

## 9th EPS GENERAL CONFERENCE

Florence, 14-17 September 1993

# Shifting the Emphasis

The EPS-9 opening ceremony was the occasion to celebrate the Society's 25th Anniversary and it was in this spirit that P. Blasi, the Rector of the University of Florence, welcomed the participants. G. Salvini, President of the *Accademia Nazionale dei Lincei*, then took up the theme of the unity of physics. The aim of physics is unity in all aspects. A strong EPS is needed for this so one must thank the Society's founders (G. Bernardini — the first President — speaking later gave a sprightly and vigorous account of how he remembered the early years, especially colleagues). The basic point is that people must work together and, recalling discussions about the SSC collider in the USA, not simply strive to agree on major programmes and facilities. C. Rizzuto, Director of the *Consorzio Interuniversitario Nazionale per la Fisica della Materia* (INFN) who represented Italy's Minister for Research and the Universities, described from his viewpoint as chairman of the CODEST physics panel how these interactions are promoted by the European Community's Human Capital and Mobility programme.

Short but warm statements by N. Cabibbo, President of the *Ente per la Nuova Tecnologia, l'Energia e l'Ambiente* (ENEA) and by L. Maiani, President of the *Istituto Nazionale di Fisica Nucleare* (INFN), congratulating EPS on its 25th Anniversary, were followed by G. Chiarotti, Chairman of the Physics Committee of the *Consiglio Nazionale delle Ricerche* (CNR), reminding the audience that physics figures strongly in CNR activities (20% of the CNR budget with nuclear physics handled by the INFN). However, his organization often faces what he called "hints" — hints that science should move more towards applications; hints that it should be useful to the community at large. Such hints are important and must be acted on. However, science can only develop if it nourishes its own criteria, both scientific and cultural (freedom of choice, freedom of individuals). But in doing this one must nonetheless recognize that it is still necessary to find motives for developing specific branches of science, specifically at

the EC level which is gaining importance but where science seems to be ignored.

The outlook for physics was taken up by A. Zichichi, the EPS President in 1978-80, who argued that in spite of all its successes physics is under "heavy attack" and is not doing enough to defend itself, preferring instead to take for granted the resources it enjoys. The community must react by sending out clear messages stressing that it has control of

what it is doing; that it works in a structured way to tackle fundamental problems. Physics will thereby demonstrate that it does not take for granted the world around us, notable its pollution where an "environmental holocaust" is conceivable. He urged physicists to speak up about environmental issues: the community should propose projects and seek the public's "direct support". The EPS can meanwhile play a major rôle in this "cultural clarification". Indeed, N. Kroó, the EPS President, in closing the ceremony by outlining the new challenges, spoke of how EPS will be governed by society instead of by research. But the spirit of Florence must be kept alive in addressing new goals, such as strengthening Divisional activities and helping parts of Europe reestablish themselves.

*Left, upper: sitting in the front row at the EPS-9 opening ceremony were (from left to right) A. Zichichi, G. Salvini, G. Chiarotti, and C. Rizzuto.*

*Left, lower: L. Maiani, the President of INFN.*

*Right, upper: G. Bernardini (on the left) with R.A. Ricci, who chaired the conference.*

*Right, lower: the Cecil Powell Memorial Medal was presented to W. Buckel by C.A.P. Foxell (on the left) President of The Institute of Physics.*



## EPS-9 SCIENTIFIC PROGRAMME

# Physics at Frontiers

While it is true that the EPS-9 scientific programme maybe did not bring to light radically new physical concepts, such remarks do not do justice to the breadth and scope of today's physics revealed in what E. Brézin (ENS, Paris), the Chairman of the Programme Committee, called a beautiful demonstration of the health of the field. The 17 plenary talks and the 16 parallel sessions made outstanding efforts to render a world composed of frontiers — frontiers in space, time, energy, temperature, and velocity — as accessible as possible. There was discussion of nuclear models, atoms in high-intensity fields, atomic-level probes, light forming patterns, car-

bon in softer forms and novel structures, chemical reactions at femtosecond scales, and the Universe's unknown matter. Moreover, the sophistication of modern techniques such as parallel supercomputers, thin-film storage media, advanced detectors, and ultra-high power lasers was not overlooked, for experimental capabilities are probably advancing more rapidly today than theoretical understanding.

### WORKING AT THE ATOMIC LEVEL

The programme began with the continuing developments that are opening up the nanometre world with H. Rohrer (IBM, Zurich)

highlighting the new frontiers offered by working with individual objects down to the atomic scale. They derive from the radically different nature of the physical processes determining nanoscale properties (e.g., chemical bonding rather than bulk effects control mechanical properties, relaxation times reduced by 1000 times); from the 1000-times larger electric fields that can be supported; and from the dominance of non-classical features (e.g., quantum and single electron effects). Using local probes (Fig. 1) one can handle today only a few aspects (structure, electrical properties, growth and diffusion) of simple model systems in surface science and electrochemistry. The challenge is to go far beyond this to the surface science of real systems involving simultaneous experiments on individual objects that are inhomogeneous at the atomic scale. Later will come tools, processes, sensors, and devices, ending up