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Report on ICFA

Yoshio Yamaguchi

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1. Introduction

I am going to make a report on ICFA. This was originally scheduled to be given by Professor Telegdi, the ICFA-chairman. However, he got suddenly sick, so unwillingly I have to deliver this talk. I could do it much better in my mother tongue but I have to speak here in English. There is a very good account on ICFA by ICFA secretary, Owen Lock, in Europhysics News, June 1985. I shall follow more or less his description.

2. ICFA and its composition

ICFA stands for the International Committee for Future Accelerators. ICFA is the sub-committee of the IUPAP-Commission on Particles and Fields, which has created this ICFA Committee and also approves its members (see Transparency 1).

I may begin with the composition of ICFA. It consists of three members from CERN Member States, three from United States, three from USSR, one from <sup>ub</sup> Dubna member states excluding USSR, one from China, one from Japan, one from Fourth Region (which means regions other than Europe, USSR and United States), and the ~~the~~ chairman of IUPAP Commission

on Particle and Fields as the ex-officio member. Right now, the names of members are given in Transparency 2. The chairman is Val Telegdi and the secretary is Owen Lock.

3. Origin and Aims of ICFA

I shall give a brief account of the origin of ICFA which stemmed from series of East-West Meetings of senior or leading physicists among various regions, see Transparency 3. Namely, leaders of CERN and High Energy Physics in USSR, and JINR (Dubna) started a series of talks (East-West European Meetings). Then, members from USA were added to these Meetings. Finally there was a very crucial seminar organized by V. F. Weisskopf: the title was the International Topical Seminar on Perspectives in High Energy Physics, held in New Orleans, March 1975. There were many serious talks/discussions on the international collaboration. In particular, a notion of a very big accelerator complex (abbreviated as VBA) as the world wide collaboration was proposed as the target which should be formulated as soon as possible. The examples of VBA (at the time) were given in Transparency 3. Later the one was evolved into LEP at CERN and the other gave a basis for SSC in the United State.

In the following year, we had the Serpukhov-Moscow Meeting in May 1976 and made a recommendation to create the international committee called ICFA.

C11(that is an abbreviation of the IUPAP Commission on High Energy Physics)-meeting in 1977 at Hamburg accepted this recommendation and established ICFA and approved its members.

The aims of ICFA, as defined by IUPAP C11 commission, were given in Transparency 4.

ICFA held already twelve meetings in the past (Transparency 5).

#### 4. Activity of ICFA in the Past

ICFA, in accordance with the aims mentioned above, held three ICFA workshops(Transparency 6). Particularly, the second one was very important. There a conceptual design, or let's say a design study, of 20 TeV proton synclotron which gave a basis for SSC later was made and the idea of colliding linacs was proposed by Richter and Skrinsky, independently, which later realized as SLC.

ICFA formulated a guidelines for the international use of major high energy regional facilities which were approved by all directors of the major high energy physics laboratories in the world in 1981 (see Transparency 7). It says, e.g., large high energy facilities such as high energy accelerators or colliders be accessible to all qualified physicists irrespective of sex, race, nationality, religions, etc. Of course, any experimental proposal must be physically sensible, must have feasibility, and must have a possibility of funding, otherwise proposal would be imaginary.

#### 5. ICFA-Seminar on Future Perspective in High Energy Physics, 1984.

I shall now report on the ICFA seminar held in May 1984 at KEK in Japan. This seminar was the second one on future perspectives in high energy physics. It was sponsored by INS and KEK and more or less equally participated from four regions. Most of participants were senior and active physicists but a few were from funding agencies like DOE, etc. Its participants included notably the representatives from Australia, Canada, China, India, Mexico, Korea, and Vietnam.

The seminar contained survey of accelerator plans under construction and under consideration, physics possibility at super high energies, present status as well as their future perspectives of experimental techniques, and so on. Also there were two panels on how to encourage international collaborations and on international construction of accelerators and large detectors.

We reached unanimous conclusions at this ICFA seminar, which is summarized in Transparency 8.

#### 6. The Revised ICFA Guidelines and the ICFA Panels

Based upon the recommendation of the ICFA Seminar, ICFA and then C11, had revised the ICFA guidelines (see Transparency 9).

In the first phase of ICFA we were very much concerned with VBA as the world-wide enterprise and we wished that its

preparation could be done as quick as possible. But it might have been a little bit too early and optimistic to plan VBA. Therefore in the second phase of ICFA we shifted to a more practical and pragmatic side than in the first phase. Thus, we adopted the three items as the revised ICFA guidelines. The new guidelines implies that VBA could be the project in the next century.

Secondary, we formulated guidelines for ICFA Panels to be created(see Transparency 10). ICFA decided to establish the following four ICFA Panels:

- Panel I: Super Conducting Magnets and Cryogenics,
- Panel II: Beam Dynamics,
- Panel III: New Accelerator Schemes,
- Panel IV: Instrumentation.

The last Panel is not on present instrumentation but those should be realized after ten years when we have super high energy machines with super high intensities or very large luminosities. Then the most of instrumentations used at present accelerators or colliders could not be used any more. We need to build up something new that is the aim of the Panel IV.

The chairmen for these Panels are indicated by underline. Each panel should have at least 16 members from all regions in the world, i.e., not only from United State, Western and Eastern Europe but also from other regions, say, China, India, Japan, Latin America, etc..

These Panels(see Transparency 11) should survey the present status and activities, try to avoid unnecessary overlap in their R&D and to have better contact among many relevant groups.

Catalogues of relevant subjects, etc., may be prepared. And perhaps some review articles or even books may have to be prepared on these subjects. Panel IV is considering to create a periodic bulletin of news-letters type aiming rapid circulation of information on current developments or even on new ideas. It is very important to maintain efficient exchange of technical information and to have exchange of real experts and physicists. Standardizations needed for superconducting magnets and materials, computer codes or measuring procedures for superconducting magnets, and relevant data bases.

Furthermore, we need to have more close contact with industries, whereby referring to Japan as a model having a good collaboration between physicists and industries (I felt a little bit paradoxical about it since I know many defects in such collaborations in Japan).

We ought to organize specialized workshops on these subjects and, say, summer or winter schools or conferences devoted to these subjects. Or maybe we should ask for the conference organizers to accommodate special sessions in the existing conferences, e.g., the instrumentation session to deal with the specific subjects.

Finally, I show the (partial) lists of the members of the ICFA Panels (see Transparencies 12, 13, 14 and 15). In Panel I: Superconducting Magnets and Cryogenics, we are not filling members from USSR and also the fourth region due to some technical difficulties. It is in general difficult to choose appropriate members from the fourth region in each Panel. So there are still vacant seats in the Panels.

Panel IV is, as I said before, on Instrumentation for those needed after ten years from now. You will see here we have intended to include members not from three traditional regions (USA, Eastern and Western Europe, which have been active in high energy physics). We see recently that there is steady growth of high energy physics, first in theories, and then in experimental activities and finally accelerator technology, in developing regions.

I wish to emphasize that appropriate peoples from all region should be included in the four ICFA Panels.

#### 7. Final Comments

Finally I would like to say a few words.

High Energy Physics is not only benefited by but also contributing very much to forefront of high-technology as we all know. Also high energy communities are maintaining free exchange of ideas and scientists, etc., as manifested e.g. by this symposium. We are proud of great success of international collaborations and their beautiful outcomes in our field. The present status of international collabora-

tions ought to be further widened to the truly world-wide ones.

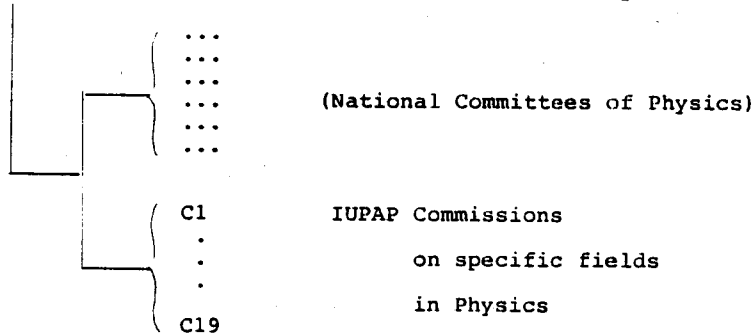
I now compare ours to those in other competing fields of big sciences with respect to international collaboration. Space research is spending a lot of money, more than high energy physics, on, say, rockets, satellites, etc. But there are so many black boxes or classified items. For example, Japanese scientists cannot open a black box in space technology supplied by a foreign country from military reasons. Another big project is the fusion project. There one sees a possible future profit, so there are many delicate problems connected with patents and so there are many classified issues. Therefore, I am quite sure and very proud of the fact that in high energy physics we have the best freedom in performing international collaboration among all sciences.

Lastly, international collaboration we are doing is purely for the academic purpose, namely basic research in natural science. However, scientists are not alone. They have their families and are living in the societies. So, our families are automatically involved in our international collaboration as well. This means, that we are not only doing physics but also we inevitably see different cultures of the different regions. Accordingly, we shall extend our mutual understanding, which is a basis eventually leading to the world peace.

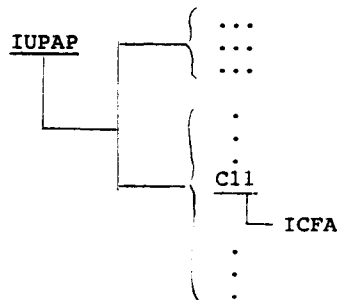
This concludes my report. Thank you.

ICFA: International Committee for Future Accelerators

IUPAP (International Union of Pure & Applied Physics)



- examples:
- C4 Commission on Cosmic-Rays
  - C11 Commission on Particles & Fields (High Energy Physics)
  - C12 Commission on Nuclear Physics



ICFA (April 1985)

Chairman	V. L. Telegdi	(ETH, Zürich)
Secretary	W. O. Lock	(CERN, Geneva)
CERN Member States	J. Sacton H. Schopper V. L. Telegdi	(Libre de Bruxelles, Bressel) (CERN, Geneva) (ETH, Zürich)
USA	B. McDaniel L. Pondrom N. Samions	(Cornell, Ithaca) (Wisconsin, Madison) (BNL, Upton)
USSR	E. Myae A. N. Skrinsky (to be nominated)	(IHEP, Protvino) (INP, Novosibirsk)
JINR Member States-USSR	Nguyen Van Hieu	(IP, Hanoi)
China	Fang Shouxian	(IHEP, Beijing)
Japan	Y. Yamaguchi	(INS, Tokyo)
Fourth Region	P. K. Malhotra	(TIFR, Bombay)
Chairman of IUPAP Commission on Particles & Fields	I. Mannelli	(ex officio) (CERN, Geneva)

ORIGIN OF ICFA

Terms of reference of ICFA as decided  
by C11 Commission in 1976 - 1977

Series of East-West Meetings

- \* to review future perspectives in HE Physics
- \* international collaborations

USA - USSR  
CERN - USSR      JINR (DUBNA)  
                          IHEP (PROTVINO)

CERN - USSR Meetings

- |              |      |               |
|--------------|------|---------------|
| 1. Riga      | 1967 | EE + WE       |
| 2. Semmering | 1968 | EE + WE       |
| 3. Tbilisi   | 1969 | EE + WE + USA |
| 4. Morges    | 1971 |               |

International Topical Seminar on  
Perspectives in High Energy Physics  
New Orleans, 3-7 March 1975  
EE + WE + USA + Japan

- \* International Collaboration
- \* VBA (Very Big Accelerator Complex)  
(world-wide collaboration)

examples of	e <sup>+</sup> e <sup>-</sup>	100 GeV/beam	LEP
VBA	p	10 TeV	SSC

"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 of the exchange of information on future plans of regional facilities and for the formulation of advice on joint studies and uses".

VBA (Very Big Accelerator Complex)  
world-wide collaboration!

Serpukhov-Moscow Meeting

17-21 May 1976	Serpukhov
22-25 May 1976	Moscow
	EE + WE + USA + Japan + ...

ICFA

C11 Meeting	TBILISI	20 July 1976
C11 Meeting	HAMBURG	30 Aug. 1977

established ICFA  
approved ICFA members

Transparency 5

ICFA-members

Terms of ICFA members: 3 yrs + 3 yrs

Terms of ICFA chairman: 3 yrs

1 nomination

members from	nominated by
USA	Chairman, HEPAP
Western Europe	DG, CERN
USSR	Logunov
Dubna countries excluding USSR	Directorate JINR
Japan	DG, KEK

2 approval of ICFA members by C11

ICFA Meetings

1	29 Aug.	1977	HAMBURG	ISLEPH
2	27 Jan.	1978	CERN	
3	20 Oct.	1978	FERMILAB	ICFA-Workshop
4	11 Oct.	1979	CERN	ICFA-Workshop
5	9 July	1980	CERN	ICHEP
6	21 Oct.	1981	SERPUKHOV	ICFA-Workshop
7	27/28 July	1982	PARIS	ICHEP
8	10/13 Aug.	1983	FERMILAB	ICHEA
9	21 Nov.	1983	CERN	
	21/22 Nov.	1983	CERN (Extended Meeting)	
10	18/19 May	1984	KEK	ICFA-Seminar
11	12 Oct.	1984	INP (GATCHINA)	
12	10 Apr.	1985	TIFR (BOMBAY)	
13	2 Oct.	1985	FNRS (BRUSSELS)	

Transparency 6

ICFA Workshops

1. Technical Possibilities and Limitations of Accelerators and Detectors

Fermilab  
16 - 21 Oct. 1978

2. Accelerator and Detector Possibilities and Limitations

Les Diablerets and CERN  
4 - 10 Oct. 1979

\* 20 TeV PS → SSC

\* Colliding Linacs  $e^+e^-$  → SLC

3. Possibilities and Limitations on Superconducting Magnets for Accelerators

Protvino  
19 - 24 Oct. 1981



Guidelines proposed by ICFA for the Interregional  
Utilization of Major Regional Experimental Facilities  
for High-Energy Particle Physics Research

(Agreed by ICFA at its Fifth Meeting held at CERN on 9 July 1980)

- Considering that in the future major experimental facilities for high energy particle physics research, notably the very largest particle accelerators and colliding beam machines, are likely to be few in number, probably only one of each type of the very highest energy and that these machines will be located in different regions of the world,
- And recognizing that experimental physicists from all regions will wish to gain access to these few machines in order to pursue their research,
- ICFA proposes that the regional laboratories operating these facilities should adopt a common policy towards experimental physicists from other regions seeking to use the facilities they operate. The guidelines proposed are as follows:
  1. The selection of experiments and the priority accorded to them are the responsibility of the Laboratory operating the regional facility.
  2. The criteria used in selecting experiments and determining their priority are:
    - (a) scientific merit
    - (b) technical feasibility
    - (c) capability of the experimental group
    - (d) availability of the resources required.

3. It is expected that teams from other regions will normally wish to join with local regional teams to form experimental groups in proposing and carrying out experiments using a regional facility. The national or institutional affiliations of the teams should not influence the selection of an experiment nor the priority accorded to it.
4. The availability of the resources needed for the experiment are examined at the time of selection of the experiment (see 2 (d) above). The contributions of each team and of the Operating Laboratory to an experiment are the subject of agreements drawn up between the Operating Laboratory and the authorized leaders of the teams in the experimental group. When appropriate, realisation of the proposals approved may be effected within the framework of bilateral and multilateral agreements in force or newly reached arrangements.
5. Operating laboratories should not require experimental groups to contribute to the running costs of the accelerators or colliding beam machines nor to the operating costs of their associated experimental areas.
6. It is expected that averaged over a reasonable period of time the application of guideline 2. above will lead to a balanced use of the major new facilities by the regions concerned. However, if at any time an Operating Laboratory finds that the participation of teams from other regions in their experimental programme is becoming excessive, the Operating Laboratory may be obliged to limit that participation. Any such action should be accompanied by discussions with the relevant authorities of the regions concerned and consultations with the other operating laboratories subscribing to the Guidelines laid down in this document.

the Conclusions of the ICFA Seminar (May 1984, KEK)

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.

5

Revised ICFA Guidelines (1984)

"To promote international collaboration in all phases of the construction and exploitation of very high energy accelerators"

"To organize regularly world-inclusive meetings for the exchange of information on future plans for regional facilities and for the formulation of a consensus on joint studies and uses"

"To organize workshops for the study of problems related to super high-energy accelerator complexes and their international exploitation"

GUIDELINES FOR ICFA PANELS

1. Each panel for a particular field should generally include not more than 16 members, with an effort towards an adequate balance among the regions.
2. ICFA will choose the panel Chairmen from among the nominees of the regions.
3. The panels should encourage the exchange of information and coordinate the pertinent activities (e.g. exchange of personnel and/or equipment) of the regions represented in it. Panel members should act as representatives of their regions.
4. The regional work in a particular field should be organized by the participating Institutions.
5. The panels should organize their meetings at least once a year to establish programmes and to analyse results. The times and places of these meetings should be agreed upon in advance.
6. The panel Chairmen should report once a year to ICFA on the progress of their activities.

ICFA Panels

Panel	1st Meeting	2nd Meeting	Notes
I SC mag & Cryogenics (G. Brianti)	Feb 1985		Mar/Apr. 1986 Workshop (USA) Industry
II Beam Dynamics (N. Dikansky)	Oct. 1985 Novosibirsk		
III New Accelerator Schemes (A. Sesslew)	Summer 85 CERN		Autumn 1986 Conf. (USA)
IV Instrumentation (T. Ekelof)	Feb 1985	autumn 1985	Session in Instrm. Conf. School Industry

~16 members from all regions in the world, including from China, India, ...Japan, Latin America

(Panel)	<i>examples of activity</i>
IV	survey present activities,
II,IV	prepare, e.g., catalogue of subjects, articles, books
IV	periodic bulletin of news-letter type rapid & early dissemination of current developments & ideas
I,II,III	exchange technical information and peoples
I	standardization, materials
I	computed codes, measuring procedures and data bases
I,IV	collaboration with Industry
I,II,IV	organize specialized workshop
III,IV	organize session(s) in Instrumentation Conferences
IV	organize (summer) schools
III	organize conferences

Transparency 12

PARTIAL MEMBERSHIP LIST OF  
ICFA PANELS

<u>I. SC MAGNETS AND CRYOGENICS</u>		Chairman: G. Brianti
Europe	(3)	G. Brianti (CERN) C. Daum (NIKHEP) + 1
USA	(3)	P. Reardon (BNL) C. Taylor (LBL) A. Tollestrup (FNAL)
Japan	(2)	M. Hirabayashi (KEK) S. Mitsunobu (KEK)
USSR	(3)	From { ( K.P. Myznikov (Serpukov) ( A.I. Ageev (Serpukov) ( V.A. Titov (Efremov Inst., ( V.V. Kalinin (Efremov Inst. ( V.T. Smoliankin (ITEP) ..... (Dubna)
	(+ 1)	
Fourth Region	(2)	Yan Lu-guang (Inst. Metallu .....

Transparency 13

II. BEAM DYNAMICS

Chairman: N. Dikansky

Europe	(3)	E. Keil (CERN) A. Piwinski (DESY) + 1
USA	(4)	A. Chao (SLAC) R. Talman (Cornell) C. Pellegrini (BNL) C. Leemann (LBL)
Japan	(2)	T. Suzuki (KEK) T. Katayama (INS, Tokyo)
USSR	(3)	From { ( E.A. Mias (Serpukov) ( V.I. Balbekov (Serpukov) ( D.G. Koshkarev (ITEP) ( I.A. Shukeilo (Efremov Inst., Leningrad) ( A.A. Kolomenskiy (Lebedev) ( - Esin (INS, Moscow) <u>N. Dikansky (Novosibirsk)</u> ..... (Dubna)
	(+ 1)	
Fourth Region	(2)	Fang Shou-Xian (IHEP, Beijing) .....

III. NEW ACCELERATOR SCHEMES

Chairman: A. Sessler

Europe	(3)	M. Eriksson (Maxlab, Lund) J. Lawson (RAL) J. Le Duff (Orsay)
USA	(4)	R. Palmer (BNL) A. Sessler (BNL) R. Jameson (Los Alamos) P. Morton (SLAC)
Japan	(2)	T. Kamei (KEK) M. Yoshioka (INS, Tokyo)
USSR	(4)	{ Yu.S. Fedotov (Serpukov) { O.A. Gusev (Efremov Inst., Leningrad) { V.K. Plotnikov (ITEP) { A.C. Amatuni (Yerevan) { E.M. Laziev (Yerevan) { Yu.P. Vahrushin (Efremov Inst., Leningrad) { A. Lebedev (Lebedev) { - Balakin (Novosibirsk) ..... (Dubna)
	(+ 1)	
Fourth Region	(1)	.....

From

IV. INSTRUMENTATION

Chairman: T. Ekelof

Europe	(4)	C. Fabjan (CERN) T. Ekelof (Uppsala) A.W. Valenta (Siegen) + 1
USA	(4)	J. Pilcher (Chicago) M. Breidenbach (SLAC) D. Nygren (LBL) D. Hartill (Cornell)
Japan	(2)	S. Iwata (KEK) H. Okuno (INS, Tokyo)
USSR	(3)	{ A.M. Zaitsev (Serpukov) { V.A. Sen'ko (Serpukov) { V.A. Liubimov (ITEP) { V. Sidorov (Nobosivirsk) { V.M. Lobashev (INS Moscow) { A. Vorobjev (INPI, Gatchina) ..... (Dubna)
	(+ 1)	
Fourth Region	(2)	..... .....

From