

8. Activities of Rokkasho Research Center (RRC)

The Rokkasho Research Center (RRC, established in May 2007) promotes cooperation and joint research with the Broader Approach (BA) activities that are being undertaken in parallel with the ITER project and builds the technical foundation for the development of a prototype fusion reactor, by supporting the participation of collaborators of NIFS and universities based on academic standpoints. Furthermore, to promote the interdisciplinary expansion of issues being tackled in fusion research, we are focusing on disseminating research issues to a range of academic fields, inviting interdisciplinary meetings, and promoting interdisciplinary joint efforts. As an example, the fourth mid-term strategic project of the Research Organization of Information and Systems (ROIS), “Statistical-mathematical modeling for plasma data, complementary to plasma physics,” has been established and we are deepening/widening collaborations with communities such as statistical-mathematics and data science. In addition, we are actively working on to contribute to human resource development through establishing and deepening cooperation with neighboring educational institutions.

RRC’s Homepage: <https://www.nifs.ac.jp/en/about/rrc.html>

Highlighted Activities in FY2024

The RRC has been a hub for promoting the research project; Research Organization of Information and Systems (ROIS), The 4th Mid-Term Strategic Projects, “Statistical-Mathematical Modelling on Plasma Data: Complementary to Plasma Physics”. The project ended (after the approved fixed-term), by holding a concluding workshop at NIFS (Toki) on February 13-14, 2025. This interdisciplinary collaboration body, then, was selected as the Open Mix Laboratory (OML) project “Creation and Development of Statistical Mathematical Fusion Studies” of the National Institutes of Natural Sciences (NINS). Based on the results of the ROIS project, we will further expand the scope of our collaborative activities between fusion and statistical-mathematics, utilizing diverse and numerous data on fusion research and innovative methodologies in the statistical- mathematics study.

The “School to Experience Japan’s DEMO Fusion Reactor – Manufacturing, Integrated Innovation –”, which was selected for the 2024 National Institute for Fusion Science Schooling and Networking Initiative, was held for two days on March 3-4, 2025, at the Aomori City Cultural Tourism Exchange Facility, Nebuta Museum “Wa Rasse”. This school was organized by forming an executive committee, participating with the Rokkasho Fusion Energy Institute of the National Institutes for Quantum Science and Technology (hereafter, QST Rokkasho Institute) and the University of Tokyo, chaired by the Director of the NIFS RRC. More than one hundred people participated, mainly from a range of domestic industries. In addition to the keynote speech on the progress of fusion research and expectations for the industry, and a lecture on Japan’s DEMO fusion reactor design research, the event included a lecture on the basics of DEMO reactor components and elements, and a tour of the QST Rokkasho Institute, which is the research and development center for the DEMO reactor. The event embodied the intention of stimulating participants’ desire to get involved in fusion research and allowing them to gain an overall understanding and recognition of the positioning of each company and individuals areas of expertise and interest in the overall design, as well as the relationships with others’ efforts (which should be the foundation of “integrated innovation”).



Fig. 1 Group photo after the opening ceremony and keynote speech of the “School to Experience Japan’s DEMO Fusion Reactor – Manufacturing, Integrated Innovation –”

We also continue collaboration with nearby educational institutions. In May 2024, a RRC member gave a lecture entitled “Challenges to the unexplored, towards the realization of fusion energy” at the class of Engineering Design (ED) I for advanced-course first-year students at the National Institute of Technology (KOSEN), Hachinohe College. The contents are designed so that students can feel that their nearby area (Rokkasho village) has been and will further evolve as the world-leading base for fusion research. A lecture is also planned for 2025.

In addition, we are working to promote regional collaboration by participating in events and holding seminars related to the “Aomori Prefectural College” initiative, which we joined as a partner institution in 2023.



Fig. 2 At the beginning of the lecture at the National Institute of Technology (KOSEN), Hachinohe College, the fusion technology map (material from the Cabinet Office’s Fusion Strategy Experts Meeting) was shown and then it was emphasized that a range of technology elements (for which students can lead and contribute in the near future) are necessary to realize fusion energy.

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