

involved on work showing how the details of fission are dominated by shell effects and this work was described in a talk by R. Balian. Some of the ways fission is contributing to the main stream through the spectroscopy of the shape isomers were discussed by S. Bjornholm. One of the highlights of the fission contributions was the experiment carried out at Munich in which the E2 internal conversion lines of the ground state rotational band of the shape isomer have been observed and show the expected larger moment of inertia.

It was the calculations of the nuclear potential energy surface which led to the speculations on super heavy elements and the possibility of their

formation in heavy ion reactions. Swiatecki, in a talk linking fission and heavy ion reactions, emphasized the relevance of the information obtained on the shape of the nuclear potential energy surface to the possibility of formation of super heavy elements and the critical need for knowledge of nuclear viscosity.

A different approach to the nucleus is involved in the remaining topic covered by the conference — nuclear physics above 100 MeV, in which high energy projectiles or mesons are used to probe the fine structure of nuclei. It is from these experiments, as Wilkinson emphasized in a closing talk, that we are getting evidence that the nucleus really is made from neutrons and protons. There were contributions

showing the effect of the 3-3 resonance in pion-nucleus scattering and in photo-meson production in nuclei, but the inelastic electron scattering and the  $p,2p$  experiments which reveal the low-lying bound levels still appear to disagree on the position of the lowest  $s$  level.

This conference showed that heavy ion and high energy approaches to the nucleus are beginning to take us away from the traditional preoccupation with light ion reactions and the few nucleons at the top of the Fermi sea. It was successful and timely in bringing together these developing fields and in highlighting areas where, with appropriate facilities, our understanding of the nucleus will be enriched.  
L.L. Green

## Physics of Semiconductors

25-29 July 1972, Warsaw, Poland

The International Conference on the Physics of Semiconductors was held in Warsaw, 25-29 July 1972, as the eleventh in the series of biannual international conferences, which are supposed to summarize two-year periods in the development of semiconductor physics.

The conference was organized by the Institute of Physics of the Polish Academy of Sciences together with the University of Warsaw and sponsored by the International Union of Pure and Applied Physics.

The organizers received more than 450 contributed papers, of which they could accept less than one-third. The invited speakers and subjects were chosen on the basis of suggestions sent to us by the members of both the International and the Polish

Programme Committees. The seven plenary invited papers should give some idea of what, we felt, are the most important subjects in the current development of semiconductor physics. **A.L. Efros** of Ioffe Institute in Leningrad spoke on *Low Temperature Conductivity of Strongly Compensated Semiconductors*, **T. Kasuya** of Thoku University in Sendai on *New Aspects of the Electronic Properties of Magnetic Semiconductors*, **W. Paul** of Harvard University on *Current Status of Some Basic Problems in Amorphous Semiconductors*, **I. Solomon** of Ecole Polytechnique in Paris on *Spin-Dependent Properties of Semiconductors*, **D.C. Tsui** of Bell Laboratories on *Quantum Effects in the Semiconductor Surface Layer*, and **W. Zawadzki** of the Institute of Physics

in Warsaw on *Electron Scattering and Transport Phenomena in Small-Gap Semiconductors*.

The conference was attended by more than 600 participants. Among the biggest delegations were: Poland — 110, USA and USSR — 80 each, France and German Federal Republic — 50 each, Czechoslovakia and German Democratic Republic — 30 each, Great Britain and Japan — 25 each.

The general opinion was that the conference was a success. The participants complimented the programme, as being truly international and well-organized both in time and in the choice of invited papers.

The next conference will be held in Stuttgart in 1974, and will be organized by Dr. O.G. Folberth, IBM Component Development Laboratory, Schönaicherstr. 220, D-703 Böblingen, Fed. Rep. of Germany.

J. Kolodziejczak

## ESSDERC 1972

11-15 September 1972, Lancaster, UK

The Second European Solid State Device Research Conference was held at the University of Lancaster, England, from 11-15 September 1972, and was attended by over 300 scientists from 19 countries. This series of conferences has become established by combining the German and British meetings on the same topic, and like them features a small number of invited lectures and a large number of ten-minute contributed papers. This year the invited talks were by **E. Ash** (*Integrated Optics*), **M. Bernard** (*Non-Linear Optical Susceptibilities*), **J. Colins** (*Ferrimagnetic Film Microwave*

*Devices*), **W. Merz** (*Ferroelectric Applications*), **E.G.S. Paige** (*Acoustic Surface Wave Devices*) and **H. Queisser** (*Semiconductors in the Relaxation Regime*). All reached an unusually high standard, but Hans Queisser's contribution must be singled out as exceptional. A stranger entering the hall during the applause at the end might well have thought that a US Presidential candidate was being nominated! The talk was concerned with the behaviour of semiconductors when the carrier lifetime was shorter than the dielectric relaxation time, a condition that causes most of our

standard assumptions to become invalid, and that turns conventional teaching on its head. One feature of the other invited talks that aroused some comment was the avoidance of semiconductor topics. Most solid state device conferences in the past have been heavily weighted towards semiconductors, and it was interesting to note how so many other areas are now proving ripe for exploitation. A special evening discourse by W. Shockley on the early history that lay behind the invention of the transistor entertained a large audience. For an hour or so, they were taken back twenty-five years, and treated to a well-prepared and documented exposition, bringing in characters familiar and unfamiliar, and tracing their subsequent fates.

Strict refereeing by a knowledgeable programme committee had been unable to fault nearly 100 contributed papers, and two parallel sessions were needed to accommodate them. Fortunately, Lancaster has suitable lecture theatres adjacent to each other, and it was relatively easy to commute. The organizers consistently allotted the more popular session to the smaller theatre, but there were few complaints. Topics covered included Microwave Devices, Schottky Barriers, Surface Acoustic Waves, Semiconductor Material Processing, Liquid Crystals, Electroluminescence and Glassy Switches, but most excitement was generated by a paper from M.F. Tompsett, in which he showed a colour TV picture obtained using charge-coupled image-sensing arrays.

The extra-curricular activities were also educational. Those who took the afternoon outing towards the Lake District saw one lake, one stately home, and one coach crash. At the dinner at the Wintergarden in Morecambe, the guest speaker was F.J.M. Laver, the U.K. Post Office Board Member for Data Processing, and both his speech and the menu were excellent. We are told that the dozen ladies who came with their husbands made good use of their time, with visits arranged to Blackpool, the Lake District and Lancaster Castle.

ESSDERC 1973 is to be held in Munich from 18-21 September 1973, and the Chairman will be H. Weiss, Siemens Research Laboratories, Munich.  
C. Hilsom

## Society News

### Reduced rates to journals for IOM

In 1973, Individual Ordinary Members of EPS have been offered the following reduced rates to journals published by The Institute of Physics:

#### Journal of Physics Series

A: <i>Mathematical, Nuclear and General</i>	12 issues £ 8.00
B: <i>Atomic and Molecular Physics</i>	12 issues £ 8.00
C: <i>Solid State Physics</i>	24 issues £ 12.00
D: <i>Applied Physics</i>	18 issues £ 10.00
E: <i>Scientific Instruments</i>	12 issues £ 6.00
F: <i>Metal Physics</i>	12 issues £ 6.00

Offprints of all letters in <i>Journal of Physics A-D and F</i>	78 issues £ 12.00
<i>Physics in Medicine and Biology</i>	6 issues £ 4.50

### Individual Ordinary Members

The following have been accepted as Individual Ordinary Members of EPS:

E. Arimondo, Pisa	J. Hevesi, Szeged	H. Niedrig, Berlin
O.-M. Bilaniuk, Grenoble	H.E. Hoenig, Frankfurt/Main	M. Ricco, Lucca
A. Blaauw, Hamburg	A. Hryniewicz, Krakow	E. Roeckl, Darmstadt
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D. Callebaut, Dendermonde	Q. Kessel, Storrs	K.S. Sood, Sutton
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D. Hahn, Berlin	K. Moriarty, Egham	R.E. Woodham, Bromley
W. Hering, Garching		

<i>Reports on Progress in Physics</i>	12 issues (journal version)	£ 10.00
	3 issues (bound volumes)	£ 10.00
<i>Physics in Technology</i> (formerly <i>Review of Physics in Technology</i> )	3 issues	£ 4.00
<i>Physics Education</i>	7 issues	£ 3.50
<i>Physics Bulletin</i>	12 issues	£ 4.00

Further details and sample copies of these journals may be obtained from M. Grover, Circulation Manager, The Institute of Physics, Netherpton House, 23 Marsh Street, Bristol BS1 4BT, UK to whom subscriptions should also be sent.

### Correction

We apologise to A. Baldin (Dubna) for omission of his name from the Board of the High Energy and Particle Physics Division in the November 1972 issue, page 4.

## New Books from North-Holland

### Many-Body Problems

By G.E. BROWN, NORDITA, Copenhagen, Denmark, and State University of New York, Stony Brook, U.S.A.

1972. 240 pages  
Dfl. 40.00 (ca. \$ 12.50) Paperback

Contents: Self-Consistent Fields. Occupation Number Representations. Perturbation Theory. Excitations and Green's Functions. Random-Phase Approximation. The Landau Theory of Fermi Liquids. Phonons and Electrons. Theory of Superconductivity.

### Polarons in Ionic Crystals and Polar Semiconductors

Proceedings of the 1971 Antwerp Advanced Study Institute on Fröhlich Polarons and Electron-Phonon Interactions in Polar Semiconductors.

Edited by JOZEF T. DEVREESE, University of Antwerp, Belgium.

1972. 807 pages  
Dfl. 140.00 (ca. \$ 43.75)

Contains the proceedings of a meeting held to review the progress made in polaron physics since 1962. The major theoretical and experimental developments dealt with in this book include: magneto-optical properties (with applications relating to II-VI and III-V semiconductors); internal excited states (resonances) of polarons and their role in the optical and magneto-optical properties of free and bound polarons (applications to alkali-halides, thallos-halides and silver-halides); transport properties (including high field effects) with an extension of the KUBO formation; polarons in degenerate semiconductors; piezo-polarons; acousto-polarons; small-polarons (transition metal oxides); excitons; effects of nonparabolicity of bands; alternative formulations of the theory. With contributions from leading physicists in the field, the book is intended for graduate physicists with a background in solid state physics. Many tables are given which relate physical constants to polaron properties.

### Principles and Application of Magnetic Cooling

By R.P. HUDSON, National Bureau of Standards, Washington.

NORTH-HOLLAND SERIES IN LOW TEMPERATURE PHYSICS, Vol. 2

1972. 248 pages  
Dfl. 60.00 (ca. \$ 18.75) Paperback

Contents: Historical introduction. Principles of magnetic cooling. Paramagnetism. Experimental procedure. Properties of individual substances. Nuclear magnetism. Appendices: Effects of a crystal field splitting. Schottky-effect anomaly in heat capacity. Singlet states and the quenching of orbital angular momentum. Kramers' theorem. Generation of matrix elements of angular momentum operators. High temperature approximations using principle of invariance of diagonal sum, or trace. Pulsed nuclear magnetic resonance. Vapour pressure tables for <sup>3</sup>He and <sup>4</sup>He.

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