

## Activities of the International Committee for Future Accelerators (ICFA)

October 2008 to October 2011

Roy Rubinstein – ICFA Secretary

### 1. Introduction

Each year, there are two ICFA meetings: one at the major yearly IUPAP-sponsored particle physics conference (Lepton-Photon Symposium or International Conference on High Energy Physics) and an extended two-day meeting in February. At the February meeting, directors of the world's leading particle physics laboratories are also invited, which allows a much more extensive discussion of the present and future status of particle physics.

The current ICFA membership is given in Appendix I.

### 2. Particle Physics---A Global Picture

A booklet, titled "Beacons of Discovery", is being produced by an ICFA subgroup, to provide a global picture of particle physics. It will not be a roadmap, as ICFA is not a world program committee, but is intended to show the excitement of particle physics. It will explain that we will be able to answer some of the major current science questions, lead to a vision of the future of particle physics, and it will also highlight the spin-offs from the field. The document will be completed by October 2011.

### 3. ICFA Seminar

The 10<sup>th</sup> ICFA Seminar on Future Perspectives in Particle Physics" will be held at CERN on 3-6 October 2011. These Seminars are held every three years to allow for an international exchange of information primarily on plans for future facilities in the field of particle physics. Invitees include leading world particle and accelerator physicists, and also representatives of government funding agencies. One major objective of the 2011 Seminar will be to discuss and produce a final version of "Beacons of Discovery" (see Item 2, above).

#### 4. Revised ICFA Guideline #5

Since 1980, ICFA has had “Guidelines for the Interregional Utilization of Major Regional Experimental Facilities for High-Energy Particle Physics Research”. Guideline #5 stated:

“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.”

This Guideline became the basis for IUPAP discussions on similar guidelines in other physics fields. Taking into consideration the current uniqueness and large cost of frontier particle physics facilities, Guideline #5 was modified at ICFA’s February 2011 meeting to:

"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. However, in particular for a large global facility, allocation of operating costs should be agreed by the project partners before project approval, while still allowing open access for experimental groups."

#### 5. ILCSC

The International Linear Collider Steering Committee (ILCSC) was set up by ICFA to facilitate the global collaborative effort on the International Linear Collider (ILC), an electron-positron collider that the particle physics community envisages as the next major world accelerator after the LHC. ILCSC formed the Global Design Effort (GDE) to design this accelerator and appointed a Research Director to lead the design of the detectors for the ILC.

In 2008, ILCSC set up the Project Advisory Committee (PAC) to assist it in the oversight of both the GDE accelerator activities and the ILC detector activities. The PAC holds two-day reviews of the status of the accelerator and detector work twice a year.

## 6. ILC: Accelerator

Significant progress has been made over the past several years on superconducting RF cavity gradients, a major part of the ILC accelerator R&D. A gradient of 35 MV/m (the original design figure) has been achieved by several vendors with 50% yield; the goal for 2012 is 90% yield. Several accelerator baseline changes have been made during the past year, leading to reductions of the original cost estimate. An interim report on the accelerator design was produced in June 2011, with a final report, including costing, due in late 2012.

## 7. ILC: Detectors

Two detector designs, ILD and SiD, were validated by an advisory committee, and these collaborations are close to completing interim reports on their detectors; final design reports are due in late 2012. Many spin-offs from ILC detector R&D look valuable for other particle physics detectors, and for detectors in other fields of physics.

## 8. Future Linear Collider Activities

The mandates of the ILCSC and the R&D programs on the ILC accelerator and detectors did not go past the end of 2012. ICFA and ILCSC now recognize that this work will need to continue after that date, with additional R&D necessary, and it will be crucial to keep the teams together until a decision is made by governments on whether/when to construct the ILC. It should also be noted that there is a design for a higher energy linear collider, CLIC, underway at CERN; which accelerator should be proposed to governments will await physics results from the LHC. Discussion is underway on appropriate structures to keep the ILC program continuing past 2012, and to coordinate the two programs. To avoid duplication, CLIC will very likely come under ICFA in the same way as for ILC.

## 9. Collaboration with the International Committee for Ultra Intense Lasers

A joint task force between ICFA and the International Committee on Ultra-High Intensity Lasers (ICUIL; IUPAP Working Group 7) has been set up to study the laser acceleration of particles. Two workshops have been held, and a resulting White Paper "High Power Laser Technology for Accelerators" is now available and will be published later in 2011.

## 10. Reports

Reports frequently are presented to ICFA meetings on the activities of: ICFA's Panels; each country and lab represented at the meeting; Funding Agencies for Large Colliders (FALC); InterAction (a particle physics communication organization); and the CLIC project.

## Appendix I

### ICFA MEMBERSHIP

October 2011

#### CERN Member States

R. Heuer  
J. Mnich  
T. Nakada

#### USA

R. Brock  
P. Drell  
P. Oddone

#### Japan

S. Komamiya  
A. Suzuki (Chair)

#### Russia

E. Levichev  
A. Zaitsev

#### Canada

W. Trischuk

#### China

H. Chen

#### Other Countries

G. Alves  
I-S. Ko  
V. Tsakanov

#### C11

P. McBride

(Secretary: R. Rubinstein)