

July 2000

ICFA MEMBERSHIPCERN Member States

Lorenzo Foa  
Luciano Maiani  
Albrecht Wagner

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Eugene Beier  
Jonathan Dorfan  
Michael Witherell

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Sachio Komamiya  
Hirotaka Sugawara (Chair)

Russia

Mikhail Danilov  
Nikolai Dikansky

Canada

Robert Carnegie

China

Chen Hesheng

Other Countries

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Won Namkung (Korea)  
Zekeriya Aydin (Turkey)

CII

Peter Kalmus

(Roy Rubinstein – Secretary)

## 1. A Global Accelerator Network

A. Wagner continued the discussion of this topic, which he had initiated at the 1999 ICFA Seminar. He presented an updated version (Appendix I), and a proposal for an Interlaboratory Task Force on Remote Operation (Appendix II). Wagner said that accelerators could be built like large experiments.

This will pool resources and keep accelerator culture alive in the labs that do not get a major new facility. The proposed Interlaboratory Task Force is a start to a community study of this idea.

A major new facility should be built near an existing lab (the host); the community and governments have accepted the idea of international collaboration on detectors; lab will have a core of experts, but a remote lab will diagnose a problem

over the net in the equipment it is responsible for, and tell the host experts what to fix and how to fix it. The accelerator building costs will be shared, with the major host operating cost being electricity. Remote access and control is the key to getting other labs involved. Remote operation is done in other fields: satellites, space stations, the Hiroshima light source, astronomy (telescopes steered from remote sites), and a power station in Switzerland operated from Germany. A network of labs would be interested in working on the accelerator and using the accelerator; the concept could be extended to other fields, such as synchrotron light sources.

There was considerable discussion of Wagners proposal. Among items raised were the following. The technology exists now to do what is proposed. In the commissioning of an accelerator, the luminosity goal is not reached immediately, and what will keep accelerator experts back at their home institutions focussed on improving performance? (For detectors, there is a common goal of getting the physics out.) There must be a way for everyone to feel that it is their project. The proposed Task Force will mainly address technical issues. Existing accelerators could not be operated this way, as certain necessary components are missing. For commissioning, perhaps all accelerator people should be at the accelerator for the first year or so. The accelerator culture at existing labs must not be lost, since one of the best spin-offs of HEP is the accelerators used in other fields. Could a technical problem on the accelerator using this proposal be solved as fast as with current accelerators? For some accelerator problems, many different parts of the accelerator are involved. There should be duplicate accelerator control rooms in several locations. The cost of implementing this proposal must be studied. Would all technical people eventually end up at the host site? Running an experiment remotely works because an experiment is static, but this is not true of an accelerator, which changes continuously.

Following discussion, it was agreed to set up the ICFA Task Force (Appendix III). There will be 2 Subgroups. Subgroup 1 will study general considerations of implementation of this proposal, to determine further what needs to be developed, such as a management structure and an organizational framework. Subgroup 2 will study technical considerations, and their influence on the design and cost of the accelerator.



## ICFA Task Force for Global Laboratory (non-technical)

### task

- (a) How to maintain active interest and participation in project in all member institutes.
- (b) Identify areas that need to be developed.
- (c) Work out mechanisms for co-operation and decision taking.

### members

- A.Astbury (TRIUMF, coordinator)
- J.Colas (ATLAS/CMS)
- L.Evans (CERN)
- Y.Kimura (KEK)
- E.Paterson (SLAC)
- M.Shochet (CDF)
- D.Trines (DESY)

## Interim Report

(a)

construction stage    heavy involvement of all  
the participating laboratories

operation stage        Just participating in the remote  
operation does not guarantee  
the raison d'etre of participating  
laboratories

Ex) Rutherford Lab  
TRIUMF

(b)

(c)

necessity of a host nation  
→ necessity of a host laboratory

to avoid "SSC mistake"

host nation : pay  $1/3 \sim 1/2$  of the costs

partners : in kind contribution

× LHC

No. of partners  $\lesssim 10$

host laboratory:	technical contribution
	civil engineering
	power, water
	legal issues
	environmental problems

## Experience from LEP/LHC/TEVATRON/detectors

two principles

(1) consensus

(2) peer pressure

⇒ cost problems and delays

“not suitable for the machine building”

⊙ hierarchical line management

⊙ minimum number of funding sources

## ICFA task force for Global Laboratory (technical)

members: E.Balakin (INP), P.Czarapta (FNAL)  
D.Harthill (Cornell), S.Myers (CERN)  
N.Phinney (SLAC), M.Serio (INFN)  
N.Toge (KEK), F.Willeke (DESY, coordinator)  
C.Zhang (IHEP)

### (Introduction)

- (1) Next machine requires a new mode of international and inter-laboratory collaboration.
- (2) An obvious consequence of multi-laboratory project is that the accelerator will be located a considerable distance from the contributing institutions.
- (3) Once the implications of remote operation are understood, the location of any new project may become much less important than it is today



## Goals

- A) a model of remote operation
- B) examination of the experience available
- C) existing examples
- D) technical developments required
- E) communication to lab directors

### (A) example of $e^+ e^-$ - collider

- (1) general structure
- hardware components: injectors, damping ring  
main linacs, beam delivery  
final focusing
  - responsibilities of collaborators
    - (1) control system infrastructure
    - (2) all BPM electronics
    - (3) all power supplies of a particular type
    - (4) all rf controls (or all of a particular frequency)

### (2) Control management

responsible for the coordination of design and construction, operation and maintenance management of common infrastructure.

← control board

### (3) design board



#### (4) machine operation

control center

- ⊙ need not to be at a fixed geographical location
- ⊙ virtual center

#### conditions

- ⊙ each collaborator will have a fully functioning control room capable of operating the entire accelerator
- ⊙ “permanent video conference”

#### mechanism

- ① machine operation board
- ② maintenance
- ③ skilled maintenance
- ④ trouble shooting and intervention on components
- ⑤ communications
- ⑥ radio active safety
- ⑦ exceptional situation

# GLOBAL SCIENCE FORUM

(Formerly MEGASCIENCE F.)

(Members from OECD Countries)  
(Reports to Governments)

April 2000 Workshop to consider forming  
Working Group on HEP.

ICFA expressed concern that there be input from  
HEP community.

All activities truly Global, not just OECD countries.  
ICFA representative at all activities.

Recommendation to GSF that a “consultative  
Group” on HEP be set up

**GSF approved**

Report to GSF, and all participating Governments,  
no later than June 2002

## STUDIES –FUTURE HEP PROJECTS

### ICFA TASK FORCE

Reports due February 01

### JAPAN

Update JLC Milestones – End 00

### US

Update 98Gilman Report – 00

Form New HEPAP Panel – Early 01

Report – Late 01

Snowmass Study – Summer 01

### EUROPE

ECFA / DESY Study – SEPT 00

TDR – March 01

ECFA Special Panel on Long Term  
Perspectives of Particle Physics in  
Europe (L.FOA – Chair)

June 01

ICFA suggests that these regional study groups collaborate to reach a global consensus.