1990 Hewlett-Packard Europhysics Prize

The Hewlett-Packard Europhysics Prize for 1990 for outstanding achievements in solid state physics has been awarded jointly to Dr. Roberto Car and Dr. Michele Parrinello of the International School for Advanced Studies, Trieste for "the development of a novel and powerful method for the ab initio calculation of molecular dynamics".

As described in their recent article in Europhysics News 20 (1988) 69, the Car-Parrinello method efficiently combines the advantages of molecular dynamics sampling with the accuracy of the local-density-functional approach to yield remarkably accurate simulations of many scientifically and technologically important phenomena.

The award will be presented at the 8th General Conference of the EPS to be held in Amsterdam on 4-8 September 1990.

Ion Beams in Materials Research and Technology

4th Europhysics Industrial Workshop (EIW-4)

The high doses (above 10^{16} cm^{-2}) over large surface areas required for conventional ion implantation demand machines with high current beams. However, even larger currents are needed for ion beam synthesis where doses are often above 10^{18} cm^{-2}. Closest to application is probably SIMOX (separation by implantation of oxygen) technology in which a crystalline silicon-on-insulator structure results from the formation of a buried silicon-oxide layer upon oxygen implantation at elevated substrate temperatures. Good results have been obtained and it now remains to be seen if the advantages of making large CMOS structures in monocrystalline silicon layers on a buried oxide outweigh the increase in costs of the starting material. Other ion beam synthesis programmes are still in a much more exploratory phase, an interesting one being the formation of buried crystalline CoSi_{2} layers in silicon with alignment of the lattice with the substrate crystal.

Another clear tendency is the increasing importance of high energy implantation at about 1 MeV and above, for which more and more establishments are acquiring the necessary equipment. High energy implantation is already being used to achieve more flexible control of doping profiles in Si-technology than can be obtained by low energy implantation followed by a diffusion step (e.g. retrograde wells in CMOS technology). Most of the other work in this area is still in the research phase, such as damage creation by high energy beams where one interesting phenomenon that has been observed is the solid state epitaxial regrowth of amorphised layers stimulated by a flux of energetic ions.

The extension of dose levels and implantation energies to higher values is leading on the one hand to the synthesis of novel materials, and on the other hand to the refinement and validation of computer simulation programmes for the implantation process. This was vividly demonstrated by the extensive discussion during the workshop on the amorphisation of silicon and the properties of the amorphised material.

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More Funds for Physics from the EC

The European Communities' main funding programme for research and technical development is called the Framework Programme 1987-1991. It has a budget of 5.4 GECU of which about 290 MECU is assigned to programmes that aim to promote scientific and technological cooperation.

The Research Ministers of the European Communities approved in December 1989 a new Framework Programme 1990-1994, with a budget of 5.7 GECU, that overlaps the earlier programme. It is divided into three areas (enabling technologies, management of natural resources, management of intellectual resources). Some 748 MECU are earmarked for industrial and materials technologies, essentially following on from the current BRITE/EURAM Programme. The last item has as its main activity "human capital and mobility" or Researchers' Europe which aims to provide the European research system with trained human resources. The total budget is 518 MECU, a very substantial increase over the equivalent for the first Framework Programme. It combines several existing programmes and adds some new initiatives, including the annual award of postgraduate fellowships and support for European conferences.

Europhysics News will monitor how the new funds for the follow-on programmes are to be spent as details filter out of Brussels.

CEC Support for Conferences

Funds up to a maximum amount of 25,000 ECU to meet the cost of a conference, school or workshop may be available from the Directorate General for Science, Research and Development (DG XII) of the Commission of the European Communities through SCIENCE PLAN 1988-1992. The conditions that must probably be satisfied if an application for financial support is to be successful have been clarified in the course of discussions between the Society and the Directorate. It is perhaps useful to point out that members should take advantage of this information. Moreover, the administrative links which have been established can be used as an efficient and effective means for coordinating activities with DG XII. EPS members seeking support for conferences and the like from DG XII in general, and SCIENCE PLAN 1988-1992 in particular, are therefore asked to seek advice from Gero Thomas before submitting proposals. One should note that there are no fixed dates for their submission to SCIENCE PLAN 1988-1992, but that up to about four months are required before a decision is announced. SCIENCE PLAN 1988-1992 will continue under the recently approved Framework Programme 1990-1994 but with the title "Researchers' Europe".