Report of the Review Committee of the "KEK Roadmap 2013"

Review Dates & Location: 5 & 6 April 2013, KEK laboratory

Introduction

The Committee received the draft of the five year "KEK Roadmap 2013" report before the meeting and during the meeting heard more presentations about the status of the KEK programs. The list of review committee members is given in Appendix A. This review was requested by the KEK Director-General and the report is organized along the charge received from the KEK Director-General. This charge can be found in Appendix B. The agenda for the two days of the review at KEK is in Appendix C.

General observations

The KEK program covers a broad spectrum of science including particle physics, nuclear physics, material science, life sciences and accelerator science. The underlying facilities and tools are all based on accelerated particle beams, which are referred to as "quantum" beams and include electrons, positrons, protons and derived beams from those sources are neutrons, photons, muons and other hadron beams. The Committee was impressed by the breadth and depth of this program being executed at the KEK and J-PARC sites.

The recovery of the J-PARC accelerators after the catastrophic earthquake of March 11, 2011 is nothing short of amazing. The casual visitor has to look hard to find any sign of the heavy damage that the site suffered. The staff of KEK and JAEA is to be commended for this heroic effort.

The improvement of both intensity and quality of the primary and secondary beams is of crucial importance for the recovery and continued progress of the suspended experimental programs.

The proposed five-year Roadmap is challenging but is in line with the outstanding performance of KEK in fulfilling the previous roadmap and, more generally, in developing one of the most advanced accelerator-based science program in the world. The broad scope of activities proposed in the "KEK Roadmap 2013" will, if completed, make Japan the world leader in this field. The Committee considers the proposed Roadmap very convincing in terms of scientific quality and fully endorses it.

Charge 1: Evaluate the scientific roles that KEK is currently playing from the perspectives of the world-wide accelerator-based science community, especially in the following respects:

Particle and nuclear physics

Quark Flavor Physics

In the past decade KEK has been a world leader in the study of CP violation and heavy-flavor physics, thanks to the outstanding performance of the KEKB accelerator that achieved the world's highest luminosity for an electron-positron collider.
Among the large number of important results obtained by the BELLE collaboration at KEKB, it is worth to recall the discovery of CP violation in B-meson decays, as predicted by the Kobayashi-Maskawa model. The discovery of this phenomenon, and the precise confirmation of the mechanism describing quark-flavor mixing within the Standard Model also performed at BELLE, has indeed been recognized by the 2008 Nobel prize in physics awarded to Kobayashi and Maskawa.
In addition to the discovery of CP violation in B meson decays, BELLE has achieved an impressive series of precision measurements in flavor-changing transitions that put strong bounds on possible extensions of the Standard Model(SM). Despite the advent of new high-statistics experiments in flavor physics at hadron colliders in the last few years, BELLE's results on B →tau nu, b → s gamma, tau → mu gamma and other rare decay modes are still the world most precise measurements/limits on these sensitive probes of physics beyond the Standard Model.

Neutrino program
The T2K neutrino experiment aims to make high precision measurements of the neutrino mixing parameters especially related to ν_e appearance and ν_μ disappearance and to address the mass hierarchy and CP violation. These are important unanswered question in the neutrino sector today.

T2K successfully started data-taking on schedule and after the quick recovery from the earthquake, the beam power was increased to 230kW. Although this is still lower than the design value of 750kW, they are leading the accelerator-based neutrino research program worldwide. We congratulate the T2K collaboration for observing ν_e appearance which for the first time indicated θ_{13} to be non-zero and followed by more than 3 sigma evidence. It also provides the possibility of observing CP violation in the future high precision measurement. We also congratulate them on their success in reducing uncertainties on θ_{23} and $(\Delta m_{32})^2$ from the ν_μ disappearance measurement leading to the world best precision. The importance of T2K is reflected by the large participation from outside Japan. Because of these T2K successes, today KEK is the major center of the neutrino research in the world.

Large Hadron Collider(LHC)/ATLAS

KEK has made significant contributions to the CERN LHC program, including the magnets for the accelerator; central solenoid and contributions to other subsystems of the ATLAS detector, data analyses such as Higgs → tau tau etc, as well as theoretical evaluations for physics searches. In addition KEK has been playing a pivotal role in coordinating the LHC/ATLAS efforts among

the 16 institutions in Japan. The Committee commends the impressive performance of the KEK group for their participation and leadership in the LHC program in Japan.

ILC

KEK has long been one of driving forces for the R&D for the ILC. Since the last 5-year roadmap in 2008, the KEK ILC team has made substantial steps forward, such as SCRF technology development and achievement of 32 MeV/m acceleration gradient as well as ATF/STF progress. Preparation of industrialization has also been undertaken. Detector R&D and physics simulations show excellent progress. The Committee is particularly impressed by the effort to engage the community in general and to seek broad support from the industrial sector and the government.

Particle Physics with Muons and Kaon beams:

The case for new physics beyond the Standard Model at the TeV mass scale and higher remains strong, and recent limits on this new physics from direct searches at the LHC strongly compels the case for probes with even high mass scale sensitivity. Fundamental particle physics research with muon and kaon probes answers this call, and will be enabled by the KOTO experiment (discovery and measurement of the $K^0 \rightarrow \pi^0 \nu\bar{\nu}$ process), development of the (MUSE) H-line that will support future precision measurements with muons (in particular g-2/μ-EDM), and the addition of a new Main-Ring target station and a high momentum beamline that will support the timely staged development of the coherent muon-to-electron ($\mu^- A \rightarrow e^- A$) conversion experiment (COMET). The opportunity to advance the muon-to-electron conversion experiment (COMET) experiment in a staged manner is an exciting development for the world-wide program of muon physics.

Theoretical Physics.

The theoretical activities in KEK cover a wide range of topics from string theory to particle physics phenomenology, and are well recognized at the international level. As in all major laboratories, an active and diversified theoretical group is a key ingredient to fully exploit new results from experimental programs, to connect research in different fields (in particular accelerator-based particle-physics, cosmology, and astrophysics), and to develop future experimental programs.

Among the points of excellence of KEK in theoretical physics, particularly relevant are the activities connected to large-scale supercomputer infrastructures. Improving further the precision of lattice-QCD for hadron physics will be critical in complementing the experimental efforts of BELLE-II at SuperKEKB.

Nuclear Physics Research in the Hadron Hall

The new primary high momentum beamline will open new opportunities to study the properties of hadrons within nuclei, which may help us understand the generation of hadron masses in QCD. Recent research highlights from hadron hall include the first observation of Hyper-nuclei at J-PARC, a high sensitivity search for and setting a stringent limit on the Θ^+ production cross-section in the $\pi^- p \rightarrow K^- X$ channel.

Materials and life science

The recently restructured Institute of Materials Structure Science (IMSS) has become a major instrument for delivering KEK's mission to support a broad user community.

The type of science performed in IMSS is highly relevant to society in terms of education (thousands of students trained at the various facilities), intellectual stimulations, as well as direct and indirect impact through Technology Transfer to industry

KEK, through the provision of neutrons, photons, muon and positron sources, offers a world-unique suite of quantum beams. The development toward a coherent use of these quantum beams will lead to an unprecedented understanding of materials at the atomic and molecular level. The original concept of focusing on "*H+spins*" is an excellent catalyst to realize this vision.

IMSS is responsible for operating some 50 beamlines on behalf of a very diverse and growing user community. With an increasing number of non-expert users, requirement for professional support is even more acute. We urge management to establish a strategy to realize an appropriate level of scientific and technical support across all beamlines and instruments, in accordance with accepted international standards.

Particle accelerator and related technologies

The accelerator projects that have been carried out over the last decade are extremely impressive. The scientists and technologists at KEK have designed and built all of the advanced technologies required by the science program. It is difficult to imagine greater productivity of such extremely complex systems by any other group in the world.

Foreign involvement in the accelerator construction of SuperKEKB and J-PARC has been minimal. For the ILC, there was significant foreign involvement and the Committee looks forward to continuing this model for the ILC construction.

Leadership of some of the technologies should be ceded to foreign laboratories, following the lead of the experiments (e.g. Belle-II or T2K). This would help mitigate the problem of the limited number of accelerator experts available at KEK.

Detector-related technologies

The KEK detector R&D enterprise is an impressive spectrum of activities with excellent international visibility. The activities range from the development of next generation pixel technologies for colliders to many examples of broader instrumentation impacts in other research fields well beyond particle physics.

Partnerships between KEK and industry are very powerful, and many research fields world-wide have benefited from these partnerships. One clear example is the ubiquity of Multi-Pixel-Photon Counters (MPPCs) which now are a standard tool for detector designers.
The leadership on developing Silicon-On-Insulator (SOI) pixel technologies is an important contribution for upgrade scenarios for the ATLAS LHC detector and for future ILC pixel tracking technologies.

International relations, Human Resource development
Since the last roadmap review the KEK program attracted many more international collaborators. T2K, Belle II and ATF are truly global collaborations. This is excellent. The J-PARC neutron program has the potential to be truly world class with significant outreach to an international user base.

Charge 2: Evaluate the strategy for the next five years in the KEK Roadmap particularly in terms of their competitiveness and complementarity for :

Particle and nuclear physics program at J-PARC
Neutrino program: Comments& Findings:

1. The committee believes T2K will be able to establish ν_e appearance at 5 sigma level very soon and will start probing CPV and mass hierarchy in combination with the data from other experiments, NOvA in particular.
2. To achieve these goals, it is critical that J-PARC complex be able to deliver 750 kW and beyond at the earliest time.
3. The committee strongly endorses the study of a mega-ton class water Cherenkov detector (Hyper-Kamiokande) or 100-kilo-ton class liquid argon TPC for the next phase long baseline neutrino research in Japan, in order to remain at the forefront of neutrino research.

Nuclear Physics Research in the Hadron Hall: Comments & Findings:

1. Even with significant progress to date and opportunities for the future, there is concern that the slow extracted beam program in the hadron hall has come on-line relatively slowly as a consequence of J-PARC priorities. We strongly encourage KEK and J-PARC to run the facility optimally with 9 cycles of running per year in order to deliver broadly on nuclear and particle physics research opportunities.
2. Further progress with slow-extraction experiments in the Hadron Hall relies on improving the instantaneous spill quality (duty factor) of delivered beam as well as the integrated intensity. Excellent progress has been made in improving the duty factor toward what is required by the high intensity experiments. Further progress is required, and we strongly encourage effort here.
3. The committee feels strongly that Stage-1 of the COMET experiment should proceed expeditiously, and that funding for the full scope of COMET be vigorously pursued.

4. Ultimately, a significant expansion of the hadron hall is motivated by a suite of research opportunities in both nuclear and particle physics. This expansion will increase the number of research groups that can simultaneous operate, and will allow for a more permanent installation of major detector systems.

Materials and life science program at J-PARC

J-PARC Neutrons, Comments & Findings:

The Committee is impressed by the achievements of The Materials and Life Science Facility(MLF) at J-PARC. In a short time, despite adverse tectonic conditions, the MLF has demonstrated the potential to reach a world leading position in neutron science. Beside the foreseen development toward the 1MW designed goal, the following issues must be addressed:

1. full realization of a balanced instrumental suite, including complete detector coverage, sample environment provision and support facilities.
2. in all aspects, a coherent strategy needs to be developed across all instrument suites, independent of their funding sources.

J-PARC Muons, Comments & Findings:

Still in an early development phase, this important technique will benefit greatly with the realization of the ultra-low muon beam: unique opportunities will then open for the investigation of surfaces in materials science and biology. With this demanding technique, an even greater urgency to deliver appropriate scientific and technical support is needed.

SuperKEKB/Belle II

Non-standard sources of flavor mixing are naturally expected in extensions of the Standard Model that predict new particles not far from the TeV scale. While the direct searches of these new particles at high energies provide a direct information on the mass spectrum of the possible new theory, the indirect information from low-energy flavor-changing processes translates into unique constraints on their couplings. Moreover, precise measurements of flavor-changing processes can even probe scales of new physics above those directly accessible at high-energy colliders.

The upgrade of KEKB into SuperKEKB, with the goal of a peak luminosity larger by a factor of 40, allowing the detector facility to accumulate 50 times more data than what was available for Belle, provides a unique opportunity in this respect. This program is both fully complementary to the search for new-physics at the high-energy frontier, and to flavor-physics at hadron colliders (most notably LHCb). Indeed experiments at e+e- machines have a unique potential for decay modes with missing energy and neutral particles that represent a large fraction of the mostly clean and interesting observables in B, D and tau decays.

The status of Belle-II, with a significantly larger international collaboration with respect to BELLE, is a clear demonstration of the high quality of and strong interest in this KEK program. The Committee looks forward to exciting results from 2016 onwards.

LHC/ATLAS

Comments & Findings

In the current 5-year roadmap, it is proposed to continue the involvement for the detector upgrade, physics analyses, and to prepare for the luminosity upgrade.

ILC

Comments & Findings

In the current 5-year roadmap, KEK proposes to continue to enhance its leadership on ILC efforts, including advanced collider R&D, and engineering design of the facility.
Given the recent discovery of the Higgs boson at the CERN LHC, the particle physics roadmap has been reinforced accordingly. There exists a golden opportunity now for KEK, and Japan, to lead a global effort to realize a Higgs factory. The Higgs factory is the initial stage of a program that will extend to higher energies, searching for physics beyond the Standard Model, such as Dark Matter. The Committee strongly encourages KEK to take the initiative to build strong international collaborations with national support from other agencies and industry.
To facilitate such a major effort on a global scale, the Committee feels that significant resources, both in manpower and in finance, should be properly allocated to KEK. The success of the ILC program would put KEK and Japan in a world leading position in particle physics for years to come.

Photon science (Synchrotron radiation research)

Comments & Findings

1. The photon factory with 3500 users yearly, training of thousands of graduate students, strong industrial participation and an impressive collection of high-impact results in many areas of science, represents an important pillar for KEK. Through the identification of 6 key areas of science excellence the short term is secured and forms the basis for future upgrades of beamlines and instrumentation.
2. The construction of the compact ERL (cERL), building on the outstanding accelerator expertise existing at KEK, is making great progress. The completion of this project to demonstrate and gain experience of the key ERL technologies is very important. In the long term the ERL is an interesting prospect for a future light source and should be kept in the plans at KEK.
3. The issue is for the mid-term gap: the community as represented by the Japanese Society for Synchrotron Research, has identified the immediate need for a low-emittance, state-of-the-art storage ring. Both from geographic (Tokyo area) and technical points of view, KEK is ideally positioned to realize the needs of the community.

New developments of accelerator and detector technologies

This section of the document combines the Committee's Comments and Findings on all accelerators in the KEK facilities.

Particle and nuclear physics program at J-PARC: *Accelerator Technologies*
Comments & Findings:
The J-PARC accelerators have resumed beam delivery to all of the different facilities; a non-trivial, complex task. The progress delay in beam delivery by about a year is understandable, and is significantly less than what might have been expected, given the magnitude of the damage. However, the programs are starved for beam; reaching the design power goal needs to be achieved as soon as possible. An improvement in the spill factor would also help the experiments. The instabilities in the slow extraction are attributed to ripple in the Main Ring power supplies. The use of a feedback/feed forward system could well mitigate the problem while waiting for the improved power supplies.

It is critical that J-PARC reaches the goal of 750 kW on the neutrino target as soon as possible. KEK management should work closely with JAEA to ensure that the upgrades happen as soon as possible. The competitiveness of the neutrino program depends on it.

Materials and life science program at J-PARC: *Accelerator Technologies*
Comments & Findings:
The intensity of neutrons produced by the neutron target has now exceeded that of SNS and ISIS, an excellent result. This is due to the greater conversion efficiency of protons to neutrons, the SNS power actually exceeds that of J-PARC. The power upgrade of J-PARC to 1 MW is foreseen for 2015. This is clearly important and would help the experimental throughput of the facility. The upgrades of the Linac energy benefits all of the experimental programs at J-PARC.

SuperKEKB/Belle II: *Accelerator Technologies*
Comments & Findings:
KEKB was the premier B-Factory in the world, with performance that exceeded that of PEP-II. SuperKEKB was initiated two years ago and should finish construction by the end of FY14; commissioning will start with physics research starting within the five-year outlook. The Committee hopes that this aggressive schedule will be maintained.

LHC accelerator: *Accelerator Technologies*
Comments & Findings:
KEK made crucial contributions to the LHC machine with part of the interaction region inner triplet superconducting quadrupoles. This was an essential contribution to successful LHC operation for physics. KEK is well positioned for essential contributions to the LHC high luminosity upgrade: superconducting magnets, magnetic alloy cavities and RF amplifiers for the upgrade of the injector system (PS-booster).

ILC: *Accelerator Technologies*

Comments & Findings:
The SRF technology test facility STF was successfully set up and produced crucial input to the ILC TDR. STF2 will be of strategic importance for the continuation of the R&D program during the ILC project preparation phase (industrialization process for high-gradient cavity fabrication, beam test of a full ILC RF unit with three superconducting modules at design specifications, etc.). ATF/ATF2 has demonstrated ultra-low emittance beam and tight focusing with an energy-scaled final focus system similar to the ILC system. Continuation of the R&D program at ATF is likewise crucially important for ILC construction preparation.

***Photon Science**: Accelerator Technologies*
Comments & Findings:
KEK operates two light sources: the Photon Factory(PF), in operation since 1982; and the PF-AR, in operation since 1987 as a storage ring light source dedicated to time-resolved x-ray experiments.
These facilities are heavily used and very productive. Approximately 92 KEK staff members are responsible for these facilities, including the support of 48 experiment stations.
The PF had an upgrade and refurbishment in 2005, which included the installation of small-gap undulator sources. Future plans call for beamline upgrades to continue through 2017 on the PF and implementation of top-up operation for the PF-AR by 2015. Both the PF and PF-AR are expected to continue operation until at least 2020.
KEK is considering two alternatives for the development of new light sources, a short-term option (a state of the art storage ring) and an energy-recovery linac (ERL).
The ERL is the subject of a sizable accelerator physics research effort. A low-energy ERL (cERL), based on a high-brightness DC gun, is at an advanced stage of construction. The long-range goal for this initiative is a 3 GeV ERL with associated X-Ray FEL Oscillator using 6-7 GeV electrons that have been accelerated through two passes in the ERL. The envisioned development path for this alternative leads to construction starting in 2014-2015: the Committee finds this overly ambitious.
Recently a new medium-term future has been proposed, a state-of-the-art 3 GeV storage ring source. In response to a recent (March 2013) report by the Japanese Society for Synchrotron Radiation (an umbrella organization for synchrotron radiation users in Japan), which prioritized a low-emittance synchrotron radiation source, the Roadmap has been modified to include this as a near-to mid-term development at KEK.

Evaluation of photon science strategy

Energy recovery linacs are the focus of great interest in the accelerator community, and significant progress has been made toward understanding their capabilities. Simultaneously, storage ring light source design has made remarkable conceptual breakthroughs to higher-performance ring designs, rivaling the extrapolated performance of ERLs. The performance

advantage of an ERL over an "ultimate storage ring" design has been narrowed over the past 2-3 years.
The Committee feels that KEK should give serious consideration to construction of a 3 GeV-range "state-of-the-art light source" as an alternative to either a "3rd Generation" light source ring or an ERL, while pursuing experimental accelerator physics research using the low energy ERL test facility.
The Committee notes that no mention was made of a future light source in the B-Factory tunnel, after the SuperKEKB/Belle II run is completed in the 2026 time frame. Meanwhile research papers have been published on the performance of "ultimate light sources" in the PEP tunnel and Fermilab Main Ring; and PETRA-III is already running.

New developments of accelerator and detector technologies
Accelerator technologies.
Comments & Findings:
KEK is pursuing advances and developments in accelerator technologies, notably connected to superconducting RF cavities and DC magnets. The lab has a comprehensive program of technology transfer to industry for superconducting RF systems suitable for ILC.
KEK has successfully demonstrated damping ring accelerator physics design and technology in support of ILC, and is now pursuing R&D for the ILC electron source.
In the course of developing its proton driver, KEK is about to install the in-house designed accelerating structures in the proton linac at J-PARC.

Evaluation of Strategy

The focus on technology transfer to industry is an extremely important objective in making the ILC a reality.

Detector Technologies.
Comments and Findings:
The detector R&D enterprise is currently a decentralized organization and this is well suited to the dynamic landscape which requires continued coordination. An addition of 1-2 researchers would make a large difference.
Partnerships between KEK and industry are very powerful, and many research fields world-wide have benefited from these partnerships. The Committee strongly recommends that this continues in the future.
The leadership on developing Silicon-On-Insulator (SOI) pixel technologies is an important contribution for upgrade scenarios for the ATLAS LHC detector and for future ILC pixel tracking technologies.
In light of the potential opportunity of hosting the ILC, KEK should continue to evaluate the need for test-beam facilities for the growing user community.

International relations, Human Resource development

Comments & Findings:

KEK should play the leading role in establishing the ILC preparatory group and the international design team. This will require additional funding and a significant expansion of the KEK staff directed towards ILC.

KEK is encouraged to further increase its outreach activities especially internationally and regarding the ILC developments in Japan

Create an environment in which a unique, international project like ILC can be executed. This will require new directions, organizations and creating the correct cultural environment (schools, etc).

Start a program to attract the next generation to work on the ILC: physicists (accelerator & HEP), engineers etc. May be through even more and specific connections to universities.

Charge 3:Assess if the goals of the proposal programs are attractive enough to the international science community, and are realistic and achievable in the given time frame considering the level of technological developments. Comment on aspects of human and financial resources and infrastructures necessary to achieve these goals.

Comments & Findings:

- ATF and STF programs have demonstrated to be highly attractive to international collaborators and will continue to do so.

Recommendations:

- For the preparation phase towards ILC approval and construction start, the KEK ILC team must be significantly reinforced with additional personnel. At the same time all possible efforts should be made to attract international collaborators to the ILC core team.
- The J-PARC neutron and muon program has the potential to be truly world class with significant outreach to an international user base, but the level of scientific and technical support across all instruments needs to be raised towards the international standard.

Charge 4:Give general opinions on the roles that KEK is anticipated to play in the long range global scope of accelerator-based science in future.

Comments & Findings:

- It is clear that the wide scope of activities proposed in the Roadmap would, if completed, make Japan the leader in accelerator-based science in the world.
- However, this requires that KEK will aggressively seek international participation in all of the accelerator projects, following the lead of the ATF and ILC R&D projects.

- KEK is a world leading accelerator research center today and, in the future, could become the home of the strongest all-around accelerator research center in the world.

Appendix A: KEK Roadmap 2013 Review Committee member list

Committee members and field of expertise.

Field	member
HEP	S.Bertolucci (CERN) T.Han(Pittsburgh, Theory) K.Inoue(Tokoku) G.Isidori (Frascati, Theory) N. Mondal (TIFR) B.Tschirhart (Fermilab) H.Weerts(Argonne) Chair
Nuclear physics	R.Milner (MIT) T.Nakano(Osaka)
Accelerator	R.Brinkmann(DESY) J. Galayda (SLAC) A.Hutton (J Lab)
Photon	Y.Amemiya(Tokyo) I.Lindau (Stanford)
Neutron/ Muon	J. Mesot(PSI) A.Taylor (STFC)

Appendix B: Charge received.

Charges to the KEK Roadmap Review Committee by the KEK DG April 2, 2013

Charge 1

Evaluate the scientific roles that KEK is currently playing from the perspectives of the world-wide accelerator-based science community, especially in the following respects:

- Particle and nuclear physics
- Materials and life science
- Particle accelerator and related technologies
- Detector-related technologies

Charge 2

Evaluate the strategy for the next five years in the KEK Roadmap particularly in terms of their competitiveness and complementarity for :

- Particle and nuclear physics program at J-PARC
- Materials and life science program at J-PARC
- SuperKEKB/Belle II
- LHC/ATLAS
- ILC
- Photon science (Synchrotron radiation research)
- New developments of accelerator and detector technologies

Charge 3

Assess if the goals of the proposal programs are attractive enough to the international science community, and are realistic and achievable in the given time frame considering the level of technological developments. Comment on aspects of human and financial resources and infrastructures necessary to achieve these goals.

Charge 4

Give general opinions on the roles that KEK is anticipated to play in the long range global scope of accelerator-based science in future.

Appendix C; Agenda for 5 & 6 April 2013 Review

Meeting of KEK Roadmap Review Committee

KEK, Tsukuba, JAPAN
Tentative Agenda

April 4, 2013 (Optional)

J-PARC site tour at Tokai campus

12:00 Leave at the hotel

13:20 Arrive at J-PARC, Tokai

13:20 – 16:30 J-PARC site tour

Material Life science Facility (MLF), Neutrino facility Hadron Hall, and Main Ring (50GeV Synchrotron) will be toured.

16:30 Leave J-PARC

18:00 Arrive at the hotel

April 5, 2013

08:30 – 09:00 Closed session

08:30 Welcome address — Atsuto Suzuki, Director General, KEK

08:40 Executive session

09:00 – 12:30 Open session

09:00	Status of KEK	Atsuto Suzuki
09:30	KEK Roadmap	Yasuhiro Okada
09:50	IPNS	Masanori Yamauchi
10:20	Coffee Break	
10:40	IMSS	Kazuyoshi Yamada
11:10	Accelerator Lab	Katsunobu Oide
11:30	Applied Research Lab	Suichi Ban
11:50	Detector Development	Junji Haba

12:10 – 13:30 Lunch

13:30 – 17:50 Open session

13:30 J-PARC

Overview (15) Naoto Saito

Neutrino (15) Takashi Kobayashi

	Hadron Hall (15)	Kazuhiro Tanaka
	Neutron (15)	Toshiya Otomo
	Muon (15)	Ryosuke Kadono
	Accelerator (15)	Tadashi Koseki
15:00	SuperKEKB/BelleII	Yoshihide Sakai
15:30	LHC/ATLAS	Katsuo Tokushuku
16:00	Coffee Break	
16:20	ILC	Akira Yamamoto
16:50	Photon science	Youichi Murakami
17:30	New development on Accelerator and Detector Technologies	Mitsuaki Nozaki

17:50 – 19:00 Executive session

19:30 – 21:00 Reception at Okura Frontier Hotel, Tsukuba

April 6, 2013

09:00 – 11:00 KEK facility tour

KEKB, ATF, STF, cERL, PF, and PF-AR will be toured.

11:20 – 12:30 Closed session

12:30 – 13:30 Lunch

13:30 – 17:00 Executive session and Drafting

17:00 – 17:30 Closing remarks

17:30 Adjourn