determine the fundamental crystal-chemical laws governing the formation of dense high-pressure phases. Particular attention on the part of both experimenters and theoreticians should be paid to the problem of the transition of dielectrics into the metallic state. Of large scientific and practical significance is the study of the mechanisms of phase transformations and chemical reactions in strong shock waves, and the investigation of the electrical, optical, and magnetic phenomena accompanying the shock compression. One should expect interesting results to be obtained from a study of the expansion of bodies compressed by strong shock waves.

[1] Ya. B. Zel'dovich and Yu. P. Raĭzer, Fizika udarnykh voln (Shock Wave Physics), Fizmatgiz, 1963.

[2] L. V. Al'tshuler, Usp. Fiz. Nauk 85, 197 (1965) [Sov. Phys.-Usp. 8, 52 (1965)].

[3] L. V. Al'tshuler and A. A. Bakanova, ibid 96, 193 (1968) [11, 678 (1969)].

[4] S. B. Kormer, ibid 94, 641 (1968) [11, 229 (1968)].

[5] L. V. Al'tshuler, B. N. Moiseev, R. F. Trunin, L. V. Popov and G. S. Simakov, Zh. Eksp. Teor. Fiz. 54, 785 (1966) [Sov. Phys.-JETP 27, 420 (1966).

[6] Comportement des milieux denses sous hautes pressions dynamiques, Paris—New York, 1968.

[7] A. A. Bakanova, I. P. Dudoladov and Yu. N. Sutulov, Fiz. Tverd. Tela 11, 1881 (1969) [Sov. Phys.-Solid State 11, 1515 (1970)].

V. B. Braginskiĭ, Detectors of Gravitational Radiation.

The article discusses the present status of searches for gravitational radiation of extraterrestrial origin. A review is presented of the results obtained in the experiments of J. Weber, and the difficulties in the interpretation of his experimental data are considered. The prospect of increasing the sensitivity of gravitational-radiation detectors are considered, especially detectors of the heterodyne type.

[1] J. Weber, Phys. Rev. Lett. 20, 1307 (1968).

[2] J. Weber, Phys. Rev. Lett. 22, 1320 (1969).

[3] I. S. Shklovskiĭ, Astron. Zh. 46, 935 (1969) [Sov. Astron. AJ 13, 734 (1970)].

[4] J. Weber, Anisotropy and Polarization in the Gravitational Radiation Experiment. Preprint (1969).

[5] V. B. Braginskiĭ, Ya. B. Zel'dovich, and V. N. Rudenko ZhETF Pis. Red. 10, 437 (1969) [JETP Letters 10, 280 (1969)].

[6] V. B. Braginskiĭ, Zh. Eksp. Teor. Fiz. 53, 1442 (1967) [Sov. Phys.-JETP 26, 835 (1967)].

[7] V. B. Braginskiĭ and V. N. Rudenko, Usp. Fiz. Nauk 100, 395 (1970) [Sov. Phys.-Usp. 13, No. 2 (1970)].

A. G. Masevich, A. M. Lozinskiĭ, and V. E. Chertoprud, Special Astronomical Observations of Artificial Celestial Bodies for Problems of Geophysics and Geodesy and in the New Large Soviet Telescope for these purposes

Accurate photographic observations of artificial earth satellites, carried out from many stations in accordance with special programs, are used sucessfully to investigate the density of the upper layers of the atmosphere and its variation as a function of the activity of the sun, to solve problems in cosmic geodesy on the basis of simultaneous observations from several stations, and to determine more accurately the earth's figure by determining the higher-order terms in the expansion of the earth's potential. This work has been carried out by the Astronomic Council of the USSR Academy of Sciences since 1957 on the basis of a specially created network of observation stations, which recently have been greatly expanded by adding stations in the African continent.

A new high-accuracy astronomical installation, specially intended for the observation of satellites, has been created in the USSR and comprises at present the largest telescope capable of following a satellite and registering the instant of observation accurate to 1 msec. This telescope is located at the Zvenigorod station of the Astronomic Council and is presently being readied for operation.

The Astronomic Council is performing statistical studies of the fluctuations of the parameters of the upper atmosphere and of the structure of the absorption bands of the variable radiation from the sun.

A. I. Nikishov and V. I. Ritus, Interaction of Electrons and Photons with a Very Strong Electromagnetic Field.

A characteristic value of the intensity of the electromagnetic field in quantum electrodynamics is

$$B_0 = m^2c^3/e\hbar = 4{,}4\cdot 10^{13}\ \text{э}.$$

At the Compton wavelength, such a field performs work equal to mc^2 (we use $\hbar = c = 1$). The parameter B_0 is characteristic of nonlinear quantum-electrodynamic effects (for example, the passage of an electron through a potential barrier, pair production by an electric field in vacuum), which reach their optimal values in fields of the order of B_0. Unfortunately, the intensities of the existing fields are weaker than B_0 by many orders of magnitude, and therefore the probabilities of many effects are exponentially small and incapable of being observed. It is possible, however, to observe certain nonlinear quantum effects also at fields of intensity $B \ll B_0$, by using an ultrarelativistic particle with momentum $p \sim m(B_0/B)$. Then, in the particle rest system, the intensity of the field will be of the order of B_0 and the probability of the process becomes optimal. Regardless of the type of the field in the laboratory system, in the particle rest system it will be very close to the field of a plane wave, for which $E \perp H$ and $E = H$. As a result, the probabilities for an ultrarelativistic particle in a constant field will depend on a single invariant parameter

$$\chi = [(F_{\mu\nu}p_\nu)^2]^{1/2}/B_0 m,$$

equal in order of magnitude to the field in the proper system, and referred to B_0 or Bp_0/B_0m; the dependence on purely-field invariants that are small compared with 1 and χ can be neglected. The probabilities $W(\chi)$ describe exactly the processes in a constant crossed field ($E \perp H$, $E = H$) and approximately those in an arbitrary constant field; the degree of approxima-