

# 5. Fusion Science Archives (FSA)

The Fusion Science Archives were established in 2005 to learn lessons from the past fusion science archives preserved and to maintain collections of historical documents and materials that are related to fusion research in Japan. These activities are important from the viewpoint of the historical evaluation of fusion research, its social accountability and making references for seeking future directions.

Since then, historical materials on fusion research and/or organizations related to fusion research have been collected and preserved at the FSA. They are stored in acid-free folders and boxes. The total number of registered items is now approximately 25,500. Most of those catalogues are available to the public through the internet in a hierarchical structure and can be accessed by the use of an electronic retrieval system.

The following collaborative works are performed this fiscal year along these lines:

- **Archival Studies on Collaborations in Heliotron Studies at Kyoto University (NIFS17KVXV015)**

T. Mizuuchi (Kyoto Univ.) *et al.*

The activities of this archival study are focused on the materials related to the development of plasma experimental devices, especially on the development of the series of Heliotron devices originating from Kyoto University. The range of objects in the archives covers not only the hardware but also related researchers, research groups, and their activities which have contributed to the development of the Heliotron concept. In these years, digitizing works of the minutes of research group meetings (PEC, etc.) from the Heliotron-E project has progressed. As of the end of this fiscal year, up to 28 of the 44 volumes of PEC files have been digitized, and electronic files are recorded and stored on DVDs and HDDs. Some other unfilled materials have been recorded on older recording media such as MO. We have started to transfer them to a new recording medium that can be easily accessed in the current PC environment.

- **History of the early days of Nuclear Fusion Research Group in Japan (NIFS17KVXV017)**

C. Namba (NIFS FSA) *et al.*

The organization “Nuclear Fusion Research Group of Japan” (KAKUYUGO KONDANKAI, hereafter referred as KK) was established in 1958. Dr. H. Yukawa was the first president of this organization. This KK continued to perform an important role in research and development of fusion science in Japan as a voluntary organization for researchers, until it became “The Japan Society of Plasma Science and Nuclear Fusion Research” in 1983. The theme of this work is to clarify the establishment process of the KK and how researchers organized and planned to promote fusion development research. We have examined the 1st to 6th volumes of the journal of KK called “KAKUYUGOU KENKYU” and the bulletins of the standing committee of the KK. We have confirmed that the KK organized research meetings and symposiums actively, that they provided places for discussion on the promotion policy of fusion research and issued timely detailed minutes, and that the KK played roles for selection of members for committees related to plasma-fusion research.

- **Collaborative Activities at NIFS Fusion Science Archives (NIFS FSA) (NIFS17KVXV018)**

S. Kubo (NIFS, FSA) *et al.*

The purpose of this collaboration is to arrange and promote the general archival activities under a NIFS collaboration framework.

One of the topics of this fiscal year in the archives activity is that the important relics of Professor Kodi Husimi

are added to the collection of the FSA. The collection of Koji Husimi which was originally collected and registered to the FSA is transferred from the so called “Husimi Salon” of Institute of Plasma Physics, Nagoya University and later from his house. An added new collection is from his second house in Nagano and includes several medals and certificates of awards he had received, pictures taken from 1950s, drawings during his childhood etc. The newly added collection was immediately digitized utilizing the equipment consolidated in FY2019.

- **Construction of Digital Library of Husimi Koji Archives (NIFS18KVXV019)** H. Iguchi (NIFS, FSA) *et al.*  
Historical documents donated by Koji Husimi, who was the first director of Institute of Plasma Physics, Nagoya University, are key contents of the NIFS Fusion Science Archives. They are useful in tracing the history of research activities in plasma physics and fusion science in Japan, especially in universities. About 4,800 items are stored and registered in 120 storage boxes. Most of the documents are rather old. The quality of papers is poor and they are fragile. Printed letters in some documents are getting difficult to read. In order to preserve those documents for future reference, it is necessary to convert them into digital documents. The plan started three years ago. About 900 documents are digitalized as PDF files. However, it is still one fifth of the total Husimi documents. The final purpose of the program is to make a digital library of all the Husimi collections. It is still at the beginning stage of the program.
- **Trend of plasma spectroscopic research in Japan’s university laboratories surveyed from the chronicle of collaborative research meetings (NIFS19KVXV0020)** N. Yamaguchi (Comprehensive Research Organization for Science and Society (CROSS)) *et al.*  
A workshop called the “Plasma Elementary Process workshop” or “Spectroscopy workshop” has been held as collaboration research between the Institute of Plasma Physics, Nagoya University (IPPJ) and NIFS from 1969 to the present. The chronological table of the history of the workshop has been compiled. The cumulative number of universities that contribute the workshop is 56, while the first workshop was attended by the nine major universities. University laboratories where researchers investigate plasma spectroscopy theoretically or experimentally are distributed around Japan.
- **Research study on the initiation phase of the Japanese fusion reactor technology (NIFS19KVXV021)**  
S. Matsuda (Tokyo Inst. Technology) *et al.*  
Based on archive documents kept in the JAERI, NIFS and Tokyo University, a study on the initiation phase of Japanese fusion reactor technology has been planned and started. The beginning of systematic development had to wait until fusion reactor studies started in 1970, when essential technologies were identified. Roughly, it started about ten years later than the plasma confinement researches. Although a power reactor for fusion is similar to one for fission, many fusion technologies are almost new and large scale and have to be developed for the first time. These include technologies for superconducting magnets, vacuum vessels, plasma heating systems, pumping systems, tritium fuel systems, plasma facing materials such as the first wall and divertor, and remote handling systems.