Werk

Titel: Relativitätstheorie (s. a. Geometrie; s. a. Quantentheorie; s. a. Astronomie und ...

Jahr: 1936

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schon mehrfach in der Himmelsmechanik benutzt wurde (z. B. bei der Berechnung der Störungen der Kometen), sind die Störungskräfte der inneren Planeten klein und ändern sich langsamer. Verf. stellt neue angenäherte Formeln zur Berechnung der Störungskräfte der inneren Planeten und gibt eine allgemeine Theorie zur Berechnung der absoluten Störungen der Asteroiden in Abhängigkeit von der störenden Wirkung der inneren Planeten. *A. Andronoff, A. Witt* (Moskau).

Gialanella, L.: Sulle perturbazioni della eccentricità nel problema dei due corpi di masse lentamente crescenti. Atti Accad. naz. Lincei, Rend., VI. s. **22**, 529—533 (1935).

Suppose that the mass of the system varies according to the law $m = m_0 + \varepsilon\varphi(t)$, where m_0 is constant, ε is small and $\varphi(t)$ is either an increasing exponential function of the time or a polynomial with positive coefficients of degree not less than the third. Confining attention to elliptical motion, it is then shown that the first order variation of the eccentricity during a complete revolution (with respect to ε) is negative, thus putting into evidence the observed cosmological tendency toward circular orbits. If, however, φ is a linear or quadratic polynomial, the first order variation of the eccentricity is zero. *D. C. Lewis* (Ithaca, N. Y., U.S.A.).

Armellini, G.: L'eccentricità dei sistemi binari nel caso di masse variabili col tempo. Atti Accad. naz. Lincei, Rend., VI. s. **23**, 165—170 (1936).

A polynomial equation is found connecting the eccentricity and its first and second derivatives with the mass and its first and second derivatives. *D. C. Lewis.*

Relativitätstheorie.

Colwell, Robert Cameron: Concealed systems and relativity. Philos. Mag., VII. s. **21**, 976—980 (1936).

Fragen der Interpretation einiger Formeln der speziellen Relativitätstheorie. *Heckmann* (Göttingen).

Engstrøm, H. T., and Max Zorn: The transformation of reference systems in the Page relativity. Physic. Rev., II. s. **49**, 701—702 (1936).

In the equivalent reference-systems of Leigh Page's relatively (this Zbl. **13**, 234) light travels rectilinearly with constant velocity, but two equivalent systems are not necessarily Lorentz transforms of one another. In the present note the authors point out that the whole group of transformations belonging to Page's relativity consists of all transformations which leave invariant the equation $dx^2 + dy^2 + dz^2 + d\tau^2 = 0$ ($\tau = ict$), and is therefore (according to S. Lie) a 15-parameter group of conformal transformations. They further show that the assumption of constant light-velocity, together with the existence of one reference-system with straight light paths, implies the straightness of light paths in all such systems. *H. S. Ruse* (Edinburgh).

Robertson, H. P.: An interpretation of Page's „New relativity". Physic. Rev., II. s. **49**, 755—760 (1936).

The author examines Page's "New Relativity" (this Zbl. **13**, 234) in the light of his own general kinematical theory (this Zbl. **13**, 39), of which, he concludes, Page's theory is a special case. This being so, Page's work is readily understandable in terms of a simple though somewhat artificial space-time of a type met with in general relativity, so that there is no real foundation for his contention that the new relativity renders Einstein's theory untenable. The author shows incidentally that the transformation derived by Page for relatively accelerated reference systems belongs to the 4-dimensional conformal group (cf. Engstrøm and Zorn, the prec. rev.), and remarks that an electrodynamical theory based on transformations of this type has been developed by H. Bateman [Proc. London Math. Soc. **7**, 70 (1908); **8**, 223 (1909)] and E. Cunningham [ibid. **8**, 77 (1909)]. *H. S. Ruse* (Edinburgh).

Robertson, H. P.: Kinematics and world-structure. II. Astrophys. J. 83, 187—201 (1936).

Robertson, H. P.: Kinematics and world-structure. III. Astrophys. J. 83, 257—271 (1936).

Nachdem der Verf. in einer ersten Arbeit (I) [Astrophys. J. 82, 284—301 (1935); vgl. dies. Zbl. 13, 39] aus dem kosmologischen Homogenitätspostulat Folgerungen für die Metrik der Welt gezogen hat, betrachtet er jetzt (II) die Bewegung von Probepartikeln relativ zu den Fundamentalbeobachtern. Die Bewegungsgleichungen werden bis auf eine willkürliche Funktion zweier Variabler bestimmt. Eine explizite Gravitationstheorie ist bis dahin nicht benutzt. Als Erläuterung wird dann die Allg. Rel.Th. und eine passende Verallgemeinerung der Newtonschen Theorie herangezogen. In der nächsten Arbeit (III) werden statistisch-kinematische Betrachtungen im Rahmen der vorhergehenden Teile (I und II) angestellt, die dann wieder auf die beiden Gravitationstheorien angewendet werden. Die Milnesche kosmologische Statistik ist in den allgemeinen Ausführungen des Verf. mitenthalten. — Im übrigen muß auf die Arbeiten selbst verwiesen werden, deren allgemeine Tendenz die Verteidigung der Kosmologie der Allg. Rel.Th. ist. *Heckmann* (Göttingen).

Whitrow, G. J.: World-structure and the sample principle. Z. Astrophys. 12, 47—55 (1936).

Ein neuer Zugang zum hydrokinematischen System der Fundamentalpartikel in der Milneschen Kosmologie. *Heckmann* (Göttingen).

Serghiesco, Stephan: Sur une théorie mécanique du corpuscule de lumière. C. R. Acad. Sci., Paris 202, 1563—1565 (1936).

This note contains a demonstration, based upon the theorem of the equivalence of mass and energy, of the law of refraction for a corpuscle of light. It is written for the purpose of obtaining physical interpretations of certain known results. *H. S. Ruse.*

Serghiesco, Stéphan: Sur la formule de Fresnel dans une théorie corpusculaire de la lumière. C. R. Acad. Sci., Paris 202, 1761—1762 (1936).

Making use of results obtained in an earlier note (see the prec. rev.), the author gives a simple interpretation of Fresnel's formula for the velocity of light in a moving medium. *H. S. Ruse* (Edinburgh).

Hély, Jean: Sur une théorie synthétique de la gravitation et de l'électromagnétisme. C. R. Acad. Sci., Paris 202, 1659—1660 (1936).

Hermann, H.: Der Lenard-Tomascheksche Betrag der Lichtablenkung im Schwerefeld. Z. Physik 100, 667—668 (1936).

Walker, A. G.: The Boltzmann equations in general relativity. Proc. Edinburgh Math. Soc., II. s. 4, 238—253 (1936).

In general space-time consider a continuous distribution of material particles and photons. If the system is specified by distribution-functions (one for material particles and one for photons) at each point of space-time, then these functions are restricted in that they must satisfy certain differential equations, the generalised Boltzmann equations. The object of the paper is to obtain these equations, on the assumption that no collisions take place. The Boltzmann equations are of the type

$$\frac{\partial \chi}{\partial x^i} p^i - \frac{\partial \chi}{\partial p^i} \Gamma^i_{jk} p^j p^k = 0$$

where the x^i are general coordinates, p^i is the momentum-vector, Γ^i_{jk} are the Christoffel symbols, and χ is the distribution-function. The author develops the theory of the energy-tensor in connexion with these results, and examines in particular the case when the metric is that of the Lemaitre universe. *Whittaker* (Edinburgh).

Bronstein, M.: Quantization of gravitational waves. Ž. eksper. teoret. Fis. 6, 195 bis 236 u. engl. Zusammenfassung 236 (1936) [Russisch].

Die Arbeit enthält eine konsequente (klassische und quantenmechanische) Theorie