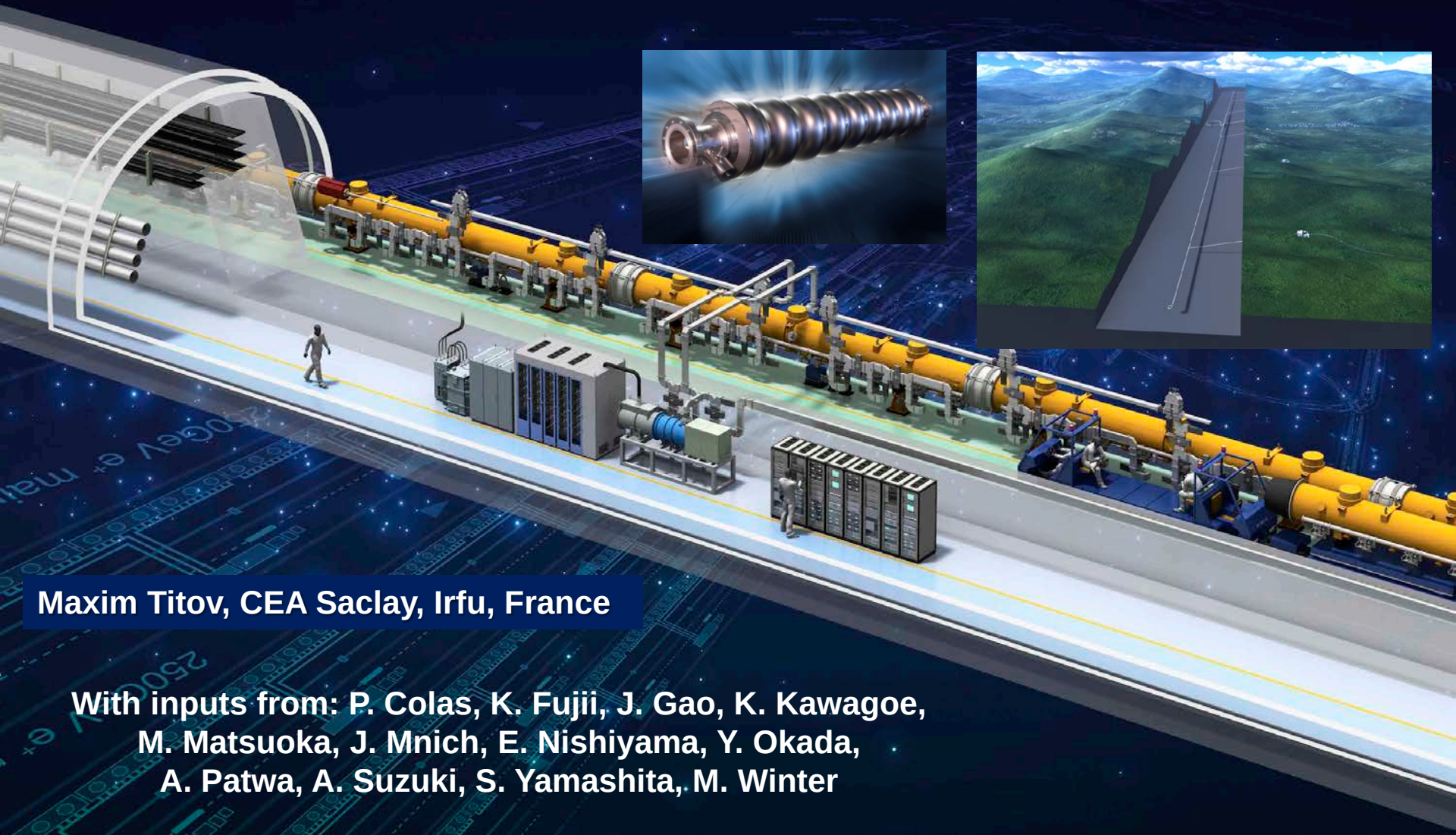
LATEST NEWS FROM ILC:

LCWS2019 HIGHLIGHTS & US/EUROPE/ASIA DIPLOMATIC LANDSCAPE



Maxim Titov, CEA Saclay, Irfu, France

With inputs from: P. Colas, K. Fujii, J. Gao, K. Kawagoe, M. Matsuoka, J. Mnich, E. Nishiyama, Y. Okada, A. Patwa, A. Suzuki, S. Yamashita, M. Winter

APERO DPhP & ILC Information Meeting, CEA Saclay, Irfu, Jan. 10 (2020)

LCWS2019 Program:

- **Joint ILC/CLIC Plenaries (Mon./Wed.)**
  - → **Accelerator/physics**
  - → **Industry session**
  - → **Nambu session**

- **Accelerator, Physics/Detector parallel sessions (Tue./Thur.)**
  - → Run at Z pole, Luminosity increase, polarization of positrons (P. Colas talk)
  - → Cavity processing, N2 infusion and doping (O. Napoly talk)

- **Political session (Friday)**
  - → Sendai Statement

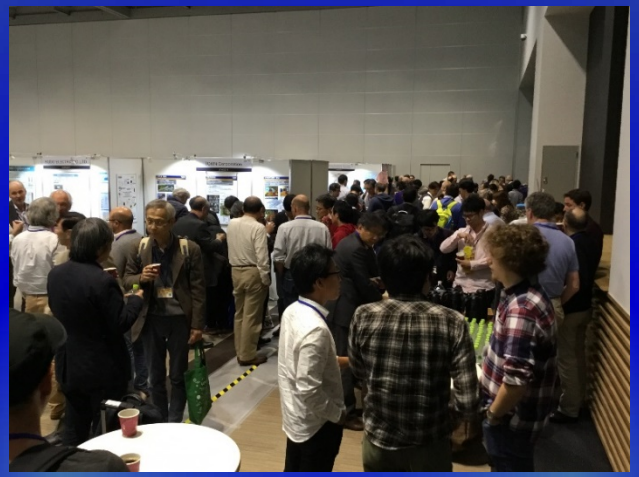
https://www.interactions.org/press-release/lcws-participants-publish-sendai-statement-support

- → Hon. Shionoya (Diet)
- → M. Pavek (US Embassy/Tokyo)
- → Europe/US next steps, ICFA, …

❖ To be discussed at “ILC Information Meeting” today afternoon
→ ongoing activities towards ICFA/LCB meeting in Feb. 2020

LCWS2019 in Sendai: Highlights

400 participants from 23 countries



60 Organizations participated in the Industry Exhibition

More 200 local business persons participated the ICFA Seminar

Researchers enjoyed excursion(s) in Tohoku region

Researchers volunteered in typhoon-affected areas

Documents / Inputs for the ESG Discussion (CERN)

- **Sep. 2019: Supporting Note for Briefing Book with five Scenarios,** prepared by the ESG Secretariat (CERN-ESU-05: http://cds.cern.ch/record/2705370).
  Personal remark: → the last 2 scenarios assume e+e− collider is built outside Europe
  → building a strategy without considering the global context (China, Japan) is inefficient → need for a global strategy of the future HEP domain

- **Oct. 2019: Physics Briefing Book**, Input for the European Strategy for Particle Physics Update 2020, arXiv:1910.11775; CERN-ESU-004

- **Oct. 2019: Input of IRFU/DPhP on EPPSU future collider scenarios**,

- **Nov. 2019: Response from the German Committee for Particle Physics (KET) to the ESG request for further input on collider scenarios**

- **Dec. 2019: Circular an Linear e+e− Colliders: Another Story of Complementary**, A.Blondel, P.Janot, ArXiv:1912.11871

- **Dec. 2019: Charting the European Course to the High-Energy Frontier**, U.Amaldi et al., arXiv:1912.13466

- **Jan. 2020: CNRS/CEA Discussion "Scénarios de futurs collisionneurs & Questions ouvertes »:** https://indico.in2p3.fr/event/20221/

Documents / Inputs for the ESG Discussion (ILC)

- **Dec. 2018: ESG submissions - arXiv:1901.09825, arXiv:1901.09829**
- **Mar. 2019: ILC state-of-the-art** (machine design, running scenarios, physics, detectors, computing, SM and BSM benchmarks), 104 pages; **arXiv:1903.01629**

➢ **May 2019: Luminosity and Site AC Power for the ILC paper** (luminosity upgrade)

➢ **May – Oct. 2019: Impact of high Q on ILC250 upgrade for record luminosities and path toward ILC380**
→ Symposium (https://indico.fnal.gov/event/20759), seminar (https://agenda.linearcollider.org/event/8266), paper (https://arxiv.org/abs/1910.01276)

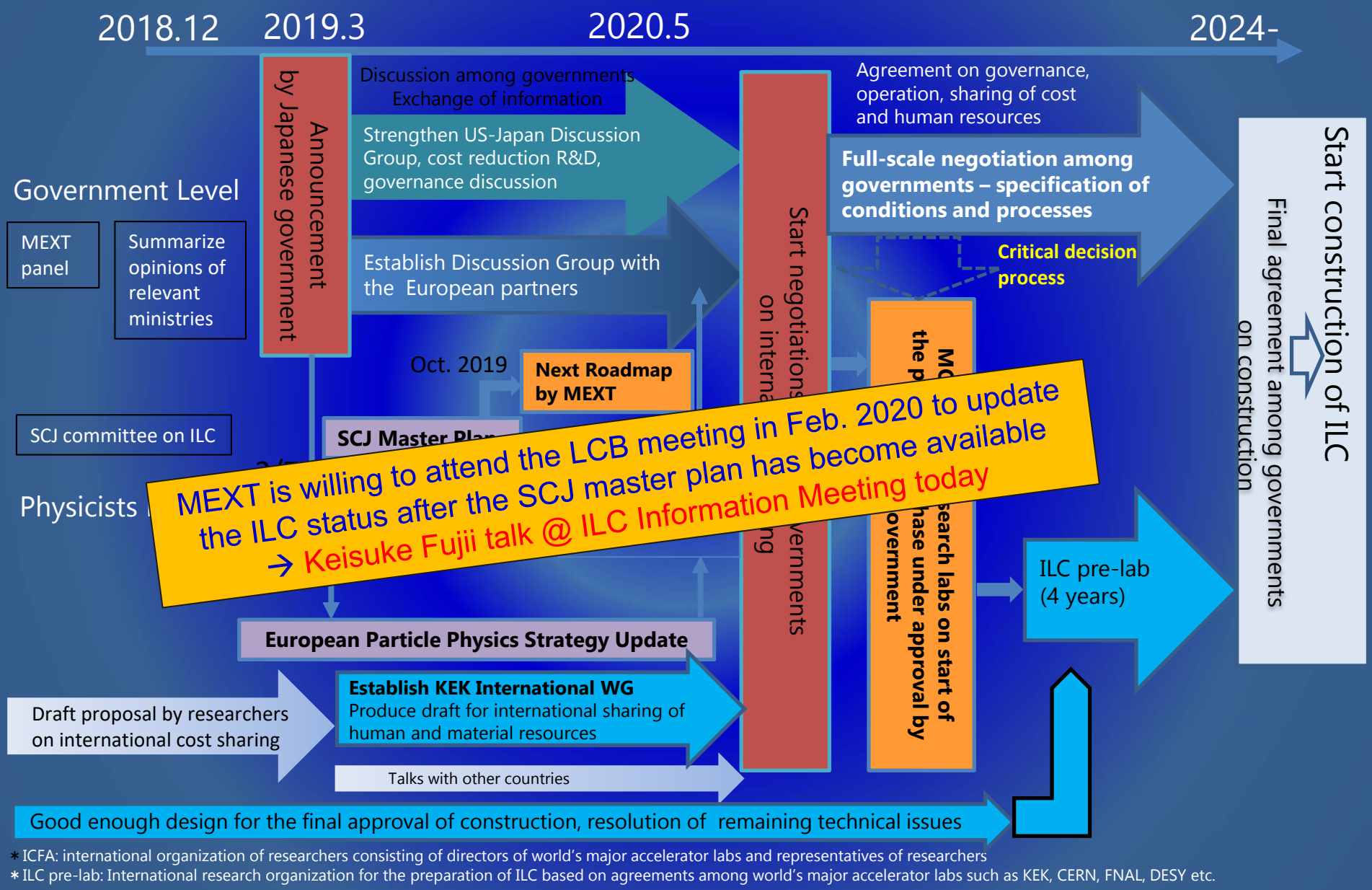
➢ **Oct. 2019: Recommendations on ILC Project Implementation**: KEK WG report (https://www.kek.jp/en/newsroom/2019/10/02/1000), recommendations sent to MEXT

➢ **Dec. 13, 2019: Recent progress towards the realization of the ILC in Japan: Cooperative efforts by Academia,Industry, and Local Region**,
T. MORI (Chair, HEP Committee), http://jahep.org/files/input_JapanHEPC_20191213.pdf

➢ **Dec.13, 2019:Status of the ILC,** M.Yamauchi, MEXT/KEK DG report, ESG meeting

➢ **Dec. 13, 2019: US DoE point of view** → ESG meeting

Processes and Approximate Timelines Towards Realization of ILC



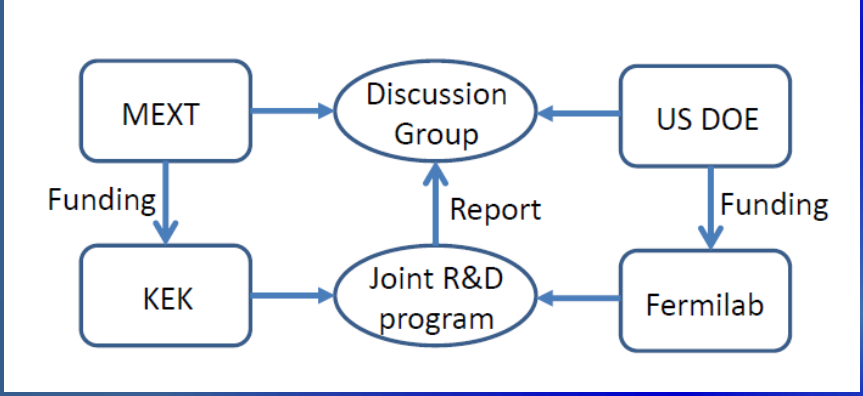
* ICFA: international organization of researchers consisting of directors of world's major accelerator labs and representatives of researchers
* ILC pre-lab: International research organization for the preparation of ILC based on agreements among world's major accelerator labs such as KEK, CERN, FNAL, DESY etc.

Japan – USA

- 2013-2017: Boost S&T cooperation in general – regular communication to:
  → Government (DOE, OSTP@DC) and Congress (S&T Approproation committee)

- 2016: US-Japan (DOE-MEXT) “discussion group” → ILC R&D on cost-reduction
- Oct. 2018: Meeting in Tokyo/KEK with DoE UnderSecretary P. Dabbar

The bilateral “discussion group”:
US-Japan DG



Similar frameworks is being established with France/Germany in 2019

Since Sep. 2019: discussions on political and governmental-levels at different meetings (e.g. 2019 STS Forum) between DoE/DOS and Japan

Speech at LCWS2019 by Hon. Rio Shionoya

http://epx.phys.tohoku.ac.jp/LCWS2019/documents/LCWS2019_Hon.Shionoya_Ryu_EN.pdf

Ryu Shionoya, Director-General of ILC Parliamentary Union

- In any event, March 7th marked a big step forward both politically and administratively.

The important point here is that this expression of interest by the Japanese government was the result of the coordination by relevant ministries and agencies, including the Prime Minister's Office and the financial authorities.

- For Japan, the ILC is about realizing an international research institution in collaboration with the world and assuming the leadership role. This is an unprecedented challenge, but we have made progress by making new processes and through trial and error.
- We hope to see further progress on the research in the ongoing discussions about cost reduction, incorporating the fast-evolving technological innovations. Investing in science and technology is our political responsibility.
- The ILC will show us the future. Let us work together for its realization.

Speech at LCWS2019 by Melinda Pavek (US Embassy/Tokyo)

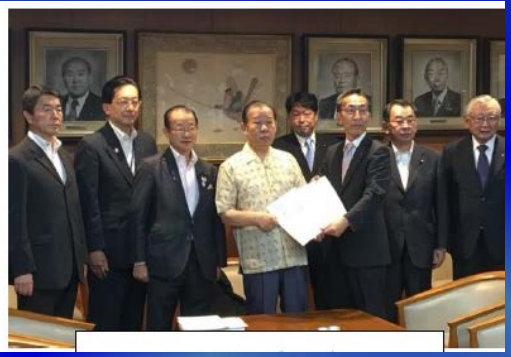
US-Japan cooperation in S&T and ILC:
https://agenda.linearcollider.org/event/8217/contributions/44502/attachments/35114/54363/Sendai_ILC_draft_remarks-_final_for_Jim.pdf

Today, I come before this distinguished body to tell you that the U.S. Department of State has done our initial due diligence, and we are ready to assist our partner agencies in moving forward with the next major particle physics facility in Japan - the International Linear Collider …

- The United States is not looking for an immediate decision on building, or hosting, the ILC. Instead, the United States is looking for Japan to signal an intent to explore hosting the ILC. We are ready to do so because of the depth of trust, partnership and collaboration that exists between the United States and Japan.
- We also know that there are still significant decisions needed from all partner governments, including the United States and Japan, before we can reach what the Department of Energy calls a “Critical Decision Zero”—an approval of the project based on the mission need
- **Let’s work together and launch the ILC project!**

Japanese Political Sector

Prime Minister official residence



Leading Party

Jul. 2018: Prime Minister Abe

Current main activity is to lobby politicians and government officials for realizing the ILC in Japan as soon as possible:

Tohoku local governors, industry/economy leaders; researchers “accompany” this process

Jun. 2019 ILC Diet members caucus

Jun. 2019 Prime minister’s official residence

Jun. 2019 Ministry of Land, Infrastructure, Transport and Tourism

Jun. 2019 Reconstruction Agency

Local Organizations call on Government to realize the ILC

"ILC Information Meeting" →
Keisuke Fujii talk @ ILC Information Meeting today

Miyagi Prefectural Assembly
Deputy Secretary of the Cabinet Secretariat
Dec 18,2019

Federation of Diet Members supporting the ILC, Tohoku ILC Promotion Council, and others:

Visit to the Minister of Education, Culture, Sports, Science and Technology (Dec 19,2019)

Progressing with France and Germany ...

Visit to Berlin/Paris on July 1 and 2, 2019:

- Occasion to convey the true profile of the ILC project (progressing steadily at the government level) and the pace at which it may converge towards the final decision;

- Establish bi-lateral Japan-Germany (JP-GE) and Japan-France (JP-FR) Discussion Groups (similar to the US/DoE – Japan/MEXT one);

  (European) Parliament members consideration(s):
  - → Desirable to expand it to tri-partite JP-GE-FR discussion group in the future;
  - → It would be valuable for them to participate to the discussion group(s) from time to time;

- Discuss the ILC project in a wider science diplomacy context accommodating more general objectives of mutual interest:

  → ILC as a major investment in FUTURE (not only in particle physics), including cultural aspects, international cooperation and the dynamics it will generate in industry and society at large;

2020 and beyond: **deepening of discussions between Japan and US, FR, GE**
→ expanding to UK, Italy (contacts initiated with Russia) other nations and CERN


LET’S

France and Germany are open for cooperation with Japan

"ILC as a Global Project" → international project, led by Japanese initiative

- Reach common understanding of the project scope and model of cost-sharing
  → high-tech equipment (accelerator): Japan (and Asia), US and Europe is to share one-third each through in-kind contributions;

- Japan – Germany / France bi-laterial contacts have been established at 4 levels:
  → Parliament/Political, MEXT – BMBF/MESRI Ministry, Funding Agency – Laboratory Level, Industry and Researchers (Liaisons) level;

Important conditions for ILC realization:

- ILC Positioning in the Result of the Next European Strategy of Particle Physics
- Global Context → ILC has to be Coexisting and Synergistic with CERN
- Create a Basis for International Cooperation in the Industrial Sector

Japan – France

Jan. 2018

Diet Federation visit (Diet, MEXT, MoFA, AAA, Tohoku) → meetings in Assemblée nationale (O. Becht, A. Tourret), MESRI (J.-P. Bourgoin, A. Beretz, C. Chardonnet), visits to IN2P3 and CEA HQ, THALES

May 2018

O. Becht visit to Japan → meetings in Tokyo (Diet), Iwate (Governor);

Nov. 2018

French (O. Becht, C. Villani) / Diet meeting in Tokyo; seminar on cooperation between EU & Japanese regions

Dec. 2018

Diet letter to O. Becht on the ILC Progress

Jan. 2019

France-OPECST note published (see next slide)

Jul. 2019

Diet Federation visit (Diet, MEXT, MoFA, AAA, Tohoku) → meeting Assemblée nationale (O. Becht, A. Tourret), MESRI (J.-P. Bourgoin, B. Larrouturou, C. Chardonnet), visit to CEA

Aug. 2019

Diet letter to O. Becht and A. Tourret on the next steps between Japan and France

Oct./Nov. 2019

O. Becht visit to Japan (this & next week)

MEXT-MESRI discussion group meeting (in preparation)

Japan – Germany

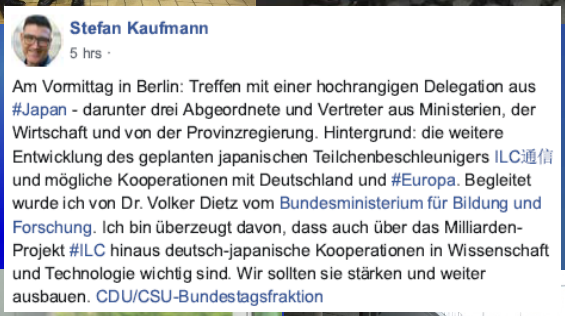
Jan. 2018
Diet Federation visit to Berlin (Diet, MEXT, MoFA, AAA Industry, Tohoku) → meetings in Bundestag (S. Kaufman) and BMBF (G. Schuette, State Secretary)

Apr. 2018
Meeting with S. Kaufmann in Bundestag

Oct. 2018
S. Kaufmann visit to Japan → discussion in Tokyo (Diet), Iwate (Governor) and KEK;

Dec. 2018
Diet letter to S. Kaufmann on the ILC Progress

Jul. 2019
Diet Federation visit to Belin (Diet, MEXT, MoFA, AAA, Industry, Tohoku) → meeting in Bundestag (S. Kaufmann, V. Dietz (BMBF))



Stefan Kaufmann
5 hrs ·

Am Vormittag in Berlin: Treffen mit einer hochrangigen Delegation aus #Japan - darunter drei Abgeordnete und Vertreter aus Ministerien, der Wirtschaft und von der Provinzregierung. Hintergrund: die weitere Entwicklung des geplanten japanischen Teilchenbeschleunigers ILC通信 und mögliche Kooperationen mit Deutschland und #Europa. Begleitet wurde ich von Dr. Volker Dietz vom Bundesministerium für Bildung und Forschung. Ich bin überzeugt davon, dass auch über das Milliarden-Projekt #ILC hinaus deutsch-japanische Kooperationen in Wissenschaft und Technologie wichtig sind. Wir sollten sie stärken und weiter ausbauen. CDU/CSU-Bundestagsfraktion

Aug. 2019
Diet letter to S. Kaufmann and G. Schuette on the next steps between Japan and Germany

Oct. 2019
1st MEXT–BMBF discussion group meeting (Oct. 9)

Japan – EU / EC

EU-Japan at the policy level

→ great mutual trust and enormous support to enhance cooperation

EU and Japan Strategic Partnership in S&T:
https://ec.europa.eu/research/iscp/index.cfm?amp;pg=japan

- March 2011: Agreement on cooperation in Science and Technology (S&T) between the European Community and the Government of Japan enters into force;
- May 2015: Endorsement of the joint vision for the new EU-Japan strategic partnership in Research and Innovation at the 23rd Japan-EU Summit Projects (includes HEP as an explicit item);

LAUNCH OF THE
EU-JAPAN REGIONAL COOPERATION HELPDESK

The EU-Japan Centre is pleased to announce that CEEJA (European Center for Japanese Studies in Alsace) in Europe together with the Prefectures of Gifu and Iwate in Japan will develop the EU-Japan Regional Cooperation helpdesk.

CEEJA support the ILC:

(V. Fermaud talk @ LCWS2019 industry session):

opening new opportunities of cooperation between EU and Japan on ILC

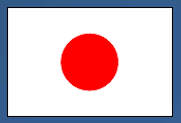
Some future ideas (in-cooperation with EU-Japan Center):

Special Event: "ILC - Industry – Innovation "

A New Challenge for Japanese and European Industries

European industry is facing a major opportunity to play a prominent role in the realisation of a novel, very large, international infrastructure to be installed in Japan for fundamental science. The project will boost and promote its most advanced technologies, in close partnership with forefront actors of Japanese high-technology industry. In order to bring together leading European and Japanese companies and their partners, it is mandatory to bridge several gaps, which range from various cultural aspects to the share of intellectual properties and governance. It is felt that a special event gathering European and Japanese stakeholders together with political representatives would act as a seed and serve as a boost for the ultimate benefit of society and scientific knowledge.

- Doors open … opportunities for a stronger EU-Japan cooperation (G. Ramanauskas talk @LCWS2019):
  - → third countries could become alike full EU partners in the new Program Horizon Europe (FP9)



Japan / ILC – China Scientific Policies

China has been a part of the ILC collaboration since 2005, as ILC GDE member (IHEP)

- 2013: Conclusions of the National meeting on important scientific strategies (464th Fragnant Mountain Meeting on « Next generation e+e- colliders: status/strategy)

  → International Linear collider (ILC) TDR has been completed after more than 20 years of preparation … Due to scientific and technological importance, Chinese scientists should participate in the ILC R&D and construction, and wish Chinese government contribute to ILC 5% of the cost, as in-kind contribution

- March 28, 2018 : Chinese Government (led by Premier Minister Keqiang Li) made public details of "Chinese Initiated International Large Scientific Plan and Large Scientific Project":

→ ... Actively participate in the other country or multi-countries' initiated Large Scientific Projects (hopefully, ILC will have good news from Japan in 2020)

→ ... Actively participate in important international scientific organizations', scientific projects and activities...

Potential technical contribution to ILC 250GeV construction from China (Just possibilities, personal point of view)

Parameters	Value
C.M. Energy	250 GeV
Peak luminosity	1.35 x10^{34} $cm^{-2}s^{-1}$
Beam Rep. rate	5 Hz
Pulse duration	0.73 ms
Average current	5.8 mA (in pulse)
Av. field gradient	31.5 MV/m +/-20% Q_0 = 1E10
# 9-cell cavity	8012 (x 1.1)
# cryomodule	928
# Klystron	~200

IHEP New SC Lab
→ construction in 2017-2020

300 cryomodules (cold mass)
or more? realistic

1 company in China - experience with "cold mass" assembly

Three cavity production centers: 800-1000 cavities in total (ideal maximum case, needs great efforts…)

3 companies in China

Damping ring magnets
Components like vacuum Chamber, etc
~1/3 or more?

J. Gao

Japan - India

New Era : Indian Research Institute - KEK Collaboration

Srikumar Banerjee
Chairman Atomic Energy Commission,
Secretary, Department of Atomic Energy,
Government of India

Atsuto Suzuki
Director General
Inter-University Research Institute Corporation
High Energy Accelerator Research Organization

2012:

Indian University Union - KEK Collaboration for Developing ILC Accelerator

Preparation for MoU

बीएचयू में खुलेगा इंडो– जापान सेंटर

Thomas Cook™ Forex Online

Banaras Hindu Univ.
2016.4.17

2017:

Department Of Physics
Raghava Varma
Professor
Phone: +91-22-25767582
Email: varma@phy.iitb.ac.in

पीएम नरेंद्र मोदी ने शेयर की जागरण की खबर

welcome message from Indian Prime Minister

वाराणसी : प्रधानमंत्री नरेंद्र मोदी ने दैनिक जागरण वेबसाइट की खबर 'बीएचयू में खुलेगा इंडो जापान सेंटर' को अपने निजी वेबसाइट नरेंद्रमोदी डाट इन के वाराणसी सेक्शन में शेयर किया है। प्रधानमंत्री नरेंद्र मोदी समय समय पर अपने संसदीय क्षेत्र वाराणसी की प्रमुख खबरों को अपनी वेबसाइट का हिस्सा बनाते रहते हैं। इस बार जागरण डाट काम की 18 अप्रैल को वेबसाइट पर प्रकाशित बीएचयू की खबर को शेयर किया है। खबर में भारत और जापान के संबंधों को मजबूती देने के क्रम में शैक्षिक आदान प्रदान की इस खबर को वेबसाइट पर खबर के लिंक के साथ शामिल किया है।वाराणसी : प्रधानमंत्री नरेंद्र मोदी ने दैनिक जागरण वेबसाइट की खबर 'बीएचयू में खुलेगा इंडो जापान सेंटर' को अपने निजी वेबसाइट नरेंद्रमोदी डाट इन के वाराणसी सेक्शन में शेयर किया है। प्रधानमंत्री नरेंद्र मोदी समय समय पर अपने संसदीय क्षेत्र वाराणसी की प्रमुख खबरों को अपनी वेबसाइट का हिस्सा बनाते रहते हैं। इस बार जागरण डाट काम की 18 अप्रैल को वेबसाइट पर प्रकाशित बीएचयू की खबर को शेयर किया है। खबर में भारत और जापान के संबंधों को मजबूती देने के क्रम में शैक्षिक आदान प्रदान की इस खबर को वेबसाइट पर खबर के लिंक के साथ शामिल किया है।

MoU was established in January 2017

ILC Collaboration with Indian Physicists:

Representatives from 10 Indian accelerator labs and KEK had a meeting to discuss Indian involvement in ILC:

- Agreed to set up « Indo-Japan Center for Accelerators and Detectors » in Banaras Hindu University, as a base of Indian participation in ILC
- 2017: MoU has been signed between Banaras Hindu University and KEK

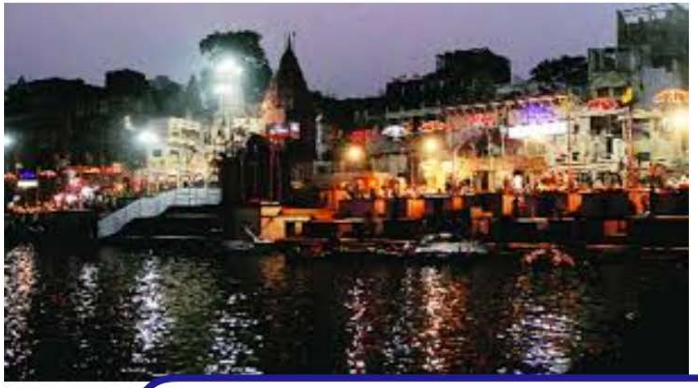
Japan - India

India - Japan together can do wonders Shinzo Abe, (PM Japan)

INDIA has manpower

JAPAN has the technology

R. Varma, LCWS2019 Industry Session



WILLINGNESS
&
Good Will

Use the opportunity to benefit both the nations

Ongoing discussions between Japan and India on possible contribution to the ILC

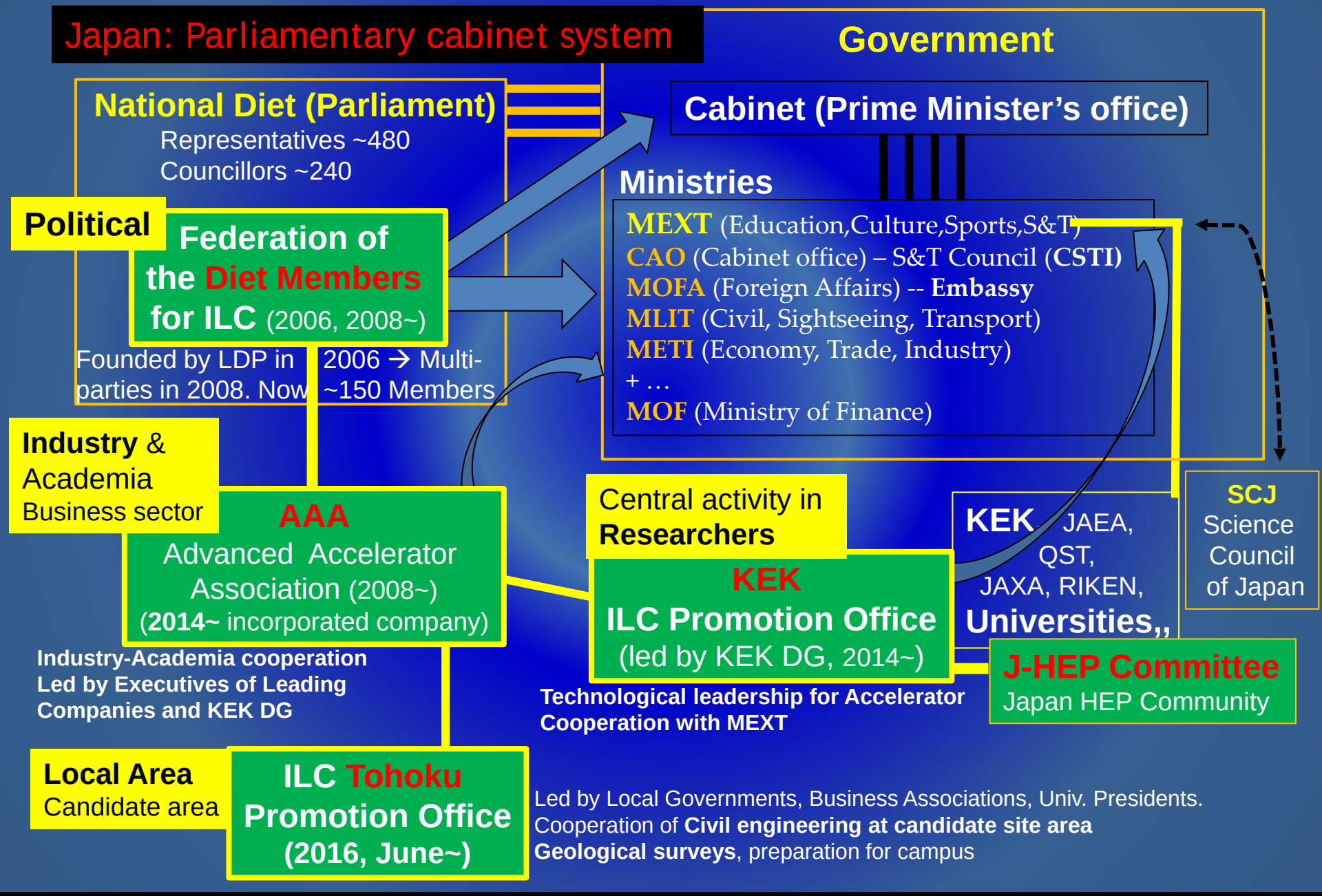
Politics

Local community

Industry/Economy

Media

Essential Bodies for ILC Promotion in Japan



Realizing the ILC as the National Project with Cross-Cutting Policies

Unified HQ for Implementing Regional Revitalization

Head: Hon. Takeo KAWAMURA

HQ for Promoting National Land Resilience

Head: Hon. Toshihiro NIKAI

Research Council for Strategy on Science, Technology and Innovation

Chair: Hon. Kisaburo TOKAI

HQ for Accelerating Reconstruction from Great East Japan Earthquake

Head: Hon. Fukushiro NUKAGA

Established in September 2018

Research Council for Strategy on Intellectual Property

Chair: Hon. Akira AMARI

Secretary-General LDP

Liberal Democratic Party

Coordination Council for Realization of ILC

(Representative: Hon. Takeo KAWAMURA)

(Across-party group) Science and Technology Group

Chair: Hon. Hiroyuki HOSODA

Advanced Accelerator Assoc. Promoting Science and Technology

Chair: Mr. Takashi NISHIOKA

ILC 100 People Committee

Knowledgeable Advisors

Hon. Hiroya MASUDA (former Minister for Internal Affairs)

Prof. Atsushi SUNAMI (Vice President, GRIPS)

Tohoku ILC Promotion Council

Representative: Mr. Hiroaki TAKAHASHI, Prof. Hideo OHNO

ILC Supporters

(Across-party group) Federation of Diet Members in Support of ILC

Chair: Hon. Takeo KAWAMURA
Secretary General: Hon. Ryu SHIONOYA

Current ILC-Tohoku Activities (I)

Tohoku region has been developing a local version of CPDG (Comprehensive Project Design Guideline), dedicated in the ILC construction site, comprised of:

① [Regional Base of Fabrication, Maintenance and Storage for ILC Accelerator Components]:
② [Detailed Design of ILC Energy Flow from Electric power input to Thermal Energy Output]
③ [Design of Tunnel Facilities dedicated in Kitakami District]
④ [Green ILC]
⑤ [Tohoku Master Plan based on ILC]
⑥ [Economic Ripple Effect induced by ILC]
⑦ [Messages from the Nobel Laureates in Physics: Hoping for the ILC to be sited in Japan]
⑧ [Report on Design and Cost-Estimation for ILC in the Kitakami District]

①

②

③

④

Current ILC-Tohoku Activities (II)

⑤

ILC
東北マスタープラン
～国際リニアコライダー建設を契機とした東北の発展を目指して～
［概要版］

ILC絵画コンクール入賞作品

⑥

国際リニアコライダー日本誘致がもたらす
イノベーション・経済波及効果調査報告書
［概要版］

⑦

Hoping for the International Linear Collider (ILC)
to Be Sited in Japan
Messages from the Nobel Laureates in Physics

Dr. Burton Richter (1976)
Dr. Steven Weinberg (1979)
Dr. Sheldon Lee Glashow (1979)
Dr. Jerome Isaac Friedman (1990)
Dr. Gerard 't Hooft (1999)
Dr. Masatoshi Koshiba (2002)
Dr. David Gross (2004)
Dr. Toshihide Maskawa (2008)
Dr. Makoto Kobayashi (2008)
Dr. Barry Barish (2017)

(winning year)

⑧ Report on Design and Cost-Estimation for ILC in the Kitakami District

We support the ILC
Accelerating Innovation
Tohoku ILC Promotion Council
Tohoku Japan

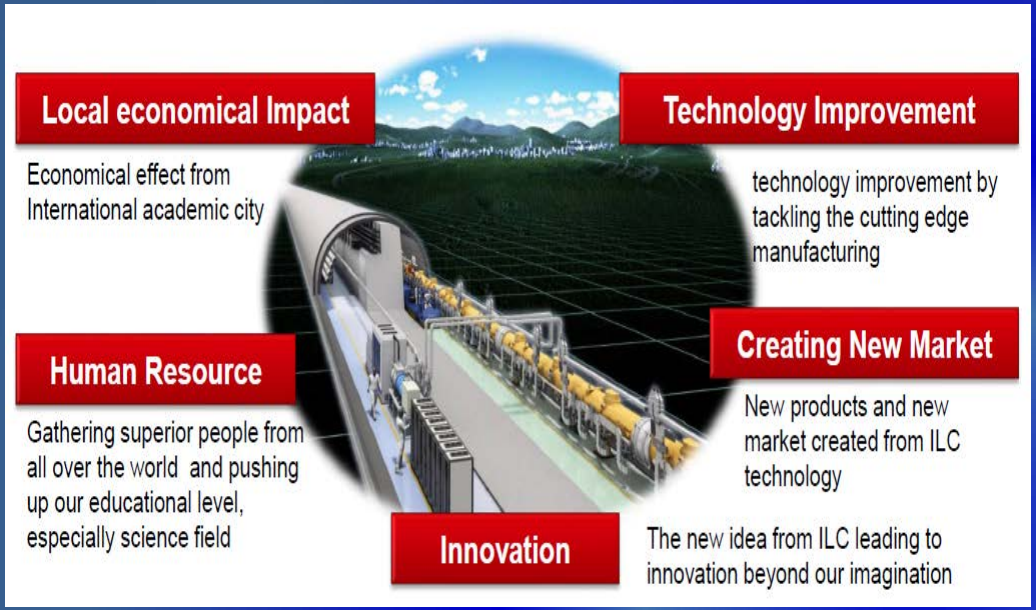
東北におけるＩＬＣ準備状況

473 pages

平成３０年３月

東北ＩＬＣ推進協議会
東北ＩＬＣ準備室

Advanced Accelerator Association (AAA) Activities in 2019



25/April/2019	#60 Technology Group Meeting The latest information of advanced accelerators
12/July/2019	#2 Project Promotion Study Group Meeting Progress report
24/June/2019	General Meeting
18/July/2019	#61 Technology Group Meeting; The topics of SRF technologies
26/Sep./2019	#62 Technology Group Meeting; Quantum beam technology and its applications
16/Oct./2019	#3 Project Promotion Study Group Meeting; Town development inspired by ILC
17/Oct./2019	#16 Green ILC working group
18/Nov./2019	#4 Project Promotion Study Group Meeting; Japanese environment policy and ILC
28/Nov./2019	#63 Technology Group Meeting Frontiers of Superconducting Accelerators and Recent Trends in Accelerator Technology
9/Jan./2020	#64 Technology Group MeetingILC's Beam dump and related technology