

eScience Activities in Japan

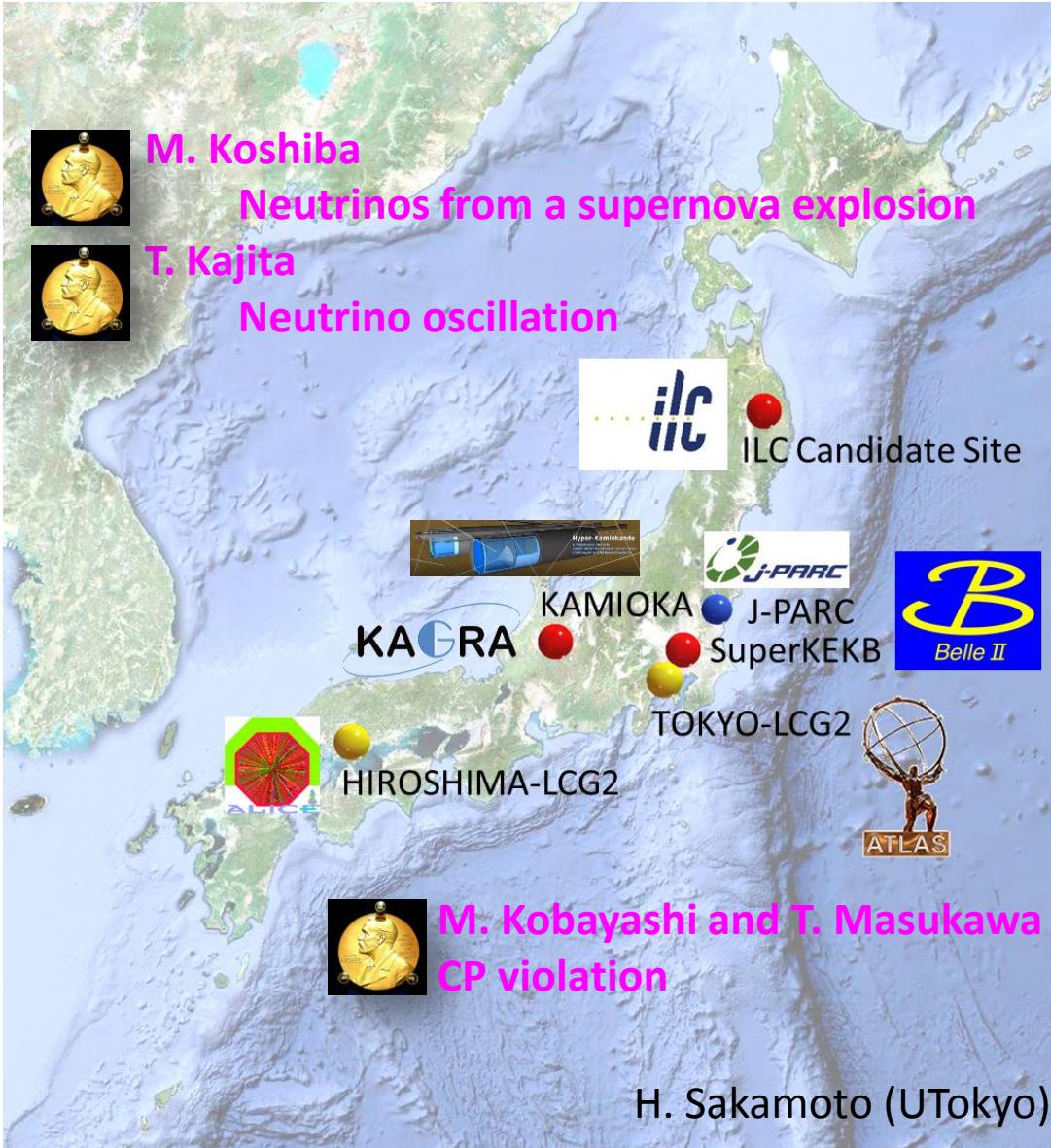
Tomoaki Nakamura

KEK (HIGH ENERGY ACCELERATOR RESEARCH ORGANIZATION)

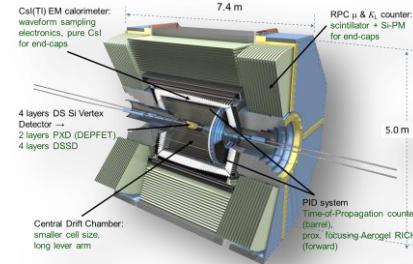


Computing Research Center

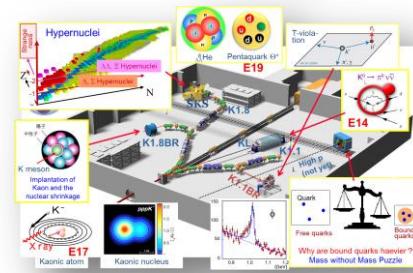
Demand for computing from particle physics



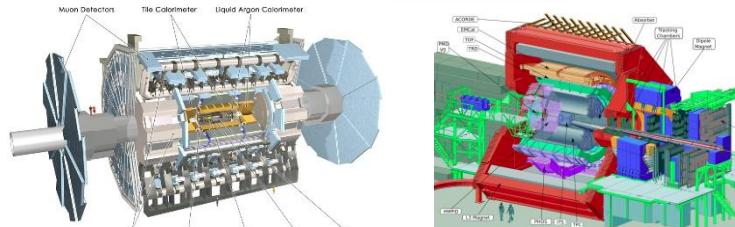
Belle II at SuperKEKB



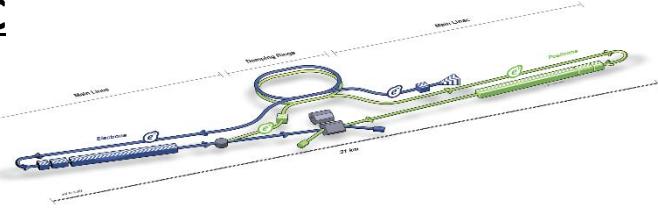
J-PARC



ATLAS and ALICE at LHC

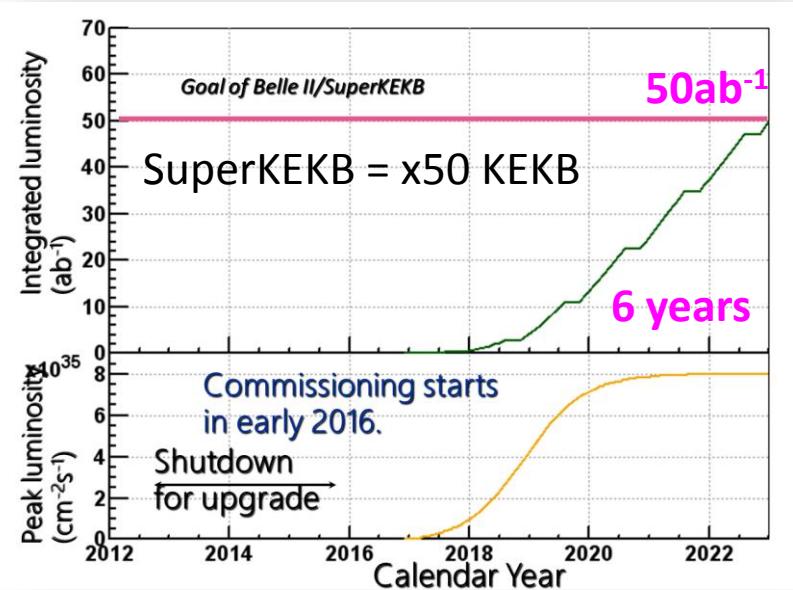
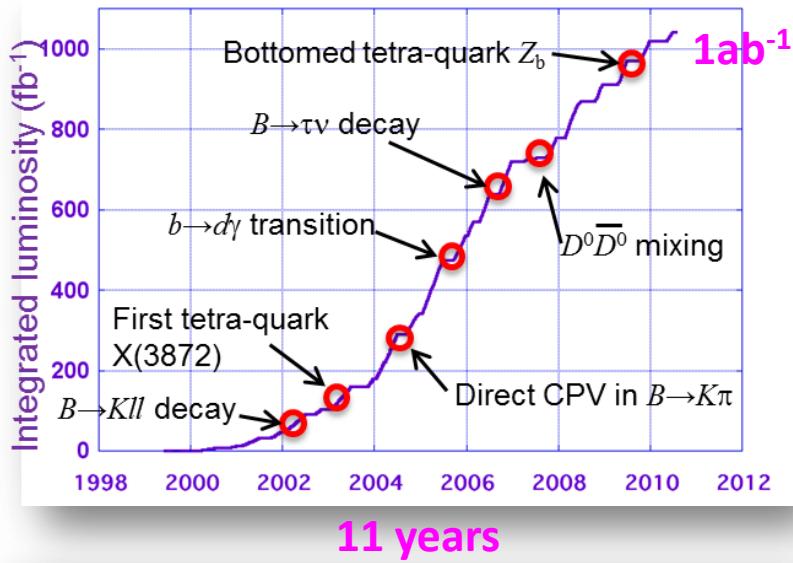


ILC

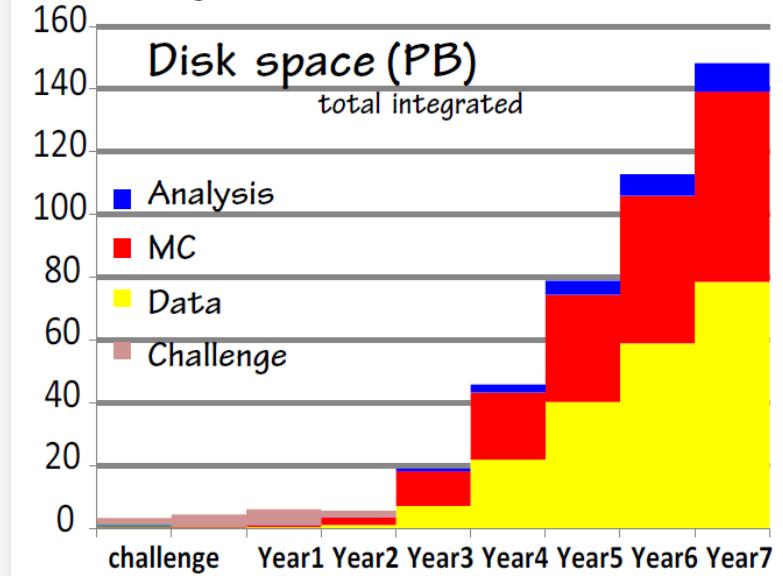
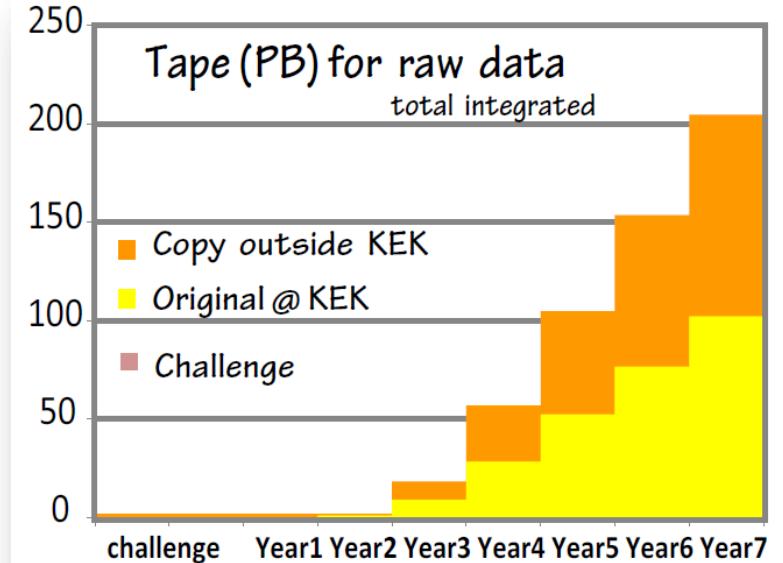


Belle II data volume

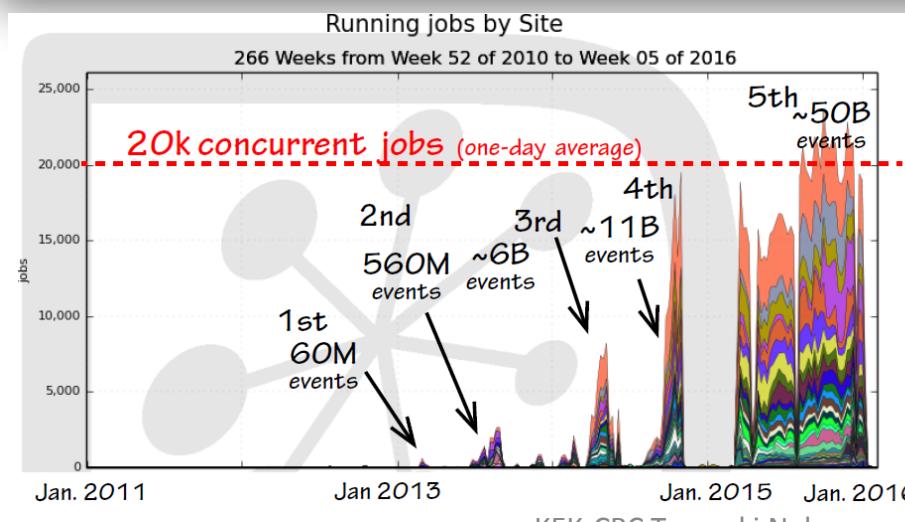
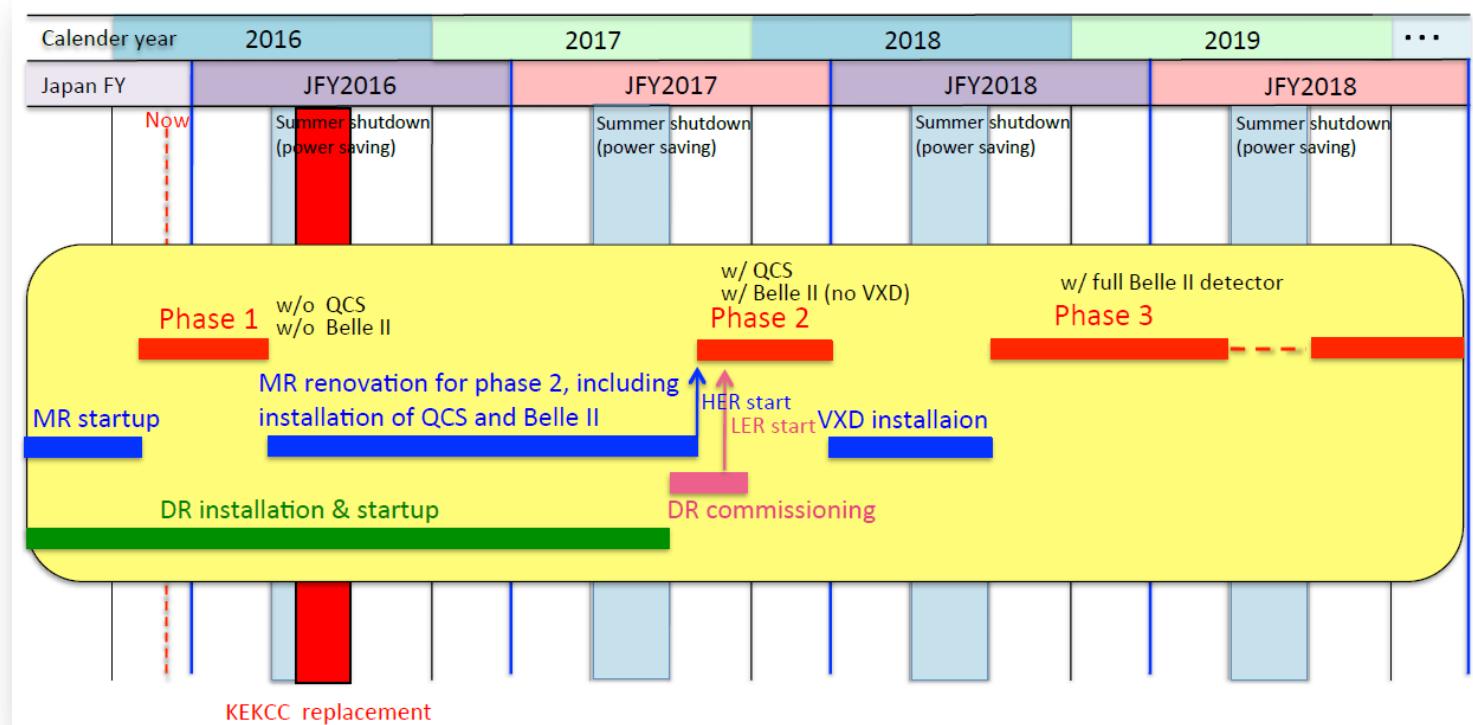
Accelerator



Computing



Schedule of Belle II and computing preparation



17 countries/regions

Australia, Austria, Canada, China, Czech R., Germany, India, Italy, Japan, Korea, Poland, Russia, Slovenia, Taiwan, Turkey, Mexico, USA

~40 sites

GRID, Cloud, local cluster is available

T. Hara (KEK)

aiming the larger scale

First turns and successful storage of beams in the SuperKEKB electron and positron rings

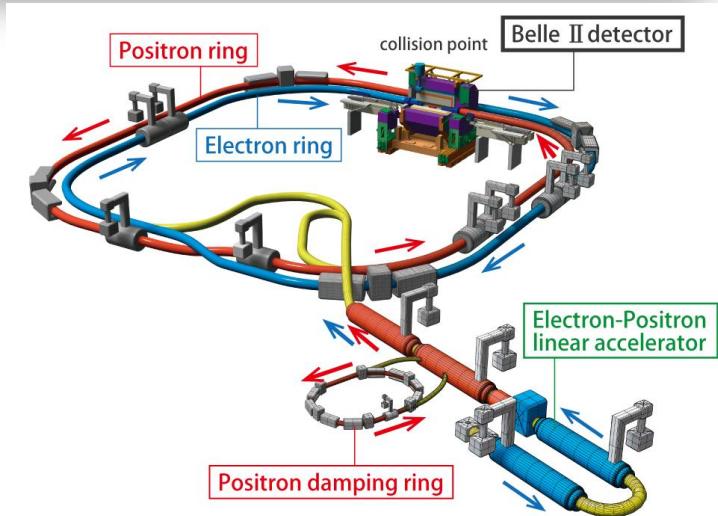
<https://www.kek.jp/en/NewsRoom/Release/20160302163000/>

March 2nd, 2016

High Energy Accelerator Research Organization (KEK)

[Primary research result]

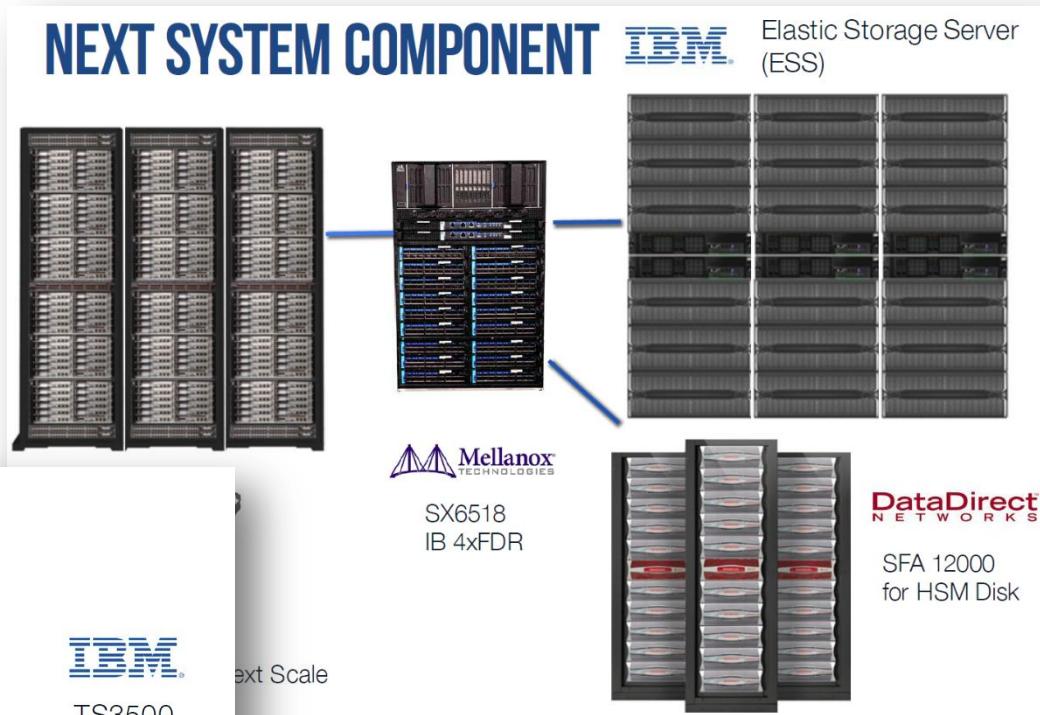
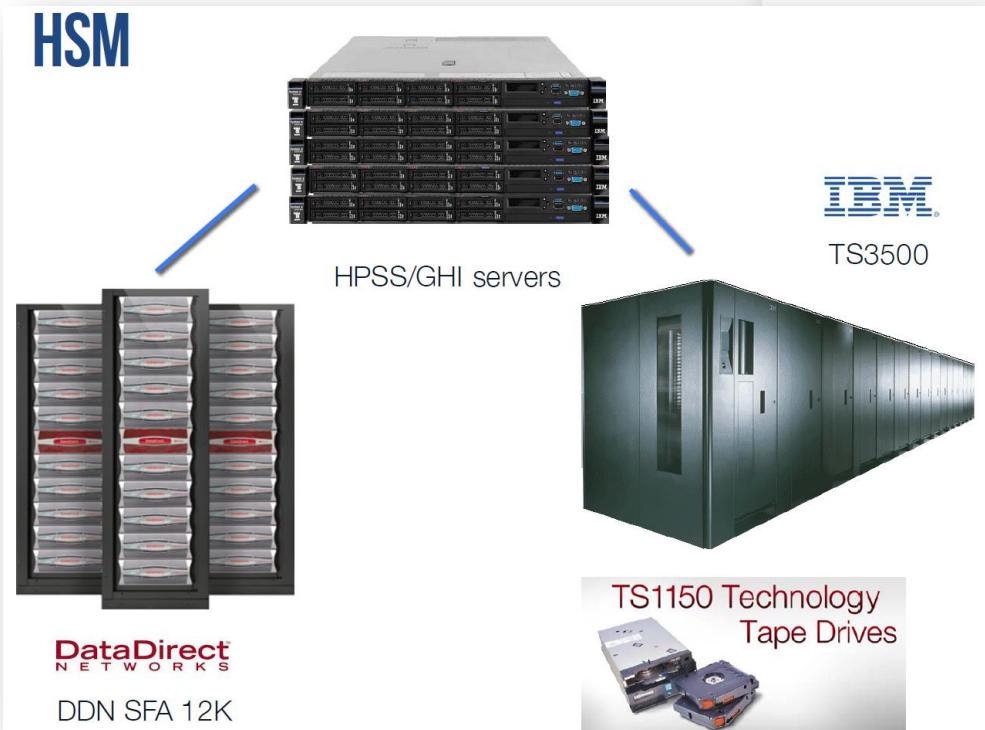
After five years of large-scale upgrade work, SuperKEKB, an electron-positron colliding accelerator at KEK in Japan, has started test operations. SuperKEKB succeeded in circulating and storing beams in the electron and positron rings, which is the first milestone of its commissioning.



Upgrade of KEK Central Computer (KEKCC)

New KEKCC will start operation from
Sep. 2016

Just in construction phase



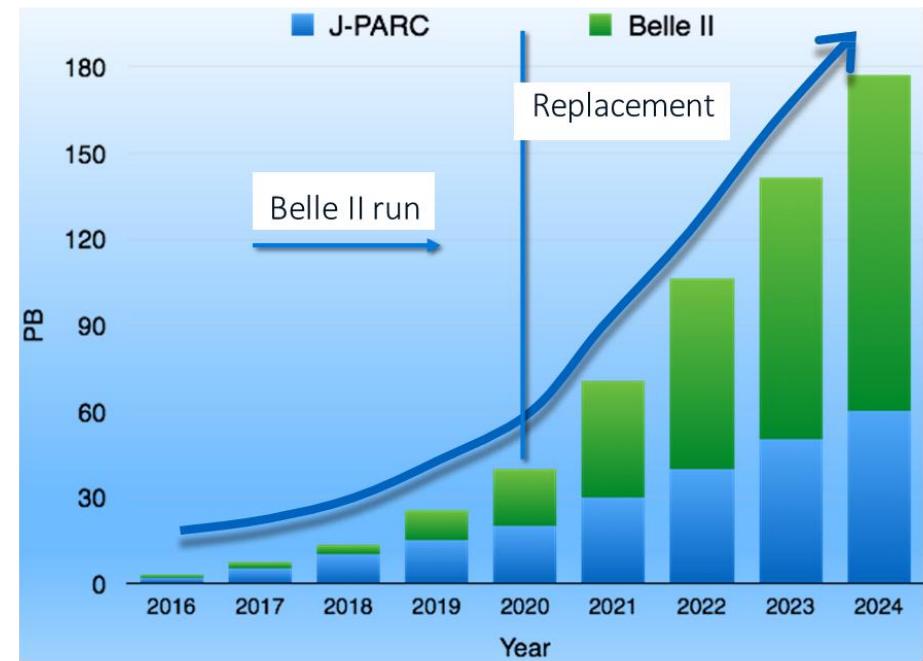
Very high Integration
10K CPU cores in 6 racks
All comp. node have SSD
High speed interconnect with storage
InfiniBand 4xFDR
Can use tape as disk transparently
GPSS-HPSS integration

Computing requirement for KEKCC

	CPU (cores)	Disk (PB)	Tape (PB)
Belle	1,000	1.2	3.5
Belle II	7,500	9	29
ILC	400	0.3	1.5
CMB	250	0.5	1
J-PARC	1,650	5.9	27
KOTO	1,000	5	15
T2K	300	0.2	1
MLF	50	0.5	8
Others (J)	300	0.2	3
Total	10,800	17	65
Current Sys.	4,000	7	18
Next Sys.	10,000	13	70

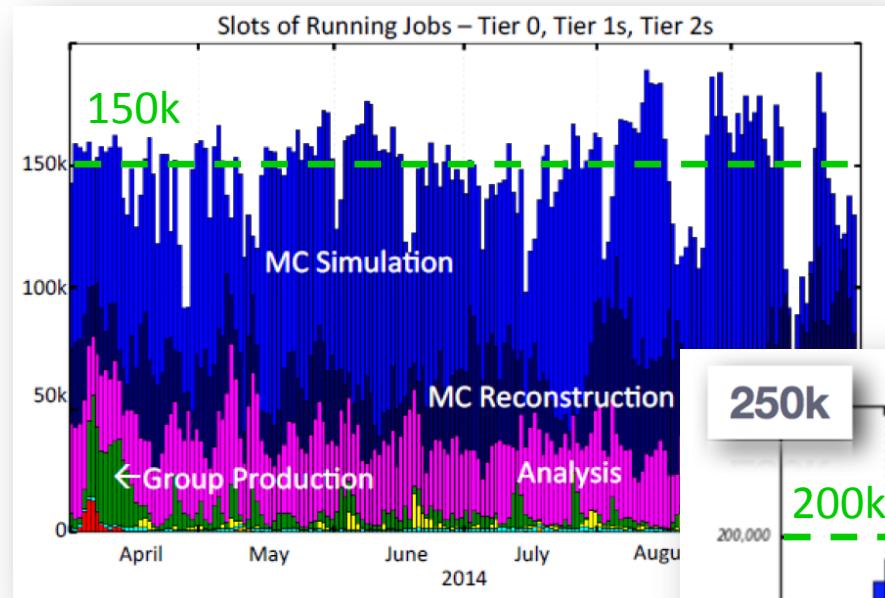
Demand for computing resource is increasing

**Not only from High Energy Physics
precise measurement produce large data**

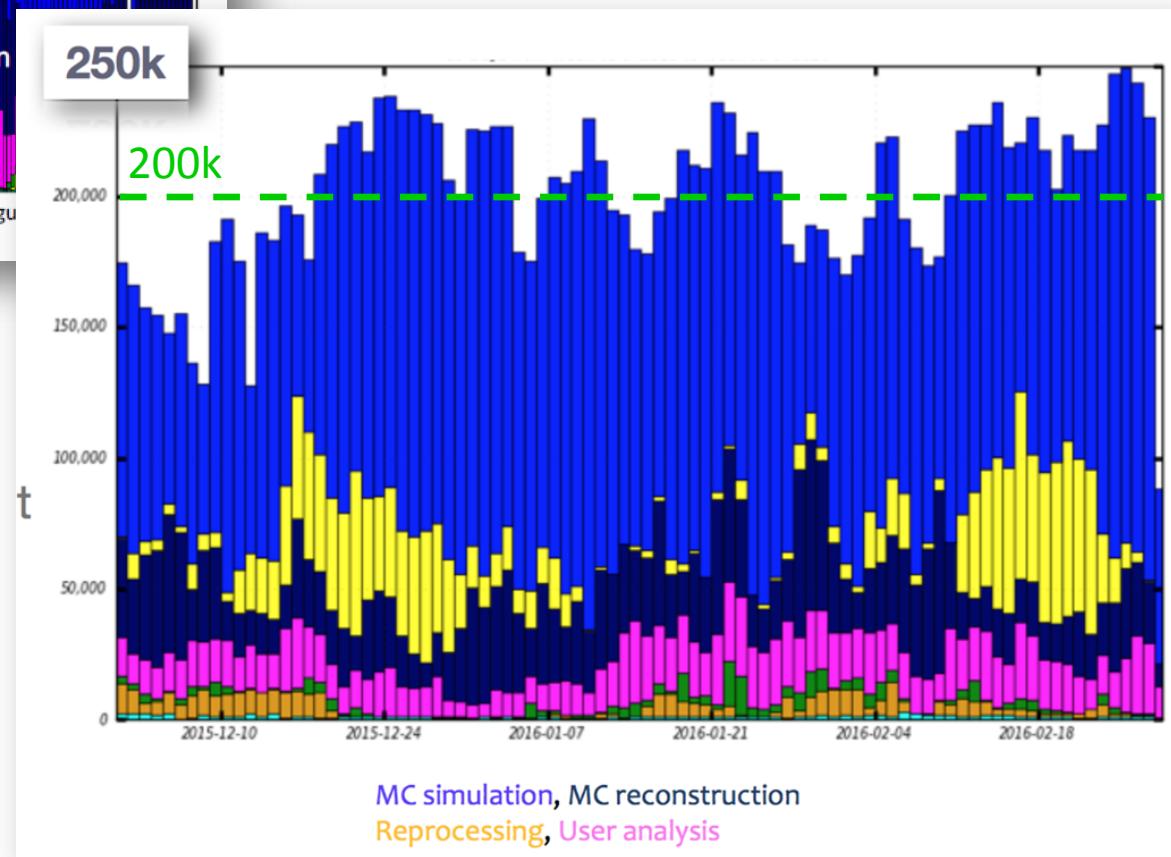


K. Murakami (KEK)

ATLAS computing



Need further resource
HPC
Effective use of commercial cloud
Volunteer computing (BOINC)



E. Lancon (CEA)

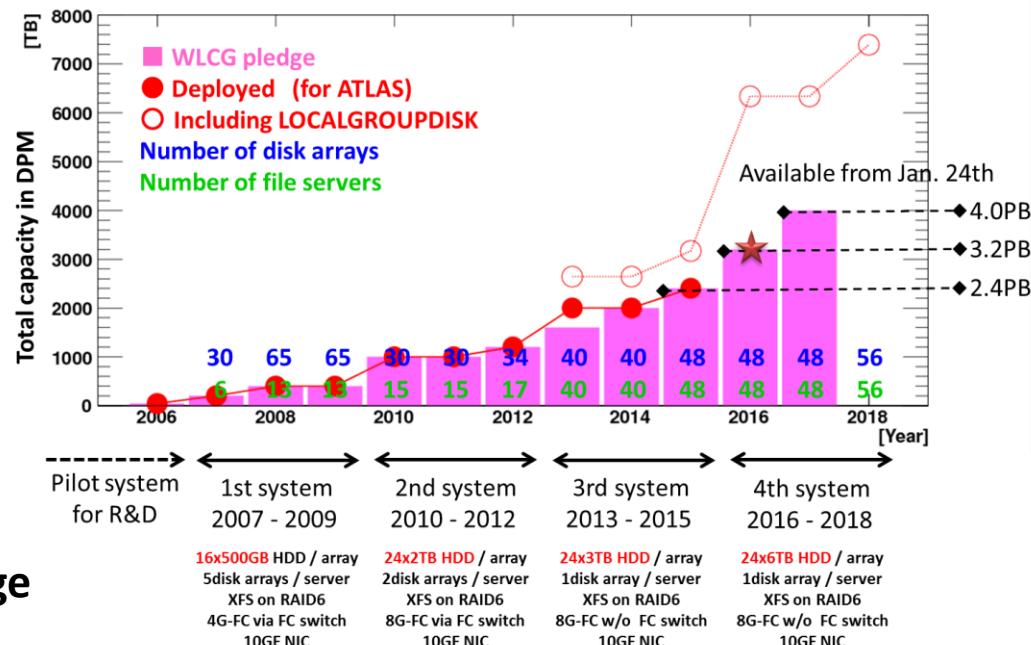
ATLAS Tier2 Upgrade at UTokyo



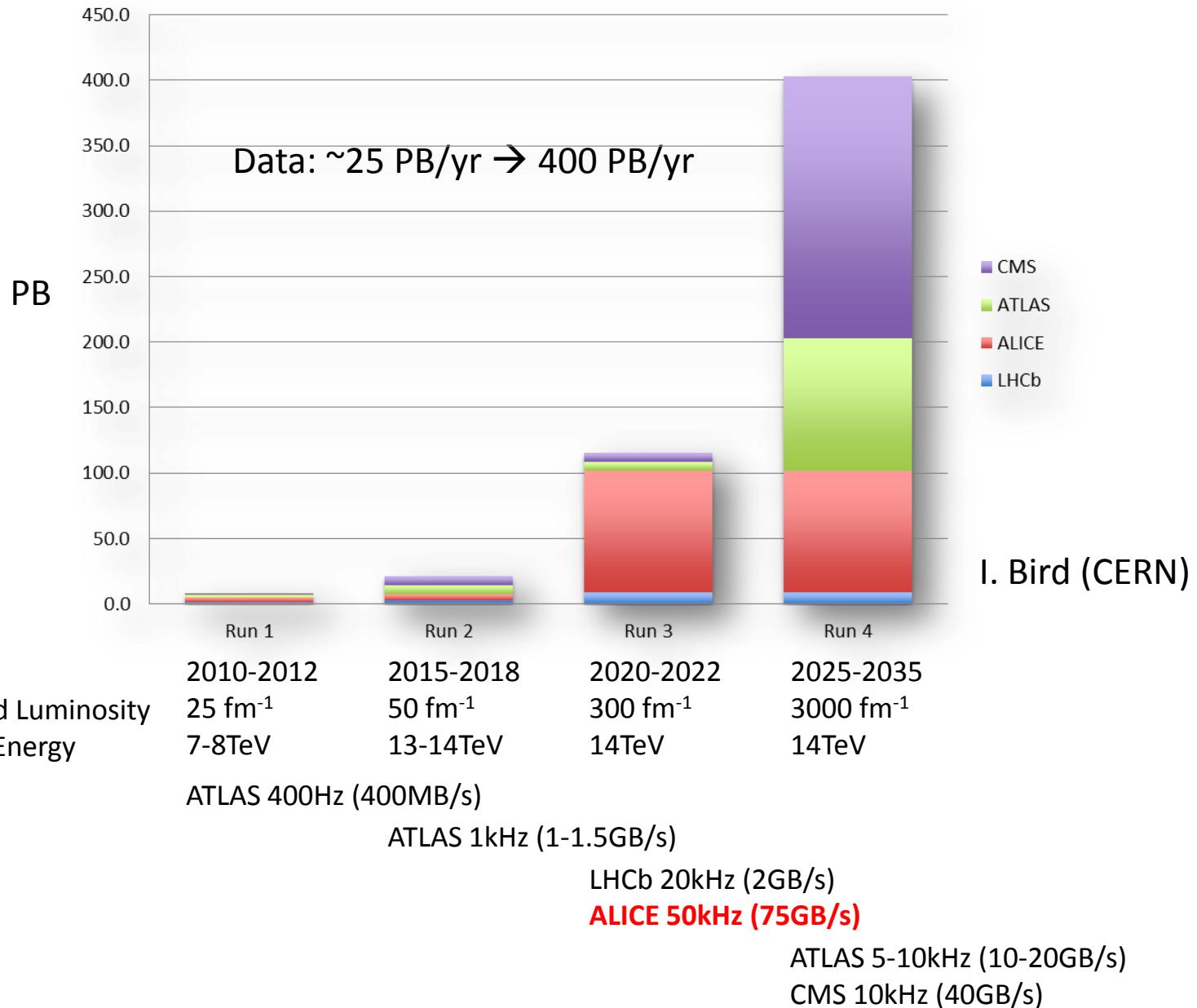
System migration was just completed at the end of Jan. 2016

10K CPU cores including service instance
3840 cores have been deployed, will be increased to 5760 core for ATLAS

10PB Disk including non-Grid use
Already available 6.3PB as Grid storage



ALICE data volume in future



Second Tier2 site for ALICE experiment

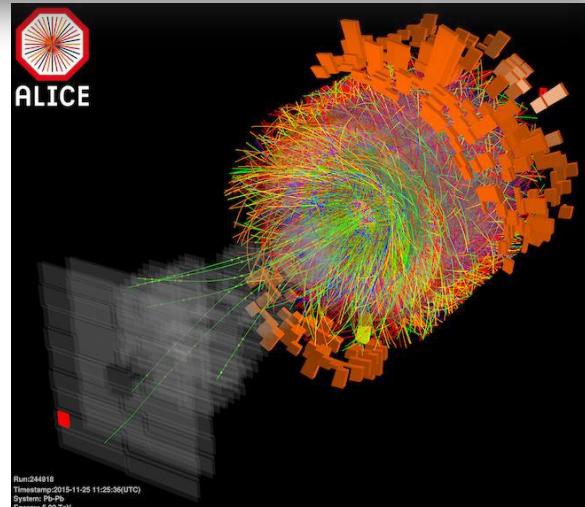
ALICE Tier-2 at Hiroshima

- The ALICE T2 site "JP-HIROSHIMA-WLCG" with grid middleware EMI-3 on SL6.5... as stable as possible.
- GRID service; APEL, sBDII, CREAM-CE, XROOTD, DPM-SE, VOBOX... as compact as possible.
- WN resources; 1356 Xeon-cores in total
 - Xeon5355(4c@2.6GHz) x 2cpu x 16 boxes
 - Xeon5365(4c@3.0GHz) x 2cpu x 20 blades
 - Xeon5570(4c@2.9GHz) x 2cpu x 26 blades
 - Xeon5670(6c@2.9GHz) x 2cpu x 3 blades
 - Xeon5660(6c@2.8GHz) x 2cpu x 42 blades
 - E5-2470v2(10c@2.4GHz) x 2cpu x 16 blades
- Storage; 1,056TB disks on 9 servers, but no MS
- Around 3/4 resource deployed to ALICE GRID, and the rest for a local cluster
- Network B/W: 1Gbps on 40Gbps-SINET4 in Japan
- WLCG support by ASGC in Taiwan
- Responsible by Prof. Toru Sugitate
- Operated by TS and K.Tarunaga (M2) under remote technical support by SOUM corp., Tokyo.



Toru Sugitate / Hiroshima Univ. / HepNet-J User's Meeting @ Hiroshima / 2015-11-24

T. Sugitate
(HiroshimaU)



2016/03/15

Participate in WLCG officially soon

Tsukuba ALICE T2 status



Members:

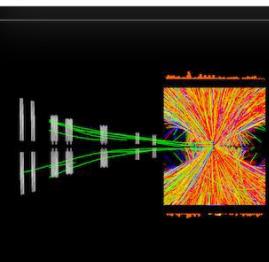
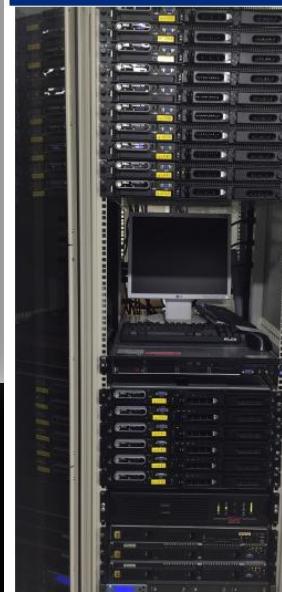
- T. Chujo (responsible), S. Kato (technical staff)

Status:

- Infrastructures, MW (EMI 3.1), and service have been set-up.
- Setting up T2 for the test job submission by ALICE.
- 16 WN's (X5355; 4 cores x 2 cpu, @2.6GHz) in a rack.
- Used IP: HepNet-J.
- Connected to SINET-4/(5) (via HepNet-J).

Plan:

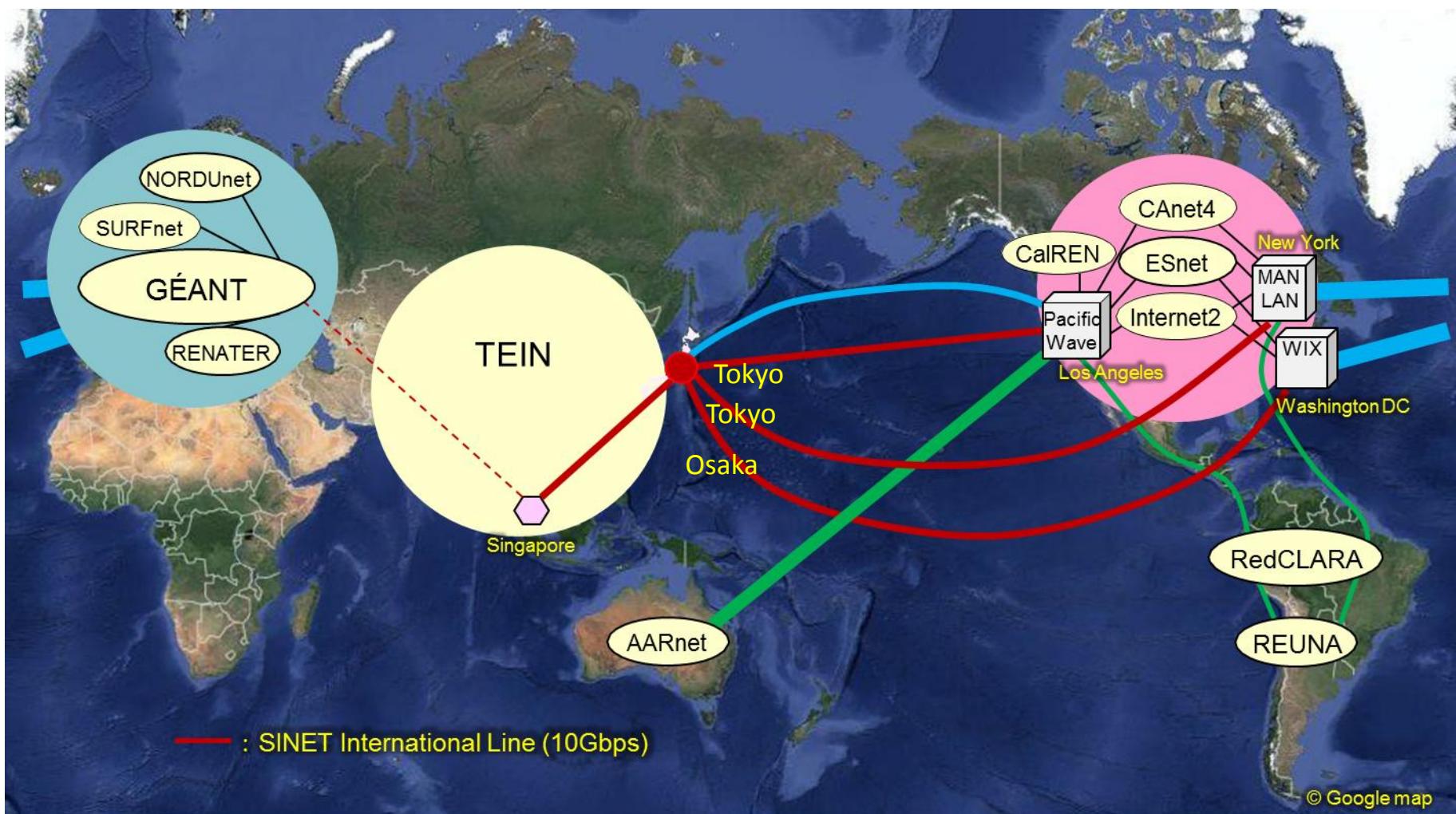
- Sign-up WLCG (2016).
- Will use University's IPs for head nodes for the future connection to WLCG (and LHCONE), with the support by U.Tsukuba info. center and KEK.



T. Chujo (UTsukuba)

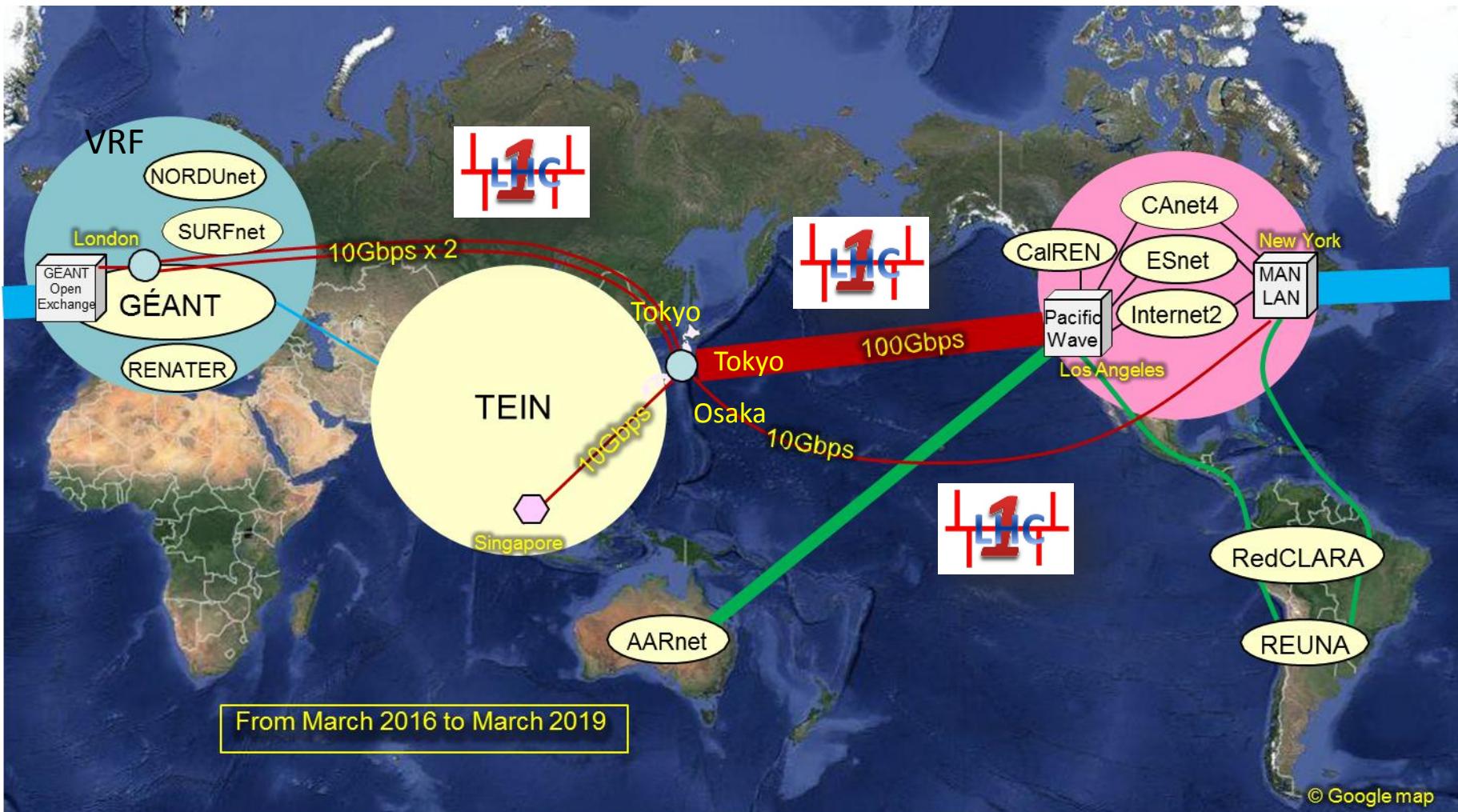
KEK-CRC Tomoaki Nakamura

SINET4 until JFY2015 (Mar. 2016)



Y. Kubota (NII)

SINET5 from JFY2016 (Apr. 2016)



Y. Kubota (NII)

Summary

Demand for computing from high-energy physics is further increasing.

Data Driven Discovery phase is coming also for the small experiment by the precise measurement. It is not only for the energy frontier experiments.

A lot of activity and continuous effort is indispensable for the more improvement of computing environment. Computing is already one of the necessary subsystem.

Belle II at SuperKEKB:	KEK
ATLAS:	ICEPP, UTokyo
ALICE:	HiroshimaU, UTsukuba
International network:	NII

**Development of computing
directly yields new results at the next generation project.**