tionship between string theory and conformal-invariant two-dimensional theory. The papers by L. Mesincescu and W. Siegel analyze the problems of the theory of superstrings within the framework of the covariant formalism developed by M. Green and J. Schwarz.

The articles of the second section (the authors are W. Siegel, B. Zweibach and T. Banks, and M. Peskin) discuss different aspects of the second-quantized string theory in which the principal object is the string field—a functional of the contour in space-time. The necessity is emphasized of introducing an infinite set of string fields in order to obtain a local covariant action for a string field theory.

In the articles of the "String phenomenology" section phenomenological predictions of the theory of heterotic superstrings are analyzed within the framework of the scheme of compactification of the six "extra" dimensions onto the so-called Calabi-Yau space (a 6-dimensional Kähler manifold with the SU(3) holonomy group). In particular, a detailed discussion is given of the mathematical properties of the Calabi-Yau space (G. Horowitz), the correspondence at low energies with the grand unification theories (A. Strominger, C. Nappi, B. Ovrut) and other problems.

On the whole the book gives a quite complete idea concerning the level of development of superstring theory as of the end of 1985 and can serve as an introduction into this rapidly developing field of modern theoretical physics. It is of undoubted interest both for specialists, and also for those beginning the study of string theory.

Physical crystallography

V. G. Terziev

Usp. Fiz. Nauk **153**, 533 (November 1987)

P. Paufler, *Physikalische Kristallographie*, Akademie-Verlag, Berlin, 1986, pp. 325.

The book by P. Paufler, a professor at the Karl Marx University in Leipzig, entitled "Physikalsiche Kristallographie" is a presentation of a course of lectures which the author gave to physics students of the third and fourth years. The monograph is devoted to a description of the effect on the crystal properties of anisotropy arising in crystals due to an ordered atomic structure. As the author indicates in the introduction, at present there already exist a number of textbooks on this subject which have achieved good reputations, including the well-known book by the Soviet authors Sirotin, Shaskol'skaya, Vaĭnshteĭn, Zheludev, and others.

In the present volume the material is presented predominantly by expressing tensor quantities in a form which is independent of coordinates. This, in the author's opinion, leads not only to a saving of space, but also to a more easily understandable presentation of the material. The content of physical crystallography is not reduced by the author to a phenomenological description of all the crystal properties with the aid of tensors, since a detailed study of these properties is the subject of solid-state physics and chemistry and a number of other sciences. Moreover, a detailed description of a tremendous amount of experimental material would only obscure the presentation.

The book consists of ten chapters. The first two chapters contain a brief presentation of the principal physical concepts and mathematical apparatus needed for understanding the subsequent material. Then the basic physical crystal properties are examined with these properties grouped in accordance with the rank of the tensors with the aid of which they are described. The material, as a rule, is presented in the following sequence: experimental data, then a phenomenological description of the effect and its atomistic interpretation. The book concludes with a list of references consisting of more than 500 titles and a number of appendices.

On the whole the book under review is a well-written textbook on physical crystallography and can be of use both to undergraduates and to graduate physics students, and also to specialists in the field of solid-state physics.

Translated by G. M. Volkoff

0038-5670/87/111013-01$01.80