

ARIS2014 - 2nd Conference on Advances in Radioactive Isotope Science

T. Motobayashi*¹

The second conference on Advances in Radioactive Isotope Science (ARIS 2014) was held at the Ito International Research Center in Tokyo on June 1-6, 2014. It was jointly organized by the RIKEN Nishina Center and CNS, the University of Tokyo, sponsored by IUPAP (International Union of Pure and Applied Physics), and supported by several Japanese institutions and societies. The first ARIS conference was held in 2011 in Leuven, Belgium, by merging the two meetings, ENAM (International Conference on Exotic Nuclei and Atomic Masses) and RNB (International Conference on Radioactive Nuclear Beam). In a joint assembly of the advisory committees of the two meetings, the ultimate goal of ARIS was set to create the “flagship conference” series on the science of radioactive isotopes, including the physics of exotic nuclei and studies with RI beams. Since the Nishina Center and the CNS have extensively studied on radioactive isotopes with excellent RI-beam facilities and their significant contributions in the near future are foreseen, the second conference in Japan was very well-timed.

The scientific scope of ARIS 2014 was of the following subjects, taking over the ones of the first conference with some modifications: 1)nuclear structure, 2)nuclear astrophysics, 3)fundamental symmetries and interactions, 4)nuclear reactions and responses, 5)nuclear properties including atomic masses and fundamental constants, nuclear moments and radii, rare decay modes, and nuclei at the driplines, 6)nuclear EOS and its implications, 7)heaviest elements and fission, 8)radioactive isotope production and developments of experimental devices, 9)computational developments, 10)applications, and 11)other related issues.

On Sunday June 1, public lectures attracted a large

audience of about 300 people including high school students. The conference started on Monday with the welcome address by the Conference Chair, Hideto En'yo. In the first scientific session chaired by the Conference Co-chair, Takaharu Otsuka, Robert Janssens gave the keynote talk addressing “big” questions in the field and providing an overview of the new and important developments after the first conference.

The number of registrants turned out to be 407 from 27 countries. Thus the highly optimistic goal set by the organizers was reached, reflecting the considerable interest and amount of work done in this the research field. The conference photo shown below (Fig. 1) delivers the lively atmosphere of the conference.

There were 48 plenary talks and 82 oral presentations in three parallel sessions held on June 3 and 6 afternoons. Recent highlights from RIBF, the new neutron magic number 34 experimentally confirmed for the neutron-rich nucleus ^{54}Ca and first life-time measurements for a number of nuclei in the r-process path, for example, attracted much attention as well as new results from world facilities. Among 239 papers presented in poster sessions, seven posters presented by young scientists were selected as “Best Posters”, and the awarding ceremony took place in the closing session. Angela Bracco summarized the conference by selecting major aspects from numerous presentations and emphasizing the bright future of the field.

The conference proceedings will be published electronically in the JPS Conference Proceedings Volume 6 (2015). The next ARIS conference will be jointly hosted by NSCL and TRIUMF.



Fig. 1. Conference photo taken in the session hall.

*¹ Scientific Secretary of ARIS2014, RIKEN Nishina Center

The 8th Nishina School

T. Kishida*¹ and H. Ueno*¹

The RIKEN Nishina Center (RNC) has commenced Nishina School to enhance international research relationship in the Asian Region through human-resource development in the field of nuclear physics. In this program, undergraduate students are being accepted by the RNC from Peking University since 2008 and from Seoul National University since 2012 for two weeks every summer. Both the programs have been merged since 2013.

The 8th Nishina School was held from July 28 to August 8, 2014. The curriculum of the School was designed to introduce the pleasure of nuclear physics into the undergraduate students from Peking University (5 students) and Seoul National University (5 students). The first week, program consisted of lectures and basic experimental trainings. In the second week they performed a real-beam experiment using the RIKEN Pelletron accelerator, starting from its planning and followed by the analyses and the discussions. On the last day of the School, the presentation session by the students was held. The program timetable in 2014 is shown in Fig. 1.

In response to a request for improving the management of the Nishina School proposed by the people in charge of the Nishina School held in the last year, the RNC director convened a preparatory meeting on December 25, 2013, to discuss the development of an organizational management system of the Nishina School and the improvement of transparency in the decision-making process. For this purpose, it was determined at the meeting to newly set up the Nishina School Steering Committee. The Committee is composed of Ueno (Chair), En'yo, Sakurai, and Sakai. The Committee Meetings were held four times on March 3, April 23, May 26, and July 15, 2014. Kishida, principle of the Nishina School, also attended all these Meetings as an observer. Their meeting minutes were reported at the second, fourth, and fifth RNC Coordination Committee Meetings held in 2014.

In order to enhance the experimental training, the Committee determined to incorporate accelerator experimental training into the curriculum. In this year, cross-section measurements were conducted for the $^{12}\text{C}(p,\gamma)^{13}\text{N}$ reaction utilizing a proton beam at $E_p = 1600\text{--}1850$ keV delivered from the RIKEN Pelletron accelerator. Technical instructions of the experimental training were provided by Research Scientists in Nuclear Spectroscopy Lab., Spin Isospin Lab., and RI Physics Lab. They were technically assisted by IPA and JRA researchers of these laboratories.

The Committee also considered that enhancement

of working-level dialogue among the persons in charge of, e.g., the entire program, experimental trainings, and office procedures is an important subject. This year, three working-level meetings, including an on-site meeting at the Pelletron, were held on July 4, 10, and 18. Despite such a gradual improvement, the situation can be further improved.

All the students had a good experience and enjoyed the School and life at the RNC. Figure 2 shows a photograph taken at the opening ceremony on July 28.

First Week	Jul. 27 (Sun)	Jul. 28 (Mon)	Jul. 29 (Tue)	Jul. 30 (Wed)	Jul. 31 (Thu)	Aug. 1 (Fri)	Aug. 2 (Sat)
Morning (10:30-11:45)		Opening	Lecture 2: Intro. of Nucl. Phys. (Ogawa)	Lecture 4: Scintillation detectors (Doornenbal)	Training B: Nal detector - Analysis (Isobe)	Lecture 5: Accelerator (Kase)	
Afternoon 1 (13:30-14:45)		RIBF tour	Lecture 3: Nucl. Phys. Metrology (Sato)	Training B: Nal detector - Measurement (Isobe)	Student interim presentation (1)	Lecture 6: Nucl. astrophys. (Motobayashi)	
Afternoon 2 (15:30-16:45)		Lecture 1: Communication (Kishida)	Training A: Oscilloscope Coaxial Cable (Kishida)			Lecture 7: Safety training (Tanaka)	

Second Week	Aug. 3 (Sun)	Aug. 4 (Mon)	Aug. 5 (Tue)	Aug. 6 (Wed)	Aug. 7 (Thu)	Aug. 8 (Fri)	Aug. 9 (Sat)
Morning (10:30-11:45)		Labwork Instruction 1: Exp. description (Zenihiro)	Labwork: Pelletron beam time (Nakao)	Labwork Instruction 2: Analysis details (Doornenbal)	Labwork: Data analysis (Isobe)	Report preparation	
Afternoon 1 (13:30-14:45)		Visit of Pelletron	Technical assistance: • Imamura • Ohtomo • Zengyang • Suzuki • Jin • Powell	Labwork: Data analysis (Zenihiro)	Labwork: Result & discussions (Isobe)	Student final presentation	
Afternoon 2 (15:30-16:45)		Labwork: Exp. planning (Zenihiro)			Interim presentation (3)	Closing	
Afternoon 3		Interim presentation (2)					

Fig. 1. The curriculum and timetable of Nishina School 2014. The lectures and experimental trainings are indicated in blue and red, respectively.



Fig. 2. Photograph of Nishina School 2014.

*¹ RIKEN Nishina Center

The 27th World Conference of the International Nuclear Target Development Society (INTDS2014)

H. Okuno,^{*1} H. Hasebe,^{*1} H. Kuboki,^{*1} H. Imao,^{*1} A. Yoshida,^{*1}
K. Morimoto,^{*1} D. Kaji,^{*1} K. Yoshida,^{*1} and K. Sakuma^{*1}

The 27th World Conference of the International Nuclear Target Development Society (INTDS 2014) was held from August 31st to September 5th, 2014 at the National Museum of Emerging Science and Innovation (Miraiikan) in Odaiba Tokyo, Japan with special emphasis on targets for accelerator-based research. INTDS 2012 was organized by the RIKEN Nishina Center for Accelerator-based Science, Saitama.

The series of INTDS conferences dates back to 1963 when the "First Symposium on Research Materials for Nuclear Measurements" was held sponsored by the Central Bureau for Nuclear Measurements (CBNM; recently, IRMM, -Institute for Reference Materials and Measurements) in Belgium. Since then, researchers involved in target preparation shared their experience and discussed related problems during biennial conferences hosted alternatively in Europe, North America, and Asia (www.intds.org). The 23rd INTDS conference was held in Tsukuba, Japan in 2006. It was delightful to meet again in Japan on the occasion of the 27th International INTDS conference.

More than 77 participating scientists from 17 countries (Belgium, Canada, China, France, Germany, India, Italy, Japan, Korea, Pakistan, Poland, Romania, Russia, South Africa, Switzerland, UK, USA), met in Tokyo to present over 67 scientific contributions covering the wide field of "State-of-the-art Technologies for Nuclear Target and Charge Stripper". A laboratory tour of the RIKEN RI Beam Factory was included in the scientific program to introduce the institution and laboratories. The conference comprised eleven different sessions titled, "Targets and strippers for RIBF", "Classical accelerator targets", "RI beams", "Gas strippers", "Liquid strippers", "Production targets", "Medical and industrial applications", "Radioactive targets", "Target characterization", "Liquid and gas targets", "Radioactive targets", and "Laser-related targets". The sessions included many activities such as the discussion of exciting new developments or methods, reports on improvements of established techniques, presentation of scientific results by young scientists, and the introduction of new groups and laboratories in the society.

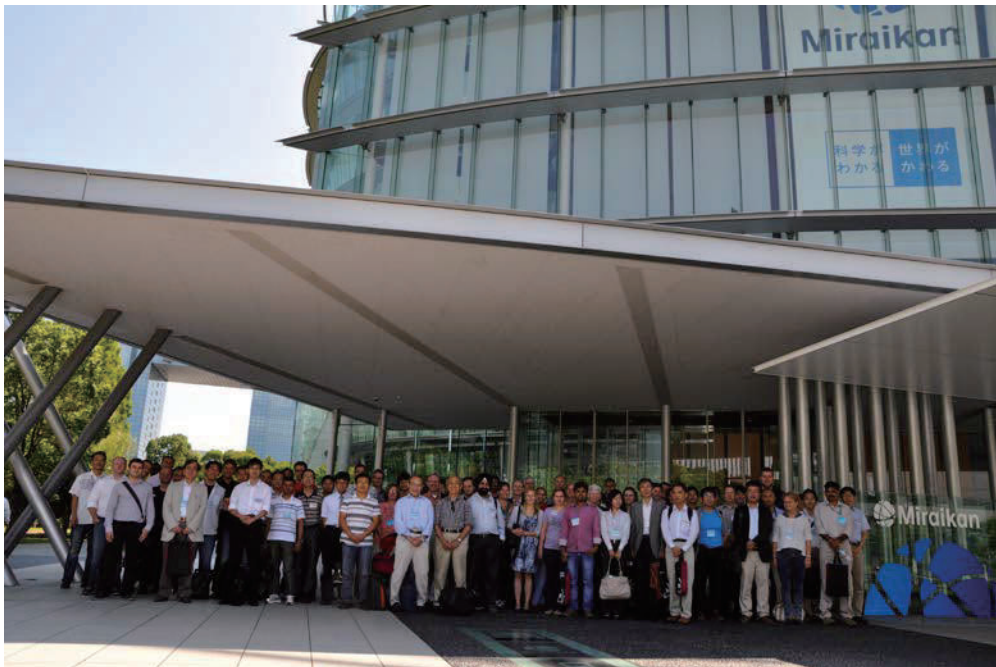


Fig. 1: Photo of conference attendees

^{*1} RIKEN Nishina Center for Accelerator-Based Science

The 6th International Conference on Trapped Charged Particles and Fundamental Physics

M. Wada,^{*1} P. Schury,^{*1} Y. Ichikawa,^{*1} and Y. Ito^{*1}

The 6th International Conference on Trapped Charged Particles and Fundamental Physics (TCP2014) was held from 1st to 5th December, 2014 at the Takamatsu International Conference Hall. Prior to the conference, a preschool (TCP school) for young researchers was organized from 28th to 29th November at the Nishina Hall of RIKEN where inspiring lectures were given by S. Ulmer, R. Thompson, R. Hayano, H. Katori, V. Dzuba, Yu. Litvinov, W. Nörtershäuser. About 60 participants enrolled in the school and half of them went to Takamatsu.

During the conference, a variety of scientific programs using stored particles were actively discussed. Anti-Hydrogens are routinely synthesized and precision spectroscopy of them is being actively pursued. Multi-reflection time-of-flight (MRTOF) mass spectrographs were put online at three different laboratories at almost the same time at ISOLDE, RIKEN and GSI, and are also under preparation at TRIUMF, MSU, ANL, and IBS in Korea. Advanced resonance detection methods in Penning trap mass spectrometers were discussed. Several fundamental symmetry studies using molecular ions, neutral atoms and highly charged ions (HCI) were discussed. The highlight of the conference was a sympathetically cooled HCI crystal in a linear Paul trap by Heidelberg-Aarhus collaboration. It can be a next-generation frequency standard, but also provides a platform for research in physics beyond the standard model such as time variation of the fine structure constant. An Australian theorist suggests that Cf^{16+} is the best candidate for such research at present.

A total of 107 registered participants attended and 63% of them were from abroad. We invited 47 speakers. Of them, 45 accepted the invitation, 2 of whom later cancelled. We accepted 23 oral presentations and 26 posters; additionally, 3 oral contributions included posters.

An international workshop, NNP2014, was held at the same time and location, hence joint sessions and social events were held.

In the international organization committee meeting, it was decided that TCP2018 will be held in USA and organized by G. Bollen of MSU.



Fig. 2 An attraction during the banquet.



Fig. 1 Participants of TCP2014 in Takamatsu

^{*1} RIKEN Nishina Center