1 OUTLINE

1.1 Supercomputer System

In School year 2023 (SY 2023), the ISSP supercomputer center provided users with System B - Dell PowerEdge C6525/R940 system named "ohtaka" and System C - HPE Apollo 2000 Gen10 Plus/HPE Apollo 6500 Gen10 Plus system named "kugui". System B is a massively-parallel supercomputer with two types of compute nodes: 8 "Fat" nodes and 1680 "CPU" nodes. "Fat" nodes are each comprised of four Intel Xeon Platinum 8280 CPUs (28 cores/CPU) and 3 TB of memory per node. "CPU" nodes have two AMD EPYC 7702 CPUs (64 cores/CPU) and 256 GB of memory per node. System B achieves about 6.881 PFLOPS in theoretical peak performance with high power efficiency. The subsystem comprised of only CPU nodes ranks 87st in the Nov. 2020 Top 500 List, which is a ranking based on total performance measured by the HPL benchmark. The compute nodes communicate to each other through HDR100 Infiniband and are connected in fat tree topology. SY 2023 was the fourth year of the operation of the current System B. System C is a massively-parallel supercomputer with two types of compute nodes: 128 "CPU" nodes and 8 "ACC" nodes. "CPU" nodes are each comprised of two AMD EPYC 7763 CPUs (64 cores/CPU) and 256 GB of memory. The compute nodes communicate to each other through HDR200 Infiniband and are connected in fat tree topology. "ACC" nodes are each comprised of one AMD EPYC 7763 CPUs (64 cores/CPU), four NVIDIA A100 40GB for HGX GPUs and 256 GB of memory. System C achieves 973 TFLOPS in theoretical peak performance. SY 2023 was the second year of the operation of the current System C. As shown in Fig. 1, users can access both systems via the Internet using SSH public key authentication. For further details, please contact ISSP Supercomputer Center (SCC-ISSP).

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1.2 Project Proposals

The ISSP supercomputer system provides computation resources for scientists working on condensed matter sciences in Japan. All scientific staff members (including post-docs) at universities or public research institutes in Japan can submit proposals for projects related to research activities on materials and condensed matter sciences. These proposals are peer-reviewed by the Advisory Committee members (see Sec. 1.3), and then the computation resources are allocated based on the review reports. The leader of an approved project can set up user accounts for collaborators. Other types of scientists, including graduate students, may also be added. Proposal submissions, peer-review processes, and user registration are all managed via a web system.

The computation resources are distributed in a unit called "point", determined as a function of available CPU utilization time and consumed disk resources. There
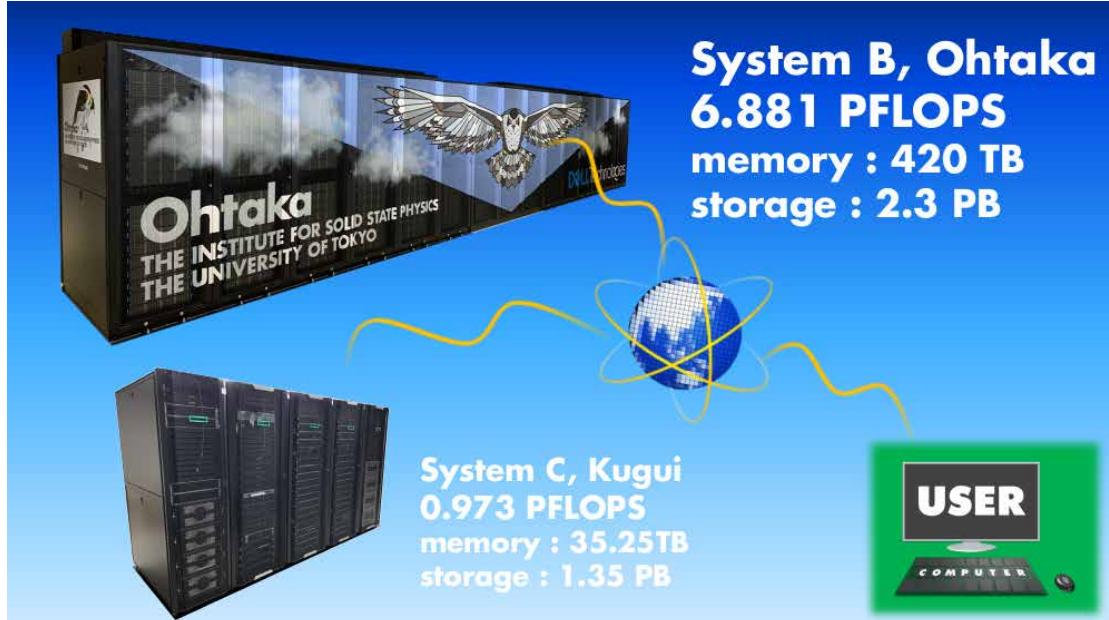
Figure 1: Supercomputer System at the SCC-ISSP

were calls for six classes of research projects in SY 2023. The number of projects and the total number of points that were applied for and approved in this school year are listed in Table 1.

- Class A is for trial use by new users; proposals for Class A projects are accepted throughout the year.

- Proposals for projects in Classes B (small), C (mid-size), E (large-scale), and S (exceptional) can be submitted twice a year. Approved projects in Classes A, B, C, and E continue to the end of the school year.

- In Class D, projects can be proposed on rapidly-developing studies that need to perform urgent and relatively large calculations. An approved project continues for 6 months from its approval.

- Class S is for projects that are considered extremely important for the field of condensed matter physics and requires extremely large-scale computation. The project may be carried out either by one research group or cooperatively by several investigators at different institutions. A project of this class should be applied with at least 10,000 points; there is no maximum. We require group leaders applying for Class S to give a presentation on the proposal to the Steering Committee of the SCC-ISSP. Class S projects are carried out within one year from its approval.

- Project leaders can apply for points so that the points for each system do not exceed the maximum point shown in this table.

Table 1: Classes of research projects in SY 2023. Total points listed in this table are rounded. In Class D, we collect information about the projects ended in each semester.

Class	Maximum Points		Application	# of Proj.	Total points			
					Applied		Approved	
	Sys–B	Sys–C			Sys–B	Sys–C	Sys–B	Sys–C
A	100	50	any time	24	2.4k	1.2k	2.4k	1.2k
B	650	100	twice a year	99	58.1k	7.3k	38.5k	6.5k
C	6.5k	500	twice a year	185	996.9k	58.4k	513.6k	45.8k
D	10k	500	any time	7	43.5k	1.5k	39.6k	1.5k
E	20k	1.5k	twice a year	17	317.0k	25.5k	185.0k	20.7k
S	–	–	twice a year	0	0	0	0	0
SCCMS				12	27.0k	2.6k	27.0k	2.6k
Total				344	1444.9k	96.6k	806.1k	78.3k

In addition, from SY 2016, ISSP Supercomputer has been providing 20% of its computational resources for Supercomputing Consortium for Computational Materials Science (SCCMS), which aims at advancing parallel computations in condensed matter, molecular, and materials sciences on the 10-PFlops K Computer and the exascale post-K project. From SY 2020, up to 10% of the computational resources have been provided for SCCMS. Computational resources have also been allotted to Computational Materials Design (CMD) workshops, as well as CCMS hands-on workshops.

1.3 Committees

In order to fairly manage the projects and to smoothly determine the system operation policies, the Materials Design and Characterization Laboratory (MDCL) of the ISSP has organized the Steering Committee of the MDCL and the Steering Committee of the SCC-ISSP, under which the Supercomputer Project Advisory Committee (SPAC) is formed to review proposals. The members of the committees in SY 2023 were as follows:

Steering Committee of the MDCL

OKAMOTO, Yoshihiko	ISSP (Chair person)
KAWASHIMA, Naoki	ISSP
YAMAURA, Jun-ichi	ISSP
OZAKI, Taisuke	ISSP
NOGUCHI, Hiroshi	ISSP
UWATOKO, Yoshiya	ISSP
SUGINO, Osamu	ISSP
KUBO, Momoji	Tohoku Univ.

HUKUSHIMA, Koji   Univ. of Tokyo
HONDA, Fuminori   Kyushu Univ.
SHIMAKAWA, Yuichi   Kyoto Univ.
OTSUKI, Junya   Okayama Univ.
OBA, Fumiyasu   Tokyo Tech.
KUDO, Kazutaka   Osaka Univ.
MATSUDA, Tatsuma   Tokyo Metropolitan Univ.

Steering Committee of the SCC-ISSP

KAWASHIMA, Naoki   ISSP (Chair person)
NOGUCHI, Hiroshi   ISSP
OZAKI, Taisuke   ISSP
SUGINO, Osamu   ISSP
TSUNETSUGU, Hirokazu   ISSP
KATO, Takeo   ISSP
KIMURA, Takashi   ISSP
FUKUDA, Masahiro   ISSP
IDO, Kota   ISSP
NAKANO, Hiroyoshi   ISSP
NAKAJIMA, Kengo   Univ. of Tokyo
OTSUKI, Junya   Okayama Univ.
MOTOME, Yukitoshi   Univ. of Tokyo
ONO, Tomoya   Kobe Univ.
TODO, Synge   Univ. of Tokyo
KUBO, Momoji   Tohoku Univ.
OBA, Fumiyasu   Tokyo Tech.
WATANABE, Hiroshi   Keio Univ.
HUKUSHIMA, Koji   Univ. of Tokyo
KITAO, Akio   Tokyo Tech.
HAMADA, Ikutaro   Osaka Univ.
YOSHIMI, Kazuyoshi   ISSP
YATA, Hiroyuki   ISSP
FUKUDA, Takaki   ISSP
MOTOYAMA, Yuichi   ISSP

Supercomputer Project Advisory Committee

KAWASHIMA, Naoki   ISSP (Chair person)
OZAKI, Taisuke   ISSP
NOGUCHI, Hiroshi   ISSP
SUGINO, Osamu   ISSP
TSUNETSUGU, Hirokazu   ISSP
KIMURA, Takashi   ISSP
KATO, Takeo   ISSP

FUKUDA, Masahiro	ISSP
IDO, Kota	ISSP
NAKANO, Hiroyoshi	ISSP
NAKAJIMA, Kengo	Univ. of Tokyo
MOTOME, Yukitoshi	Univ. of Tokyo
TODO, Synge	Univ. of Tokyo
KUBO, Momoji	Tohoku Univ.
OBA, Fumiyasu	Tokyo Tech.
WATANABE, Hiroshi	Keio Univ.
HUKUSHIMA, Koji	Univ. of Tokyo
ONO, Tomoya	Kobe Univ.
OTSUKI, Junya	Okayama Univ.
KITAO, Akio	Tokyo Tech.
HAMADA, Ikutaro	Osaka Univ.
IKUHARA, Yuichi	Univ. of Tokyo
SHIBATA, Naokazu	Tohoku Univ.
AKAGI, Kazuto	Tohoku Univ.
YANASE, Yoichi	Kyoto Univ.
HATSUGAI, Yasuhiro	Univ. of Tsukuba
OKADA, Susumu	Univ. of Tsukuba
KOBAYASHI, Nobuhiko	Univ. of Tsukuba
HOTTA, Takashi	Tokyo Metropolitan Univ.
MATSUKAWA, Hiroshi	Aoyama Gakuin Univ.
YAMAUCHI, Jun	Keio Univ.
HAGITA, Katsumi	National Defense Academy
KONTANI, Hiroshi	Nagoya Univ.
YUKAWA, Satoshi	Osaka Univ.
SUGA, Seiichiro	Univ. of Hyogo
YASUDA, Chitoshi	Univ. of the Ryukyus
KIM, Kang	Osaka Univ.
MORIKAWA, Yoshitada	Osaka Univ.
KOGA, Akihisa	Tokyo Tech.
SHIMOJO, Fuyuki	Kumamoto Univ.
TAKETSUGU, Tetsuya	Hokkaido Univ.
TSURUTA, Kenji	Okayama Univ.
HAMAGUCHI, Satoshi	Osaka Univ.
NISHIDATE, Kazume	Iwate Univ.
KAGESHIMA, Hiroyuki	Shimane Univ.
ISHII, Fumiyuki	Kanazawa Univ.
TATETSU, Yasutomi	Meio Univ.
YANAGISAWA, Susumu	Univ. of the Ryukyus
SHUDO, Ken-ichi	Yokohama Natl. Univ.
OHMURA, Satoshi	Hiroshima Inst. Tech.
NOGUCHI, Yoshifumi	Shizuoka Univ.
NAKAMURA, Kazuma	Kyushu Inst. Tech.

GOHDA, Yoshihiro	Tokyo Tech.
RAEBIGER, Hannes	Yokohama Natl. Univ.
KAWARABAYASHI, Tohru	Toho Univ.
KATO, Yusuke	Univ. of Tokyo
NASU, Joji	Tohoku Univ.
HOTTA, Chisa	Univ. of Tokyo
ISOBE, Masaharu	Nagoya Inst. Tech.
TANAKA, Shu	Keio Univ.
KOBAYASHI, Kazuaki	NIMS
TATEYAMA, Yoshitaka	NIMS
TAMURA, Ryo	NIMS
HIGUCHI, Yuji	Kyushu Univ.
KAWAMURA, Mitsuaki	Univ. of Tokyo
TADA, Tomofumi	Kyushu Univ.
HATANO, Naomichi	Univ. of Tokyo
YOSHINO, Hajime	Osaka Univ.
OKUMURA, Hisashi	NINS-ExCELLS
HOSHI, Takeo	NIFS-PQP
TSUNEYUKI, Shinji	Univ. of Tokyo
SUZUKI, Takafumi	Univ. of Hyogo
YOSHIMOTO, Yoshihide	Univ. of Tokyo
TOHYAMA, Takami	Tokyo Univ. of Sci.
ARITA, Ryotaro	Univ. of Tokyo
OGATA, Masao	Univ. of Tokyo
WATANABE, Satoshi	Univ. of Tokyo
YABANA, Kazuhiro	Univ. of Tsukuba
FURUKAWA, Nobuo	Aoyama Gakuin Univ.
KUROKI, Kazuhiko	Osaka Univ.
TANAKA, Yukio	Nagoya Univ.
KUSAKABE, Koichi	Univ. of Hyogo
SAKAI, Toru	Univ. of Hyogo
ISHIBASHI, Shoji	AIST
OTANI, Minoru	Univ. of Tsukuba
TOMITA, Yusuke	Shibaura Inst. Tech.
SHIRAISHI, Kenji	Nagoya Univ.
OGUCHI, Tamio	Osaka Univ.
KAWAKATSU, Toshihiro	Tohoku Univ.
OTSUKI, Tomi	Sophia Univ.
ODA, Tatsuki	Kanazawa Univ.
ARAI, Noriyoshi	Keio Univ.
UNEYAMA, Takashi	Nagoya Univ.

1.4 Staff

The following staff members of the SCC-ISSP usually administrate the ISSP Supercomputer.

KAWASHIMA, Naoki	Professor (Chair person)
NOGUCHI, Hiroshi	Associate Professor
OZAKI, Taisuke	Professor
SUGINO, Osamu	Professor
IDO, Kota	Research Associate
FUKUDA, Masahiro	Research Associate
NAKANO, Hiroyoshi	Research Associate
YOSHIMI, Kazuyoshi	Project Researcher
AOYAMA, Tatsumi	Project Researcher
MOTOYAMA, Yuichi	Technical Specialist
YATA, Hiroyuki	Technical Specialist
FUKUDA, Takaki	Technical Specialist
ARAKI, Shigeyuki	Project Academic Specialist

2 STATISTICS (SCHOOL YEAR 2023)

2.1 System and User Statistics

In the following, we present statistics for operation time taken in the period from April 4th 2023 to March 31th 2024 (SY 2023). In Table 2, we show general statistics of the supercomputer system in SY 2023. The total numbers of compute nodes in System B "ohtaka" and System C "kugui" are 1688 and 136, respectively. Consumed disk points amount to about a few percent of the total consumed points in both System B and System C.

Table 2: Overall statistics of SY 2023

	System B ohtaka	System C kugui
total service time ($\times 10^3$ node·hours)	13944	1135
number of executed jobs	509541	132715
total consumed points ($\times 10^3$ point)	472	26
CPU points ($\times 10^3$ point)	456	25
disk points ($\times 10^3$ point)	16	1
total exec. time ($\times 10^3$ node·hours)	12929	1008
availability	94.81%	95.77%
utilization rate	92.70%	88.83%