

## PREFACE

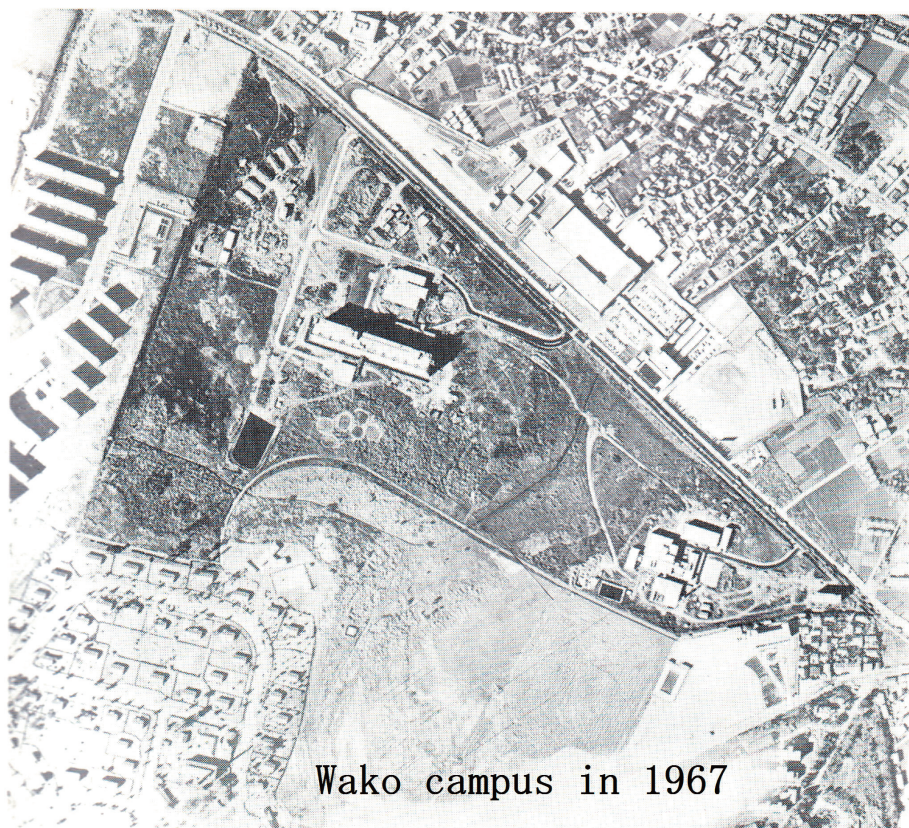
With this volume, we celebrate the 50th anniversary of the RIKEN Accelerator Progress Report. In 1966, 50 years ago, RIKEN's 4th cyclotron was commissioned at the Wako Campus, and the first volume of the Accelerator Progress Report was issued. Now, if one were to see the Wako campus of 50 years ago, one would recognize only the administration building, main building, and our accelerator facility. That was the place and time where we restarted our scientific journey to make Yoshio Nishina's dreams come true.

On June 7, 2017, RIKEN celebrated the 50-year anniversary of the Wako Campus. At the front of the monument of the 4th cyclotron, Nishina-Tomoka, a new cherry blossom created at Nishina Center was planted, and the Nihonium Memorial Monument was unveiled. What an honor for Nishina Center! The Wako City Mayor, Matsumoto, congratulated RIKEN on the anniversary with an interesting story; this campus was initially meant to be the Athletes' Village for the Tokyo Olympics in 1966. He was happy that the campus went to Yoyogi, following which RIKEN established itself in the campus and Wako City became the birthplace of nihonium.

The year 2016 started with the news of Morita's Element 113 Research Group in RIKEN earning naming rights for element 113, which graced the front page of all major newspapers, followed by the news of nihonium (Nh) being proposed as the name and symbol for the element in June. The morning following the news report, Minister Hase of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Parliamentary Secretary Toyota for MEXT, and Wako-City Mayor Matsumoto visited Nishina Center to congratulate us and went on a tour of GARIS.

On December 1, a press conference was held in Hakata to announce that nihonium had been approved as the official name and that it will take its place at the periodic table. On January 1, 2017, we received the news that the Asahi Prize will be given to the Element 113 Research Group. Finally on March 14th, 2017, at the presence of His Imperial Highness Crown Prince, the president of the International Union of Pure and Applied Chemistry, Prof. Tarasova, declared "the 113th element is named nihonium."

In 1908, Masataka Ogawa, a professor at Tokyo Higher Normal School, discovered element 48 and named it "nipponium (Np)." Regrettably, it was later found that the element was wrongly identified and that it was, in fact, element 75, which is in the same family of elements but located one level below in the periodic table.



Wako campus in 1967



Eventually, elements 43 and 75 were named technetium (Tc) and rhenium (Re), respectively. It turned out that technetium was the first nuclide on the periodic table that does not have a stable isotope. In 1940, Yoshio Nishina et al. succeeded in producing element 93 but failed to identify its nuclide, and could not obtain naming rights for the element. Element 93 was later discovered by McMillan et al., who named it neptunium with the symbol Np, which had been once adopted as the symbol for nipponium.

Nishina had many seemingly impossible dreams. But now, Nishina's new element has reappeared as nihonium. Nishina's 2nd cyclotron reappeared as the RI Beam Factory, which is unparalleled in the world. Nishina's perceptions on RI applications are now our specialties. We are proud of what we have been accumulating with the 50 volumes of Accelerator Progress Reports.

In October 2016, RIKEN became a Designated National Research and Development Institute. I consider this a big chance for us to continue to move forward by going along with a positive trend that we have been blessed with in the 50 years of the Reports. With the supplementary budget of 4 billion yen for the RILAC upgrade we successfully managed to acquire, let us forge ahead toward a higher goal by advancing the RIBF upgrade project further.

Hideto En'yo  
Director  
RIKEN Nishina Center for Accelerator-Based Science