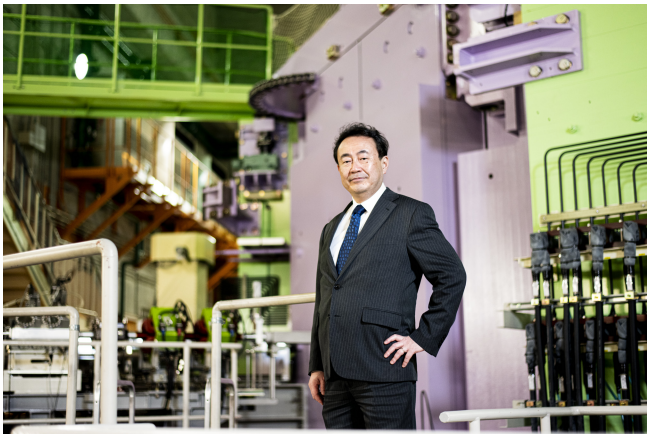
PREFACE



The RIKEN Accelerator Progress Report is the annual report of all the research activities conducted at the RIKEN Nishina Center for Accelerator-Based Science (RNC). This volume covers the activities conducted during the Japanese fiscal year 2021 (i.e., April 2021 to March 2022).

Masaaki Kimura launched a new laboratory, "Nuclear Many-body Theory Laboratory," in October 2021 to further strengthen nuclear theory activities cooperating with experimental programs at Radioactive Isotope Beam Factory (RIBF). Yoshitaka Hatta has been appointed as Group Leader of Theory Group in RIKEN BNL Research Center (RBRC) as of May 2021.

Two years have passed since restrictions on social activities were first imposed due to the coronavirus crisis. However, we are yet to know what changes the pandemic will bring for us in future.

The COVID-19 vaccination drive began in 2021 along with implementation of other measures to prevent the spread of the virus. Although we managed to overcome a huge rise in the coronavirus cases last summer, we had to face the spread of a new variant, Omicron, at the end of the year. The emergence of new variants of coronavirus counters the effect of the vaccine. However, this cannot be prevented. Therefore, it is imperative to find ways to adapt to living alongside the coronavirus.

Our society is progressively becoming polarized in the way people think: "virus" vs "vaccination," "justice" vs "injustice," "restriction" vs "ease," "wealth" vs "poverty," "authentic" vs "fake," and "nation" vs "individual." Because science and technology always seek "authenticity," according to me, the pandemic has not significantly changed how science and technology is viewed. I believe that science and technology originate from curiosity and ideas of an "individual" and its end goal is welfare of humanity. Consequently, I anticipate that science and technology connecting "individual" with humanity will play a vital role despite the pandemic.

Many outstanding research results were obtained at RNC last year, some of which took less than a year since their inception, while others were the fruition of research that took more than several decades. We will continue to strive to contribute significantly to research, which we hope will yield results in future.

Eleven press releases were disseminated in FY2020. Selected strides made in 2020 have been compiled in the "Highlights of the Year" section in this volume, which show successful multi-disciplinary activities of RNC for science, technology, and innovation. It is noteworthy that these were achieved not only the in-house researchers and engineers in RNC but also by collaborating users at RIBF, RBRC, and Rutherford Appleton Laboratory. "Measurement of neutron-rich high-dense matter pressure," published in Physical Review Letters is a result obtained with the SπRIT TPC in the SAMURAI magnet to give the information on equation-of-state in asymmetric nuclear matter. The heavy-ion beam breeding successfully created a new type of Satsuma mandarin orange, which will have a huge impact on the orange market in Japan. RNC has started delivering ^{211}At for an investigator-initiated trial at Osaka University Hospital for refractory thyroid cancer.

Colleagues of RNC were awarded: Tomoko Abe for the "IAEA Women in Plant Mutation Breeding Award," and Ryo Taniuchi for "Inoue Research Award for Young Scientist." "Young Scientist Award of the Physical Society of Japan" was given to Tokuro Fukui, Junki Tanaka and Takumi Yamaga. Masaomi Tanaka was awarded the "RIBF Thesis Award." "Student Presentation Award of the Physical Society of Japan" and "2021 Symposium on Nuclear Data Poster Presentation Award" were given to Akira Hirayama and Kenta Sugihara, respectively. The "2021 RIKEN Awards" included the "EIHO Award," which was given to Kazuhide Tsuneizumi *et al*. "BAIHO Award" was given to Tadaaki Isobe and Junki Tanaka, and "OHBU Award" to Momo Mukai and Minori Tajima.

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