

Partner Institution
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1. Abstract

The Center for Nuclear Study (CNS) aims to elucidate the nature of nuclear system by producing the characteristic states where the Isospin, Spin and Quark degrees of freedom play central roles. These researches in CNS lead to the understanding of the matter based on common natures of many-body systems in various phases. We also aim at elucidating the explosion phenomena and the evolution of the universe by the direct measurements simulating nuclear reactions in the universe. In order to advance the nuclear science with heavy-ion reactions, we develop AVF upgrade, CRIB and SHARAQ facilities in the large-scale accelerators laboratories RIBF. The OEDO facility has been developed as an upgrade of the SHARAQ, where a RF deflector system has been introduced to obtain a good quality of low-energy beam. A new project for fundamental symmetry using heavy RIs has been starting to install new experimental devices in the RIBF. We promote collaboration programs at RIBF as well as RHIC-PHENIX and ALICE-LHC with scientists in the world, and host international meetings and conferences. We also provide educational opportunities to young scientists in the heavy-ion science through the graduate course as a member of the department of physics in the University of Tokyo and through hosting the international summer school.

2. Major Research Subjects

- (1) Accelerator Physics
- (2) Nuclear Astrophysics
- (3) DONUTS/NUSPEQ
- (4) Quark Physics
- (5) Nuclear Theory
- (6) OEDO/SHARAQ
- (7) Exotic Nuclear Reaction
- (8) Fundamental Physics

3. Summary of Research Activity

(1) Accelerator Physics

One of the major tasks of the accelerator group is the development of ion sources and the optimization of the beam transport system for the experimental devices installed in the E7 experiment room. In 2024, HyperECR ion source operated for 1,735 hours. A stability control system for the ion source is currently under development using machine learning technology. Several neural network models have been developed and tested with operational data. The results suggested that a trend of beam current can be predicted when adequate training data are provided. For the development of the pepper-pot emittance monitor (PEM), searches for measurement errors were performed at Micro Analysis Laboratory, Tandem accelerator, The University of Tokyo and the measurement errors estimated from the construction of PEM proved effective. Added to this, to distance the PEM's camera taking beam views from beamline as a means of decreasing radiation damage, the optical system was improved and the object distance came up to 4 m.

(2) Nuclear Astrophysics

The main activity of the nuclear astrophysics group is to study astrophysical reactions and special nuclear structures, using the low-energy RI beam separator CRIB. An experiment to directly study astrophysical $^{13}\text{N}(\alpha, p)$ reaction was performed at CRIB in June 2024, in an international collaboration with TUNL and other groups in the world. The measurement was successfully completed with a high intensity ^{13}N beam, nearly 1×10^6 pps at maximum, with a purity of better than 90%. A beam production test for carbon isotope beam was performed in May 2024, using a solid beryllium target, collaborating with the groups of Brussels and Kyushu University.

(3) DONUTS

The Low Energy Nuclear Reaction group studies exotic structures and nuclear dynamics using low-energy heavy ion beams. The parts of ImPACT17-02-1 and -2, the transmutation of the long-lived fission products with protons and deuterons, and the surrogate reaction of the neutron capture reaction, have been published. The data analysis of the other experiments are in progress. In addition, as a pilot experiment of the fusion reaction measurement at OEDO in the future, a new project was started to evaluate the fusion reaction cross sections of the near symmetric system at HIMAC. In collaboration with the SPADI-Alliance, RNC, RCNP, and other domestic institutes, the ASAGI board is being developed for the readout of the SR-PPAC detector. The CNS GRAPE (Gamma-Ray detector Array with Position and Energy sensitivity) remains a key instrument for high-resolution in-beam gamma-ray spectroscopy. Digital signal processing equipment for GRAPE is also under development. Furthermore, a new type of scintillator with a wide dynamic range (La-GPS), and a novel SiC semiconductor detector, are under development. Beyond our domestic activities, we are participating in experiments at FRIB.

(4) Quark Physics

Main goal of the quark physics group is to understand the properties of many-body QCD system such as quark-gluon plasma at extremely high-temperatures and color-glass condensate at extremely high-energies. The group has been involved in the ALICE

experiment at Large Hadron Collider (LHC) at CERN, and the ePIC experiment at the Electron-Ion Collider (EIC) at BNL, where the EIC is the future collider project at BNL and will start its operation from 2034. As for ALICE, the group has involved in the data analyses, which include the measurement of low-mass lepton pairs in p-p and Pb-Pb collisions, the measurement of long range two particle correlations in p-Pb collisions, searches for thermal photons in high multiplicity pp collisions. The group has involved in the ALICE-TPC upgrade using a Gas Electron Multiplier (GEM), where the group is very active in the development and benchmarking of the online space-charge distortion corrections using machine learning techniques running on the Graphical Processing Unit (GPU). The group has started R&D for the MAPS silicon pixel detector for the ALICE ITS3 and ALICE3 upgrade. The group has been conducting development of streaming data acquisition system for the ePIC experiment at the EIC.

(5) Nuclear Theory

The nuclear theory group is conducting large-scale shell-model calculations, having a strong relationship to the project “Program for Promoting Researches on the Supercomputer Fugaku.” We have investigated nuclei in Ni and Er regions based on our Monte Carlo shell model and quasiparticle vacua shell model calculations. Based on the nuclear theoretical calculations described above and on measurements of astrophysically relevant nuclear reactions at CRIB conducted by the CNS group, we investigated the nucleosynthesis of heavy elements in explosive astrophysical environments, such as those involving the *r*-process and *rp*-process.

(6) OEDO/SHARAQ

The OEDO/SHARAQ group conducts experimental studies with radioactive isotope (RI) beams using the high-resolution SHARAQ spectrometer and the OEDO beamline for decelerated RI beams. The unique strength of the OEDO-SHARAQ system lies in its versatility for both low-energy RI production and high-resolution spectroscopy. In 2024, the SHARAQ21-R1 experiment was conducted. The transmission of ^{50}Ca was found to be less efficient compared to ^{130}Sn . In addition, we continue to analyze previously obtained data and maintain the beamline. The experimental study of 0^- strength in nuclei using the parity-transfer charge exchange (^{16}O , ^{16}F) is in the final stage. We are also discussing the future plan of OEDO/SHARAQ.

(7) Exotic Nuclear Reaction

The Exotic Nuclear Reaction group studies various exotic reactions induced by heavy-ion beams. We completed the data analysis of the double charge exchange $^{48}\text{Ca}(^{12}\text{C}, ^{12}\text{Be})$ reaction taken in 2021 and found a candidate of the double Gamow-Teller resonance. The centroid energy and the width by simply taking an averaged excitation energy below $E_x = 34$ MeV were $E_c = 23 \pm 3$ MeV and $\Gamma = 6 \pm 1$ MeV, respectively.

(8) Fundamental Physics

To investigate the mechanism on antimatter disappearance and the properties of dark matter, the development of the experimental apparatus is being conducted for the search of the EDM (Electric Dipole Moment) of heavy elements, particularly francium (Fr), which is highly sensitive to quantum correction effects arising from CP violation. Significant progress has been made in constructing a beamline to produce the ^{210}Fr with an AVF cyclotron through nuclear fusion reactions and developing a high-intensity source of ^{225}Ac , an alpha-emitter that serves as a generator for ^{221}Fr with radiochemical methods. This year, to suppress major systematic errors such as magnetic field fluctuations and vector light shifts, an optical lattice co-magnetometer was successfully developed. This device traps two types of stable atoms, Rb and Cs, in an optical lattice and precisely measures their spin precession frequencies. The principle of this novel method was demonstrated for the first time internationally.

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List of Publications & Presentations**Publications****[Original Papers]**

- N. R. Ma, M. Sferrazza, H. Yamaguchi, S. Okamoto, P. Descouvemont, S. Hayakawa, S. Cherubini, T. Doi, Y. Fujikawa, K. Inaba, T. Kawabata, A. Kohda, G. Manico, M. La Cognata, S. Palmerini, R. G. Pizzone, A. Sakaue, K. Sakanashi, and H. Shimizu, “ $^{10}\text{C} + \alpha$ elastic scattering: A study of the proton-rich ^{14}O nucleus and alpha clustering,” *Phys. Rev. C* **109**, 054302 (2024).
- M. Mazzocco, N. Keeley, A. Lagni, A. Boiano, C. Boiano, M. La Commara, C. Manea, C. Parascandolo, D. Pierroutsakou, C. Signorini, E. Strano, D. Torresi, H. Yamaguchi, D. Kahl, P. Di Meo, J. Grebosz, A. Guglielmetti, Y. Hirayama, N. Imai, H. Ishiyama, N. Iwasa, S. C. Jeong, H. M. Jia, Y. H. Kim, S. Kimura, S. Kubono, G. La Rana, C. J. Lin, H. Miyatake, M. Mukai, T. Nakao, M. Nicoletto, S. Pigliapoco, K. Rusek, Y. Sakaguchi, A. M. Sánchez-Benítez, F. Soramel, T. Teranishi, N. Toniolo, Y. Wakabayashi, Y. X. Watanabe, L. Yang, Y. Y. Yang, and H. Q. Zhang, “Inclusive ^7Be production cross section in the $^8\text{B} + ^{208}\text{Pb}$ system at the coulomb barrier,” *Phys. Rev. C* **110**, 044611 (2024).
- N. Lu, Y. H. Lam, A. Heger, Z. X. Liu, and H. Yamaguchi, “New $^{63}\text{Ga}(p, \gamma)^{64}\text{Ge}$ and $^{64}\text{Ge}(p, \gamma)^{65}\text{As}$ reaction rates corresponding to the temperature regime of thermonuclear X-ray bursts,” *Phys. Rev. C* **110**, 065804 (2024).
- X. Yao, T. Kajino, Y. Luo, T. Hayakawa, T. Suzuki, H. Ko, M. -K. Cheoun, S. Hayakawa, H. Yamaguchi, and S. Cherubini, “Exploring the neutrino mass hierarchy from isotopic ratios of supernova nucleosynthesis products in presolar grains,” *The Astrophysical Journal* **980(2)**, 247 (2025).
- A. Tumino, C. Bertulani, S. Cherubini, G. D’Agata, A. D. Pietro, P. Figuera, G. Guardo, M. Gulino, S. Hayakawa, M. La Cognata, M. L. Commara, L. Lamia, D. Lattuada, M. Mazzocco, A. Moro, J. Mraček, A. Oliva, S. Palmerini, R. Pizzone, G. Rapisarda, S. Romano, M. Sergi, R. Spartà, S. Typel, and H. Yamaguchi, “Indirect methods with transfer reactions: The trojan horse method and the asymptotic normalization coefficient,” *Prog. Part. Nucl. Phys.* **143**, 104164 (2025).
- L. W. Yang, Y. D. Fang, J. H. Xu, J. H. Li, Z. H. Jia, C. X. Jia, W. Q. Zhang, J. L. Wang, C. Y. Guo, Z. X. Zhou, L. Ni, G. S. Li, X. H. Zhou, B. Guo, S. Y. Wang, M. L. Liu, Y. H. Zhang, C. Y. He, F. L. Liu, S. Wang, D. P. Sun, and L. H. Zhu, “New level scheme and shell model description of the near-spherical nucleus Nb 94,” *Phys. Rev. C*, **110**, 054309 (2024).
- H. Cheng, B. -H. Sun, Li-H. Zhu, M. Kusakabe, Y. Luo, T. Kajino, C. -J. Wang, X. -Q. Yao, C. -Y. He, F. -L. Liu, and B. Guo, “Photonuclear Reaction Rates of $^{157,159}\text{Ho}$ and $^{163,165}\text{Tm}$ and Their Impact in the γ -process,” *The Astrophysical Journal*, **975(2)**, 161 (2024).
- I. Cox, Z. Y. Xu, R. Grzywacz, W. -J. Ong, B. C. Rasco, N. Kitamura, D. Hoskins, S. Neupane, T. J. Ruland, J. M. Allmond, T. T. King, R. S. Lubna, K. P. Rykaczewski, H. Schatz, B. M. Sherrill, O. B. Tarasov, A. D. Ayangeakaa, H. C. Berg, D. L. Bleuel, G. Cerizza, J. Christie, A. Chester, J. Davis, C. Dembski, A. A. Doetsch, J. G. Duarte, A. Estrade, A. Fijałkowska, T. J. Gray, E. C. Good, K. Haak, S. Hanai, J. T. Harke, C. Harris, K. Hermansen, D. E. M. Hoff, R. Jain, M. Karny, K. Kolos, A. Laminack, S. N. Liddick, B. Longfellow, S. Lyons, M. Madurga, M. J. Mogannam, A. Nowicki, T. H. Ogunbaku, G. Owens-Fryar, M. M. Rajabali, A. L. Richard, E. K. Ronning, G. E. Rose, K. Siegl, M. Singh, A. Spyrou, A. Sweet, A. Tsantiri, W. B. Walters, and R. Yokoyama, “Proton shell gaps in $N = 28$ nuclei from the first complete spectroscopy study with FRIB decay station initiator,” *Phys. Rev. Lett.* **132**, 152503 (2024).

- R. Lozeva, M. Si, H. Naïdja, A. Odahara, C. -B. Moon, S. Nishimura, P. Doornenbal, G. Lorusso, P. -A. Söderström, T. Sumikama, J. Wu, Z. Y. Xu, D. S. Ahn, H. Baba, F. Browne, R. Daido, Y. Fang, N. Fukuda, N. Inabe, T. Isobe, D. Kameda, I. Kojouharov, N. Kurz, T. Kubo, D. Murai, Z. Patel, S. Rice, H. Sakurai, H. Schaffner, L. Sinclair, H. Suzuki, H. Takeda, H. Watanabe, A. Yagi, R. Yokoyama, F. L. Bello Garrote, J. -M. Daugas, F. Didierjean, E. Ideguchi, T. Ishigaki, H. S. Jung, T. Komatsubara, Y. K. Kwon, P. Lee, C. S. Lee, S. Morimoto, M. Niikura, H. Nishibata, and I. Nishizuka, “First β -decay spectroscopy of the $^{139}_{52}\text{Te}_{87}$ nucleus and its P_n branching,” *Phys. Rev. C* **110**, 064303 (2024).
- S. Neupane, N. Kitamura, Z. Y. Xu, R. Grzywacz, S. J. Novario, J. Okołowicz, M. Płoszajczak, B. S. Hu, J. M. Allmond, A. Chester, J. M. Christie, I. Cox, J. Farr, I. Fletcher, J. Heideman, D. Hoskins, T. T. King, A. Laminack, S. N. Liddick, M. Madurga, A. L. Richard, P. Shuai, K. Siegl, P. Wagenknecht, and R. Yokoyama, “First β -delayed neutron spectroscopy of ^{24}O ,” *Phys. Rev. C* **110**, 034323 (2024).
- X. H. Sun, H. Wang, K. Yoneda, N. Aoi, H. Baba, P. Bednarczyk, Zs. Dombrádi, P. Doornenbal, Zs. Fülöp, S. Go, T. Hashimoto, E. Ideguchi, K. Kobayashi, Y. Kondo, J. Lee, H. N. Liu, W. P. Liu, J. L. Lou, M. Matsushita, R. Minakata, T. Motobayashi, D. Nishimura, H. Otsu, H. Sakurai, Y. Shiga, Y. P. Shen, D. Sohler, D. Steppenbeck, Y. L. Sun, S. Takeuchi, A. Tamii, R. Tanaka, Z. Y. Tian, Zs. Vajta, T. Yamamoto, X. F. Yang, Z. H. Yang, Y. L. Ye, R. Yokoyama, and J. Zenihiro, “Production of neutron-rich nuclei in the vicinity of ^{78}Ni : Fragmentation reactions of unstable ^{81}Ga and ^{82}Ge beams,” *Phys. Lett. B* **858**, 139081 (2024).
- T. T. Yeung, A. I. Morales, J. Wu, M. Liu, C. Yuan, S. Nishimura, V. H. Phong, N. Fukuda, J. L. Tain, T. Davinson, K. P. Rykaczewski, R. Yokoyama, T. Isobe, M. Niikura, Zs. Podolyák, G. Alcalá, A. Algora, J. M. Allmond, J. Agramunt, C. Appleton, H. Baba, R. Caballero-Folch, F. Calvino, M. P. Carpenter, I. Dillmann, A. Estrade, T. Gao, C. J. Griffin, R. K. Grzywacz, O. Hall, Y. Hirayama, B. M. Hue, E. Ideguchi, G. G. Kiss, K. Kokubun, F. G. Kondev, R. Mizuno, M. Mukai, N. Nepal, M. N. Nurhafiza, S. Ohta, S. E. A. Orrigo, M. Pallàs, J. Park, B. C. Rasco, D. Rodríguez-García, H. Sakurai, L. Sexton, Y. Shimizu, H. Suzuki, A. Vitéz-Sveicz, H. Takeda, A. Tarifeño-Saldivia, A. Tolosa-Delgado, J. A. Victoria, Y. X. Watanabe, and J. M. Yap, “First exploration of monopole-driven shell evolution above the $N = 126$ shell closure: New millisecond isomers in ^{213}Tl and ^{215}Tl ,” *Phys. Rev. Lett.* **133**, 072501 (2024).
- J. T. Li, N. Imai, R. Yokoyama, S. Michimasa, T. Chillery, R. Kojima, S. Hanai, N. Kitamura, T. Saito, D. Suzuki, D. Nishimura, M. Amitani, C. Fukushima, Y. Nakamura, R. Kageyama, J. Sonoda, E. Takada, S. Sakaguchi, and Z. G. Xiao, “A mosaic-type array composed of Si photodiodes for charged-particle detection,” *Nucl. Instrum. Methods Phys. Res. A* **1070**, 170019 (2025).
- M. Singh, R. Yokoyama, R. Grzywacz, A. Keeler, T. T. King, J. Agramunt, N. T. Brewer, S. Go, J. Liu, S. Nishimura, P. Parkhurst, V. H. Phong, M. M. Rajabali, B. C. Rasco, K. P. Rykaczewski, D. W. Stracener, A. Tolosa-Delgado, K. Vaigneur, and M. Wolińska-Cichocka, “YSO implantation detector for beta-delayed neutron spectroscopy,” *Nucl. Instrum. Methods Phys. Res. A* **1073**, 170239 (2025).
- A. Tolosa-Delgado, J. L. Tain, M. Reichert, A. Arcones, M. Eichler, B. C. Rasco, N. T. Brewer, K. P. Rykaczewski, R. Yokoyama, R. Grzywacz, I. Dillmann, J. Agramunt, D. S. Ahn, A. Algora, H. Baba, S. Bae, C. G. Bruno, R. Caballero Folch, F. Calvino, P. J. Coleman-Smith, G. Cortes, T. Davinson, C. Domingo-Pardo, A. Estrade, N. Fukuda, S. Go, C. J. Griffin, J. Ha, O. Hall, L. Harkness-Brennan, T. Isobe, D. Kahl, M. Karny, L. H. Khiem, G. G. Kiss, M. Kogimtzis, A. Korgul, S. Kubono, M. Labiche, I. Lazarus, J. Liang, J. Lee, J. Liu, G. Lorusso, K. Matsui, K. Miernik, F. Montes, B. Moon, A. I. Morales, N. Nepal, S. Nishimura, R. D. Page, M. Piersa-Siłkowska, V. H. Phong, Zs. Podolyák, V. F. E. Pucknell, P. H. Regan, B. Rubio, Y. Saito, H. Sakurai, Y. Shimizu, J. Simpson, P. -A. Söderström, D. W. Stracener, T. Sumikama, R. Surman, H. Suzuki, M. Takechi, H. Takeda, A. Tarifeño-Saldivia, S. L. Thomas, M. Wolińska-Cichocka, P. J. Woods, and X. X. Xu, “Impact of newly measured β -delayed neutron emitters around ^{78}Ni on light element nucleosynthesis in the neutrino wind following a neutron star merger,” *Phys. Rev. Lett.* **134**, 172701 (2025).
- Y. Shimizu, T. Kubo, T. Sumikama, N. Fukuda, H. Takeda, H. Suzuki, D. S. Ahn, N. Inabe, K. Kusaka, M. Ohtake, Y. Yanagisawa, K. Yoshida, Y. Ichikawa, T. Isobe, H. Otsu, H. Sato, T. Sonoda, D. Murai, N. Iwasa, N. Imai, Y. Hirayama, S. C. Jeong, S. Kimura, H. Miyatake, M. Mukai, D. G. Kim, E. Kim, A. Yagi, “Production of new neutron-rich isotopes near the $N = 60$ isotones ^{92}Ge and ^{93}As by in-flight fission of a 345 MeV/nucleon ^{238}U beam,” *Phys. Rev. C* **109**, 044313 (2024).
- K. Miki, K. Kameya, D. Sakai, R. Urayama, N. Imai, S. Ishikawa, S. Michimasa, S. Ota, M. Sasano, H. Takeda, T. Uesaka, H. Haba, M. Hara, Y. Hatano, T. Hayamizu, N. Kobayashi, A. Tamii, S. Adachi, T. Chillery, M. Dozono, Y. Fujikawa, H. Fujita, N. Fukuda, T. Furuno, J. Gao, S. Goto, S. Hanai, S. Hayakawa, Y. Hijikata, K. Himi, Y. Hirai, J. W. Hwang, M. Ichimura, D. Inomoto, M. Inoue, H. Kasahara, T. Kawabata, K. Kishimoto, S. Kitayama, K. Kusaka, J. Li, Y. Maeda, Y. Maruta, T. Matsui, T. Matsuzaki, S. Nakai, H. Nishibata, M. Otake, Y. Saito, H. Sakai, A. Sakaue, H. Sato, K. Sekiguchi, Y. Shimizu, S. Shimoura, L. Stuhl, T. Sumikama, H. Suzuki, R. Tsuji, S. Tsuji, H. Uetsu, Y. Utsuki, T. Wakasa, A. Watanabe, K. Yako, Y. Yanagisawa, N. Yokota, C. Yonemura, K. Yoshida, M. Yoshimoto, and RIBF SHARAQ11 Collaboration and RCNP E502 Collaboration “Precise spectroscopy of the $3n$ and $3p$ systems via the $^3\text{H}(^3\text{He})3n$ and $^3\text{He}(^3\text{He}, t)3p$ reactions at intermediate energies,” *Phys. Rev. Lett.* **133**, 012501 (2024).
- J. W. Hwang, T. Chillery, M. Dozono, N. Imai, S. Michimasa, T. Sumikama, N. Chiga, S. Ota, S. Nakayama, D. S. Ahn, O. Beliuskina, K. Chikaato, N. Fukuda, S. Hayakawa, E. Ideguchi, K. Iribe, C. Iwamoto, S. Kawase, K. Kawata, N. Kitamura, K. Kusaka, S. Masuoka, H. Miki, H. Miyatake, D. Nagae, R. Nakajima, K. Nakano, M. Ohtake, S. Omika, H. J. Ong, H. Otsu, H. Sakurai, P. Schrock, H. Shimizu, Y. Shimizu, X. H. Sun, D. Suzuki, H. Suzuki, M. Takaki, M. Takechi, H. Takeda, S. Takeuchi, T. Teranishi, R. Tsunoda, H. Wang, Y. Watanabe, Y. X. Watanabe, K. Wimmer, K. Yako, H. Yamada, K. Yamada, H. Yamaguchi, L. Yang, R. Yanagihara, Y. Yanagisawa, H. Yoshida, K. Yoshida, and S. Shimoura, “Production cross-sections of residual nuclides from $^{93}\text{Zr} + p$ at 27 MeV/nucleon,” *Prog. Theo. Exp. Phys.* **2024**, 093D03 (2024).
- S. Pigliapoco, M. L. Cortes, F. Recchia, S. M. Lenzi, M. A. Bentley, P. Doornenbal, A. Jungclaus, K. Wimmer, L. Zago, D. Rudolph, F. Browne, T. Koiwai, H. Sakurai, T. Arici, A. Fernandez, J. A. Tostevin, N. Imai, N. Kitamura, B. Longfellow, R. Lozeva, B. Mauss, D. R. Napoli, M. Niikura, J. Lopez, P. Ruotsalainen, R. Taniuchi, S. Uthayakumar, V. Vaquero, R. Wadsworth, and R. Yajzey, “Isospin symmetry investigation of the proton-unbound nucleus $T = 3/2$ ^{55}Cu ,” *Nucl. Phys. A* **1056**, 123023 (2025).
- S. Go, Y. Tsuzuki, H. Yoneda, Y. Ichikawa, T. Ikeda, N. Imai, K. Imamura, M. Niikura, D. Nishimura, R. Mizuno, S. Takeda, H. Ueno, S. Watanabe, T. Y. Saito, S. Shimoura, S. Sugawara, A. Takamine, and T. Takahashi, “Demonstration of nuclear gamma-ray polarimetry based on a multi-layer CdTe Compton camera,” *Sci. Rep.* **14**, 2573 (2024).

- B. Moon, W. Korten, K. Wimmer, P. Doornenbal, T. R. Rodríguez, N. Aoi, H. Baba, F. Browne, C. Campbell, S. Chen, H. Crawford, H. de Witte, C. Fransen, H. Hess, E. Ideguchi, S. Iwazaki, N. Kitamura, A. Kohda, T. Koiwai, B. MaussR. Mizuno, M. Niikura, T. Parry, P. Reiter, H. Sakurai, D. Suzuki, R. Taniuchi, S. Thiel, and Y. Yamamoto, “Triaxial deformation of neutron-rich Zr nuclei explored by high-resolution in-beam γ -ray spectroscopy,” *Phys. Lett. B* **858**, 139047 (2024).
- S. Acharya (ALICE) *et al.*, “Measurement of ω meson production in pp collisions at $\sqrt{s} = 13$ TeV,” *J. High Energy Phys.* **04**, 067 (2025).
- S. Acharya (ALICE) *et al.*, “Proton emission in ultraperipheral Pb-Pb collisions at sNN = 5.02 TeV,” *Phys. Rev. C* **111**, no.5, 054906 (2025).
- S. Acharya (ALICE) *et al.*, “Medium-induced modification of groomed and ungroomed jet mass and angularities in Pb-Pb collisions at sNN = 5.02 TeV,” *Phys. Lett. B* **864**, 139409 (2025).
- S. Acharya (ALICE) *et al.*, “Multimuons in cosmic-ray events as seen in ALICE at the LHC,” *JCAP* **04**, 009 (2025).
- S. Acharya (ALICE) *et al.*, “First observation of strange baryon enhancement with effective energy in pp collisions at the LHC,” *J. High Energy Phys.* **03**, 029 (2025).
- S. Acharya (ALICE) *et al.*, “Measurement of the inclusive isolated-photon production cross section in pp and Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV,” *Eur. Phys. J. C* **85**, no.5, 553 (2025).
- S. Acharya (ALICE) *et al.*, “Measurement of $f_1(1285)$ production in pp collisions at $s = 13$ TeV,” *Phys. Lett. B* **866**, 139562 (2025).
- S. Acharya (ALICE) *et al.*, “Multiplicity-dependent jet modification from di-hadron correlations in pp collisions at $\sqrt{s} = 13$ TeV,” *J. High Energy Phys.* **03**, 194 (2025).
- S. Acharya (ALICE) *et al.*, “Particle production as a function of charged-particle flatnecity in pp collisions at $s = 13$ TeV,” *Phys. Rev. D* **111**, no.1, 012010 (2025).
- S. Acharya (ALICE) *et al.*, “Rapidity dependence of antideuteron coalescence in pp collisions at $s = 13$ TeV with ALICE,” *Phys. Lett. B* **860**, 139191 (2025).
- S. Acharya (ALICE) *et al.*, “Measurement of beauty production via non-prompt charm hadrons in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV,” *J. High Energy Phys.* **11**, 148 (2024).
- N. J. Abdulameer (PHENIX) *et al.*, “Centrality dependence of Lévy-stable two-pion Bose-Einstein correlations in sNN = 200 GeV Au + Au collisions,” *Phys. Rev. C* **110**, no.6, 6 (2024).
- S. Acharya (ALICE) *et al.*, “Measurement of the inclusive isolated-photon production cross section in pp collisions at $\sqrt{s} = 13$ TeV,” *Eur. Phys. J. C* **85**, no.1, 98 (2025).
- N. J. Abdulameer (PHENIX) *et al.*, “Jet modification via π^0 -hadron correlations in Au + Au collisions at $\sqrt{s_{NN}} = 200$ GeV,” *Phys. Rev. C* **110**, no.4, 044901 (2024).
- S. Acharya (ALICE) *et al.*, “Measurement of Λ production in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV,” *Phys. Lett. B* **860**, 139066 (2025).
- S. Acharya (ALICE) *et al.*, “Measurement of the production and elliptic flow of (anti)nuclei in Xe-Xe collisions at $\sqrt{s_{NN}} = 5.44$ TeV,” *Phys. Rev. C* **110**, no.6, 064901 (2024).
- S. Acharya (ALICE) *et al.*, “Probing strangeness hadronization with event-by-event production of multistrange hadrons,” *Phys. Rev. Lett.* **134**, no.2, 022303 (2025).
- S. Acharya (ALICE) *et al.*, “Investigating Λ baryon production in p-Pb collisions in jets and the underlying event using angular correlations,” *Phys. Rev. C* **111**, no.1, 015201 (2025).
- S. Acharya (ALICE) *et al.*, “Measurement of the impact-parameter dependent azimuthal anisotropy in coherent ρ^0 photoproduction in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV,” *Phys. Lett. B* **858**, 139017 (2024).
- S. Acharya (ALICE) *et al.*, “Charm fragmentation fractions and $c\bar{c}$ cross section in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV,” *Eur. Phys. J. C* **84**, no.12, 1286 (2024).
- S. Acharya (ALICE) *et al.*, “Measurement of the production cross section of prompt Ξ_c^0 baryons in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV,” *Eur. Phys. J. C* **85**, no.1, 86 (2025).
- S. Acharya (ALICE) *et al.*, “Investigating strangeness enhancement with multiplicity in pp collisions using angular correlations,” *J. High Energy Phys.* **09**, 204 (2024).
- S. Acharya (ALICE) *et al.*, “Investigating strangeness enhancement in jet and medium via $\phi(1020)$ production in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV,” *Phys. Rev. C* **110**, no.6, 064912 (2024).
- S. Acharya (ALICE) *et al.*, “Measurement of Ω_c^0 baryon production and branching-fraction ratio $BR(\Omega_c^0 \rightarrow \Omega^- e^+ \nu_e)/BR(\Omega_c^0 \rightarrow \Omega^- \pi^+)$ in pp collisions at $\sqrt{s} = 13$ TeV,” *Phys. Rev. D* **110**, no.3, 032014 (2024).
- A. Sakaue, K. Yako, S. Ota, H. Baba, T. Chillery, P. Doornenbal, M. Dozono, N. Ebina, N. Fukuda, N. Fukunishi, T. Furuno, S. Hanai, T. Harada, S. Hayakawa, Y. Hijikata, K. Horikawa, S. W. Huang, N. Imai, K. Itahashi, N. Kobayashi, Y. Kondo, J. Li, Y. Maeda, T. Matsui, S. Y. Matsumoto, R. Matsumura, S. Michimasa, N. Nakatsuka, T. Nishi, K. Sakanashi, M. Sasano, R. Sekiya, N. Shimizu, Y. Shimizu, S. Shimoura, T. Sumikama, D. Suzuki, H. Suzuki, M. Takaki, S. Takeshige, H. Takeda, J. Tanaka, Y. K. Tanaka, Y. Togano, R. Tsuji, Z. H. Yang, K. Yoshida, M. Yoshimoto, J. Zenihiro, and T. Uesaka, “Candidate for the Double Gamow-Teller Giant Resonance in ^{48}Ca Studied by the $(^{12}\text{C}, ^{12}\text{Be}(0_2^+))$ Reaction at 250 MeV/Nucleon,” *Prog. Theo. Exp. Phys.*, **2024**, 123D03 (2024).
- V. Tripathi, S. Bhattacharya, E. Rubino, C. Benetti, J. F. Perello, S. L. Tabor, S. N. Liddick, P. C. Bender, M. P. Carpenter, J. J. Carroll, A. Chester, C. J. Chiara, K. Childers, B. R. Clark, B. P. Crider, J. T. Harke, R. Jain, B. Longfellow, S. Luitel, M. Mogannam, T. H. Ogunbeku, A. L. Richard, S. Saha, N. Shimizu, O. A. Shehu, Y. Utsuno, R. Unz, Y. Xiao, S. Yoshida, and Y. Zhu, “Low spin spectroscopy of neutron-rich $^{43,44,45}\text{Cl}$ via β^- and βn decay,” *Phys. Rev. C* **109**, 044320 (2024).
- P. J. Li, J. Lee, P. Doornenbal, S. Chen, S. Wang, A. Obertelli, Y. Chazono, J. D. Holt, B. S. Hu, K. Ogata, Y. Utsuno, K. Yoshida, N. L. Achouri, H. Baba, F. Browne, D. Calvet, F. Chateau, N. Chiga, A. Corsi, M. L. Cortes, A. Delbart, J. -M. Gheller, A. Giganon, A. Gillibert, C. Hilaire, T. Isobe, T. Kobayashi, Y. Kubota, V. Lapoux, H. N. Liu, T. Motobayashi, I. Murray, H. Otsu, V. Panin, N. Paul,

- W. Rodriguez, H. Sakurai, M. Sasano, D. Steppenbeck, L. Stuhl, Y. L. Sun, Y. Togano, T. Uesaka, K. Wimmer, K. Yoneda, O. Aktas, T. Aumann, K. Boretzky, C. Caesar, L. X. Chung, F. Flavigny, S. Franchoo, I. Gasparic, R. -B. Gerst, J. Gibelin, K. I. Hahn, J. Kahlbow, D. Kim, T. Koiwai, Y. Kondo, D. Korper, P. Koseoglou, C. Lehr, B. D. Linh, T. Lokotko, M. MacCormick, K. Miki, K. Moschner, T. Nakamura, S. Y. Park, D. Rossi, E. Sahin, F. Schindler, H. Simon, P. -A. Soderstrom, D. Sohler, S. Takeuchi, H. Toernqvist, J. Tscheuschner, V. Vaquero, V. Wagner, V. Werner, X. Xu, H. Yamada, D. Yan, Z. Yang, M. Yasuda, and L. Zanetti, “Spectroscopy of deeply bound orbitals in neutron-rich Ca isotopes,” *Phys. Lett. B* **855**, 138828 (2024).
- R. Zidarova, M. L. Cortés, V. Werner, P. Koseoglou, N. Pietralla, P. Doornenbal, A. Obertelli, T. Otsuka, Y. Tsunoda, Y. Utsuno, N. L. Achouri, H. Baba, F. Browne, D. Calvet, F. Chateau, S. Chen, N. Chiga, A. Corsi, A. Delbart, J. -M. Gheller, A. Giganon, A. Gillibert, C. Hilaire, T. Isobe, T. Kobayashi, Y. Kubota, V. Lapoux, H. N. Liu, T. Motobayashi, I. Murray, H. Otsu, V. Panin, N. Paul, W. Rodriguez, H. Sakurai, M. Sasano, D. Steppenbeck, L. Stuhl, Y. L. Sun, Y. Togano, T. Uesaka, K. Wimmer, K. Yoneda, O. Aktas, T. Aumann, L. X. Chung, F. Flavigny, S. Franchoo, I. Gasparic, R. -B. Gerst, J. Gibelin, K. I. Hahn, D. Kim, T. Koiwai, Y. Kondo, J. Lee, C. Lehr, B. D. Linh, T. Lokotko, M. MacCormick, K. Moschner, T. Nakamura, S. Y. Park, D. Rossi, E. Sahin, P. -A. Söderström, D. Sohler, S. Takeuchi, H. Toernqvist, V. Vaquero, V. Wagner, S. Wang, X. Xu, H. Yamada, D. Yan, Z. Yang, M. Yasuda, and L. Zanetti, “Gamma-ray spectroscopy of ^{55}Sc ,” *Phys. Scr.* **99**, 075309 (2024).
- M. Madurga, J. M. Christie, Z. Xu, R. Grzywacz, A. Poves, T. King, J. M. Allmond, A. Chester, I. Cox, J. Farr, I. Fletcher, J. Heideman, D. Hoskins, A. Laminack, S. Liddick, S. Neupane, A. L. Richard, N. Shimizu, P. Shuai, K. Siegl, Y. Utsuno, P. Wagenknecht, and R. Yokoyama, “New isomeric transition in ^{36}Mg : Bridging the $N = 20$ and $N = 28$ islands of inversion,” *Phys. Rev. C* **109**, L061301 (2024).
- A. Kumar, N. Shimizu, Y. Utsuno, C. Yuan, and P. C. Srivastava, “Large-scale shell model study of β -decay properties of $N = 126$, 125 nuclei: Role of Gamow-Teller and first-forbidden transitions in the half-lives,” *Phys. Rev. C* **109**, 064319 (2024).
- S. Sahoo, P. C. Srivastava, N. Shimizu, and Y. Utsuno, “Nuclear structure properties of $^{193-200}\text{Hg}$ isotopes within large-scale shell model calculations,” *Phys. Rev. C* **110**, 024306 (2024).
- S. Leoni, B. Fornal, A. Bracco, Y. Tsunoda, and T. Otsuka, “Multifaceted character of shape coexistence phenomena in atomic nuclei,” *Prog. Part. Nucl. Phys.* **139**, 104119 (2024).
- G. Zhen, H. Liu, A. Dohi, G. Lü, N. Nishimura, C. Zhu, and R. Xu, “Systematic Study of the Composition of Type I X-Ray Burst Ashes: Neutron Star Structure versus Reaction Rate Uncertainties,” *The Astrophysical Journal* **982** 122 (2025).
- A. Dohi, N. Nishimura, R. Hirai, T. Takeda, W. Iwakiri, T. Tamagawa, A. Aoyama, T. Enoto, S. Iwata, Y. Kato, T. Kitaguchi, T. Mihara, N. Ota, T. Takahashi, S. Watanabe, and K. Yamasaki, “NinjaSat monitoring of Type-I X-ray bursts from the clocked burster SRGA J144459.2-604207,” *Publications of the Astronomical Society of Japan* **77** (2025).
- A. Dohi, N. Nishimura, R. Hirai, T. Takeda, W. Iwakiri, T. Tamagawa, A. Aoyama, T. Enoto, S. Iwata, Y. Kato, T. Kitaguchi, T. Mihara, N. Ota, T. Takahashi, S. Watanabe, and K. Yamasaki, “Evidence of non-Solar elemental composition in the clocked X-ray burster SRGA J144459.2-604207,” *Publications of the Astronomical Society of Japan* **77** (2025).
- N. Ozawa, K. Nakamura, and Y. Sakemi, “Conception, modelling, and characterization of a fiber amplifier with a simple and easy-to-repair configuration intended for the use in harsh environments,” *EPJ Techn. Instrum.* **11**, 3 (2024).

[Review Article]

北村徳隆, 「 ^{32}Mg と ^{30}Mg のガンマ線分光による「反転の島」の研究」, *原子核研究* **69**, 25 (2025).

[Proceedings]

- H. Yamaguchi, S. Hayakawa, H. Shimizu, K. Okawa, F. L. Liu, Q. Zhang, N. R. Ma, S. Ahn, D. Kim, C. Y. Park, J. Hu, and Y. H. Lam, “Nuclear Astrophysics with Exotic Beam; Thick-target Measurements at CRIB,” *EPJ Web Conf.*, **297**, (2024), 01017.
- C. Chang, L. Yang, C. J. Lin, H. Yamaguchi, N. R. Ma, S. Hayakawa, P. W. Wen, H. M. Jia, T. P. Luo, C. Yin, Z. J. Huang, H. R. Duan, S. X. Zhu, H. R. Wang, Z. R. Fan, H. Y. Li, and L. Y. Fu, “Reaction dynamics of proton drip-line nuclei at energies around the Coulomb barrier,” *EPJ Web of Conferences* **306**, (2024), 01009.
- T. Gunji, “Hadron Physics at EIC,” Fourth International Workshop on the Extension Project for the J-PARC Hadron Experimental Facility (HEF-ex 2024), arXiv:2409.00366
- J. T. Li, N. Imai, R. Yokoyama, S. Michimasa, T. Chillery, R. Kojima, S. Hanai, N. Kitamura, T. Saito, D. Suzuki, D. Nishimura, M. Amitani, C. Fukushima, Y. Nakamura, R. Kageyama, J. Sonoda, E. Takada, S. Sakaguchi, and Z. G. Xiao, “Development of a mosaic-type array formed by Si photodiodes for charged-particle detection in heavy-ion collisions,” *EPJ Web Conf.* **206**, (2024), 01037.
- J. T. Li, N. Imai, R. Yokoyama, S. Michimasa, T. Chillery, R. Kojima, S. Hanai, N. Kitamura, T. Saito, D. Suzuki, D. Nishimura, M. Amitani, C. Fukushima, Y. Nakamura, R. Kageyama, J. Sonoda, E. Takada, S. Sakaguchi, and Z. G. Xiao, “Probing heavy-ion fusion reaction $^{136}\text{Xe} + ^{64}\text{Zn}$ in inverse kinematics” *Nucl. Phys. A* **1059**, (2025), 123079.

Presentations

[International Conferences/Workshops]

- H. Yamaguchi (oral, invited), “Nuclear astrophysics with RIBs at CRIB,” the 12th European Summer School on Experimental Nuclear Astrophysics (Santa Tecla School), Grand Hotel Faraglioni, Acitrezza, Catania, Italy, June 16–21, 2024.
- H. Yamaguchi (oral, invited), “Measuring astrophysical reaction with low-energy RI beams at CRIB—recent progress in Asian collaborations,” The 2024 Annual Meeting of A3 Foresight Program, Hotel ICC, Daejeon, Korea, July 17–20, 2024.
- H. Yamaguchi (oral), “Experiments with low-energy RI beams at CRIB; thick-target method measurements,” Nuclear Physics seminar, CIAE, Beijing, China, September 6, 2024.

- H. Yamaguchi (oral, invited), “Studying astrophysical reactions with low-energy RI beams—the projects at CRIB,” The 17th international symposium on Origin of Matter and Evolution of Galaxies (OMEG2024), Sichuan University, Chengdu, China, September 8–13, 2024.
- H. Yamaguchi (oral, invited), “Nuclear Astrophysics with Low-energy RI beam for the TOPTIER project,” Korea-Japan Symposium on TOPTIER Platform in Extreme Rare Isotope Science, Seoul National University, Seoul, Korea, December 16–17, 2024.
- H. Yamaguchi (oral, invited), “Studies on nuclear Structure, reaction, and astrophysics at CRIB,” RCNP-CENuM-OMEG Symposium on Nuclear Structure, Reaction, and Astrophysics: NuSRAP2024, Research Center for Nuclear Physics, Osaka University, Osaka, Japan, December 18–20, 2024.
- F. L. Liu (oral), “Direct measurement of the cross section for $^{102}\text{Pd}(p, \gamma)^{103}\text{Ag}$ reaction in the p-process,” 12th European Summer School on Experimental Nuclear Astrophysics, Catania, Italy, June 16–22, 2024.
- F. L. Liu (poster + oral), “Direct measurement of the cross section for $^{92}\text{Mo}(\gamma, n)^{91}\text{Mo}$ reaction in the p-process,” The Joint International School SNP-CNS SS 2024, RIKEN, Wako, Japan, August 3–8, 2024.
- F. L. Liu (oral), “Direct measurement of the cross section for $^{102}\text{Pd}(p, \gamma)^{103}\text{Ag}$ reaction in the p-process,” The 17th International Symposium on Origin of Matter and Evolution of Galaxies (OMEG2024), Chengdu, China, September 8–13, 2024.
- K. Okawa (poster), “Data analysis of the $^{26}\text{Si}(\alpha, p)^{29}\text{P}$ reaction for the nucleosynthesis in the X-ray bursts,” Origin of Matter and Evolution of Galaxies (OMEG2024), Chengdu, China, September 8–13, 2024.
- Kodai Okawa (invited), “Data analysis of the $^{26}\text{Si}(\alpha, p)^{29}\text{P}$ reaction for the nucleosynthesis in the X-ray bursts,” Ukakuren Workshop 2025, “Stellar sites of origin of the elements and chemical evolution of stars,” KEK, Tsukuba, March 24–26, 2025.
- N. Imai, “Physics opportunity at OEDO/SHARAQ with HYPATHIA,” Hypathia Workshop, IOP, March 20–21, 2025.
- N. Imai, “Frontier of nuclear spectroscopy at OEDO and SHARAQ,” Seoul National University, Korea-Japan Symposium on TOPTIER Platform in Extreme Rare Isotope Science, December 15–17, 2025.
- R. Yokoyama, “A novel ^{139}La -GPS scintillator for β -implantation detectors in decay spectroscopy at fragmentation facilities,” Active Stoppers for Decay Experiments, Parc Científic de la Universitat de València, Spain, March 24–26, 2025.
- R. Yokoyama, Joint Sunflower-SHARAQ/OEDO workshop, “SHARAQ experiments for octupole deformation,” September 5–7, 2024.
- N. Kitamura, “In-house development of waveform digitizers for nuclear physics experiments at RIBF,” Streaming Readout Workshop SRO-XII, Tokyo, December, 2024.
- Y. Yamamoto, “Lifetime measurement with gamma-ray tracking detector for study of meson exchange current,” Advancing physics at next RIBF (ADRIB25), January 22–23, 2025.
- N. Imai, “The Surrogate Reactions for the Neutron-Capture Rate Using OEDO and SHARAQ in RIBF,” 14th International Conference on Nucleus-Nucleus Collisions (NN2024), Whistler, BC Canada, August 18–23, 2024.
- J. T. Li, “Study of νp -process nucleosynthesis in core-collapse supernovae via $^{56}\text{Ni}(\text{d}, p)$ reaction,” 14th International Conference on Nucleus-Nucleus Collisions (NN2024), Whistler, BC Canada, August 18–23, 2024.
- N. Kitamura, “Exploring the Mysteries of ^{32}Mg via Precision In-Beam Gamma-Ray Spectroscopy,” 14th International Conference on Nucleus-Nucleus Collisions (NN2024), Whistler, BC Canada, August 18–23, 2024.
- S. Hanai, “Mass measurements of fp-shell nuclei in the vicinity of proton dripline,” Nuclear Structure 2024, Argonne National Laboratory, USA, July 22–26, 2024.
- J. T. Li, “Study on νp -process nucleosynthesis via $^{56}\text{Ni}(\text{d}, p)$ reaction using OEDO-SHARAQ beamline at RIBF,” The 17th International Symposium on Origin of Matter and Evolution of Galaxies (OMEG2024), Chengdu, China, September 8–13, 2024.
- N. Imai, “Search for superdeformed band in $N = 120$ nuclei,” RCNP International workshop “Physics Opportunities Using the 8pi Spectrometer at RCNP,” February 4–5, 2025.
- R. Yokoyama, “Study of multi-neutron emission process through beta-neutron-gamma spectroscopy of $N > 50$ Gallium isotopes,” International symposium for Single-particle and collective motions from nuclear correlation (PCM2025), Aizu, Japan, March 4–7, 2025.
- S. Hanai, “Direct mass measurements of fp-shell nuclei in the vicinity of proton-dripline,” International symposium for Single-particle and collective motions from nuclear correlation (PCM2025), Aizu, Japan, March 4–7, 2025.
- R. Yokoyama, “Study of multi-neutron emission process through beta-neutron-gamma spectroscopy of $N > 50$ Gallium isotopes,” Nuclear Structure 2024, Argonne National Laboratory, USA, July 22–26, 2024.
- J. T. Li, “Probing heavy-ion fusion reaction in $^{136}\text{Xe} + ^{64}\text{Zn}$ in inverse kinematics,” 14th International Conference on Nucleus-Nucleus Collisions (NN2024), Whistler, BC Canada, August 18–23, 2024.
- Y. Anuar, “Development of segmented La-GPS scintillation detector as a new β -implant detection tool,” Single-particle and collective motions from nuclear many-body correlation (PCM2025), Aizu, Japan, March 4–7, 2025.
- J. T. Li, “Towards the shell structure at Island of Stability: Probing heavy-ion fusion reactions in near symmetric systems,” Single-particle and Collective Motions from Nuclear Many-body Correlation (PCM2025), Aizu, Japan, March 4–7, 2025.
- N. Kitamura, “Detailed in-beam gamma-ray spectroscopy of ^{32}Mg and ^{30}Mg ,” Single-particle and Collective Motions from Nuclear Many-body Correlation (PCM2025), Aizu, Japan, March 4–7, 2025.
- Y. Yamamoto, “The 1-forbidden M1 transitions of chlorine isotopes around $N = 28$ shell closure,” Single-particle and Collective Motions from Nuclear Many-body Correlation (PCM2025), Aizu, Japan, March 4–7, 2025.
- T. Gunji, “Physics Perspectives of the EIC: From fundamental QCD to Hadron structure,” The 21st International Conference on Hadron Spectroscopy and Structure, Osaka, Japan, March 27–31, 2025.
- D. Sekihata, “Electromagnetic and Weak Probes: Experiment,” The 12th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions (Hard Probes 2024, HP2024), Nagasaki, Japan, September 22–29, 2024.
- T. Gunji, “Highlights from detectors for EIC,” The 2024 International Workshop on Future Linear Colliders (LCWS2024), Tokyo, Japan,

July 8–11, 2024.

- T. Gunji, “The Electron Ion Collider: New Development of Nuclear Physics and Japanese activities,” BNL-RIKEN Workshop, RIKEN, October 4, 2024.
- T. Gunji, “EIC Status of Japan,” EIC-Asia Workshop, Shanghai, China, July 1–7, 2024.
- Y. Utsuno (invited), “Large-scale shell-model calculations for atomic nuclei,” International Workshop on J-PARC Hadron Physics 2024, Tokai, Japan, July 23–25, 2024.
- Y. Utsuno (invited), “Single-particle vs. collective properties in neutron-rich Cd and In isotopes,” Reimei Workshop “Recent advances on nuclear shells, clusters, correlations and their knockout reaction observables,” Darmstadt, January 8–10, 2025.
- Y. Utsuno (invited), “Investigating ordered states in non-yrast levels,” Workshop “Physics Opportunities Using the 8π Spectrometer at RCNP,” Suita, Japan, February 4–5, 2025.
- Y. Tsunoda (invited), “Nuclear shapes studied by Monte Carlo shell model calculations,” “Celebrating 75 Years of the Nuclear Shell Model and Maria Goeppert-Mayer,” Lemont, USA, July 19–21, 2024.
- Y. Tsunoda (invited), “Shapes of medium-mass nuclei studied by Monte Carlo shell model and quasi-particle vacua shell model calculations,” Advancing physics at next RI Beam Factory (ADRI25), Wako, Japan, January 22–23, 2025.
- N. Nishimura, “Uncertainties in explosive nucleosynthesis in core-collapse supernovae from Monte-Carlo variations” “iReNA-CeNAM Frontiers in Nuclear Astrophysics,” Notre Dame, USA, June 3–7, 2025.
- N. Nishimura, “Can nuclear physics solve “the missing gold problem” in the evolution of Galaxy?” Structure of neutron-rich matter revealed by beta decay, RIKEN, Wako, Japan, July 29–30, 2024.
- N. Nishimura (invited lecture), “Nuclear Astrophysics and Nucleosynthesis” SNP CNS Summer School 2024, U Tokyo and RIKEN, Tokyo and Wako, Japan, August 3–8, 2024.
- N. Nishimura, “Nuclear fission of neutron-rich nuclei based on dynamical calculations for r -process nucleosynthesis” Nucleus Nucleus Collisions 2024, Whistler, Canada, August 18–23, 2024.
- N. Nishimura, “ rp -Process nucleosynthesis in X-ray bursts” Astrophysical Origins of Carbon, National Astronomical Observatory of Japan, Mitaka, Japan, September 2–5, 2024.
- N. Nishimura, “The impacts of nuclear reaction uncertainties on explosive nucleosynthesis in core-collapse supernovae” Origin of Matter and Evolution of Galaxies 2024, Chengdu, China, September 8–11, 2024.
- N. Nishimura, “The impacts of nuclear reaction uncertainties on explosive nucleosynthesis in core-collapse supernovae” Nuclear Physics in Astrophysics XI, Dresden, Germany, September 15–20, 2024.
- N. Nishimura, “Nuclear physics uncertainties for the production of heaviest r -process nuclei” NuSRAP, RCNP, Osaka University, Osaka, Japan, December 18–20, 2024.
- N. Nishimura (invited), “Challenges in nuclear-reaction studies for explosive nucleosynthesis in core-collapse supernovae” Theories of Astrophysical Big Bangs 2025, RIKEN, Wako, Japan, February 17–19, 2025.
- A. Sakaue (oral), “The Observation of Double Gamow-Teller Giant Resonance Using Double Charge Exchange (^{12}C , $^{12}\text{Be}(0_2^+)$) Reaction,” 14th International Conference on Nucleus-Nucleus Collisions (NN2024), Whistler, BC, Canada, August 22, 2024.
- A. Sakaue (poster), “The Study of Double Gamow-Teller Giant Resonance Using Double Charge Exchange Reaction of (^{12}C , $^{12}\text{Be}(0_2^+)$),” Single-Particle and Collective Motions from Nuclear Many-Body Correlation (PCM2025), Aizu, Japan, March 5, 2025.
- A. Sakaue (oral), “Double Gamow-Teller Giant Resonance in ^{48}Ca Studied by (^{12}C , $^{12}\text{Be}(0_2^+)$) Reaction at 250 MeV/nucleon,” RCNP Workshop on Theoretical and Experimental Approaches for Nuclear Matrix Elements of Double Beta Decay (NME2025), RCNP, Osaka, Japan, January 20, 2025.
- M. Fukase (oral), “Present status of high intensity Fr source development to search for the EDM,” Symposium University of Tokyo—ETH Zurich—University of Zurich, ETH Zurich Höggerberg Campus, October 15–17, 2023.
- K. Nakamura (oral), “Current status of development of laser optics for Fr permanent electric dipole moment,” Symposium University of Tokyo—ETH Zurich—University of Zurich, ETH Zurich Höggerberg Campus, October 15–17, 2023.
- T. Nakashita (poster), “Search for fundamental symmetry by trapping francium atoms,” Summit of Materials Science 2023 and GIMRT User Meeting 2023, Sendai, Japan, November 21, 2023.
- H. Nagahama (oral), “Electron EDM search with laser-cooled heavy elements,” 6th Joint Meeting of the APS Division of Nuclear Physics and the Physical Society of Japan, Hawaii, the Big Island, November 26–December 1, 2023.
- H. Nagase (oral), “Development of a novel comagnetometer for high-precision measurement of the electron’s electric dipole moment using laser-cooled francium atoms,” 6th Joint Meeting of the APS Division of Nuclear Physics and the Physical Society of Japan, Hawaii, the Big Island, November 26–December 1, 2023.

[Domestic Conferences/Workshops]

- 小高康熙 (ポスター発表), 「大強度イオンビーム用ベッパーパーボット型エミッタンス測定器開発の現状」, 第 21 回日本加速器学会年会, 山形テルサ, 2024 年 7 月 31 日–8 月 3 日.
- 鎌倉恵太 (ポスター発表), 「機械学習を用いた ECR イオン源ビーム電流予測」, 第 21 回日本加速器学会年会, 山形テルサ, 2024 年 7 月 31 日–8 月 3 日.
- H. Yamaguchi (口頭発表), “Recent activities at CRIB—the low-energy RI beam separator of CNS,” RIBF Users Meeting 2025, RIKEN Nishina Center, Wako, Saitama, Japan, January 21, 2025.
- N. Kitamura, 「高分解能波形ディジタイザの応用展開と波形処理開発の今後」, CEF-SPADI 合同研究会 次世代 DAQ・トリガーシ

システムを目指して, KEK つくばキャンパス, 2024 年 7 月.

今井伸明, 「原子核科学からのアプローチ」核融合学会第 41 回年会シンポジウム「小型球状トカマク核融合炉が拓く未来」, 2024 年 11 月 11 日.

花井周太郎, 「大強度重イオンビームのための位置感応検出器の開発」, 計測システム研究会 2024, 東京大学, 2024 年 11 月 18–24 日.

北村徳隆, 「 ^{32}Mg と ^{30}Mg のガンマ線分光による「反転の島」の研究」, 日本物理学会 2025 年春季大会, Online, 2025 年 3 月.

花井周太郎, 「ASAGI ASD カード導入に向けた試験状況—SR-PPAC の場合—」, The 3rd Workshop on Signal processing and data acquisition infrastructure (SPADI2025), RARiS 三神峯事業所, 2025 年 3 月.

N. Kitamura, 「高分解能波形ディジタル FW 開発: RIBF 実験での運用」, The 3rd Workshop on Signal processing and data acquisition infrastructure (SPADI2025), RARiS 三神峯事業所, 2025 年 3 月.

今井伸明, 「変形共存核での単一粒子軌道—非平衡状態ダイナミクスへの足掛かり」, RCNP 研究会「核子系と電子系における対相関と対凝縮相」, 2025 年 9 月 9–11 日.

N. Kitamura, “The past, present, and future of physics programs at OEDO-SHARAQ,” RIBF Users Meeting 2025, Wako, 2025 年 1 月.

郡司 卓, 「高エネルギー原子核衝突による極限現象」, 極限的物理探求に関する小研究会～天体現象と地上実験のクロスオーバー～, 東京大学, 11 月 30 日.

郡司 卓, 「Recent experimental developments of high-temperature and high-density QCD Physic」, RARiS 研究会「実験, 反応・構造計算, 格子 QCD で解き明かすハドロン分光」, 東北大学, RARiS, 11 月 20–21 日.

郡司 卓, 「Highlights of Detector Technologies of EIC experiment」, QBI 2024, 東京理科大, 2024 年 9 月 26–27 日.

郡司 卓, 「高エネルギー原子核実験で探るクォーク多体系と凝縮相」, 核子系と電子系における対相関と対凝縮相, 大阪大学 RCNP, 9 月 9–11 日.

郡司 卓, 「高エネルギー QCD 物理 (実験) 今後の展望: EIC を中心に」, QNSI kickoff workshop, 東大, 8 月 28 日.

郡司 卓, 「初めて EIC および ePIC 実験の現状」, EIC で展開する新たな素粒子・原子核物理, 東大, 5 月 28–29 日.

郡司 卓, “EIC と ePIC 実験の現状,” シンポジウム「電子-イオン衝突型加速器 EIC が展開する新たな原子核・素粒子物理」, 日本物理学会第 79 回年次大会, 2024 年 9 月 16–19 日.

小原 遼太郎 for the ALICE Collaboration, “ALICE-ITS3 アップグレードに向けた babyMOSS の性能評価,” 日本物理学会第 79 回年次大会, 2024 年 9 月 16–19 日.

宇都野 穰 (招待講演), 「大規模殻模型計算による遷移強度分布: 手法と応用例」, 研究会「核反応の時間発展ダイナミクスの解明に向けて」, 埼玉県和光市 (理化学研究所), 2024 年 9 月 25–26 日.

宇都野 穰 (招待講演), 「モンテカルロ殻模型計算によるアルファクラスターの形成」, 高密度物質研究会, 茨城県東海村 (日本原子力研究開発機構), 2024 年 12 月 14–15 日.

角田 佑介, 清水 則孝, 大塚 孝治 (口頭発表), 「モンテカルロ殻模型による $N = 50$ 近傍の核構造の研究」, 日本物理学会第 79 回年次大会, 北海道札幌市 (北海道大学札幌キャンパス), 2024 年 9 月 16–19 日.

角田 佑介 (口頭発表), 「準粒子真空殻模型法による中重核構造の研究」, 「富岳成果創出加速プログラム」基礎科学合同シンポジウム 2024, 東京都千代田区 (アーバンネット神田カンファレンス), 2025 年 1 月 8–10 日.

西村 信哉, 「重力崩壊型超新星での元素合成: 新たな原子核実験への挑戦」, CfCA ユーザーズミーティング 2024, 三鷹市 (国立天文台), 2024 年 11 月 25–26 日.

西村 信哉 (招待講演), 「 νp プロセスの序盤, 中盤, 終盤, 隙なく天体核反応測定で決めるには?」, 宇核連研究会 2025, 茨城県つくば市 (高エネルギー加速器研究機構), 2025 年 3 月 24–26 日.

阪上 朱音, 「二重荷電交換反応 ($^{12}\text{C}, ^{12}\text{Be}(0_1^+)$) を用いた二重ガモフ・テラー巨大共鳴の探索」, RCNP 研究会「原子核におけるスピン自由度の織り成すダイナミクス」, RCNP, 2024 年 12 月 11 日.

中澤 正樹 (口頭発表), 「2 光子ラマン共鳴を利用した Cs のラムゼー分光のためのパルス制御の計算」, 日本物理学会・春季大会, (オンライン), 2025 年 3 月 18 日–3 月 21 日.

永瀬 慎太郎 (口頭発表), 「電気双極子能率探索に向けたゼーマンシフトとベクトル光シフトの同時抽出」, 日本物理学会・春季大会, (オンライン), 2025 年 3 月 18 日–3 月 21 日.

Y. Sakemi (invited), “Fundamental Physics with Cold Radioactive Heavy Elements,” Neutrinos Electro-Weak interactions and Symmetries (NEWS) colloquium, October 31, 2024.

[Seminars]

N. Imai, “Challenging Neutron-Capture Reactions with an Old Idea and Cutting-Edge Technology,” Seminar at Southern university of Science and Technology, Shenzhen, China, October 10, 2024.

酒見 泰寛, 「この世界は何でできている? ～原子核が教える物質の仕組み～」, 放射線安全フォーラム 市民公開講座「基礎物理研究とそれを支える放射線安全」, 2025 年 3 月 23 日.

Awards

下浦 享, 仁科記念賞, 「4 中性子状態の実験的研究」, 2024.

N. Kitamura, Young Scientist Award of the Physical Society of Japan, 2024.

Y. Yamamoto, ANPhA award for the best presentation at PCM2025.

永瀬 慎太郎, 東京大学理学系研究科研究奨励賞, 2025 年 3 月.