

ICHEP2018, Seoul, July 4-11, 2018



ICFA REPORT

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coex

<http://icfa.fnal.gov/>



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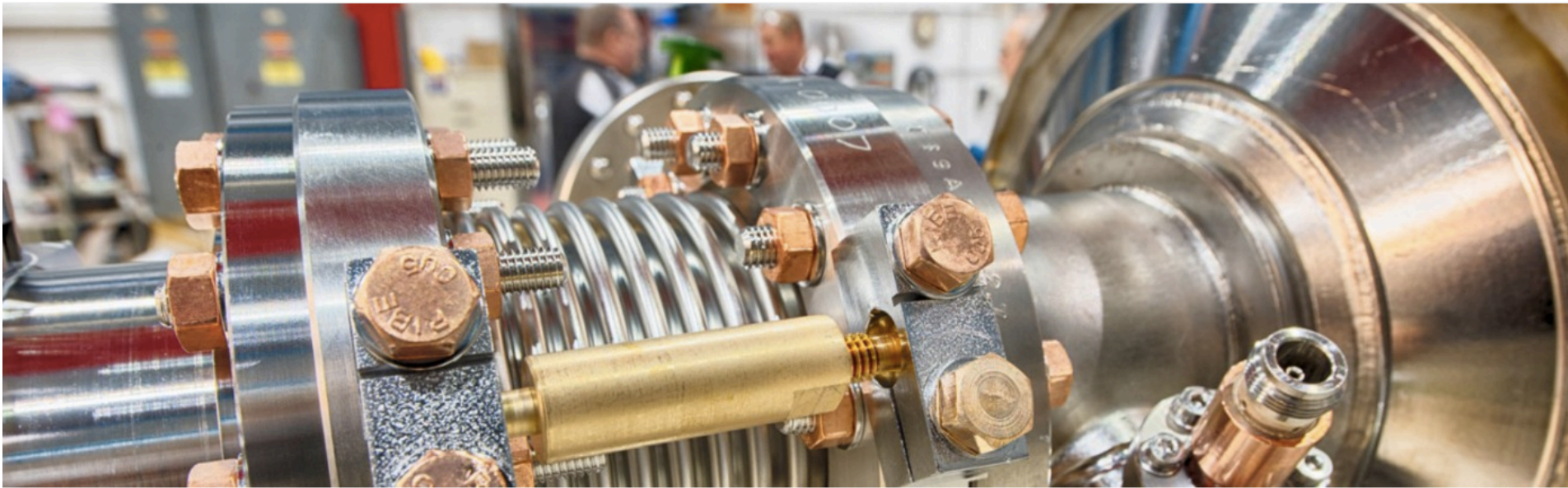
ABOUT ▾

MEETINGS

PANELS

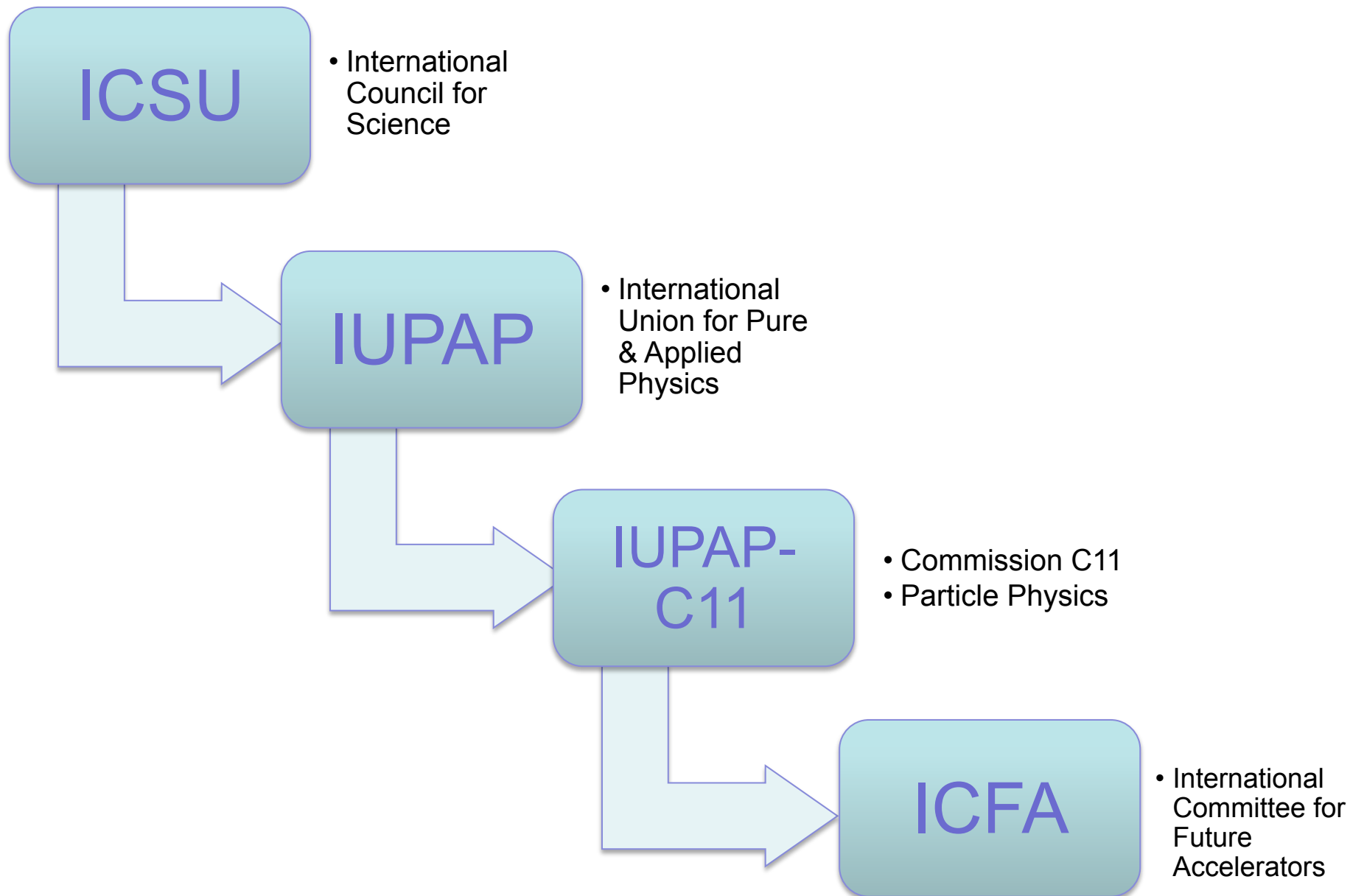
STATEMENTS

LINEAR COLLIDER ACTIVITIES



International Committee for Future Accelerators

ICFA's Relationship to IUPAP and ICSU



- ICFA was created in 1976 by the International Union of Pure and Applied Physics (IUPAP) Commission C11
 - ◆ **Promote international collaboration in the construction and exploitation of accelerators for high energy physics**
 - ◆ **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
 - ◆ **Organize workshops for the study of problems related to super high energy accelerator complexes and their international exploitations and to foster research and development of necessary technology**
- ICFA is the recognized body to represent high energy physics community on the global stage.

G. Taylor, Chair, Australia

P. Bhat, Secretary, USA

J. D'Hondt, CERN Member States

F. Gianotti, CERN Member States

**J. Mnich, CERN Member States &
Past Chair**

D. MacFarlane, USA

N. Lockyer, USA

N. Hadley, USA

I. Koop, Russia

V. Petrov, Russia

**All regions of the world
represented. Includes directors
of major Particle Physics Labs.**

Y. Wang, China

E. Álvarez, Other Countries

V. Matveev, Other Countries

P.A. Naik, Other Countries

T. Mori, Japan

M. Yamauchi, Japan

M. Roney, Canada

**H.Schellman, Chair of IUPAP C11
(ex officio)**

● Generally two meetings per year

◆ Two-day meeting during February/March

- Directors of all major laboratories involved in particle physics invited
- Chairs of FALC, ICUIL, ApPIC and WG-14 on Accelerator Science invited
- Allows extensive discussion on current projects and planning for future global projects
- Latest Meeting: March 8-9, 2018 at U. Cambridge, UK
- Next Meeting: March 7-9, 2019 at U. Tokyo, Japan

◆ During the ICHEP or Lepton-Photon conferences each year

- Previous Meeting: August 9, 2017 at LP2017 in Guangzhou, China
- At this Meeting on July 8th
- Next Meeting: August 7, 2019 LP2019, in Toronto, Canada

● An ICFA seminar is held every three years

◆ Previous: Nov. 6-9, 2017 in Ottawa, Canada

◆ Next Seminar: Fall 2020 (Venue: CERN)

- Seminar held once every three years, rotating between Asia, Americas and Europe.

“Future Perspectives in High Energy Physics”

- The goals of the Seminar are

- ◆ To get a broad overview of the status of the field
- ◆ To provide opportunity for ICFA-Community-Agency interactions



- 2017 Seminar hosted by TRUIMF, held Nov. 6-9 in Ottawa, Canada

- ◆ Program committee strived for regional and gender balance and achieved it with excellent results and very high quality!

- 212 registered participants – 92 from Americas, 78 from Europe and 42 from Asia; 44% of speakers female.

- ◆ VIP Guests: Hon. Julie Payette, the Governor general of Canada; Kate Young, Parliamentary Secretary of Science in the Government of Canada

- ICFA has set up several Panels, each with about 16 experts from around the world, on specific technical areas. Each Panel organizes its own program including workshops, newsletters, schools, etc.
 - ◆ Linear Collider Board (Chair: T. Nakada)
 - ◆ Beam Dynamics (Chair: Y. Chin)
 - ◆ Instrumentation Innovation and Development (Chair: A. Cattai)
 - ◆ Advanced and Novel Accelerators (Chair: B. Cros)
 - ◆ Interregional Connectivity (Chair: H. Newman)
 - ◆ Data Preservation in HEP (Chair: C. Diaconu)
 - ◆ Sustainable Accelerators and Colliders (Chair: M. Seidel)
 - ◆ Neutrino Panel (Completed study; terminated)
Roadmap document: <http://icfa.fnal.gov/wp-content/uploads/ICFA-Neutrino-Panel-Roadmap-discussion-document-Final-Reversion-1-04.23.17.pdf>
- ICFA recently approved new “Policies & Procedures” providing guidelines for the Panels.

Instrumentation Innovation and Development

XIV ICFA School on Instrumentation
La Habana, Cuba,
27 Nov.-8 Dec., 2017



EDIT 2018
Fermilab, Batavia IL USA
March 5-16, 2018



Beam Dynamics Panel

HB2018 (Hadron Beam) Workshop
Institute for Basic Science, Daejeon, Korea
June 17-22, 2018
150 participants



Newsletter



International Committee for Future Accelerators
Sponsored by the Particles and Fields Commission of IUPAP

Beam Dynamics Newsletter

No. 73

Issue Editor:

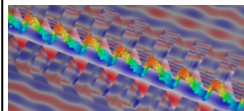
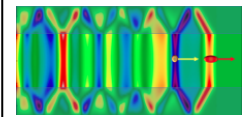
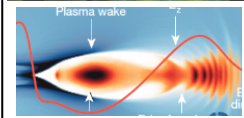
G. Machicoane and P. N. Ostroumov

Editor in Chief:

Y. H. Chin

April 2018

Advanced & Novel Accelerators



Workshops to discuss the roadmap:

WG8 EAAC, March 2018 at JAI, AAC 2018

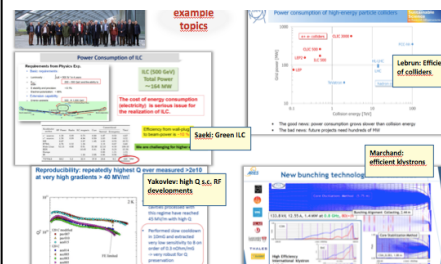
Next Meeting: August 12th at AAC venue

<https://indico.fnal.gov/event/17266/>

2017 - 2022	2022 - 2027	2027 - 2032	2032-2037
e- sources: optimization	e- acceleration: Optimization of all parameters	15 Ys Reliable staged acceleration, 10 GeV module	20 Ys Advanced Linear Collider CDR and TDR
e+ sources: Concept devt	e+ acceleration: demonstration	10 Ys x10 Improved beam quality at higher energy	
Driver development			
Accelerating structures			
Beam transport and coupling			
5 Ys Injector, Accelerator stages with controlled parameters			
		Address specific challenges: Staging → Reliability → Polarization → Efficiency → Beam Delivery System →	

Sustainable Accelerators and Colliders

4th Workshop Energy for Sustainable Science at Research Infrastructures
23-24 November 2017, Magurele, Romania



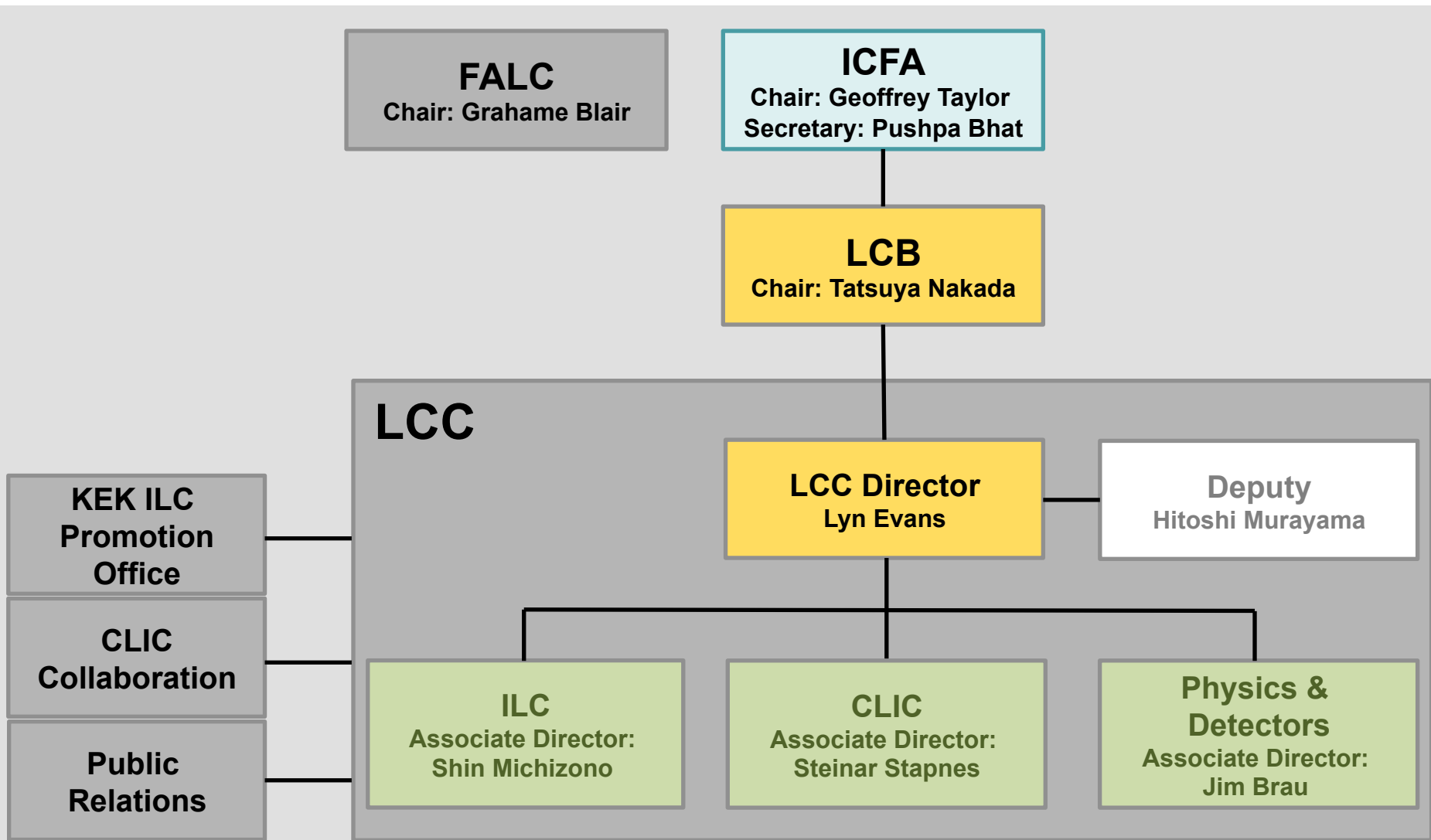
- Since ~2000, ICFA has been actively engaged in efforts towards a linear electron-positron collider
 - ◆ 2002: ICFA created the International Linear Collider Steering Committee (ILCSC) to promote the construction of an electron-positron linear collider through world-wide collaboration
 - ◆ 2003: Created the International Technology Recommendation Panel (ITRP).
 - ◆ 2005 : Set up Global Design Effort (GDE) to produce an ILC design and cost estimate
 - ◆ June 2013: Technical Design Report completed, including detectors, with costs
 - ◆ 2013: ILCSC ended; Linear Collider Board (LCB) formed to oversee the Linear Collider Collaboration (LCC)
 - Note: this structure includes ILC and CLIC
 - ◆ 2016: LCB/LCC mandate and structure updated
 - ◆ 2017 ICFA Statement endorsing ILC250 in Japan

● 2013 European Strategy for Particle Physics

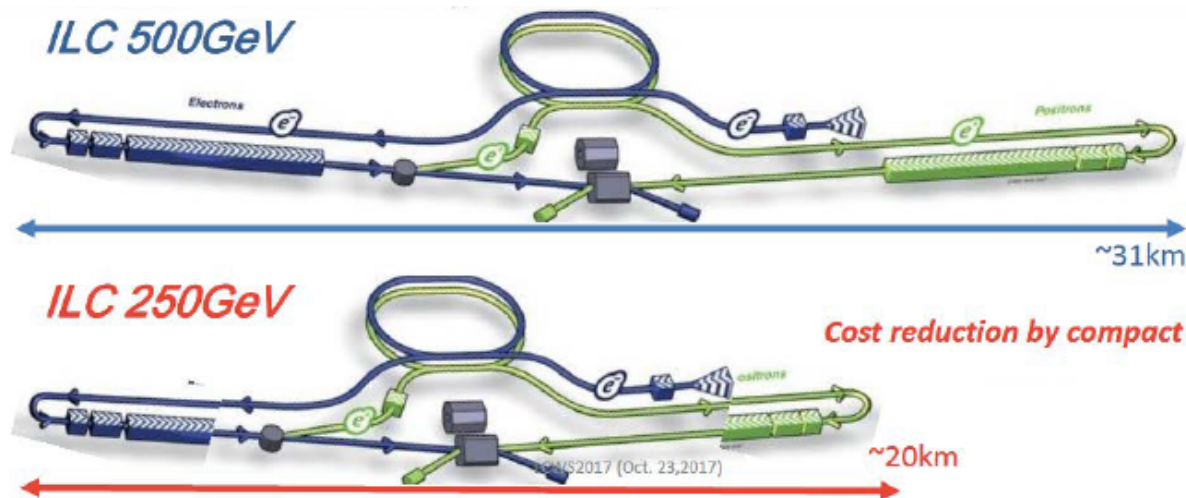
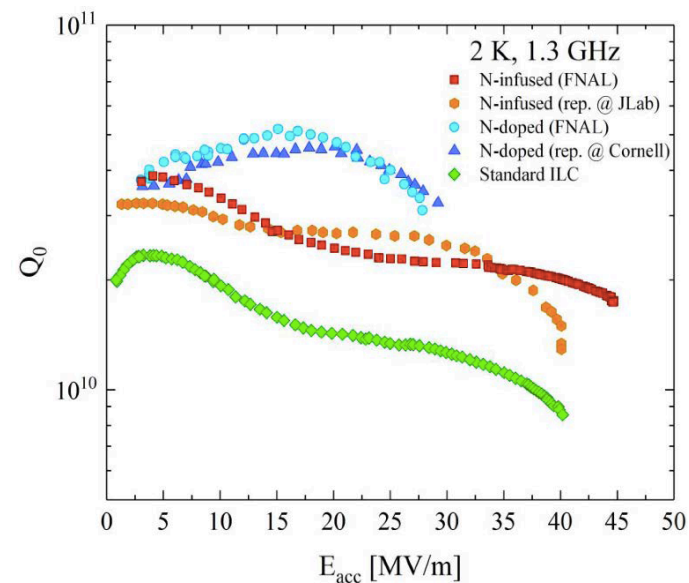
◆ The initiative from the Japanese particle physics community to host the ILC in Japan is most welcome, and European groups are eager to participate. Europe looks forward to a proposal from Japan to discuss a possible participation

● 2014 US P5: Use the Higgs boson as a new tool for discovery

◆ Recommendation 11: Motivated by the strong scientific importance of the ILC and the recent initiative in Japan to host it, the U.S. should engage in modest and appropriate levels of ILC accelerator and detector design in areas where the U.S. can contribute critical expertise. **Consider higher levels of collaboration if ILC proceeds.**



- LCC has carried out extensive studies of the accelerator design, detector and physics for 250 GeV ILC, as well as cost reduction exercises
- Cost Reduction --Technology
 - US-Japan SCRF R&D
- Cost Reduction -- Staging 250 GeV



~ cost 40% lower relative to ILC 500 TDR

- The discovery of the Higgs boson significantly strengthened the physics case for the ILC.
- With $m_H \sim 125$ GeV, a 250 GeV ILC makes a very good Higgs Factory, enabling precision Higgs measurements
- ILC is a mature design and technology
 - ◆ SCRF R&D program has exceeded the ILC spec for gradient and Q_0
 - ◆ European XFEL at DESY is a large-scale proto-type for the ILC
 - 101 cryomodules; 23.6 MV/m, accelerator length 2.1 km; 17.5 GeV e^-
- Machine upgradable to higher energies.
 - ◆ $t\bar{t}$ threshold and higher
- Other proposed machines
 - ◆ CLIC, CEPC (Circular), FCC-ee (Circular)

ICFA Statement on the ILC Operating at 250 GeV as a Higgs Boson Factory

The discovery of a Higgs boson in 2012 at the Large Hadron Collider (LHC) at CERN is one of the most significant recent breakthroughs in science and marks a major step forward in fundamental physics. Precision studies of the Higgs boson will further deepen our understanding of the most fundamental laws of matter and its interactions.

The International Linear Collider (ILC) operating at 250 GeV center-of-mass energy will provide excellent science from precision studies of the Higgs boson. Therefore, ICFA considers the ILC a key science project complementary to the LHC and its upgrade.

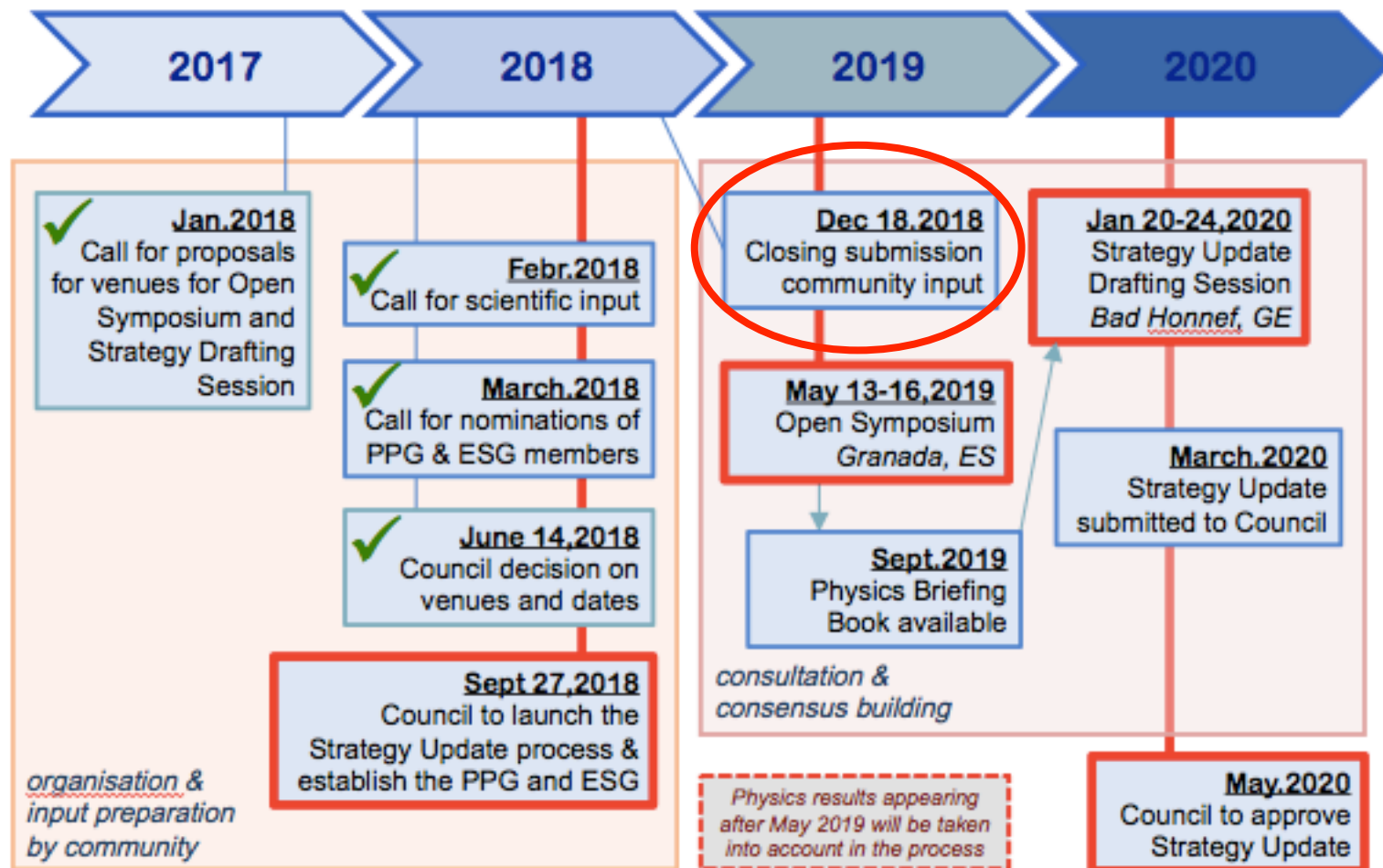
ICFA welcomes the efforts by the Linear Collider Collaboration on cost reductions for the ILC, which indicate that up to 40% cost reduction relative to the 2013 Technical Design Report (500 GeV ILC) is possible for a 250 GeV collider.

ICFA emphasizes the extendibility of the ILC to higher energies and notes that there is large discovery potential with important additional measurements accessible at energies beyond 250 GeV.

ICFA thus supports the conclusions of the Linear Collider Board (LCB) in their report presented at this meeting and very strongly encourages Japan to realize the ILC in a timely fashion as a Higgs boson factory with a center-of-mass energy of 250 GeV as an international project¹, led by Japanese initiative.

¹In the LCB report the European XFEL and FAIR are mentioned as recent examples for international projects.

European Particle Physics Strategy Update



- Project under serious consideration by the Japanese Government
 - ◆ Statement/Decision expected by the end of 2018
 - ◆ Japan is aware of the urgency and milestones (e.g., upcoming European Strategy Update)
- High level advisory panel and working groups were formed; studies completed and reports generated
 - ◆ Science Council of Japan will finalize extensive technical reviews in the coming 2-3 months.
- Encouraging interactions of Japanese Officials with agencies/governments in the US and in Europe have taken place
- Strong ongoing efforts in Japan with outreach to public, media, science community and industry



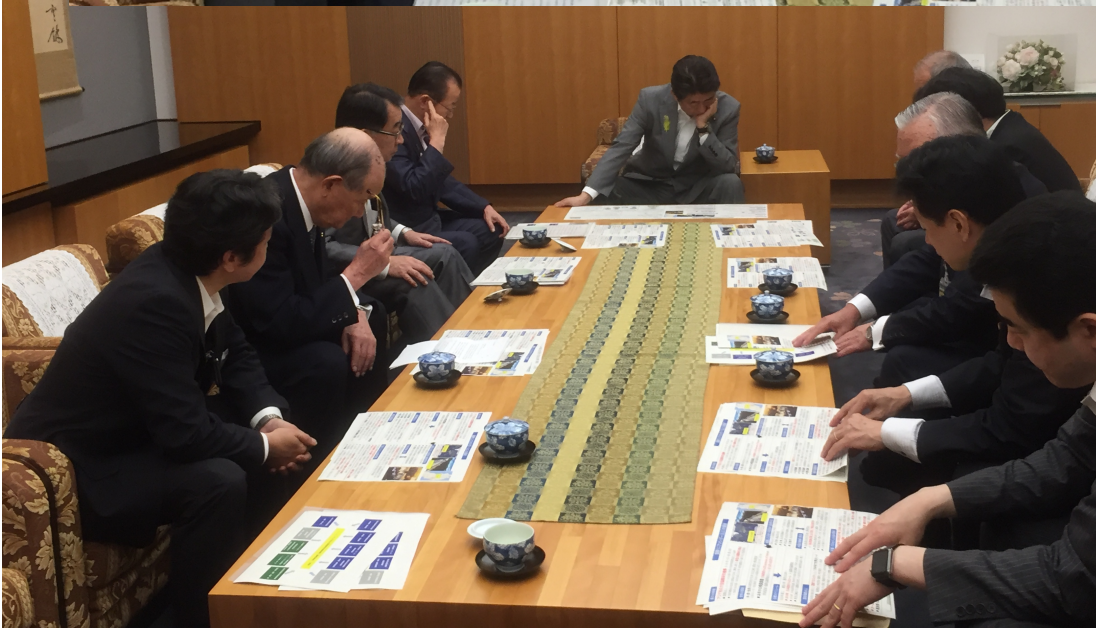
**Prof. Koshiba, Lyn Evans with Prime Minister Abe
April 2013**

Satoru Yamashita

PM Abe



July 5th



**Meeting with Prime Minister Abe
July 5th**

- Prime Minister Abe
- Deputy Chief Cabinet Secretary Nishimura
- Deputy Chief Cabinet Secretary Nogami
- Kawamura (Diet Budget committee chair)
- Shionoya (LDP election chair)
- Suzuki (Minister of Olympic)
- Onodera (Minister of Defense)
- Nishioka (AAA chair, MHI former CEO)
- Takahashi (Tohoku, Tohoku electric former CEO)
- Yamashita

- Promote International Collaboration and coordination in planning of future large accelerator facilities, providing regional balance and global benefits
- Guided by three basic requirements
 - (1) Physics Drivers, (2) Technology, (3) Resources
- Energy frontier colliders
 - ◆ **Key Current Focus:** ILC in Japan (ILC and CLIC groups working together)

ICFA anticipates deliberations on other important proposals:

- ◆ CEPC/SPPC in China
- ◆ HE-LHC, CLIC, FCC at CERN
- Accelerator-based Neutrino Program
 - ◆ LBNF in US; J-Parc in Japan

- Needless to say that Particle Physics is a global enterprise!
- International HEP collaborations are thriving in Europe, Americas and Asia, as seen from presentations at this meeting.
- ICFA has an important role in bringing the global particle physics communities together, facilitating international planning, construction and exploitation of future large HEP accelerators
- ICFA continues to champion the cause of the ILC as a Higgs factory. The world HEP community awaits Japan's decision on the ILC!
- There are good reasons to feel optimistic about the future of our field!