ISBN: 978-3-95450-248-6 ISSN: 2673-5490 doi: 10.18429/JACoW-IPAC2025-TUPM079

A REPORT FROM ISBA24 (THE 7TH INTERNATIONAL SCHOOL ON BEAM DYNAMICS AND ACCELERATOR TECHNOLOGY) IN CHIANG MAI, THAILAND

M. Kuriki*, Hiroshima University, Higashihiroshima, Japan
S. Rimjaem, Chiang Mai University, Chiang Mai, Thailand
D. Wongratanaphis, Thailand Center of Excellence in Physics, Chiang Mai, Thailand

Abstract

ISBA24 (The 7th International School of Beam Dynamics and Accelerator Technology) was held in Chiang Mai, Thailand, jointly hosted by Chiang Mai University, Hub of Talents in Particle Accelerators (operated by the Thailand Center of Excellence in Physics), Synchrotron Light Research Institute (Public Organization) and Hiroshima University. ISBA is a series of international accelerator schools initiated in 2018 at Hiroshima, Japan promoted by IINAS(IINAS-NX). ISBA24 was held from November 1 to 9, 2024. The school brought together over 80 participants, including 18 professors and experts, and 64 students from ASEAN countries and beyond. All participants enjoyed intense lectures, practical exercises, student presentations, and social events such as excursions and Thai northern style banquet. An overview of ISBA24 will be presented and human resource development in accelerator science will be discussed.

INTRODUCTION

ISBA24 [1], the seventh International School on Beam dynamics and Accelerator technology was held from 1st to 9th November, 2024 at Chiang Mai University, Thailand. Chiang Mai city, founded in 1296, was once the capital of the ancient Lanna Kingdom in northern Thailand. Chiang Mai University (CMU) was established in 1964 as the first institution of higher education in northern Thailand. ISBA24 is chaired jointly by CMU [2] and Hiroshima University [3]. Four organizations jointly hosted the event: Chiang Mai University, the Hub of Talents for Particle Accelerators under the operation of the Thailand Center of Excellence in Physics, the Synchrotron Light Research Institute, and the Program Management Unit for Human Resources & Institutional. Development, Research and Innovation (PMU-B).

The aim of ISBA is to provide young researchers and graduate students with an opportunity to learn about beam dynamics and technologies, since they are the warp and weft that support accelerator system. In addition to the above perspectives, ISBA aims at the development of accelerator science in the Asian region. It is the duty of Japan, Korea, China, Taiwan, and Thailand, as the leading accelerator regions in Asia. ISBA series was initiated as a school supported by IINAS program by MEXT, Japan in 2018 [4] and has been operated by researchers in Japan, Korea, China, Taiwan, and India. From 2023, researchers from Thailand joined the operation.The past ISBA series can be refered from the web site [5–10]. Figure 1 is a picture of the opening ceremony in a beautiful garden in CMU.

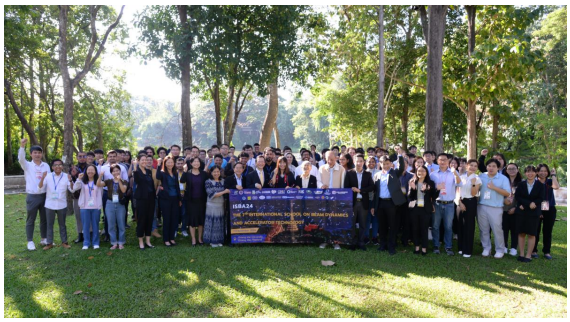

Figure 1: The group figure in the ISBA24 opening ceremony.

Since accelerator projects are realized through international cooperation, it is essential to improve the level of the entire region. It is important to provide graduate students and young researchers with opportunities to study intensively in an international environment, not only to acquire knowledge and skills, but also to create opportunities for accelerator research, to form international human networks, and to lay the groundwork for their future activities as researchers. As shown in Table 1, ISBA24 [1] was able to welcome students not only from the Asian region, but also from Europe (Turkey and Germany). Although ISBA's main scope is in the Asian region, it continues to develop as a global school. While there is United States Particle Accelerator School (USPAS) in the USA and CERN Accelerator School (CAS) in Europe, ISBA has become the leading accelerator-wide international school in the Asian region.

CURRICULUM

The curriculum of ISBA24, including the lecture material, can be found at the ISBA24 website [1]. Of the 32 lectures, roughly half are on basic accelerator topics, a quarter on accelerator applications and a quarter on hot topics. This time, AI, which is developing rapidly and is used in accelerators, and FEL, which is promoted by Chiang Mai University, were presented as the hot topics.

AI has had a big impact on accelerator science in recent years. However, it is quite possible that it could have an impact comparable to that of the industrial revolution or even the information revolution. The Industrial Revolution

* mkuriki@hiroshima-u.ac.jp

ISBN: 978-3-95450-248-6 ISSN: 2673-5490 doi: 10.18429/JACoW-IPAC2025-TUPM079

Table 1: Number of Students from Each Region Based on Their Home Institute Location

Region	Number of students
Thailand	20
Japan	13
China	12
Indonesia	7
Korea	4
Taiwan	2
India	4
Turkey	1
Germany	1
Sum	64

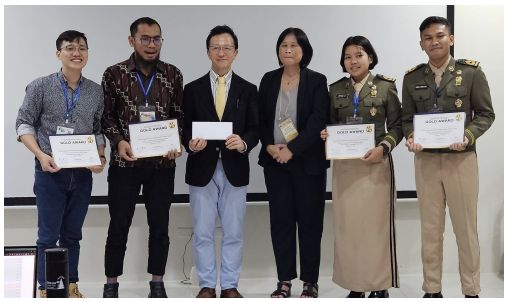

Figure 2: Awards for the Group Presentation (Hands-on Session) were given to Mr. Nguyen Huynh Phuc, Ms. Jembar Lugina Pardja, Mr. Azza Alifa Muhammad, and Mr. Daniel Manuturi Simanjuntak.

replaced many simple tasks once performed by humans with machines. AI can now process information that was difficult for conventional computers. Furthermore, generative AIreplace human "thinking" itself. How accelerator research will utilise AI and how it will be developed by AI are extremely important issues.

Beginning on the second day, November 2nd all students concentrated on the hands-on training sessions. Four training courses were set up in parallel, and students chose to work on either ASTRA [11] , ELEGANT [12], OPERA [13], or CST [14]. On the last day, November 9th, we held the final presentation session where each group presented their

Figure 3: Awards for the Group Presentation (Hands-on Session) were given to Ms. Sahar Abdelhay Ali Farrag, Mr. Kang, Jing-Hao, Mr. Tatsuki Kobayashi, Mr. Xinghao Guo

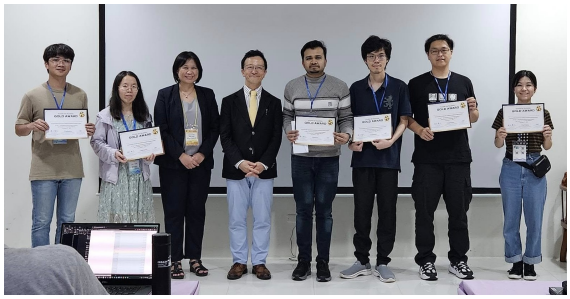

Figure 4: Awards for the Group Presentation (Hands-on Session) were given to Ms. Min Yang, Ms. Ruau Watanabe, Mr. Noman Habib, Mr. Natthapong Saengwises, Mr. Jirapat Jaroennaparat, Mr. Chang Yi-Chieh

Figure 5: Awards for the Group Presentation (Hands-on Session) were given to Mr. Komaruddin, Mr. Himanshu Mishra, Mr. Rao Zhiqiang, Mr. Noppawath Thamsanong

simulation results done in the sessions. The five top teams chosen by the lecturers were awarded as shown in Figs. 2, 3, 4, 5, and 6. Congratulations to all the award winners. Your efforts have paid off.

At the end of the ISBA24 closing ceremony, certificates were handed to all students by the lecturers. The certificate is just a piece of paper, but it will be more worthful than $10,000,000 to those who have completed 9 long days of the intensive lectures and the rigorous hands-on training. This is evident in their proud smiles as shown in Fig. 7. This picture is also evidence of the great success of the first accelerator school, ISBA, in Thailand.

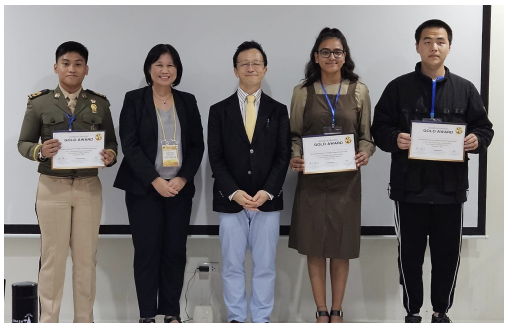

Figure 6: Awards for the Group Presentation (Hands-on Session) were given to Mr. Mario Delon Simanjuntak, Ms. Amanjot, Mr. Letian Liu, and Mr. Rattacha Boonchoo

ISBN: 978-3-95450-248-6 ISSN: 2673-5490 doi: 10.18429/JACoW-IPAC2025-TUPM079

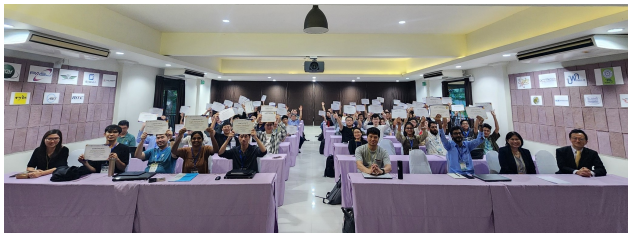

Figure 7: The final group figure taken at the ISBA24 closing session. Students hold up their certificates with wonderful smiles on their faces.

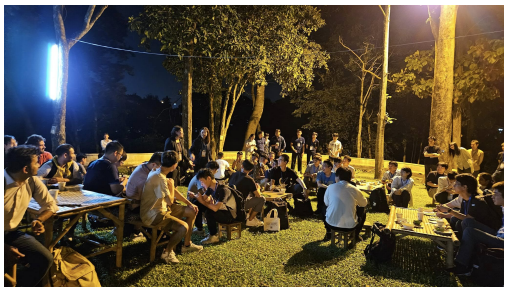

Figure 8: A spapshot of the reception dinner in Lanna-style.

SOCIAL EVENTS

A welcome dinner in traditional Lanna-style "Kad Mua" was organized to allow lecturers and students to experience the culture in Chiang Mai and to provide an opportunity for meeting. A wide variety of food and drinks were served at the stalls and participants enjoyed a meal with a cultural flavour. In Fig. 8, Sakhorn Rimjamem and Duangmanee Wongratanaphisan, two key person running ISBA24 introduced themselves.

The excursion, which featured many attractions, took place at Wat Phra That Doi Suthep, Bo Sang Umbrella Making Centre, Tha Phae Gate, and Wat Chedi Luang. Wat Phra That Doi Suthep, about 10 km from Chiang Mai University, is a major religious and historical site in northern Thailand, founded in 1383 during the Lanna Kingdom. It features classic Lanna architecture and houses a revered Buddha relic, making it a key Theravada Buddhist pilgrimage site. The temple also plays a vital role in preserving Northern Thai culture and supporting academic studies. Located at 1,073 meters, it symbolizes spiritual elevation. A popular hiking route, the Monks' Trail, connects the temple to the back of the CMU campus. Students receiving a blessing from a priest at Wat Phra That Doi Suthe as shown in Fig. 9

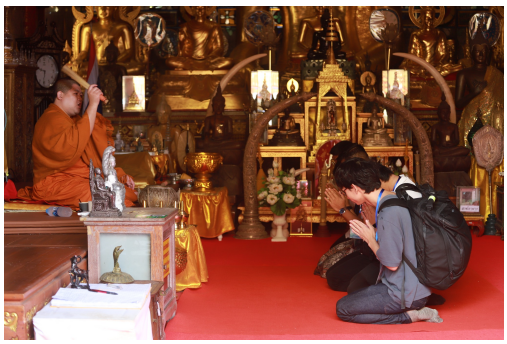

Figure 9: Students receiving a blessing from a priest at Wat Phra That Doi Suthep.

Figure 10: Traditional dances were performed in the restaurant's courtyard, with customers joining in at the end to enjoy the enchanting Thai dances, and ISBA participants were no exception.

In the evening, a farewell banquet was held at Khum Khantoke Restaurant, where ISBA participants enjoyed a traditional Lanna dinner and cultural performance. The event offered a rich cultural experience, with traditional dances that attendees, including ISBA students and lecturers, joined in on—captured in Fig. 10.

CONCLUSION

ISBA24, the first ISBA school held in Thailand, successfully brought together 64 international students for nine days of intensive study on accelerator beam dynamics and technologies, concluding with student group presentations from hands-on training. The next ISBA school will be held in Shanghai, China—now a leading accelerator research hub alongside Japan, with major projects like SHINE, CSNS, and CEPC. The host institute, SARI, features advanced facilities such as SSRF and the cutting-edge SHINE accelerator. The hope is that ISBA will continue to grow at this world-leading research site.

ACKNOWLEDGEMENTS

ISBA24 is supported by BARA SCIENTIFIC, WINGSERV TECHNOLOGY Co. Ltd., R&K Co. Ltd., Sumitomo Heavy Industries, Ltd., Metal Technology Co. Ltd., MIRAPRO Co. Ltd., Hub of Talents Particle Accelerator, Thai Synchrotron National Lab., Thailand Center of Excellence in Physics, Thai Physics Society, The Council of Scientific and Technological Associations of Thailand, Chiang Mai University, Thailand, Science Research and Innovation, Program Management Unit for Human Resources & Institutional Development,Research and Innovation, PBP-CMU Electron Linac Laboratory, National Reserach Council in Thailand, Dr. Schwin Dhammanugune Foundation, IINAS-NX, Particle Accelerator Society of Japan, and Hiroshima University. In addition, authors also would like to express their sincere thank to the CMU staff for their support in running the ISBA.

ISBN: 978-3-95450-248-6 ISSN: 2673-5490 doi: 10.18429/JACoW-IPAC2025-TUPM079

REFERENCES

[1] ISBA24 Indico web page, https://conference-indico.kek.jp/event/275/.

[2] Chiang Mai University, https://www.cmu.ac.th/.

[3] Hiroshima University, https://www.hiroshima-u.ac.jp/en

[4] IINAS-NX, https://www2.kek.jp/kokusai/iinas-nx/ja/.

[5] ISBA18 Indico web page, https://conference-indico.kek.jp/indico/event/56/.

[6] ISBA19 Indico web page, https://conference-indico.kek.jp/indico/event/84/.

[7] ISBA20 Indico web page, https://conference-indico.kek.jp/indico/event/115/.

[8] ISBA21 Indico web page, https://conference-indico.kek.jp/indico/event/158/.

[9] ISBA22 Indico web page, https://conference-indico.kek.jp/indico/event/186/.

[10] ISBA23 Indico web page, https://conference-indico.kek.jp/indico/event/213/.

[11] A Space Charge Tracking Algorithm (ASTRA), https://www.desy.de/~mpyflo/.

[12] Overview of elegant and SDDS, https://ops.aps.anl.gov/elegant.html

[13] Electromagnetic field solver (OPERA), https://www.3ds.com/.

[14] CST Studio Suite, https://www.3ds.com/.