ICFA

International Committee for Future Accelerators

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(Secretary of ICFA)

ICFA is the International Committee for Future Accelerators, set up in 1976 by the IUPAP Particles and Fields Commission, the first meeting being held in the summer of 1977. It is composed of 14 members from the different regions of the world, distributed as follows: CERN Member States 3; USA 3; USSR 3; Member States of JINR (Joint Institute for Nuclear Research, Dubna) other than USSR 1; Fourth Region 1; People's Republic of China 1; Japan 1; the Chairman of the Particles and Fields Commission is an *ex officio* member. The present Chairman of ICFA is V.L. Telegdi of ETH, Zurich.

ICFA arose out of a series of East-West meetings to review future perspectives in high-energy physics. These took place at Riga (1967), Semmering (1968), Tbilisi (1969), Morges (1971), New Orleans (1975) and Serpukhov (1976). At the last two meetings specific recommendations were made which directly led to the establishment of ICFA with the following mandate:

> "To organize workshops for the study of problems related to an international super high energy accelerator complex (VBA) and to elaborate the framework of its construction and of its use.
> To organize meetings for the exchange of information and future plans of regional facilities and for the formulation of advice on joint studies and uses."

In the little over seven years of its existence (August 1977 to the present), ICFA has been both active on the first topic and concerned with the organization of three workshops, *viz.*:

> Two on "Possibilities and Limitations of Accelerators and Detectors" (Fermilab, USA, October 1978 and Les Diablerets, Switzerland, October 1979)
> and one on "Possibilities and Limitations for Superconducting Accelerator Magnets" (Protvino, USSR, October 1981).

At the first two Workshops some of the basic parameters of accelerators now under consideration were elaborated in some detail for the first time. For example schemes for proton synchrotrons with energy up to 20 TeV using superconducting magnets were studied (now the SSC project — see below) as were ideas on colliding beams from linacs (see Table 2).

ICFA has drawn up guidelines for the use of accelerator facilities, built in one region of the world, by research physicists from other regions. During 1981, these guidelines were accepted by the Directors of all of the world's major high-energy laboratories, which effectively means that the complete range of facilities is available to physicists from any country, the only criteria used in selecting experiments to be carried out being scientific merit, technical feasibility and the capability of the group proposing the experiment.

ICFA has shown itself to be a good way of exchanging information on current and future accelerator plans in the different regions. It has helped to arrive informally at complementary accelerator programmes in the different countries and thus to ensure the most efficient use of the money available for elementary particle physics. Indeed, to further the dissemination of information, at an ICFA meeting held at Fermilab in August 1983, it was decided to postpone a fourth Workshop which had been scheduled (to take place at the Japanese National Laboratory for High Energy Physics (KEK) in May 1984) and organize instead a Seminar on "Future Perspectives in High Energy Physics", along lines similar to those of earlier meetings, notably that of New Orleans in 1975.

The Seminar took place from 14 to 20 May 1984 and was attended by about a hundred participants. Most of these were senior scientists from Eastern and Western Europe, USA, and Japan, including the Directors of almost all the major high-energy physics laboratories, but there were also representatives from Australia, Canada, China, India, Mexico, South Korea and Vietnam. (For more details see *CERN Courier* **24** (1984) 8 (October) p. 319-322.)

The first part of the Seminar was devoted to a survey of accelerators now under construction (see Table 1) and of those currently being designed or under consideration (see Table 2). This was followed by a number of talks on the physics possibilities at higher energies, on the associated experimental techniques to be used and on some technological aspects of accelerator construction, such as superconducting magnets.

The second part of the Seminar was organized as a series of panel discussions on ways and means of encourag-

Table 1 — Accelerator Facilities Now under Construction

Name	Location	Particles	Energy	First operation for physics (estimated)
BEPC	Beijing, China	electrons and positrons	2.8 + 2.8 GeV	1988
TRISTAN	KEK, Japan	electrons and positrons	30 + 30 GeV	1986
SLC	Stanford, USA	electrons and positrons	50 + 50 GeV	1987
LEP	CERN, Geneva	electrons and positrons	Initially 50 + 50 GeV then 100 + 100 GeV	end 1988
TEVATRON I	Fermilab, USA	protons and antiprotons	1 + 1 TeV	end 1986 - early 1987
HERA	DESY, Germany	electrons and protons	30 + 820 GeVp	1990
UNK	Serpukhov, USSR	protons protons	600 GeV 3 TeV	1990 1992-93

ing more interregional collaboration both in research and development work and in accelerator construction. As a result of the various debates, ICFA was able to arrive at three major conclusions which were then unanimously endorsed by all the Seminar participants at a final plenary session. These were:

1. that ICFA sees its major role as facilitating the construction of high-energy accelerators and not as arbitrating among regional options;
2. that ICFA should sponsor international panels on Superconducting Magnets and Cryogenics, on Beam Dynamics, on New Accelerator Schemes and on Future Instrumentation Innovation and Development to coordinate work in these fields;
3. that ICFA should convene seminars at regular intervals to review the status of high-energy physics and to anticipate future activities.

The purpose of the Panels is to promote in the field of accelerator design and physics instrumentation the same level of international cooperation which is now well established in the area of accelerator exploitation. Specifically, the Panels should seek to establish channels for the exchange of information, people and equipment.

At a subsequent meeting, held in Leningrad in October 1984, ICFA appointed the Chairmen of the four panels listed above. These are respectively G. Brianti (CERN), N. Dikansky (Novosibirsk), A.M. Sessler (Lawrence Berkeley Laboratory) and T. Ekelof (Uppsala). The membership of the Panels was constituted during the winter of 1984-1985; each Panel has approximately 16 members from the different regions, including China, India and Japan.

The Panels on Superconducting Magnets and on Instrumentation both met in February 1985 and the two Chairmen concerned presented a detailed programme of proposed activities to the most recent ICFA meeting which was held at the Tata Institute of Fundamental Research in Bombay in April 1985. The Chairmen of the remaining two Panels submitted short statements of their views on possible programmes of work which will be further discussed at the subsequent meetings of their respective Panels.

ICFA fully endorsed the proposals of all four Panel Chairmen, which call for a survey of present activities in the four different fields. For example the Instrumentation Panel will attempt to compile a "Catalogue" of subjects that are judged to be of importance for instrumentation innovation and development. This Panel also plans to edit a periodic bulletin of news-letter type to facilitate the rapid and early dissemination of current detector developments and ideas.

In order to attract the attention of the high energy physics community to the outstanding instrumentation problems posed by the experimental conditions at future large accelerators and to stimulate research activity on instrumentation, the Panel will encourage organizers and session leaders of established instrumentation conferences to choose topics and speakers on subjects identified in the Catalogue. The Panel also urged ICFA to sponsor a regular school on Detectors and Instrumentation in High Energy Physics, in the light of which, ICFA made a request for concrete proposals to be submitted. The next meeting of the Panel will be held in the USA in the autumn of 1985.

The Superconducting Magnet Panel made a number of proposals concerning the better exchange of technical information, standardization of materials and for better computer codes, measuring procedures and data bases. It also called for closer collaboration with industry, as did the Instrumentation Panel. Lastly it proposed to organize a specialised Workshop to review the state of the art in March/April 1986, probably in the USA; the second meeting of the Panel would take place during that Workshop.

The Chairman of the Beam Dynamics Panel also put forward proposals for the better exchange both of information and of people, and urged that specialists be stimulated to write survey articles and books. In particular he suggested that one important task of the Panel should be to spread knowledge of beam dynamics in the countries that are starting to develop accelerator technology. Lastly, the Panel intends to organize workshops on different aspects of beam dynamics. The Panel will hold its first meeting in Novosibirsk in the autumn of 1985.

The Chairman of the Panel on New Accelerator Schemes proposes to compile a list of novel accelerator programmes and to promote the exchange of personnel. He also suggested that the Panel should sponsor a Conference on Novel Accelerators to be organised in the USA in the autumn of 1986. This ICFA endorsed. The Panel will hold its first meeting at CERN in the summer of this year.

Thus the way is clear for these four world-wide Panels to start work on their respective programmes to encourage more collaboration. ICFA stresses the need to involve developing countries and has noted with satisfaction the participation of Chinese, Indian and Japanese scientists. The next meeting of ICFA will be held in Brussels in October 1985.

Table 2 — Future Accelerator Facilities under Consideration

Name or description	Location	Particles	Centre of mass energy
Superconducting Super Collider SSC	USA	pp, ($p\bar{p}$)	20+20 TeV
Hadron Collider in the LEP Tunnel	CERN, Geneva	pp, $p\bar{p}$ ep	Various options 5+5 TeV to 9+9 TeV 1.2 to 1.8 GeV
Large Linear Collider (LLC)	SLAC, USA	e^+e^-	1+1 TeV
VLEPP Linear Collider	Novosibirsk USSR	e^+e^-	Stage 1 150+150 GeV Stage 2 500+500 GeV