of the supposed order of the central temperatures of stars of the main series, and that these energies, multiplied by the ratio of the mass of the proton to that of the electron, are of the order of Millikan's values for primary cosmic ray energies. *W. H. McCrea* (Belfast).

Hund, F.: Materie unter sehr hohen Drucken und Temperaturen. Erg. exakt. Naturwiss. **15**, 189—228 (1936).

The paper is a report on the properties of matter at very high temperatures and