

# Japanese Status and Prospects

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## 1. Activities and Status of Various Sectors

- Japan HEP Community
- Efforts in Various Sectors
- Site Candidate Evaluation

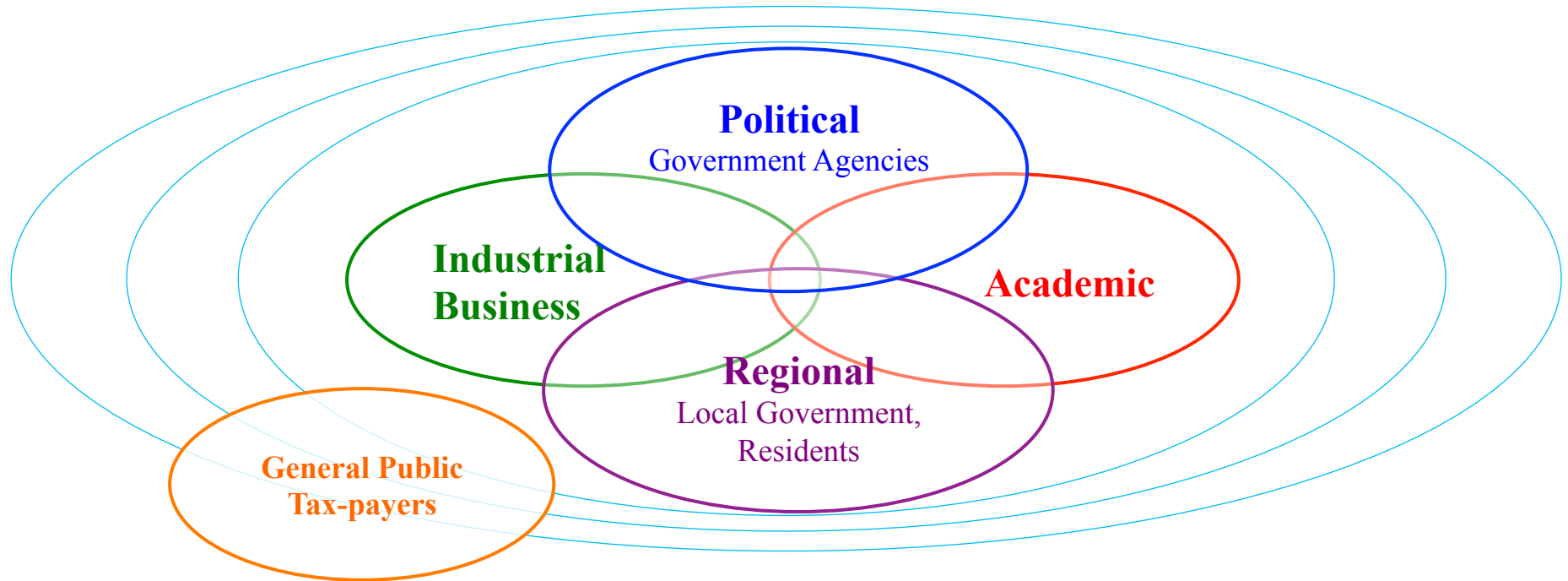
## 2. Recent Progress and Towards the Next Steps

- Processes
- MEXT / MOFA
- Science Council of Japan
- Budget Request for ILC Project Investigation
- Preparations for ILC Taskforce in MEXT

# Toward realizing ILC

ILC should be a genuine global project: the most important keys to its realization are

- **Global Governance of the Project**
- **Global Cooperation for the Science and Technology**
- **Global Design, Construction and Operation**



**Require coordination of various sectors**

2005 2006 2007 2008 2009 2010 2011 2012 2013

2005-2012

LHC physics

1<sup>st</sup> Ecm range

Global efforts

Accelerator

Baseline

Ref. Design

TDP-1

Re-baseline

TDP-2

TDR DBD

Detector

R&D

LoI

Domestic efforts in Japan

Political

1<sup>st</sup> Federation

Joint Federation by all parties

NOW

Industrial / Financial

LC Forum Japan

Advanced Accelerator Association

Academic

JAHEP Roadmap

Science Council Large Project Master Plan

SuperKEKB Approved

JAHEP Future Plan

Site / Regional

Formation of local groups

2 candidate sites

JSCE 2<sup>nd</sup> activity

Government budget for ILC geological survey

# Japanese HEP Community

- **Roadmap of High Energy Physics of Japan** (2007)
- Japanese Association of High Energy Physicists (JAHEP)
  - **“Recommendations by Subcommittee on Future Projects”**  
(Mar. 2012)
  - “ILC Strategy Council of Japan” formed  
for community-wide efforts to realize ILC (Mar. 2012)
  - **“Proposal for Phased Execution of ILC”** (Oct. 2012)
- Update of **KEK Roadmap** (already public)

# Efforts in Various Sectors

- **Politics**

- Federation of Diet members promoting ILC: established in 2006, became non-partisan in 2008, now has over 150 Diet members out of 700 total. (Chair: Mr. Takeo Kawamura, since February 2013)
- Government: LDP election platform incorporates the ILC. PM Abe speech on accelerator technology. / MEXT Minister Shimomura press conference

- **Industry**

- Advanced Accelerator Association Promoting Science & Technology (AAA): an alliance of industry and scientists (Chair: Tadashi Nishioka)

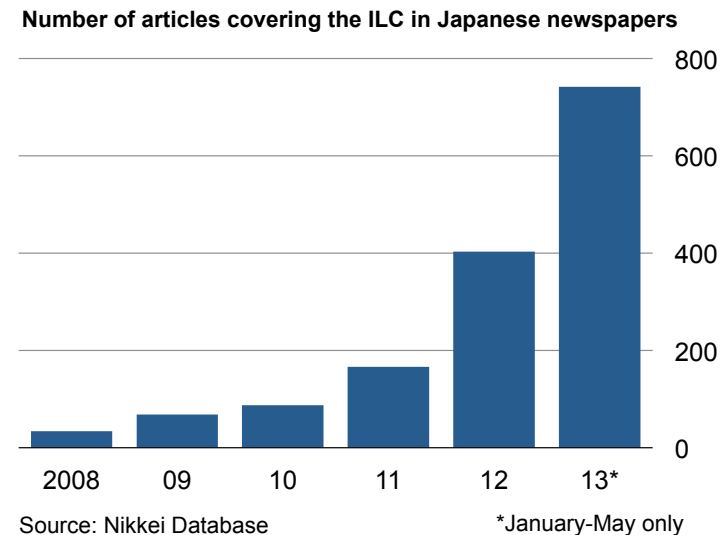
- **Business**

- Nation-wide communities in support of ILC: Japan Chamber of Commerce and Industry, Japan Association of Corporate Executives

- **Independent groups**

- Japan Policy Council: recommendations on creating a global city around the ILC lab.

- **Media coverage**



# Site Evaluation Committee

- 8 committee members: 7 HEP physicists and 1 expert on ILC-CFS.
  - Co-chairs: H. Yamamoto (Tohoku) and K. Kawagoe (Kyushu)
  - Other members: S. Narita (Iwate), A. Suzuki (KEK), M. Miyahara (KEK), S. Yamashita (Tokyo), T. Takahashi (Hiroshima), and A. Sugiyama (Saga)
- Experts on accelerators and detectors were consulted for information/knowledge/expertise required for the evaluation.
- Two expert subcommittees were set up
  - Charge of Panel 1 was to evaluate technical issues for construction
  - Charge of Panel 2 was to evaluate social infrastructure
- The site-evaluation committee has had more than 60 meetings since January 2013 (over 300 hours of discussion).

## International Review

- International Review 23-24 July 2013 at CERN
  - Chair: Lyn Evans; members: see Lyn's slide on Nov.11
- Reviewed the method of assessment
- Reviewed the technical feasibility of the preferred site (Kitakami)

# Announcement (Aug 23, 2013)

August 17, 2013

The ILC site evaluation committee of Japan has assessed the two candidate sites based on technical and socio-environmental criteria and unanimously concluded as follows:

The Kitakami site is evaluated to be the best domestic candidate site for the ILC.

In addition, the committee strongly recommends the central campus of the Kitakami site to have a good environment for living and research and to be located near the Shinkansen line for convenient access to Sendai and Tokyo.

It was one of the difficult processes to overcome towards the realization of ILC in Japan.

We will keep doing our best to solve the remaining issues.



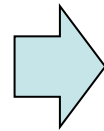
# Domestic Issues to Solve

- Site issues
- R&D and Design budget for domestic and international activities
- Human Resources
- More and more support from the general public
- Discussion with wider fields (in the academic sector)

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# NOW is the time for phase transition!!

- From R&D phase (Scientists only)
- To project preparation phase (Scientists + Governments)  
for the Decision Process if the project goes ahead or not

**The official process has been started !**

**We only have 2-3 years** to complete the preparation phase to have the decision and conclusion (for Japan)

Need **fully and timely coherent global efforts** not only for the full design of the machine but also for the **INTERNATIONAL PROCESS**, and need timely official evidence of **progress in establishing international partnership**

# A Challenge for the World and Japan

- While there are several large-scale international projects so far, such as ISS, ITER, LHC, etc., there are no well-defined model processes for how to proceed on the international S&T projects.
- It is a challenge for Japan to take a leading role from the beginning of official stream (it is the first time if Japan does). ILC would be an excellent model case also for Japan.

Of course, there is **hesitation** to jump in due to big **fear** for Japan. Once the government officially opens the door, then what will happen?

- **What if no country officially expresses interest / join ?**
- **What if the real project cost goes up ?**
- **What if no large number of researchers abroad actually participates ?**
- **What if, if, if,,,,**

- Establish **official** body: **ILC-Taskforce** in **MEXT**  
**headed by vice-Minister** (Feb. 2013)
- **Official** request to **SCJ** (Science Council of Japan) to assess the academic significance of ILC and issues to solve (May, 2013)
- Division in MEXT for all accelerator-related infrastructure: Quantum radiation research division → **Additional new division** is established in MEXT (June, 2013) : **Particle and Nuclear Research Promotion Division**; Director: S. Odoi
- **Official** hand-in process to MEXT has been done for **TDR** (Oct, 2013)
- **Official** hand-in process to MEXT has been done for **Site Assessment** (Oct, 2013)
- Direct communications started between MEXT and LCC management team
- **Governmental Budget Request** by MEXT for ILC **Project investigation** for FY2014 (conclusion for request to come early in Jan. 2014)
- **Renewal** of **ILC-Taskforce** in **MEXT** **headed by vice-Minister** (Nov. 2013)
- Committees/working groups to be established under the ILC-Taskforce (to come)

# Ministry of Foreign Affairs (MOFA)

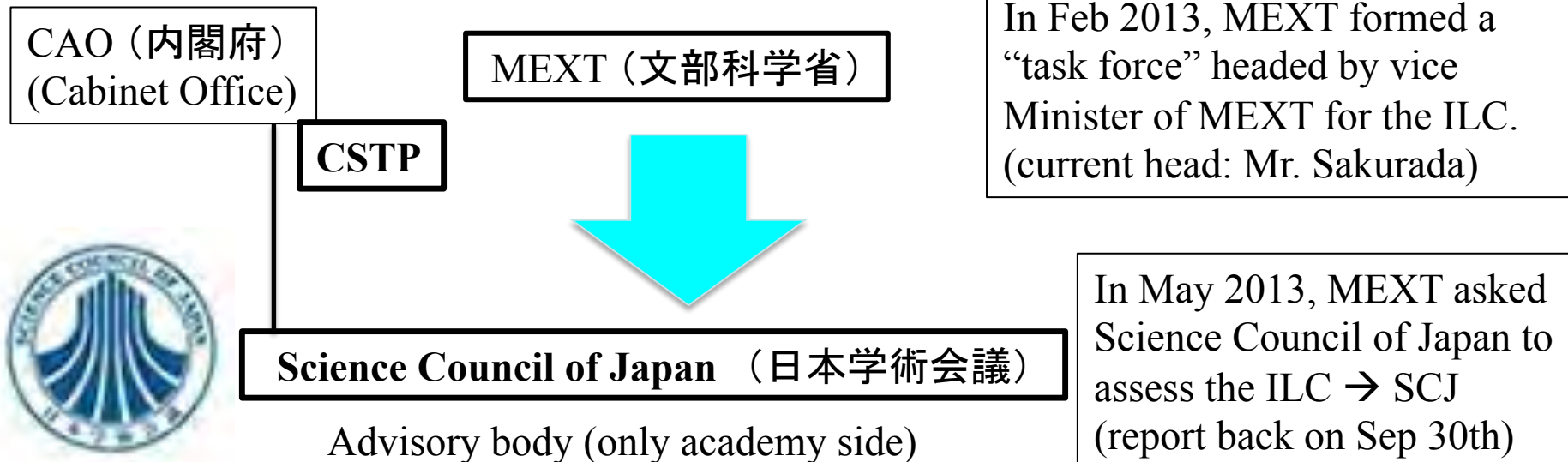
In Japan, when government authorities interact with foreign countries, consultation or cooperation by Ministry of Foreign Affairs (MOFA) is essential. **MOFA is also watching the world situation of ILC project.**

- **MOFA** actually once **surveyed in Jul.-Sep. 2013 about the government-level situation of ILC in various countries** by hearing from corresponding officials in each country/region.
- The result of the survey was *disappointing*... (told by a former vice-Minister of MOFA, who is one of the strongest supporters of ILC)
- Currently, no country **officially** supports the realization of ILC project, most are “neutral”, some are negative.. It causes additional fear and hesitation against jumping for Japan to raise the hand → **Need our best effort for “official” recognition in government branches, and to urgently prepare a list of best corresponding officers for ILC for mutually contacting among nations.** (FALC would be one of the best sets, but not all countries are involved)
- **But it’s a good starting point, because we can only go in the positive direction!**

# Processes

1. **International Partnership in/by Researchers (in good progress)**
2. **Domestic Assessments/Review in academy (Government/MEXT→SCJ) (done)**
3. → International (unofficial/official) Discussions for Partnership  
→ International (pre-)Negotiation
4. → Government Assessment / Judgment (MEXT/CSTP)  
CSTP = Council for Science and Technology Policy (総合科学技術会議)  
Chair: Prime Minister, Approval process (role of politics and government)
5. → Inter-governmental Official negotiations → Agreement → Authorization

## Government and Science Council of Japan



# 学術会議答申

。。。。前文

- ・ 日本学術会議としては以上の観点から、ILC 計画の実施の可否判断に向けた諸課題の検討を行うために必要な調査等の経費を政府においても措置し、2～3年をかけて、当該分野以外の有識者及び関係政府機関も含めて集中的な調査・検討を進めること、を提言する。
- ・ ILC の我が国への誘致の判断には、本回答が提示する諸課題や懸念事項について十分な調査・検討が行われ、建設、運転、高度化、最終処理にわたる経費の全容とその国際分担、人材や管理運営体制の問題など課題事項に対して明確な見通しが得られることが必須である。
- ・ 調査・検討と並行して海外主要国・地域の研究機関や資源配分機関との協議を行い、国際分担等に関する見極めを行うべきである。
- ・ ILC 計画を我が国で実施し高い成果を挙げるための諸条件を余すところなく検討した上で、学術コミュニティ全体の合意形成、さらには国民の理解を求めることが必要である。



# Science Council of Japan

Remarks on the ILC, September 30, 2013

## Excerpt (tentative/private translation)

- Based on the viewpoints above, the Science Council of Japan proposes that **the Japanese Government funds budget for the necessary investigations on various issues in order to judge as Japan for the realization of the ILC project, and for 2 to 3 years intensively conduct investigations** involving experts from outside the field and corresponding **Government bodies.**
- In deciding to host the ILC in Japan, it is indispensable that the issues and concerns raised by this report are fully investigated and reviewed, and clear prospects are obtained for questions such as the whole pictures of **project cost for the construction, operation, upgrades**, up to the final disposition and the **prospects of international cost sharing** thereof, as well as issues of **sharing of human resources**, and **international governance structure.**
- In parallel with the above investigations, **negotiations should be conducted with research laboratories and responsible funding authorities of primary countries and regions** to clarify **the prospects for the international cost sharing.**
- Upon fully examining the various conditions for the ILC project to be implemented in Japan and to be highly successful, it is important to form a consensus within the Japanese academic community and to seek understanding of the Japanese public.

# Budget Request

So far, the budgets given have been “**research**” budget

Government has provided **R&D** budgets for a long time (more than 10M\$/year excluding salary, more than 100M\$ M&S budget in total → all have been allocated to KEK/Universities)

- **One of the most important milestones reached!**  
**Governmental PROJECT investigation budget** (NOT KEK R&D Budget) to **officially** start project process.
- **It means** the project plan is in **official line** and **officially** within the insight of Government (not only for MEXT, but also for the whole Japanese government). Then, government officials are required to **act on** the plan.
- Requested amount is 0.5 M\$ (FY2014): One of the main usages shall be travel expenses of officers for international partnership discussions.

# MEXT



- October 1st, 2013

Minister of MEXT, H. Shimomura, in a general press conference:

Japanese government will create a working group of advisors with specialists from various fields as soon as possible. A task force exclusively set up to study the ILC at MEXT has been working since February, deepening the understanding of the project in the ministry. A new working group will be set up under the task force, which will review the possible issues on the realization of the ILC in Japan.

→ Under formation now

**Soon**, the ILC Taskforce in MEXT will start the investigation of

1. Construction cost and total Project cost (the earliest start to come)
2. Project plan from construction, operation, upgrade to possible dismantling
3. Feasibility of world-wide Sharing of human resources (accelerator experts)
4. Possible Schemes of the International organization

## Urgent request by MEXT to the HEP Community

MEXT (the head of the task-force and officers) is now requesting us to **urgently prepare materials** to start with. Otherwise, no efficient progress.

**It is urgent and vital** for the successful investigation to have ***MODELS, GUIDES and HYPOTHESIS*** by **international researchers** (lead by LCB/LCC with world-wide LC-HEP Community) and *prepare simple and easy-to-understand materials* on;

- List of relevant contact divisions/branches/bureaus/authorities in each government, to whom to first contact for ILC from Japanese Government
  - Explanations of Official situations (honest one) of ILC in each country/region
  - Project Plans (models of schedule), International Governance Models,
  - Total Project Cost and Models of necessary world-wide budget profile for ILC
  - Feasibility Demonstration of international sharing models of experts world-wide
- + Later if possible, Hypothetical models of international sharing of the project Costs

# NOW is the time for a phase transition!!

**Processes in Japan must be fully synchronized with the global efforts and situation**

It's time to go beyond the research phase and to the preparation phase including the government. First, start the official conversation, then establish partnerships, negotiations, and if conditions are met, then approval by the domestic authorities and international partnerships at the government level.

**The official process has been started !**

**Genuine OFFICIALIZATION to come when MEXT budget is approved**

**We have only 2-3 years to complete the preparation phase to have the decision and conclusion (for Japan)**

Urgent request by MEXT to the international LC community:

***Urgently Prepare MODELS, GUIDES and HYPOTHESES by international scientists (led by LCB/LCC with worldwide LC-HEP Community) and prepare simple and easy-to-understand materials***

## Personal remarks

1. It would be wonderful if we could collect during LCWS13 the information from each country/region (as many as possible) for the international summary of official situation, researchers activities, institutes, and best responsible contact branches and officers in each government.
2. It would be wonderful if we could formulate during LCWS13 some (partial) **hypotheses** on;
  - project timeline models (time schedule for construction, operation, upgrade, and finish)
  - models of sharing human resources among institutes (especially accelerator experts) during construction and operation phases.
3. It would be wonderful if we could urgently summarize the possible ways to share the information of cost evaluation with the forthcoming MEXT ILC Taskforce Process.

# **Extra Slides**

# [JAHEP] Subcommittee on Future Projects

Chair: Toshinori Mori <http://www.icepp.s.u-tokyo.ac.jp/hecsbc/>  
Recommendations received in Feb. 2012 by HEPC (Chair: Sachio Komamiya)

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The committee makes the following recommendations concerning large-scale projects, which comprise the core of future high energy physics research in Japan.

- **Should a new particle such as a Higgs boson with a mass below approximately 1 TeV be confirmed at LHC, Japan should take the leadership role in an early realization of an  $e^+e^-$  linear collider.** In particular, if the particle is light, experiments at low collision energy should be started at the earliest possible time. In parallel, continuous studies on new physics should be pursued for both LHC and the upgraded LHC version. Should the energy scale of new particles/physics be higher, accelerator R&D should be strengthened in order to realize the necessary collision energy.
- **Should the neutrino mixing angle  $\theta_{13}$  be confirmed as large, Japan should aim to realize a large-scale neutrino detector through international cooperation, accompanied by the necessary reinforcement of accelerator intensity, so allowing studies on CP symmetry through neutrino oscillations.** This new large-scale neutrino detector should have sufficient sensitivity to allow the search for proton decays, which would be direct evidence of Grand Unified Theories.

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Also mentioned: SuperKEKB, J-PARC, dark matter, neutrinoless double beta decays, CMB B-mode polarization, and dark energy



# [JAHEP] Proposal for Phased Execution of ILC

Translation of official  
JAHEP statement,  
Oct 2012

In March 2012, the Japan Association of High Energy Physicists (JAHEP) accepted the recommendations of the Subcommittee on Future Projects of High Energy Physics<sup>(1)</sup> and adopted them as JAHEP's basic strategy for future projects. In July 2012, a new particle consistent with a Higgs Boson was discovered at LHC, while in December 2012 the Technical Design Report of the International Linear Collider (ILC) will be completed by a worldwide collaboration.

On the basis of these developments and following the subcommittee's recommendation on ILC, JAHEP proposes that ILC be constructed in Japan as a global project with the agreement of and participation by the international community in the following scenario:

(1) Physics studies shall start with a precision study of the "Higgs Boson", and then evolve into studies of the top quark, "dark matter" particles, and Higgs self-couplings, by upgrading the accelerator. A more specific scenario is as follows:

- (A) A Higgs factory with a center-of-mass energy of approximately 250 GeV shall be constructed as a first phase.
- (B) The machine shall be upgraded in stages up to a center-of-mass energy of ~500 GeV, which is the baseline energy of the overall project.
- (C) Technical extendability to a 1 TeV region shall be secured.

(2) A guideline for contributions to the construction costs is that Japan covers 50% of the expenses (construction) of the overall project of a 500 GeV machine. The actual contributions, however, should be left to negotiations among the governments.

2013 Mar 27

# Lyn Evans, as Linear Collider Collaboration director, meets Prime Minister Abe

Bring message from Europe (white paper), thanks for the supports by Japan, world-wide expectation to Japan for ILC.

Prime Minister Abe, Mr Kawamura, Mr Shionoya, Lyn Evans, Prof. Koshihara, A. Suzuki, H. Murayama, S. Yamashita



Minister of MEXT

2013/11/13



Minister of S&T of CAO

Satoru Yamashita



Mr. Okamura of Japan Chamber of Commerce and Industry (business sector)

26

2013 April 30

# US-Japan symposium in Washington D.C.



Takeo Kawamura  
Chair of federation of Diet  
members



D.B. Poneman  
DOE acting Secretary



Hakubun Shimomura  
Minister of MEXT



Hiroya Masuda  
Chair of Japan Policy Council



Ryu Shionoya general secretary of the  
federation and Dr. Shiegrist of DOE director  
of US HEP division, et al.



100 invited participants from US-Japan (each ~50 persons)  
From HEP researchers, industry, political and government



at ambassador's house party, direct communication on ILC with  
Dr. Holdren, President Science Advisor, US Office of S&T Policy Director



## Federation of Diet Members for promoting ILC

In 2006, Ruling Party members (LDP at that time) established the Federation of Diet members for ILC

- In 2008, expanded to “Joint federation” among the Ruling and Opposition parties (Democratic Party, LDP, New Komeito, and so on)
- In **2013 Feb.** new headquarter was established and expanded
  - more than **150 Diet members** participate (out of ~700 Diet members)

**1<sup>st</sup> step:**  
**Efforts to help politicians understand the importance of the basic research and global projects**



**Chair:**  
**Takeo Kawamura**  
(former Chief Cabinet Secretary, Minister of MEXT, Current one of the top executives Of LDP: majority party)

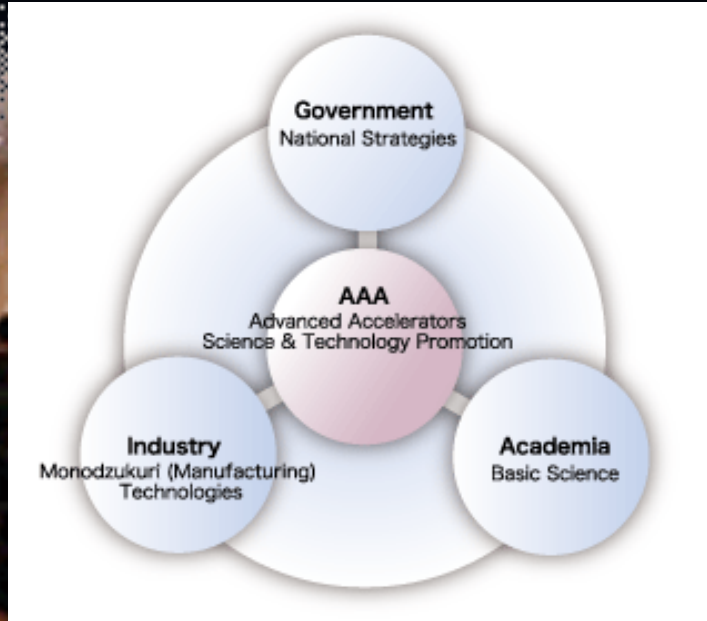
**General Secretary:**  
**Ryu Shionoya**  
(former Minister of MEXT, Current chair of S&T Div. in LDP)

The most important target of the Federation is to realize **ILC as the GLOBAL PROJECT,** and strongly **support the global R&D efforts.**

The Federation supports domestic preparation processes and investigations to prepare the case for **Japan as the host if global society wishes.**

# Advanced Accelerator Association Promoting Science & Technology

Established in 2008 to promote accelerator research and ILC. Members include 95 corporations (e.g. Kyocera, Hitachi, Mitsubishi Electric, Mitsubishi Heavy Industries, Toshiba) and about 40 universities and institutions.



<http://www.aaa-sentan.org/>



**Takashi Nishioka, Chairman**  
Former Chairman of the Board, MHI



**Kaoru Yosano, Supreme Advisor**  
Former Minister of Finance, MEXT,  
Former Chief Cabinet Secretary



**Masatoshi Koshiba, Honorary Chairman**  
Professor Emer., The University of Tokyo  
2013/11/13

Satoru Yamashita



**Atsuto Suzuki, Trustee**  
Director General, KEK



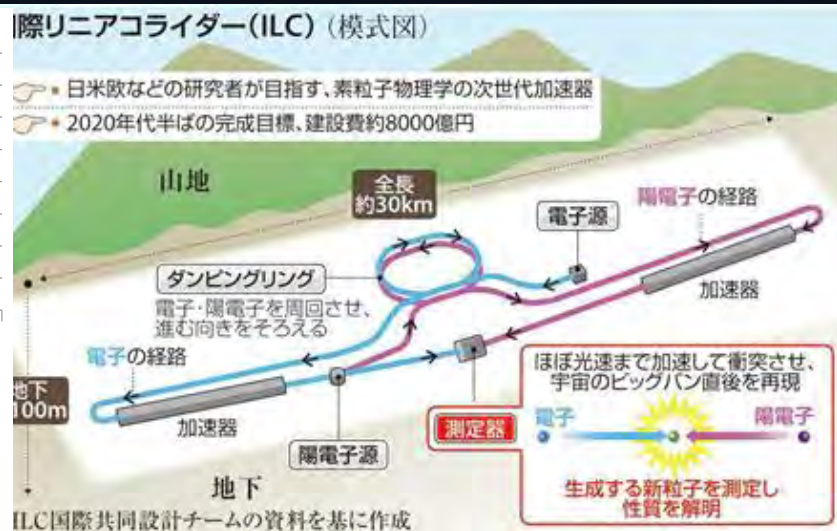
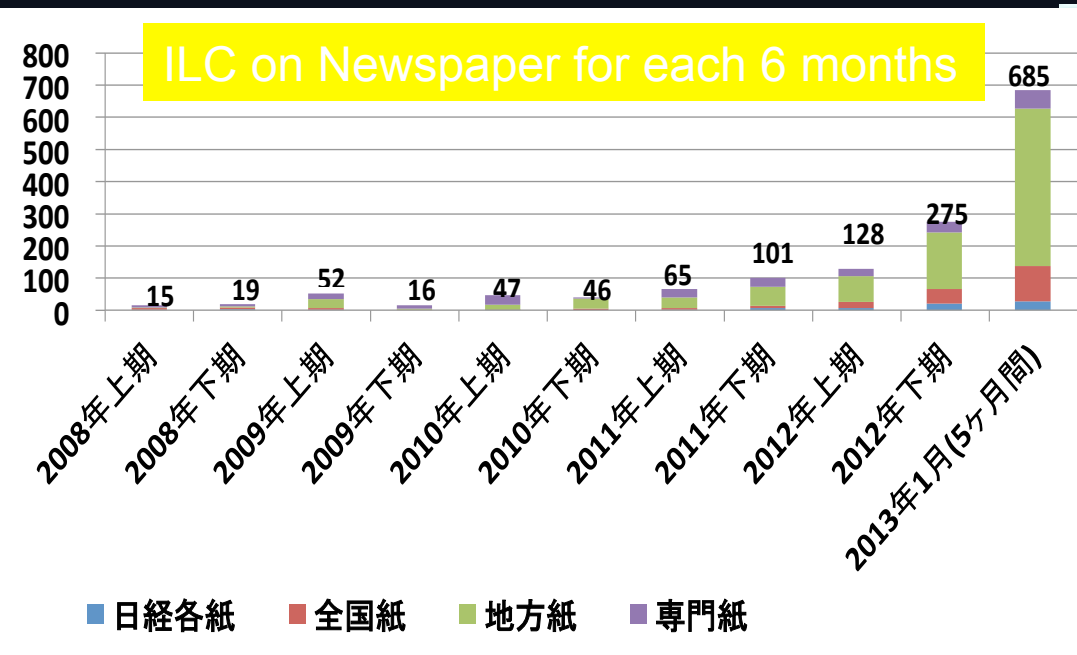
## AAA public symposium

Promoting Accelerator technology and application, basic science, and large projects





# Media Coverage



Newspaper's explanation of ILC

Frequency of media coverage is growing.

**Japan Policy Council:** experts in policy making, economics, labor, or sociology aiming to create a grand design of Japan for the next decade.

<http://www.policycouncil.jp/>

Recommendations: **“Creation of Global Cities by hosting the ILC” (Jul 2012)**

“Japan should revitalize its provincial cities to revitalize Japan itself...”

“... explore ‘Domestic Globalization’ taking advantage of the opportunity of Japan’s possible bid to host the International Linear Collider...”

### Japan-wide Big Business communities in support of ILC:

Japan Chamber of Commerce and Industry

Japan Association of Corporate Executives



Chair: Tadashi Okamura  
(former CEO of Toshiba)

Chair: Yasuchika Hasegawa

Publicize supporting comment  
(Aug. 2013)

Publicize opinion to support ILC (Apr. 2013)  
Publicize supporting comment (Aug. 2013)



# The Context

Politicians and opinion leaders recognize that science and technology is among the top priority items in policymaking.

- There is a strong motivation to pursue a global project that can attract the global intellectual communities, create a global environment (global city).
- They see the benefit of global project to the nation that goes beyond physics. They recognize a large-scale global project can help globalization of the country. Especially, science project is one of the best among the various global projects.
- This is where ILC comes in.

As a result of the general elections on December 15, 2012, the Liberal Democratic Party of Japan took over control. Their policy document **mention the ILC twice.**

### 32 科学技術政策の強力な推進力となる 真の「司令塔」機能の再構築

資源の少ないわが国にとって、今後の社会・経済をさらに発展させるため、企業の研究開発投資が激減する中、新たな成長に向けて国主導で科学技術イノベーションをリードするのが喫緊の課題です。

しかし、年間約 3.6 兆円にも及ぶ科学技術関係予算については、文部科学省を中心に、経済産業省や厚生労働省等、関係省庁に予算が配分され、各省内で同様な研究が行われている事例も見受けられ、縦割りの弊害が顕著です。また、限られた予算にも関わらず、効果的な配分が行われていないのが現状です。

そこで、産業の生命線である科学技術を国家戦略として推進し、「価値の創造拠点」とするべく、総合科学技術会議の「権限」「体制」「予算システム」を抜本的に強化し、真の「司令塔」機能へと再構築します。

具体的には、各省庁の縦割りを排し、強力な予算配分権限を集中させ、適正な評価を行うことができる人材育成とシステムの構築を行います。例えば、素粒子物理分野の大規模プロジェクトである ILC (国際リニアコライダー\*研究所建設) 計画等を含む国際科学イノベーション拠点作りに日本が主導的な役割を果たせるなど、再生医療\*や創エネ・省エネ・蓄エネ等の重点分野を産学の知を結集した国家戦略として強力に推進します。

<http://www.jimin.jp/policy/pamphlet/>

“... strongly promote important areas of science and technology as a national strategy so that Japan can play a leading role in creating global centers of science and technology including **the ILC** ... through cooperation between industry and science.”



### 92 世界に冠たる研究開発拠点の形成

イノベーションを生み出していくためには、大学や公的研究機関、産業界等が集い、協働で研究開発に取り組む「場」の構築が必要です。特に、わが国の強みを有する分野において、地域資源等も柔軟に活用しつつ、オープン・イノベーションに対応した「競争」と「協調」による世界最先端の研究開発拠点を形成します。

わが国が世界の頭脳を獲得における中核的な地位を占めていくためには、国内のみならず海外の優れた研究者を惹きつける国際的な研究ネットワークの拠点形成が不可欠であり、「世界トップレベル研究拠点(WPI)」の大幅な拡充や、素粒子分野の大規模プロジェクトである ILC (国際リニアコライダー研究所建設) 計画等を含む国際科学イノベーション拠点作りに日本が主導的な役割を果たすなど、世界水準をしのぐ優れた研究活動を行う大学や公的研究機関などに対する支援を抜本的に強化します。

“In order for our country to become a central core in gaining the brains of the world, it is indispensable to create an international research network which can attract top-level researchers, ... playing a central role in creating global centers for scientific and technological innovations such as **the ILC** ...”

**2013 Feb 28<sup>th</sup>** at Diet

Keynote policy speech by Prime Minister Abe

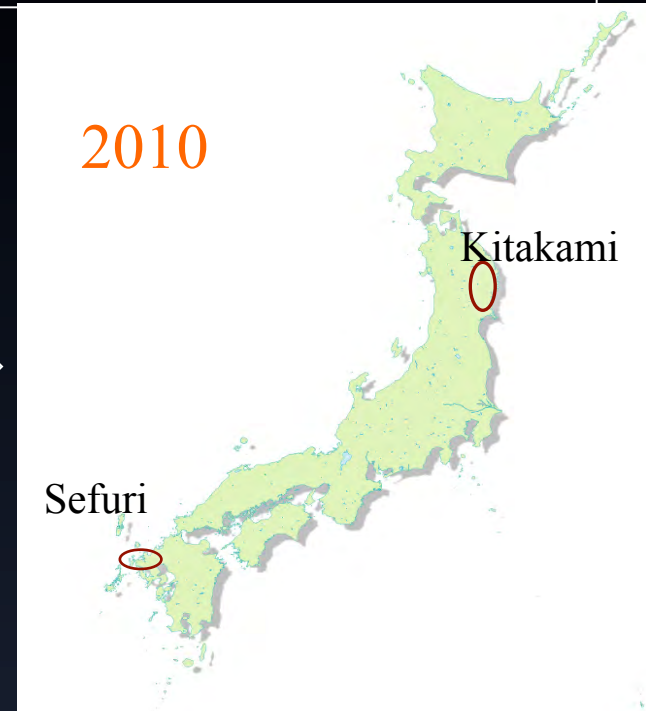
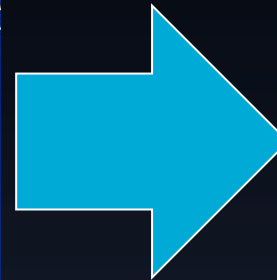
“**challenge in advanced accelerator technology**”

2013/11/19

Satoru Yamashita

# Studies of ILC candidate sites in Japan

1. 2000-2002: Survey of stable rock areas in Japan (~10 candidate sites for JLC)
2. 2006: Close cooperation with Japan Society of Civil Engineering established.



3. 2007-2009: Official core support-groups for ILC were established in two regions: Kitakami mountains (Iwate and Miyagi) and Sefuri mountains (Fukuoka and Saga).
4. 2010: Two candidates sites in Japan were made public at a JPS symposium
5. 2010: Geological survey by local universities and local governments started.
6. 2012: Geological survey based on national budget started (the 3<sup>rd</sup> supplementary budget approved in December 2011)