

"bioelectronics and biomaterials". Here I will focus attention especially on the latter topic. Biosensor research is clearly the dominant theme in this area. *I. J. Higgins* (Cranfield Institute of Technology, UK) reviewed the rapid development in the field of biosensors during the last few years. He expects protein engineering to make important advances in improving the stability of the biological components of biosensors, the most serious problem in current biosensor research. *Higgins* also reported on basic approaches to the development of biochips and biocomputers. He and others believe that bacteriorhodopsin will play an important role in that field. However, this work is still in its infancy, and it could take several more years to achieve a real breakthrough. *M. Thompson* (University of Toronto, Canada) gave a comprehensive overview of the problems of chemoreception and its role in biosensor development. The talk by *I. Karube* (Tokyo Institute of Technology, Yokohama, Japan) illustrated the steady progress being made in Japanese biosensor research and its industrial applications. This again reinforced the impression that Japanese leadership in the field of semiconductor-based biosensors is unchallenged. *M. T. Flanagan* (University College, London, UK) described the rapid evolution in the field of optical biosensors and the impressive achieve-

ments of his group in this technology. Thin films of trivalent metal phosphates have been developed by his group as new materials for optical waveguides. The cheap production of such films, their excellent structural integrity, and the ease of immobilizing proteins on their surfaces, could lead to wide use of such materials in the field of optical biosensors.

A special session of the conference was devoted to "research planning and training in biotechnology". National institutions such as the "Lund Science Park" (*S. J. Holm*, Lund, Sweden) provide a unique opportunity for scientists to offer their results to industry. Whereas such "technology parks" (usually in the neighbourhood of a university) work more on a local level, organizations such as GBF (*I. Klein*, Braunschweig, FRG, and EUREKA (*K. Draxler*, Vienna, Austria), aim to coordinate research projects on an international level. The EIT will also operate in this way. If the nearly perfect organization of this conference by *M. Chopplet* (EIT, Paris, France) can be extended into the EIT's work as mediator and communicator between industry and university, this institution will provide new leadership in this field.

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## The 1988 Fall Meeting of the Materials Research Society in Boston

The MRS held its Fall Meeting, approximately the 15th in its history, in Boston from 28 November to 3 December. 24 symposia, each lasting three or four days, incorporating more than 2000 papers in total, plus the traditional lunch-time symposium on 'Frontiers of Materials Research', constituted the main agenda. The printed program, incorporating abstracts to all papers, occupies 644 folio pages. The list of authors' names alone, just short of 5000, printed in very small type in three columns, fills 18 pages. In addition to the main programme, 27 short technical courses were on firm offer, at prices ranging from \$ 320 to \$ 770, with a further possible 23 courses on 'sale or return'. In addition, Prof. *Thurrow* of the Massachusetts Institute of Technology delivered a lecture telling his compatriots what their country needed to do to maintain technological leadership, and Prof. *Jacques Friedel* of Paris gave a lecture of reminiscences to mark the occasion of his receipt of the MRS's annual award for distinguished materials scientists.

About 4000 participants crowded the two linked hotels which housed the Meeting (not all authors of multi-author papers were present), many spilling off at intervals to drink

gallons of Coca-Cola, view the extensive exhibition of equipment and books or to consult the in-house employment exchange put on offer by the American Institute of Physics for the MRS. (This offers an indication of the type of jobs favored by MRS members.) The total membership of the MRS is now over 8000. Two peculiarities certainly help the MRS to recruit new members: all those who paid the \$ 165 registration fee were automatically registered as MRS members for the coming year, and all (except students with their reduced fee) were entitled to a free subscription, not only to the Society's *Bulletin* but also to the *Journal of Materials Research* published by the Society.

The Society, which only twelve years ago was run on a part-time and shoestring basis by a single industrial scientist, now has 18 full-time headquarters staff, most of whom seemed to be in Boston being kept extremely busy. Certainly the symposia were faultlessly organized: timekeeping was so precise that it was possible, for those nippy on their feet, to run from one symposium to another to hear a particular paper. The Meeting as a whole was masterminded by a triumvirate of scientists; these selected the symposium topics (which are proposed by enthusiasts

among the membership), and each of the approved symposia was then organized by two, three or four scientists, aided by funds provided by several corporate and government sponsors, distinct for each symposium. (The funds provided are used, *inter alia*, to contribute to some of the costs of invited speakers and some others.) The MRS as a whole has also enrolled some 150 corporate sponsors who make it possible to keep the subscription at its modest level (US \$ 50.00), so that many can afford to join.

Most of the symposia will be published in the form of volumes of camera-ready text. When this fall's publishing program is complete, the MRS will have published 144 full symposium proceedings in seven years. Some of the symposia publish only slim volumes of extended abstracts: this is entirely understandable with regard to the high- $T_c$  superconductor symposium, which (as in previous years) will provide extended abstracts together (in due course) with an optional purchase of edited videotapes. It is less easy to understand why the symposium on 'Fractal Aspects of Materials' as in previous years only offers extended abstracts: perhaps the fractal dimension of the papers is such that an abbreviated view provides the same intellectual outline as a full paper would!

One third of the symposia were more or less closely linked to microelectronics concerns, though the titles did not always make this explicit: Advances in Materials, Processing and Devices in III-V Compound Semiconductors; Laser and Particle-Beam Modification of Chemical Processes on Surfaces; Chemical Perspectives of Microelectronic Materials; Thin Films—Stresses and Mechanical Properties ... and several others. Increasing attention to the chemical aspects of microelectronic technology has been noticeable in the last few Meetings, and this tendency has also extended to some other symposium fields (e.g.,

Graphite Intercalation Products—Science and Applications, which has been a favored field for several years). Generally speaking a new field is initially tried out in a first symposium; if the response is good, the topic may be repeated in a later Meeting, and some fields (such as Laser Annealing of Semiconductors, not represented this year) become hardy near-perennials.

After a slow start, polymers are moving into the limelight: in 1988, two symposia covered liquid-crystal polymers and rigid-rod polymers, and other topics such as diffusion in polymers were treated in earlier years. Some topics which cover a physics-chemistry spectrum are apt to be treated by a more physical approach: this is true, for instance, of the 1988 symposium on Pore Structure and Permeability of Cementitious Materials.—Metals have always been the poor relations at MRS Meetings, at least in their massive form (metallic thin films get plenty of attention!) In 1988, the third in a series of excellent symposia on High-Temperature Ordered Intermetallic Alloys was held; these alloys are of great longterm interest for aviation, both airframe and engine uses, and for some terrestrial uses as well. These symposia, like all MRS symposia, owe their inception to the advocacy of a few committed members. Perhaps in due course sufficient metallurgically inclined members will propose suitable symposium topics to improve the balance. But perhaps the apparent imbalance is as it ought to be, since MRS symposia have always tended to favor fields located in the gaps between the well established major sciences. Indeed, this sense of neglected interstices could be said to have been the reason for the creation of the MRS in the first instance.

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## Conference Calendar

March 1989				
9-10	<b>The Martensitic Transformation in Science and Technology</b> Bochum (Fed. Rep. Germany) Contact: Dtsch. Ges. Metallkd., Adenauerallee 21, D-6370 Oberursel, FRG	11-14	<b>Surface Finishing '89</b> Brighton (United Kingdom) Contact: Inst. of Metal Finishing, Exeter House, 48 Holloway Head, Birmingham B1 1NQ, UK	Contact: A. L. Laskar, Phys. and Astron. Dept., Clemson Univ., Clemson, SC 29631, USA
9-11	<b>Makromolekulares Kolloquium</b> Freiburg (Fed. Rep. Germany) Contact: Prof. H. Finkelmann, Inst. für Makromol. Chemie der Univ., Stefan-Meier-Str. 31, D-7800 Freiburg, FRG	12-14	<b>High-Tech-Materials and Finishing</b> Berlin (West) Contact: Technik + Kommunikation-Verlag GmbH, Ritterfelddamm 82 h + i, D-1000 Berlin 22	13-14 <b>Regio Macro II</b> Basel (Switzerland) Contact: Prof. M. Mutter, Inst. für Org. Chem., Univ. Basel, St. Johannis-Ring 19, CH-4056 Basel, Switzerland
		12-25	<b>Diffusion in Materials</b> , NATO Adv. Study Inst. Aussois (France)	13-15 <b>Mikroelektronik</b> Baden-Baden (Fed. Rep. Germany) Contact: VDE-Zentralstelle Tagungen, Stresemannallee 15, D-6000 Frankfurt 70, FRG