

# 10. Research Enhancement Strategy Office

The Research Enhancement Strategy Office (RESO) was established on November 1, 2013, to strengthen the research activities of the Institute by planning various support programs for the researchers and conducting public relations programs for making fusion science more understandable in society. Three University Research Administrators (URAs) are working in the following five Task Groups:

- (1) The IR (Institutional Research)/Evaluation Task Group
- (2) The Young Researchers and their Career-path Development Task Group
- (3) The Collaboration Research Enhancement Task Group
- (4) The Public Relations Enhancement Task Group
- (5) The Financial Basis Strengthening Task Group

## (1) IR/Evaluation

The task group for IR and evaluation has continued its role to make systematic analyses of the present research activities of the institute. The statistical data of publications and scientific reports were collected using the NIFS article information system (NAIS), with complementary data obtained through the SCOPUS and WoS public research resource supplying companies. The outcome results of the collaboration activities were collected through the annual collaboration reports of NIFS.

## (2) Supporting Young Researchers

In the activities for supporting young researchers, three research startups were encouraged, to enhance their basic research skills. Applications were reviewed by the Young Researchers Development Task Group, and the following programs were supported in FY2021:

1. *Understanding Fine structure of Magnetic Field in Anisotropic Plasmas* (Tomoko Kawate),
2. *New Electron Cyclotron Heating Using Optical Vortices* (Toru Tsujimura),
3. *Development of Functional Optical Devices by Femtosecond Laser Micro-processing* (Hiyori Uehara).

RESO also assisted with the applications of young scientists to the ‘Grants-in-aid Scientific Research’ program. Nineteen application documents were reviewed and suggestions were given to the authors for improvement.

## (3) Enhancing Collaboration Research

Much international collaboration researches with various institutes and universities in Asia, Europe and United States was performed, although experiments or meetings in person were still not available.

NIFS has concluded international exchange agreements with overseas research institutes, of which joint research with research institutes in Europe, the United States, and China has been strengthened. For the W7-X of Max Planck Institute of Plasma Physics (Germany), we focused on joint research on common issues of helical equipment by utilizing plasma diagnostic instruments. Strengthened joint research activities took



Fig. 1 A modular coil in the winding process

place using helical devices at the University of Wisconsin (USA) and the CIEMAT Research Institute (Spain).

On the other hand, as for the CFQS (Chinese First Quasi-axisymmetric Stellarator) project, based on the bilateral agreement on General Collaboration and Exchange between NIFS and Southwest Jiaotong University (China), machine construction proceeded in Hefei, China, amid the pandemic. Manufacturing of modular coils was vigorously performed, and five coils completed the first vacuum impregnation process.

#### (4) Enhancing public relations

1) Dissemination of research achievements through EurekAlert!

Three topics were released: i) “Developing a novel joint technique for copper alloy”, ii) “A self-sustained divertor oscillation mechanism identified in fusion plasma experiment” and iii) “Plasma turbulence spreading by magnetic fluctuation reduces heat load on a fusion device wall”. These topics were also released to the media in Japan. Some topics attracted attention from the international media.

2) Information release about NIFS and fusion science

Eight research results were released in the press and disseminated on SNS (twitter and facebook) . NIFS’s web design was re-examined to enhance the dissemination of information on research results.

3) Outreach activities based on the fusion community

RESO joined a discussion of fusion science outreach headquarters with QST, universities and the Ministry of Education, Culture, Sports, Science and Technology.

4) Others

RESO introduced interesting science topics to the public on the occasion of the Science Talk in the Open Campus Online of NIFS, as shown in Figure 2. RESO produced movies, briefly introducing researchers’ activities.

#### (5) Strengthening Financial Base

Activities are being carried out with the aim of strengthening the financial base of the institute. Support activities were carried out by holding briefing sessions to obtain competitive research funds such as Grants-in-Aid for Scientific Research (KAKENHI), JST, and NEDO, and by supporting the preparation of application forms.



Fig. 2 The Science Talk in the Open Campus Online of NIFS.  
Prof. Mito talked about superconductivity to the public online.

(T. Morisaki, T. Muroga, T. Mito and K. Yaji)