SCIENCE NEWS

THRUST AREAS IN PHYSICAL SCIENCES — MEETING AT BARODA

THE Science and Engineering Research Council (SERC) of the Department of Science Technology has initiated a programme of providing major support to thrust areas in science and engineering. In order to identify such thrust areas in physical sciences a brainstorming seminar had been organized at IPCL, Baroda on 25 and 26 November 1981. About 40 scientists from various institutions in the country participated in this important meeting. An excellent working paper had been prepared for the meeting by Drs. V.G. Bhide, D. Lal and G. Venkataraman. Dr. M.G.K. Menon described the thrust area programme of SERC and underscored the importance of the task set forth for the seminar. The meeting discussed all vital issues related to the present status and future growth of physical sciences in the country. Dr. R. Ramanna presided over the seminar.

In identifying thrust areas, the following are some of the important guidelines that were employed:

(a) The area should be a frontline and emerging area critical for the future growth of indigenous research capability in the fields of science and engineering.
(b) The area should be challenging to the scientists engaged in pure as well as applied research.
(c) Research should be within our competence and resources to accept.
(d) The research capabilities to be built should have relevance to the overall socio-economic progress of the country.

Based on detailed discussions, several basic, applied and interdisciplinary areas were identified, keeping in mind that it would be often difficult to really distinguish or delineate these areas. It was recognized that basic research in physics has always been and will continue to be the cornerstone of excellence in research and provides the foundation on which any strong science and technology programme of national relevance can flourish. In basic research several aspects of the following broad areas were identified:

(a) Astronomy and astrophysics
(b) Condensed matter (including amorphous systems, polymers, low temperature phenomena, magnetism, phase transitions, matter under extreme conditions etc.)
(c) Atomic and molecular physics (including physics with lasers, new spectroscopes, scattering and collision processes etc.)
(d) Plasma physics
(e) Nonlinear phenomena
(f) Some aspects of nuclear physics, and
(g) Some aspects of high energy physics.

In applied research the following areas were identified with the full knowledge that distinction between basic and applied research is arbitrary and there is considerable overlap between the two.

(a) Materials research (including electronic, magnetic and optical materials, energy materials and so on)
(b) Laser science and technology
(c) Disordered system and their applications
(d) Semiconductor devices
(e) Speciality materials
(f) Applied optics
(g) Thin films
(h) Cryogenics, and
(i) Development of instrumentation, techniques etc. in various areas.

In interdisciplinary areas, solar system physics and biophysics were the two broad headings chosen. Under solar system physics, specific topics identified were in the areas of : solar emissions and planetary phenomena, solar system bodies, earth's atmosphere, oceanography and solid earth. Under biophysics, the topics related to conformational analysis, membranes and cell surfaces, biopolymer spectroscopy, X-ray crystallography of large molecules and psychophysics.

Several general facilities required to carry out high quality research in physical sciences were identified in the seminar. Some national facilities such as a synchrotron radiation facility were also indicated. The final report based on the deliberations of the seminar will soon be brought out by the Department of Science and Technology. DST has already published such documents in chemical and biological sciences.

The arrangements for the seminar at IPCL, Baroda, were excellent. The atmosphere provided by IPCL for the seminar was most conducive to free and in-depth discussions and much of the success of this as well as earlier seminars on thrust areas in chemical sciences and biological sciences was due to the leadership provided by Dr. S. Varadarajan, Chairman, IPCL.