

Ask scientists “What is nihonium!?”—Public lecture on the 20th anniversary of the birth of nihonium

H. Haba on behalf of the organizing committee

The public lecture titled “Ask scientists ‘What is nihonium!?’—Public lecture on the 20th anniversary of the birth of nihonium” was held on November 3, 2024, at the 2F Large Conference Room of the Administrative Headquarters Building of the RIKEN Wako Campus. This event was jointly organized by the RIKEN Nishina Center (RNC) and the Research Center for Superheavy Elements (RCSHE), Kyushu University.

An isotope of element 113, ^{278}Nh , was synthesized in the cold-fusion reaction of $^{209}\text{Bi}(^{70}\text{Zn}, n)^{278}\text{Nh}$ on July 23, 2004, at RIKEN.¹⁾ This year, 2024, marks the 20th anniversary of the first observation of element 113, the first new element discovered in Asia and Japan, which has been named nihonium (Nh).²⁾ On this occasion, a scientific lecture for the general public was held to introduce the RIBF facility, the birth of Nh, the properties of Nh, and RIKEN’s challenge to discover further new elements, and to disseminate RIKEN’s research achievements to society. This lecture focused on the relatively easy-to-understand theme of “element discovery” and was intended for the general public, including elementary, junior high, and high school students, and served as a learning and discovery opportunity for children, who would lead the next generation to develop an interest in science.

One hundred twenty-eight participants were selected by lottery to attend this event. The participants consisted of 66 adults, including university students, 13 high school students, 16 junior high school students, and 33 elementary school students and younger. Approximately half of the participants were high school students or younger, indicating a high level of interest among young people. The event was moderated by Naoko Shinozaki from beginning to end. To her question “What is nihonium!?” the first lecturer, Satoshi Sakaguchi, explained the subject explained in an easy-to-understand manner and talked about the atoms that make up the world, the nuclei at the centers of the atoms, and how new nuclei are created by colliding two nuclei with each other, using such metaphors as “If an atom is the size of a baseball stadium, the nuclei are the size of marbles.” Next, Kosuke Morita, who led the element-113 search experiment, talked about his memories of his university student days when he became involved in a research project on the synthesis of new elements, and his long research days from the moment he discovered element 113 until he received the naming right from the International Union of Pure and Applied Chemistry, saying, “It was tough, but it was fun.” Hiroyoshi Sakurai and Rie Kuwan celebrated the 20th



Fig. 1. Photo of the participants in “Ask scientists ‘What is nihonium!?’—Lecture on the 20th anniversary of the birth of nihonium” on November 3, 2024.

anniversary of the birth of Nh with the participants by singing, “Happy birthday, dear nihonium. . .”

In the latter half of the event, Kouji Morimoto introduced the upgraded RIKEN facility for superheavy-element synthesis and explained the latest status of the ongoing challenge to synthesize element 119 via the $^{248}\text{Cm}(^{51}\text{V}, xn)^{299-x}\text{119}$ reaction. In addition, Hiromitsu Haba talked about the history of the search for elements since ancient times, the recent progress in synthesizing artificial elements, the various properties of the elements, and their possible applications. Finally, all lecturers and Sakurai looked back on their childhood and talked about their current dreams. Sakurai closed this event, saying, “I was energized by the little children’s energetic questions. Your questions are Nobel-Prize-level.” Figure 1 is a commemorative photo of some of the organizers and participants taken after the event. The lectures can be viewed on YouTube.³⁾

This event was planned and organized by the organizing committee members; H. Sakurai, K. Morita, H. Haba, K. Morimoto, K. Suzuki, and N. Miyauchi of RNC; T. Orii, M. Fujii, L. K. Sasaki, R. Kuwana, I. Suzuki, and C. Shimoyamada of Nishina Center and iTHEMS Promotion Office, RIKEN; S. Sakaguchi, T. Niwase, Y. Yamanouchi, T. Fujii, N. Kitagawa, N. Miyashita, G. Otsuka, R. Shikada, and H. Watanabe of RCSHE; and N. Shinozaki, a freelance announcer. This work was supported by the RIKEN general donations received in FY2023.

References

- 1) K. Morita *et al.*, J. Phys. Soc. Jpn. **73**, 1738 (2004).
- 2) IUPAC release on November 30, 2016 (<https://iupac.org/iupac-announces-the-names-of-the-elements-113-115-117-and-118/>).
- 3) YouTube (<https://www.youtube.com/watch?v=tyKuIzOFkWM>).

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