

# Introduction

## Activities of the KEK-ILC Team toward Realization of ILC

Fumihiko Takasaki



**KEK DG, Totsuka, asked me to work in the  
KEK LC Office on April 19, 2004.**

**The charge given to me was to identify,  
what KEK can do,  
what KEK has to do:**

**with a Keyword,  
Internationalization  
and  
Industrialization,  
in mind.**



**Since the issues related Physics  
and Experiment can be better  
managed elsewhere,**

**we concentrate on  
Accelerator Issues  
today.**



**ITRP and ICFA have Chosen  
“Cold”.**

**This means,**

**Re-start from scratch  
and**

**Re-organization of Team  
for Japanese LC people.**



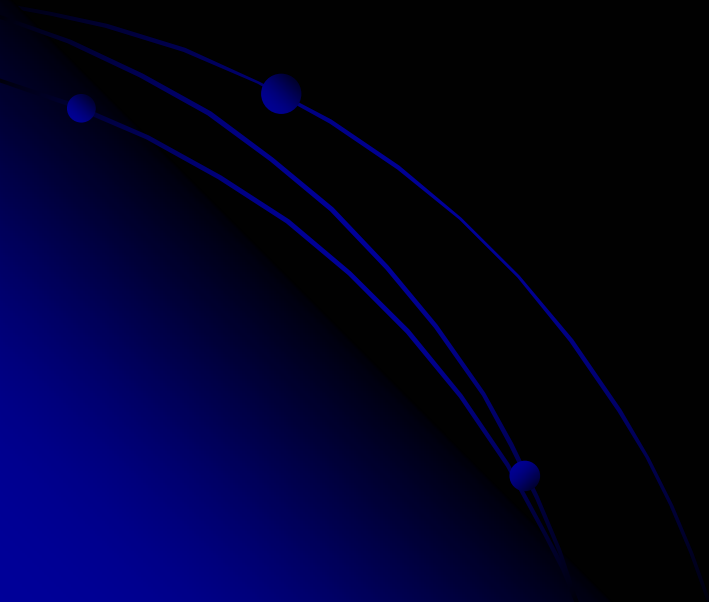
**Fortunately**, however,

- 1) we have a group of people with experience on Super-conducting RF acc. systems at TRSIATN and KEKB,
- 2) a group of people who have successfully operated the ATF with the world smallest beam emittance,

**3) and we have a dedicated, very skillful team of KEKB Accelerator which has been breaking the Luminosity record achieved ever by any collider machines.**

**So I believe that KEK has a good capability to contribute to the realization of ILC, if we are well organized.**

**How much KEK can contribute  
depends on the skill of KEK  
management.**



# Director General's Statement on ILC

## Future Development for ILC

October 5, 2004

- (1) KEK will actively take part in the R&D of the ILC to investigate its feasibility.

KEK will join the activities of the ILC design group, GDI.

KEK will collaborate with GDI as a participating member of GDI for design of the ILC, R&D, evaluation of its cost, and development of mass production technologies. KEK itself will also perform R&D for the ILC with its initiative.

Researchers ....., KEK encourages Japanese researchers to take part in ILC activities. KEK will give as much support to them as KEK's resource allows; .....

.....



- (2) KEK actively invites GDI Central Team to KEK, and makes efforts so that Japanese researchers can have important posts in GDI including its Director. ( Barry Barish was nominated as the director of GDE. )
- (3) By having the GDI Asian Regional Team at KEK, KEK manages to form an Asia collaboration scheme under the leadership of KEK.

It is expected that researchers from many Asian countries and region will become members of the GDI Asian Regional Team.

The regional Team will work with the GDI Central Team to do necessary R&D for the ILC and the design of the accelerator complex. KEK understands its role in Asia and will actively cooperate with the GDI Asian Regional Team by using KEK budget.

- (4) The Director General of KEK will support the activities of researchers who strive to have the ILC located in Japan.

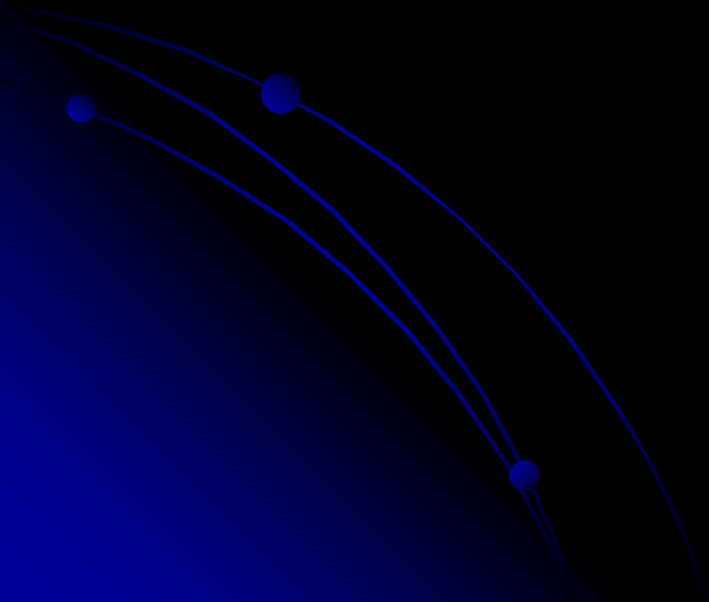
KEK thinks that it is very significant for Japan to host the ILC in the sense that this is the first establishment of the global-scale COE in Asia in the field of science. Scientists and engineers from all over the world will visit the ILC in Japan as the 21st century COE in Japan. This will mark Japan's scientific contribution to the world high. To host the ILC in Japan will make Japan as a world leader in the future of particle physics, and promote development of science and technology in Japan.

Although ILC construction should be determined by the outcome of GDE and after decision is made by governments that will join the ILC design activities, the Director General of KEK will support activities of researchers who strive to host the ILC in Japan by coordinating their opinions and encouraging their activities.

Japanese industry has already sufficient technological infrastructures to host the ILC in Japan, and the realization of ILC will bring a great deal of benefit to Japanese industry. (Japanese industry has already established its own Linear Collider Study Group.) In order to realize the construction of the ILC, it is indispensable that many countries participate in ILC and share the cost among them. Director General of KEK will ask institutes in Asia to contact their governments and persuade them to participate in the project, and he will make every effort to reach a consensus among these institutes.

(5) KEK is now carrying out large-scale projects, such as collaborations at the B factory, and the construction of J-PARC, etc. At present, top priority is to carry out these existing projects.

The order of priority for the future projects of KEK (ILC, Super KEKB, fourth-generation synchrotron radiation, J-PARC) will be decided after the feasibility of these projects has been investigated thoroughly. We note that these future projects need superconducting technology.



# **What we should do:**

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**All the activities should be planned as a part of the world wide effort and should be coordinated by GDE.**

**Even before the GDE is fully operational, regional activities should be well informed to the rest of the world.**

**TESLA TDR says :**  
**The Technology is at hand to build a  
500 GeV collider.**

**However,**  
**the estimated cost, 3.1 B€ (~4 B\$) for  
500 GeV Machine**  
**( or  $3.1 \times 2 = 6.2$  B€, 8.3 B\$,  
for 1 TeV ??? ),**  
**has to be substantially reduced  
to win support by funding agencies.**

# Reduction of Construction Cost from the TESLA numbers

seems to be a quite  
challenging task to be worked out .

Cost reduction may require us:

- to **re-design whole system,**
- to collaborate with industry  
to get ideas, **Industrialization.**

**To have a quick and smooth start of GDE,  
J. Dorfan, Chair of ICFA, proposed to  
have an ILC workshop  
in Autumn 2004.**

**Totsuka proposed to host  
the 1<sup>st</sup> ILC workshop at KEK  
in November 2004.**







# First ILC Workshop



<http://lcdev.kek.jp/ILCWS/>

# **5 Work Groups were formed for this workshop:**

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**WG-1 : Overall Design**

**WG-2 : Main LINAC**

**WG-3 : Injector**

**WG-4 : Beam Delivery**

**WG-5 : High Gradient RF Cavity**

# **In the Workshop, an ILC Road Map was proposed.**

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**2004 /11 : 1<sup>st</sup> ILC WS**

**2005 /02 : Central team**

**2005 /08 : 2<sup>nd</sup> ILC WS at Snowmass**

**Choice of Baseline**

**Parameters for CDR**

**2005 /12 : CDR**

**2007 / : TDR**

**2008 / : Site selection**

**2010 / : Start Construction**

**After the 1<sup>st</sup> Workshop, KEK ILC team has worked out a study plan for coming years directed toward CDR and TDR.**

**This will be explained today by the following speakers.**

**This plan has been and will be presented to the International ILC community.**

# **This plan will have its basis on Two Facilities : ATF and STF**

**ATF: Re-define it as  
an international research  
center for:**

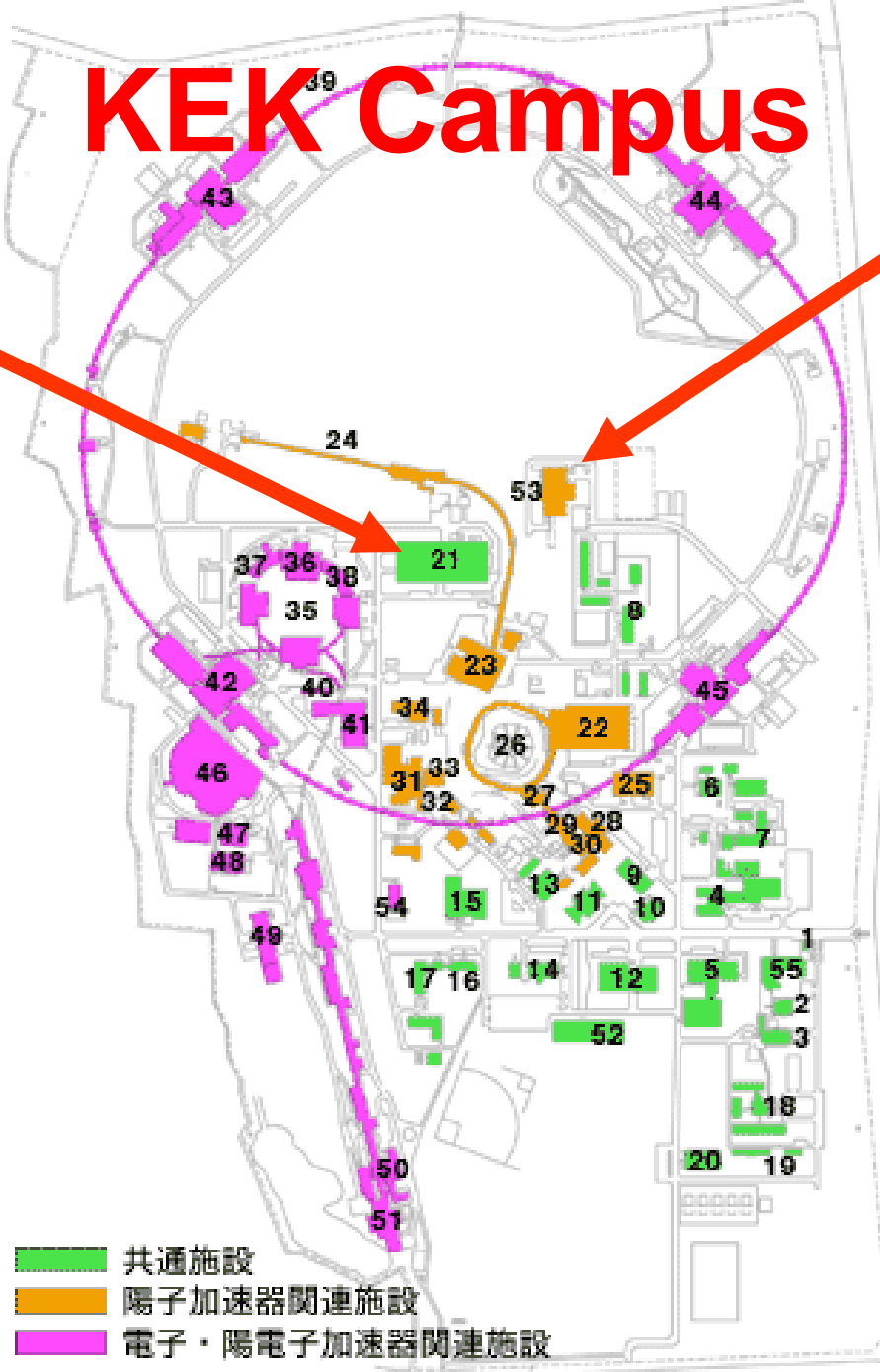
- Injector and Beam Delivery**

**STF: A new superconducting  
RF System Test Facility**

# KEK Campus

ATF

STF



# ATF



# Superconducting RF system Test Facility

**STF**





**We maintain five Working groups,  
re-defining them as the Asian  
Working Groups with the following  
group leaders;**

**WG-1 : K. Kubo (KEK)**

**WG-2 : H. Hayano (KEK)**

**WG-3 : M. Kuriki (KEK)**

**WG-4 : T. Sanuki (U. Tokyo)**

**WG-5 : K. Saito (KEK).**

**The proposed plan was reviewed  
by a Committee whose membership  
consists of:**

**A. Ando, T. Furuya, R. Hajima,  
M. Inoue, M. Kihara, Y. Kumagai,  
K. Oide, K. Satoh (Chair),  
T. Shintake, E. Minehara,  
A. Yamamoto, Y. Yamazaki**

**We asked the Committee to assess if -**

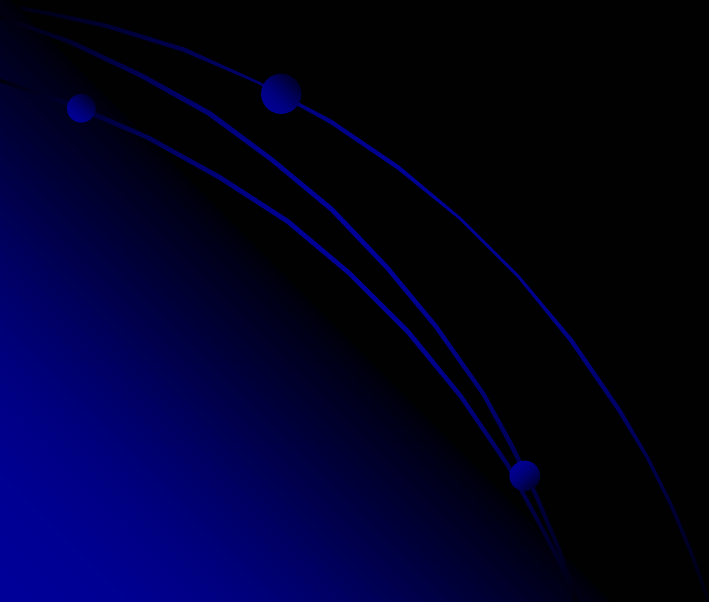
- 1) we have adequate human resources and expertise, to carry out the plan,**
- 2) the plan does not have superfluous duplication within the world wide efforts, and**
- 3) the industrialization issue is adequately addressed.**

**The review team responded with a positive recommendation to the proposed plan.**

**We would like for this committee to review the proposed plan from the same view point.**



# Internationalization



**Proposed plan was sent to directors of **DESY**, **FNAL**, and **SLAC**, and also Chair of **ILCSC**, M. Tigner, to ask for suggestion and comments, especially from the view point of avoiding duplication.**

**• We received a favorable response from some of them.**



**We visited:**

**IHEP, Beijing, China**

**and**

**Postech, Pohang, Korea,**

**to explain KEK's plan, to  
exchange idea of the study and  
to find out area of Collaboration.**



**We have had discussion with people of SLAC, FNAL, JLAB, and Cornell to find area of Collaboration.**

**We will soon visit DESY to do the same discussion.**



# Efforts to establish an Asian Regional Center (ARC) for ILC

**KEK is willing to host the ARC.  
We have worked out a MOU for ILC  
Among Asian Institutions,**

**CAT, TIFR : India**


**IHEP : China**

**KEK : Japan**

**CHEP, Postech : Korea**

**It will be signed soon.**


# 3rd ACFA statement



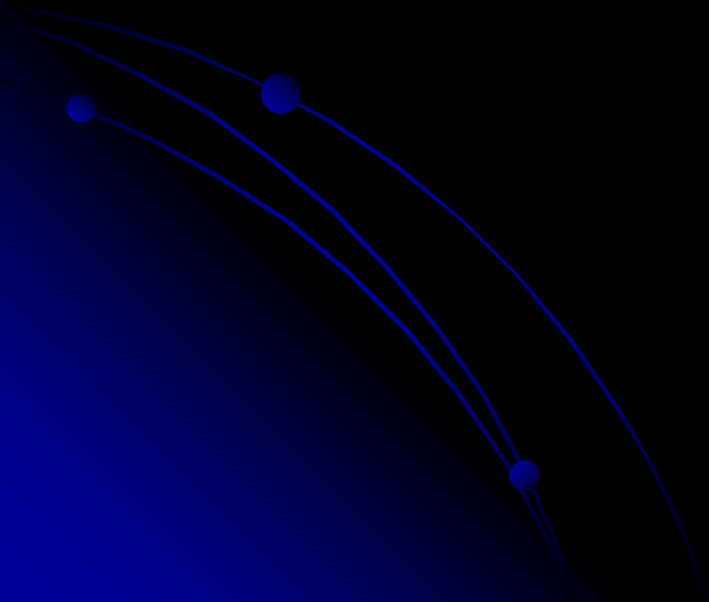
ACFA urges KEK to establish the Asian Regional Center for R&D in GDI and encourage other Asian countries to actively participate in GDI.

**ILCSC has announced the Director of GDE, Barry Barish. The Central team site will be “**Virtual**” in Phase I.**

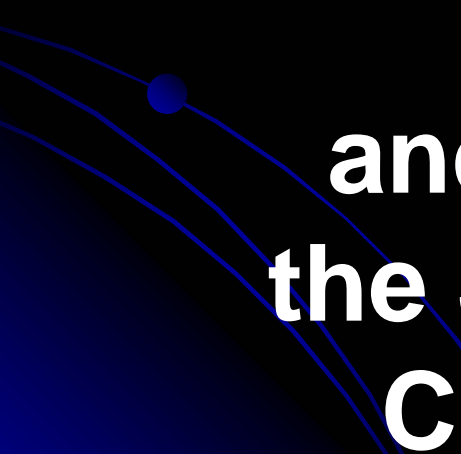
**KEK is willing to work with the Central team and colleagues from everywhere for the earliest possible realization of ILC.**



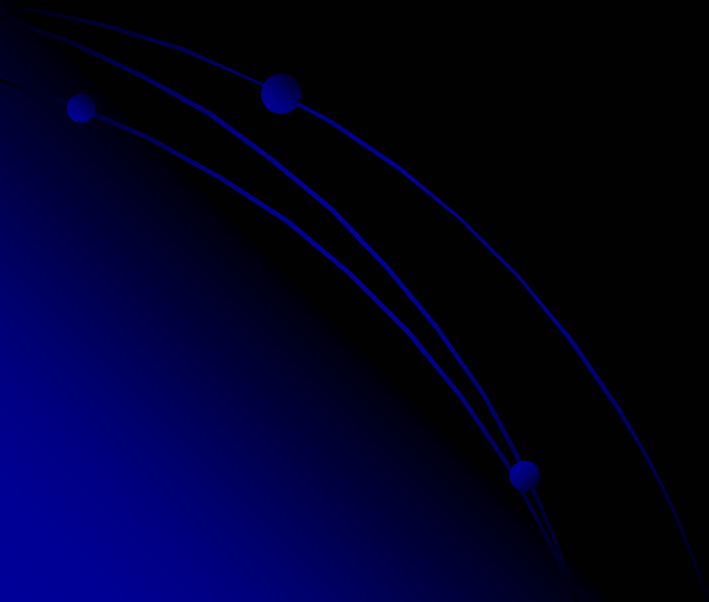
# Budget for R&Ds



**For coming fiscal year to start  
April 1<sup>st</sup>, 2005, we requested  
12 Oku-yen,  
about 12 M\$, salary not included,  
to carry out proposed plan,  
half to KEK  
and the other half to  
the Japan-US scientific  
Collaboration fund.**



# Human Resources



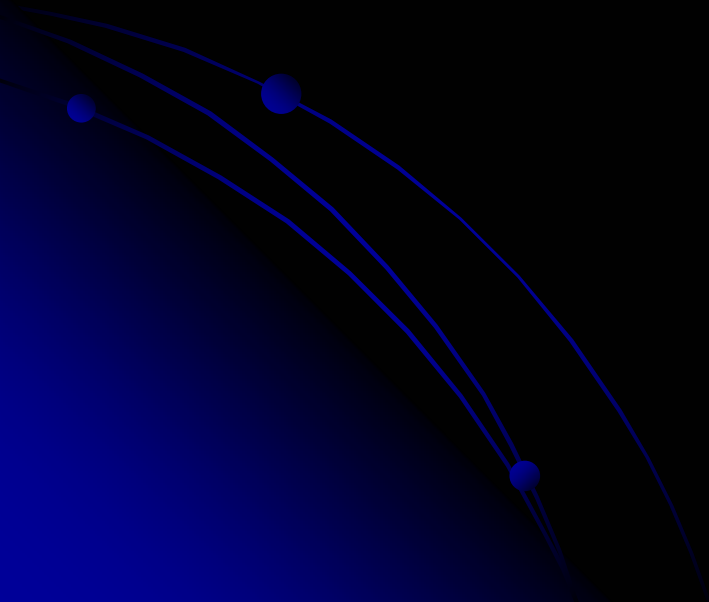
# **KEK staffs**

**65 persons : 30.2 FTE**

- ATF, ATF2 : 8.6**
- STF : 9.5**
- High G. Cavity : 10.5**
- Others : 1.6**

**Non-KEK members :**

# Industrialization



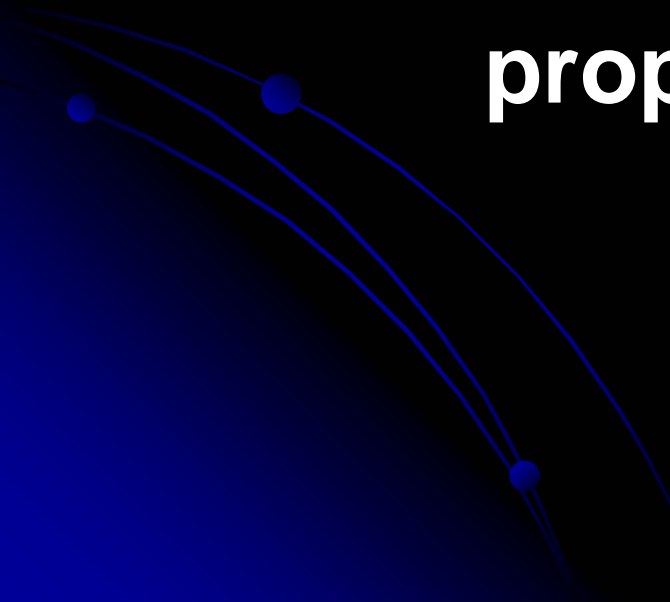


The **Linear Collider Forum of Japan** (LCFJ) was founded to provide an opportunity for the Industry people to learn about ILC in detail and also to find the most cost effective way to build ILC.

62 companies have signed up.

Industry people has been joining the meetings of five Working Groups regularly.

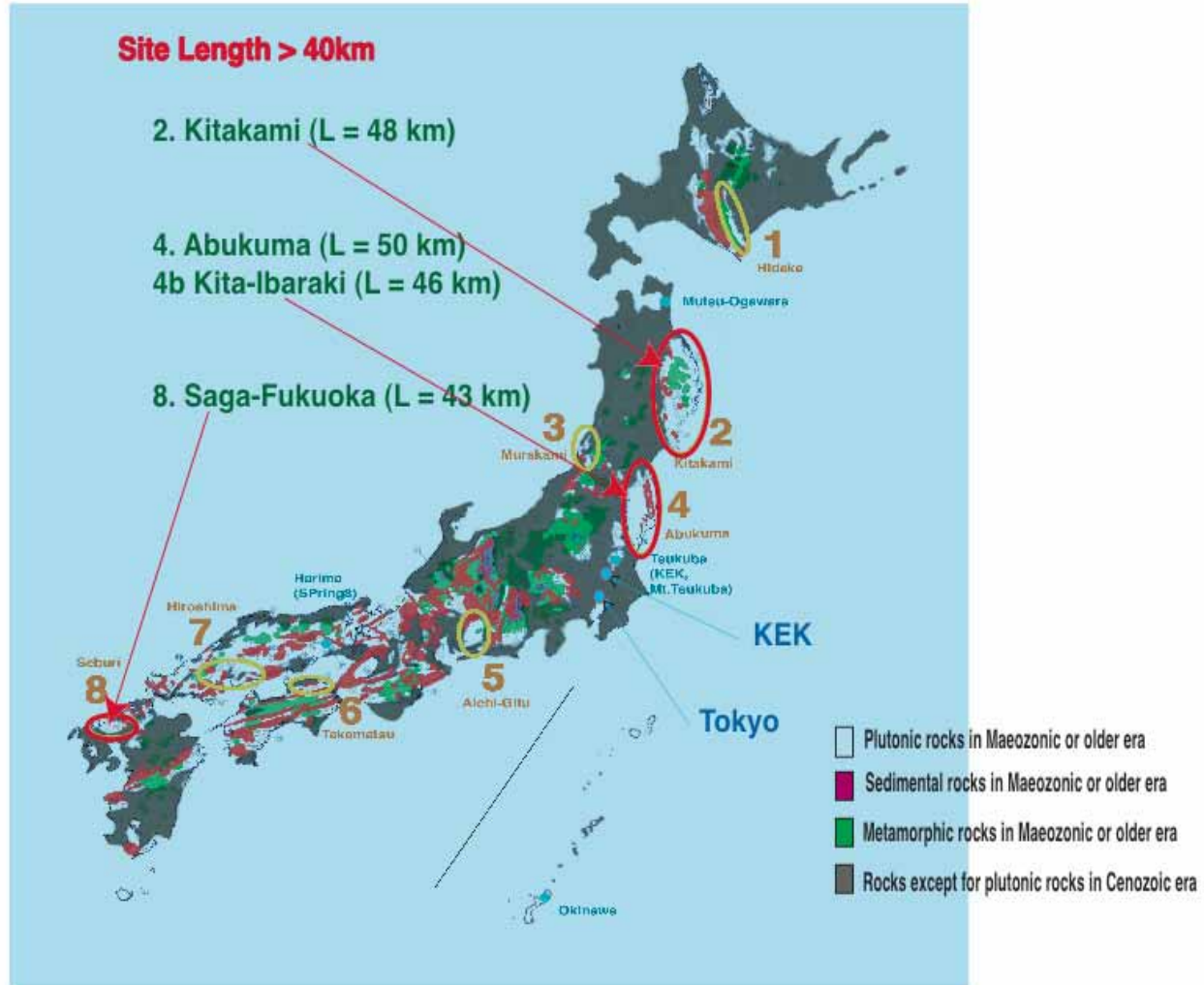
# Other issues:

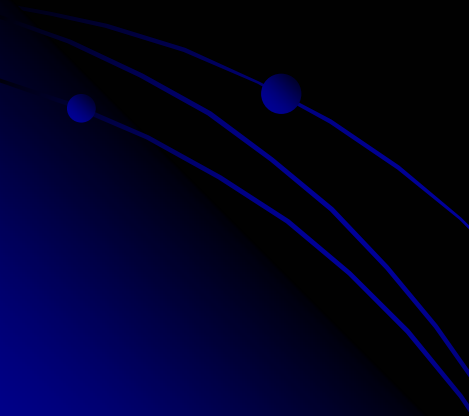
- **Site Study**  
**Possible sites in Japan**
  - **“Summer school”**  
**proposed by IHEP**
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# Site Candidates



**We have good site candidates in Japan!**





**We would appreciate it, if you could give us advices and suggestions concerning the proposed study plan and also other issues.**

**Thank you for your help.**

