

tion metals." S. K. Sikka and V. Vidjayakumar—"Changes in the electronic structure at high pressures." B. L. Diorff *et al.*—"Magnetism and chemical order in alloys." J. B. Sokoloff—"Anomalous electronic structure and transport

properties of quasicrystals." The book contains a number of other articles which are, apparently, of somewhat lesser interest.

## High magnetic fields in semiconductor physics

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Usp. Fiz. Nauk **155**, 736-737 (August 1988)

*High magnetic fields in semiconductor physics.* Ed. G. Landwehr. Springer-Verlag, Berlin; Heidelberg; New York; London; Tokyo, 1987. 562 pp. (Springer Series in Solid-State Sciences V. 71)

The book under review contains papers presented at the international conference "Application of High Magnetic Fields in Semiconductor Physics" which took place between 18 and 22 August 1986 in Würzburg (FRG). This conference was devoted to the urgent problems of semiconductor physics—the quantum Hall effect, the physics of semiconductor heterostructures and superlattices, the metal-dielectric transition, semimagnetic semiconductors and other complicated problems.

The book consists of nine parts. The first two parts (27 reports) are devoted to the integral and fractional quantum Hall effect. The scaling and percolation approximation to the quantum Hall effect, the density of states at the Landau levels in two-dimensional systems, and the quantum Hall effect in bicrystals are investigated. One should note the review papers by T. Ando on localization on Landau levels in two-dimensional systems and by I. V. Kukushkin and V. B. Timofeev on the fractional quantum Hall effect.

The third and fourth parts contain 27 reports devoted to the investigation of the effect of a magnetic field on the properties of semiconductor heterostructures and superlattices. For these systems a discussion is given of the tunnel and magnetoplasma resonances, magnetoluminescence, inelastic scattering of light, and also transport phenomena in high magnetic fields. Of particular interest is the investigation of magnetotransport in  $\delta$ -like layers of donors (F. Koch, A. Zrenner, and K. Ploog) and in the submicron semiconductor wires (R. Taylor *et al.*).

The fifth part (4 papers) examines the metal dielectric transition in strong magnetic field (in  $n$ -type silicon, in InSb, in the GaAsAlGaAs heterostructure). We note the discussion of the Anderson localization in three-dimensional systems in quantizing magnetic fields (I. Ono, T. Otsuki).

The sixth part (8 papers) is devoted to an investigation of semimagnetic semiconductors ( $A^4B^6$  compounds). Magnetospectroscopy, the Shubnikov-de Haas and Hall effects and also metal-dielectric transition are discussed. Of particular interest are the review papers by H. Pascher and G. Bauer, and also by M. Grinberg which report the latest achievements in the physics of semimagnetic semiconductors.

The seventh and eighth parts contain 12 papers devoted to the investigation of magneto-optics and magnetotransport in three-dimensional systems. Nonlinear spectroscopy and the magnetophonon effect in narrow-gap semiconductors, hopping conductivity in  $n$ -InP and other problems are discussed. We note the review of theoretical papers on the Wigner crystallization (R. Gerhards) and the investigation of the condensation of electrons in  $n$ -HgCdTe (G. Nimtz).

In the last (ninth) part (3 reports) experiments are examined on ultrahigh megagauss magnetic fields, in particular, the investigation of magnetospectroscopy of excitons in quantum wells of GaAs-AlGaAs, heterostructures, in anthracene and BiI<sub>3</sub>, and also of cyclotron resonance of electrons in PbTe, and electrons and holes in GaAs-AlGaAs superlattices.

The book under review gives a sufficiently complete idea of a number of interesting and at the moment rapidly developing directions of semiconductor physics (the quantum Hall effect, and semiconductor superlattices). The reports are written by authors who are prominent specialists in these fields (T. Ando, K. von Klitzing, V. B. Timofeev, K. Ploog and others). The book is excellently illustrated (378 figures).

The contents of the book are of essential interest for a wide circle of theoreticians and experiments specializing in a solid-state physics.

Translated by G. M. Volkoff