THE INTERNATIONAL COMMITTEE FOR FUTURE ACCELERATORS (ICFA)

The International Committee for Future Accelerators

History

1967 to 1976 East-West meetings on the future of particle physics

ICFA founded in 1976 by Commission 11 (Particles and Fields) of the International Union of Pure and Applied Physics (IUPAP)

- Study the scientific, technical, organizational aspects of world-wide collaboration to construct a very large accelerator

http://www.fnal.gov/directorate/icfa/index.html

ICFA aims (1985):

- 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 advice on joint studies and uses.
- To organize workshops for the study of problems related to super high-energy accelerator complexes and their international exploitation and to foster research and development of necessary technology.

ICFA Membership

There is a formula for membership, approximately representative of particle physics activity in different world regions

16 members + Secretary

ICFA MEMBERSHIP
September 2013

CERN Member States

R. Heuer

M. Krammer

J. Mnich

USA

N. Lockyer (Chair)

D. MacFarlane

I. Shipsey

Japan

T. Mori

Suzuki

Russia

A. Bondar

S. Ivanov

Canada

W. Trischuk

ICFA MEMBERSHIP - Continued
September 2013

China

Y. Wang

Other Countries

G. Alves

A. Roy

V. Tsakanov

C11 (ex-officio)

H. Aihara

Secretary:

R. Rubinstein

ICFA Meetings

2/year

- Alternate meetings: Directors of all major world particle physics labs are invited

ICFA Seminar

- Every 3 years "Future Perspectives in High-Energy Physics"
- Invited: 150-200 leaders of the field; funding agency representatives; media
- Next ICFA Seminar: 27-31 October 2014; Institute of High Energy Physics, Beijing

ICFA Panels
(organize studies, workshops, small conferences)

- Beam Dynamics
- Advanced and Novel Accelerators
- Instrumentation
- International Connectivity
- Data Preservation in High Energy Physics
- Neutrino
- (International Linear Collider Steering Committee)
- Linear Collider Board

ICFA Guidelines
(1980, 1993, 2011)

#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. 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.

Linear Collider (LC)

By late 1990s, consensus in Europe, Americas, Asia particle physics communities: a 500 to 1000 GeV cm e+e- LC is the next frontier accelerator after the LHC

ICFA Statement 1999:

- ICFA recommends continued vigorous pursuit of the accelerator research and development on a linear collider in the TeV energy range, with the goal of having designs complete with reliable cost estimates in a few years. We believe that an electron-positron collider optimized for the new physics should be built in a timely way with international participation.

No nation ready to take the lead, so ICFA organized LC activities for the world particle physics community

Linear Collider (LC)
Continued

2002. ICFA created the International Linear Collider Steering Committee (ILCSC) to promote the construction of an Electron-Positron Linear Collider through world-wide collaboration

2003. ILC Technical Review Committee

- Collected comparative technical data on 4 LC designs

2003. ILCSC panel produced parameter list for LC needed to achieve a listed set of physics goals

2004. ICFA created the International Technology Recommendation Panel (ITRP)

- Recommend choice among remaining 2 LC designs:

  Main Linac room temperature 11.4 GHz (X-band)

  Main Linac superconducting 1.3 GHz (L-band)

Linear Collider (LC)
Continued

2004. ITRP recommends superconducting Main Linac

- ICFA accepted recommendation
- World particle physics community quickly united behind superconducting option

2005. Barry Barish chosen by ICFA as Director of the Global Design Effort (GDE) to produce an ILC design and its cost.

GDE

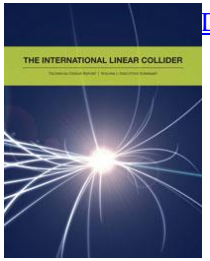
A unique global organization for the design of a large scientific project

- No host lab
- Almost no employees
- Almost no direct funding (~ US$1M per year)
- All regions of world contributed through personnel and facilities at major labs

June 2013: Technical Design Report completed, including detectors, with costs (7.7 BILCU; 22M person hours)

International technical and cost reviews in 2012/2013 validated the design

Volume 1 - Executive Summary



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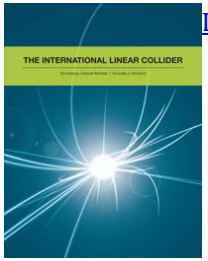
Volume 2 - Physics



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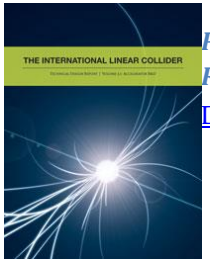
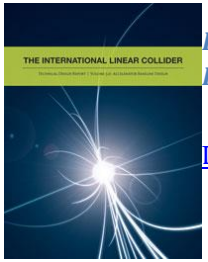
Volume 3 - Accelerator



Part I:
R&D in the Technical Design Phase
Download the pdf (91 MB)

Volume 3 - Accelerator



Part II:
Baseline Design

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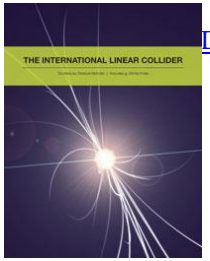
Volume 4 - Detectors



Download the pdf (66 MB)

From Design to Reality

Download the pdf (5.5 MB)
Visit the web site

2013

ILCSC ended; Linear Collider Board (LCB) formed

Formed by ICFA, to oversee the Linear Collider Collaboration

- Includes all linear collider activities (ILC and CLIC and detectors)
- Director: Lyn Evans

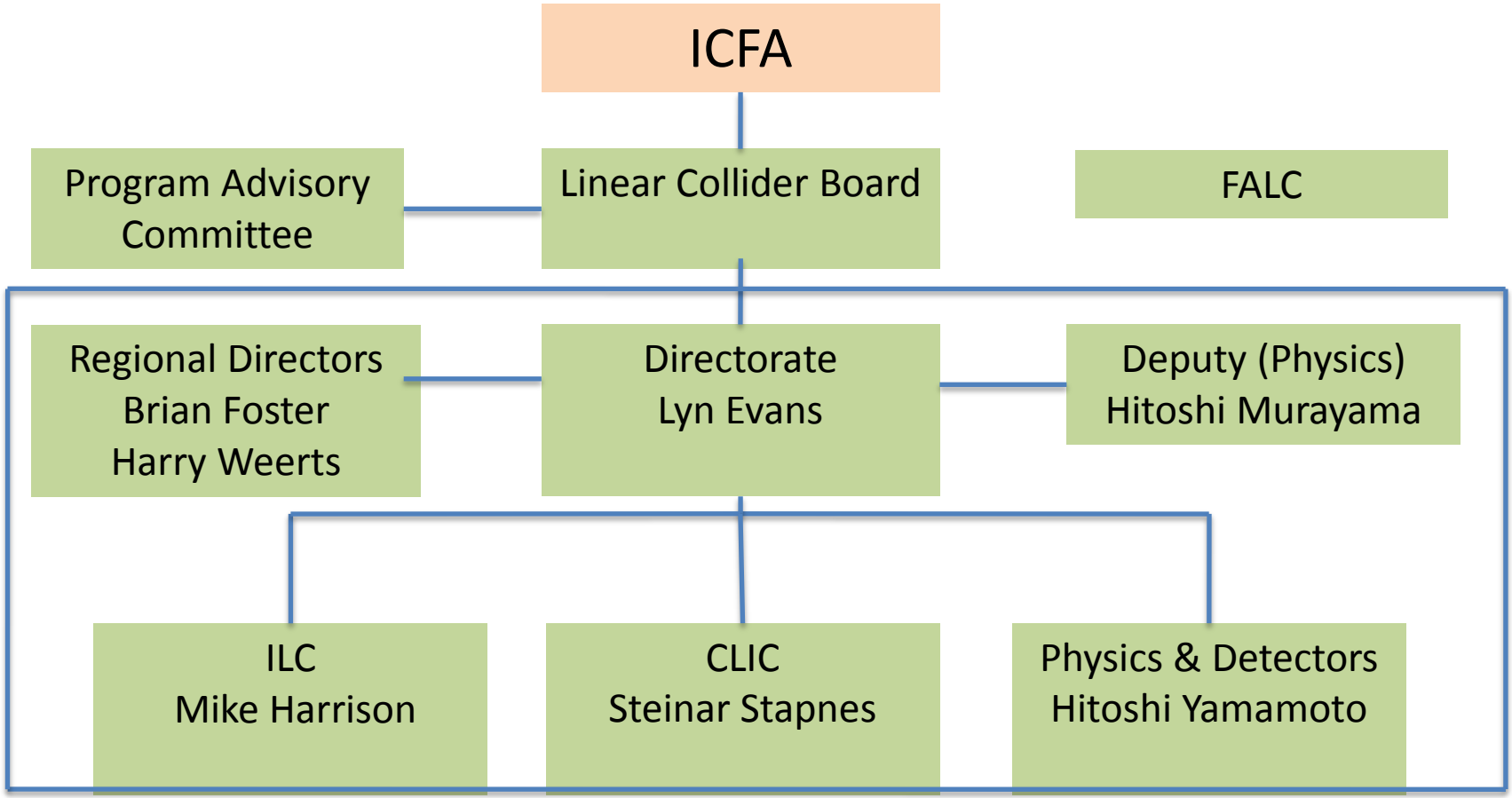
2013

- Japan: strong interest in hosting an international project to construct a linear collider
- Two sites under consideration
- Start with a Higgs Factory (250 GeV cm), with energy upgrades later

Summary

- ICFA plays an important role as a forum for discussions transcending national or regional boundaries on the future of high energy accelerators and their associated particle physics, detectors and technology
- Projects are becoming so large and costly that no single country or group of countries can carry them out alone
- More and more international discussion and cooperation is needed
- If ICFA didn't exist, something very similar would have to be invented

Organization




- Japanese Mountainous Sites -
Site-A
KITAKAMI
IWATE
TOHOKU district
Tokyo
SEFURI
Site-B
FUKUOKA
SAGA
KYUSHU district

ILC TDR Layout