

11. Research Enhancement Strategy Office

The Research Enhancement Strategy Office (RESO) was founded in October 2013, and three University Research Administrators (URAs) were assigned. Under the Research Planning Task Group, the following four Task Groups were organized.

- (1) IR(Institutional Research)/Evaluation Task Group
- (2) Public Relations Enhancement Task Group
- (3) Collaboration Research Enhancement Task Group
- (4) Young Researchers Development Task Group

(1) The collaborative research activities

- 1) Enhancing international collaborative research in the stellarator-heliotron (S-H) plasma, and steady-state operation (SSO) toward a fusion reactor

After the divertor installation to Wendelstein 7-X (W7-X), which is promoted by Max Planck Institute of Plasma Physics (IPP) at Greifswald in Germany, the third helical plasma experiment (OP1.2b) for W7-X was carried out from July to October 2018. In this campaign, the neutral particle injector (NBI) was newly installed to study fast particle physics. A fast particle confinement and verification of local heat load on the divertor was one of the crucial commissions for W7-X. Several scientists in NIFS were assigned to IPP to initiate collaboration using NBI. In order to accelerate the collaborations, the Annexes to the NIFS-IPP Agreements were updated.

Collaborative research was also enhanced with PPPL and the University of Wisconsin in the United States, CIEMAT in Spain, CEA in France, CONSORZIO RFX in Italy, Culham Centre in the United Kingdom, and Peking University and Southwest Jiaotong University (SWJTU) in China.

- 2) International research network for integrated plasma physics

In addition to the individual MoUs with Princeton University and three Max-Planck institutes (IPP, MPA and MPS), a new MoU for starting the International Research Collaboration Center for Astrofusion Plasma Physics (IRCC-AFP) in NINS was discussed. A postdoctoral fellow employed by NIFS for the integral plasma physics has finished a term of two years with fruitful international collaboration results among Princeton University and many Japanese universities.

- 3) Promoting establishment of Agreements with Asian institutes to accelerate collaborative research

In order to enhance helical and stellarator research in Asian countries, the Chinese First Quasi-axisymmetric Stellarator (CFQS) project between NIFS and SWJTU and an international research collaboration between NIFS and Peking University has been promoted. The design parameters of plasma experiment in CFQS were completed, and test manufacturing of the magnetic coils has started.

(2) Supporting young researchers

In the activities for supporting young researchers, international collaboration activities of young researchers were encouraged, enforcing their basic research skills. RESO supported the international collaboration plans proposed by young researchers in NIFS. Applications were reviewed by the Young Researchers Development Task Group. One program was supported in FY2018 as follows.

1. Measurement and analysis of ultra-violet spectra emitted from the high-Z atoms of high-energy EBIT(electron beam ion trap).

In addition, RESO supported the basic research plans of young scientists for the purpose of enhancing their fundamental scientific skills. Three programs were supported in FY2018 as follows.

1. Experimental study of recovering cracks on the plasma facing materials using strong electron beam irradiation.
2. Fokker-Planck model analysis for the confinement of energetic ions with MHD instabilities driven by the high energy ions.

3. Transport analysis with collisional radiation model based on the impurity spectroscopic measurement data in Large Helical Device.

RESO also assisted with the applications of young scientists to the ‘Grants-in-aid Scientific Research’ program. About 70 application documents were reviewed and suggestions were given to the authors for improvement.

(3) Enhancing public relations

- 1) Dissemination of research achievements through EurekaAlert!

Three topics were released: i) “The First Experimental Discovery in the World of the Propagation of Plasma Turbulence: Results of Japan-United States Joint Research,” ii) “Developing New Materials for the Fusion Reactor: Success in Developing Vanadium Alloys Strong at High Temperatures and Appropriate for Manufacturing and Welding,” and iii) “Fusion Science and Astronomy Collaboration Enables Investigation of the Origin of Heavy Elements”. These topics were released to the media in Japan, too. Some topics attracted attention from the international media.

- 2) Information release about NIFS and fusion science

The NINS director’s press conference was held on 21 December 2018 and the state-of-the art plasma and fusion science results were given to the press. RESO participated in the AAAS annual meeting and introduced NIFS and our research results to meeting participants in collaboration with other Japanese institutes, from 14-17 February 2019.

- 3) Outreach activities based on the fusion community

One of the outreach activities is to join the organization of the ITER/BA Projects annual report meeting. RESO exhibited panels showing NIFS research activities at the meeting. RESO also joined the discussion of the fusion science outreach headquarter.

- 4) Others

RESO introduced interesting science topics to the public on the occasion of the science café at the Open House of NIFS shown in the Figure 1.



Fig. 1 The science café at the Open House of NIFS.

(4) IR/Evaluation activities

The task group for the IR (Institutional Research) and evaluation continued its role to make systematic analyses of the present research activities of the institute and for providing proposals to improve the research management of the institute. A systematic reviewing was undertaken for recognizing what are important issues in managing efficient research collaborations.

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