National Institutes of Natural Sciences

National Institute for Fusion Science

NIFS Peer Review Reports in FY2024

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National Institute for Fusion Science

Advisory Committee External Peer Review Committee

Contents

Summary

of the External Review Report in FY2024

The FY2024 NIFS External Peer Review Committee (hereafter referred to as “the committee”) held its meetings and hearings from Sep.11, 2024 to Jan.20, 2025 and communicated intensively via E-mail to evaluate “Fusion Science Interdisciplinary Research Center, Advanced Academic Research Coordination Section (AARCS)” and “External Funding (EF)”. While evaluations of achievements are essential for a peer review, the external review committee has paid attention to sharing concerns and issues with NIFS and regards ideas to improve the performance and situation as important to encourage the innovative reformation which NIFS is tackling. It is also an important aspect to check how their activities contemplate "Recommendations for the Future of NIFS", "Recommendations for the Future Collaborative Research of NIFS" and “Recommendations for the Future Large Scale Research Facility Plan” compiled by the appointed Working Group and endorsed by the Advisory Committee in FY 2021, 2022 and 2023, respectively.

Two sub-committees were organized. One sub-committee was charged in AARCS, and another sub-committee was charged in EF. They have evaluated the related activities and plans along with the evaluation perspectives defined by the Advisory Committee, and compiled their reports for each subject, and then the committee worked out the review report from their reports. Since EF are closely coupled with the domestic circumstances, its original report is described in Japanese while the summary translated into English is attached.

1. Fusion Science Interdisciplinary Coordination Center, Advanced Academic Research Coordination Section (AARCS)

Construction of the Unit System (US) at National Institute for Fusion Science (NIFS) has highlighted importance of interdisciplinary collaboration in advancing fusion research. Over the past two years, the Fusion Science Interdisciplinary Coordination Center, Advanced Academic Research Coordination Section (AARCS which is called the Section in short) has facilitated collaborations across diverse academic fields, including atomic physics, auroral/magnetospheric physics, astrophysics, semiconductor manufacturing, data science, radiotherapy and other variety of science fields. These

commendable efforts have assisted excellent achievements in auroral observations using a hyperspectral camera, an upgrade of the linear plasma devices, and development of the electron beam ion trap (EBIT) device. The Section has also provided support for interdisciplinary collaboration research in early phase, acquisition of external funds, international research collaborations, fostering young researchers, and open data activities.

The Section's objectives of promoting interdisciplinary science and improving the academic environment aligns with NIFS's basic policy of "Interdisciplinary Development of Fusion Science". To achieve the objectives, the Section has provided support for budding and early-stage projects and budget requests of interdisciplinary research, assisting upgrade of the linear plasma device and development of a new EBIT device. It is important to continue the efforts for supporting the grassroot activities under domestic and international collaborations between the US and universities/institutions. The limited number of applications for the budding and mini projects, however, suggests a need for better outreach, extension of the research network and finding new research seeds. It is also crucial to form a strategy for advancing the NIFS's basic policy to move forward from the current stage, given the limited human and budgetary resources. The Section should strengthen its engagement and commitment to taking responsibility for financial and logistical aspects of research programs while players as researchers belong to Units. This role of the Section is of much importance in initiation and launching of new programs and projects. In particular, proactive initiatives by the Section are highly expected at good opportunities such as the MOONSHOT research and development program.

The Section is composed of NIFS researchers (one full-time and seven concurrent faculty members) with diverse background in fusion science. Strengthening the Section's role in analyzing interdisciplinary research trends, strategic planning, cultivating collaborations, and building academic networks remains a key priority. In addition, the rapid growth of private-sector fusion companies offers new opportunities for partnerships and potential collaborations, and the Section is expected to lead assessment of the global landscape of private and public fusion development in collaboration with two other sections at the Fusion Interdisciplinary Coordination Center. For reinforcement of the Section's function, the committee recommends leveraging the expertise of NIFS staff members and external collaborators/advisors in addition to employment of a professional university research administrator.

Collaboration with universities is a cornerstone of interdisciplinary research projects supported by the Section. It is expected to continue cultivating collaborations with advanced academic fields, both domestically and internationally. Existing international collaborations also demonstrate the value of long-term partnerships. The current successful initiatives should serve as a model for extending both domestic and international collaborative avenues under support of the Section. Section's efforts to develop career paths for young researchers are critical to the sustainability of interdisciplinary research and the development of fusion science. Retaining young talents to pursue curiosity-driven research,

rather than narrowly focused projects, will ensure the long-term sustainability of interdisciplinary collaboration.

The Section has also played a role in promoting open science, including public release of the Large Helical Device (LHD) experimental database and the auroral observation data recently obtained by the interdisciplinary collaborations. Synergy of the new EBIT device and NIFS's atomic and molecular database should serve for interdisciplinary research collaborations. These efforts position NIFS to attract international collaborators and expand its research impact. Beyond the data publication, further promotion of open science is encouraged, following the international trends of opening research data and computer simulation codes as well as promoting public relations with broader perspectives. It would increase NIFS's contribution to the global research community and open science initiatives. To push forward the open science research activities, employment of skilled personnel is recommended. Collaborating with and learning from other institutions about best practices in data management and promotion of open science would also be beneficial.

In conclusion, the Section has made excellent progress in advancing interdisciplinary research collaborations and open data activities. Continued support of early-stage research, strategic planning for domestic and international collaborations, and efforts for open science and public relations are essential to sustaining this momentum and positioning NIFS as a world leader in fusion research as well as in interdisciplinary science.

2. 外部資金

はじめに、核融合科学研究所（以下、「研究所」という）における外部資金の獲得についての課題を明確化するため、これを外部評価項目に取り上げたことを評価する。以下、評価の主要点として二つの観点からまとめを示す。第一に大学・研究機関の運営においても外部資金獲得による自主・自立性の強化が強く求められてきている時勢において、研究所自らの状況はどうか、第二にプラズマ・核融合分野の中核拠点として、コミュニティの外部資金獲得への貢献はどうか、という観点である。

第一に研究所自身の外部資金獲得状況については、産学連携体制の整備により、民間からの外部資金獲得が顕著に増加していることは評価に値する。民間との共同研究や受託研究の件数や受入金額は増加傾向にあり、特に核融合スタートアップに関するものが寄与している。大学や産業界と協力して、外部資金を獲得する実績を積み上げつつあることも大いに評価する。民間企業との共同研究を推進することは重要であり、大型共同研究契約を結ぶ戦略の下、今後のさらなる発展のための組織的支援の実施を推奨する。研究所の規模、施設、人的資源

に照らせば、研究所内のシーズと社会のニーズを繋げる相性の良い連携研究を迅速に構築することが可能であろう。

特に、科学研究費補助金及び学術研究助成基金助成金（科研費）の獲得については、早急な改善が必要である。特別推進研究が一件採択されていることは評価するが、科研費全体の獲得水準（標準 29.1%に対し 15.8%）は低迷している。現在、外部資金の公募情報を収集し、「公募事業一覧」の作成や申請促進のためのメール配信、さらに講習会等の開催など情報の公開・周知をはかる努力はなされている。また研究所内で申請書類のピアレビューの実施等の対策も開始している。また研究所内の申請と採択など外部資金の獲得状況に関わるモニタリングは実施し、科研費を取得出来ていない 30%の研究者を支援する必要性は認識されている。しかし、これらの対策の効果は検討されておらず、資料に「改善に向けた目標は策定していない」とある通り、目指すべき目標や具体的な指針、モニタリング指標が策定されていないことについては、早急に対処すべきである。また、競争的資金獲得への意識が薄いことと申請書類に関する技術の未熟さが懸念され、大学で実施例のある「インセンティブの制度化」、「申請義務の徹底」、「組織としての技術支援」等の対応策を検討し、整えることを推奨する。

第二に、コミュニティにおける外部資金の獲得への貢献については、ロードマップ 2023 への申請が採択されている点を高く評価する。また、大学との協力による科研費の獲得状況について、実施課題数に大きな年度変動がなく、所外分担者数は増加傾向にあり、コミュニティとの協働が順調にできるものと研究所の貢献を評価する。大学共同利用機関からの「コミュニティ全体の外部資金獲得への貢献」として、異分野競争となる大型外部資金（学術変革領域研究，特別推進研究，基盤研究（S），NEDO 事業等）への申請と獲得を研究所が母体となって推進をはかる努力を求める。研究力強化戦略室をはじめ、新設した核融合科学学際連携センターやユニット制などの研究所の新体制を大いに活用の上、研究所内に留まらず、コミュニティによる外部資金獲得の向上を目的とする体制の整備・強化を推奨する。

最後に、以下に十分留意されたい。研究所は、より一層自らの外部資金獲得に努力するとともに、プラズマ・核融合科学研究分野の中核たる大学共同利用機関として設備や人材をコミュニティに提供し、協働を促すことでコミュニティ全体の外部資金獲得に貢献することが求められる。ムーンショットをはじめ、広く産学官を巻き込むことを企図した制度や枠組みが整備され、核融合の早期実現への求めが高まる中で、これらの活動を通じて、プラズマ・核融合科学研究の健全な研究推進を図ることを推奨する。

2. External Funding (English translation)

To begin with, the external review committee appreciates the fact that external funding was addressed in the present review in order to clarify the issues and challenges for the National Institute for Fusion

Science (hereinafter referred to as 'NIFS'). Below, the evaluation from two key perspectives is summarized. First, in the current era where strengthening autonomy and independence through external funding acquisition is strongly required for the operation of universities and research institutions, how does NIFS's situation stand? Second, since NIFS is a core institute in the field of plasma and fusion research, how is its contribution to the external funding acquisition in the community?

First, regarding NIFS's own external funding acquisition situation, it is commendable that external funding from private sectors has significantly increased due to the establishment of an industry-academia collaboration system. The number of joint and commissioned research projects with private companies, as well as the amount of funding received, are on the rise, with particular contributions from fusion startups. It is also highly commendable that the NIFS is accumulating achievements of external funding acquisition through collaboration with universities and industries. Promoting joint research with private companies is important, and under the strategy of signing large-scale joint research agreements with private companies, it is recommended to implement organizational support for further development. Given the scale, facilities, and human resources of NIFS, it should be possible to quickly build collaborative research that aligns the research seeds of NIFS with societal needs.

Particularly, the acquisition of Grants-in-Aid for Scientific Research (*Kakenhi*) requires urgent improvement. While it is commendable that one project of Grant-in-Aid for Specially Promoted Research has been adopted, the overall level of *Kakenhi* acquisition (15.8% compared to the standard of 29.1%) remains low. Currently, measures have been initiated, including gathering information on external funding calls, creating a 'list of public funding opportunities,' distributing emails to promote applications, and holding workshops and briefings to disseminate information. Additionally, peer reviews of application documents within NIFS are being conducted. The collection of data of external funding acquisition regarding NIFS’s application and adoption status has been implemented, and the need to support the 30% of researchers who have not got *Kakenhi* has been recognized. However, the effectiveness of these measures has not been evaluated, and as noted in the documents, 'no goals for improvement have been established,' meaning that specific goals, guidelines, and monitoring indicators have not been set. This must be addressed immediately. Furthermore, there are concerns about a lack of awareness of acquiring competitive funds and the underdeveloped skills in applications. It is recommended to consider and implement measures such as 'institutionalizing incentives,' 'enforcing application duties,' and 'providing technical support as an organization,' with referring to good practices in universities.

Second, regarding the contribution to the community in acquiring external funding, the approval of the application to the Roadmap 2023 is highly commendable. Moreover, there has been little fluctuation in the number of research projects based on *Kakenhi* conducted in collaboration with universities, and the number of external collaborators has been increasing. This trend, which indicates smooth collaboration with the community and the positive impact of NIFS, is commendable. As 'Contribution to the external

funding acquisition of the entire community' from an inter-university research institute, efforts are requested for NIFS to take the lead in applying for and acquiring large-scale external funding that involves interdisciplinary competition (such as Transformative Research Areas, Specially Promoted Research, Scientific Research (S), NEDO, etc.). It is recommended to leverage NIFS's new structure, including the Research Enhancement Strategy Office, the newly established Fusion Science Interdisciplinary Coordination Center, and the Unit System, to develop and strengthen the organizational framework aimed at improving external funding acquisition.

Finally, the following should be given due consideration. NIFS is expected to continue making greater efforts to acquire its own external funding. At the same time NIFS should contribute to the external funding acquisition for the entire field by encouraging collaboration with providing its facilities and human resources to the community as an inter-university research institute central in the field of plasma and fusion science. Through these activities, it is recommended that efforts are made to promote the sound advancement of plasma and fusion science research as the demand for the early realization of nuclear fusion grows and systems and frameworks involving a broad range of stakeholders, including industry, academia, and government, such as the Moonshot Research and Development Program, are developed.

3. Additional Suggestions from the External Peer Review Committee

The committee, in constructive spirits, suggests that the following issues should be considered for review in the future.

1) If the review is reduced to a mere annual event that is over once it's completed, it would be waste of time and efforts and loses its value. The committee expects NIFS to make use of the review report for their improvement actions. The committee would appreciate the report from NIFS about their actions and measures taken against the review and their consequences.
2) The committee notes that the review of Fusion Science Interdisciplinary Coordination Center, Development Research Coordination Section (DRCS) is planned for next year.

Main Body

of the External Review Report in FY2024

1. Fusion Science Interdisciplinary Coordination Center, Advanced Academic Research Coordination Section (AARCS)

Perspective 1

What kind of collaboration with Advanced Academic Fields has been established through the activities of this section?

Findings/Evaluation

- After restructuring of National Institute for Fusion Science (NIFS) into the Unit System (US), where the fusion research is pursued as an academic research, collaboration with diverse academic disciplines should be a cornerstone of its activities. It should be highly commendable that, in a relatively short term of the last two years since the launch of the US, a variety of collaborative research with advanced academic fields has been started under the support of Advanced Academic Research Coordination Section (AARCS) with funding efforts. The list covers an impressively wide range of interdisciplinary topics from atomic physics, space and astrophysics, semiconductor manufacturing, data science, and radiotherapy. Each of these achievements is nontrivial and required dedicated and coordinated effort from both responsible researchers and NIFS leadership including AARCS (that is referred to as "The Section" hereafter) and creates academic links between NIFS and other international and/or domestic institutions.
- Fusion research and auroral/magnetospheric physics share a strong affinity due to their common foundation of plasma physics. The Section has facilitated successful collaborations, such as the application of the hyperspectral camera developed by NIFS experts to auroral observation, leading to new findings and resulting in research publications and the opening of a data archive.
- Studies on highly charged ions using an electron beam ion trap (EBIT) device contribute directly to fusion, space, and astrophysical plasma research through atomic physics. Development of a new EBIT device is therefore of great value for collaborative research with universities and academic institutions. In this regard, activities of the Section in supporting the budget acquisition for the new EBIT device construction is commendable.

Recommendations

- It is recommended to continue the efforts for cultivating and supporting collaborations with

advanced academic fields expanding both domestic and international research networks. Within the research activities of each Unit at NIFS, there exist numerous seeds for collaborations beyond the aforementioned themes. Collaborations through theory and simulation or other diagnostics of fusion plasma can be considered.

- The Section should not only continue its efforts to foster budding fields through budget allocations but also take a more proactive role in planning collaborations and extending interdisciplinary networks. In addition to the grass-root activities to establish collaborative research, further strategic planning might be beneficial. More comprehensive assessment could address (1) the large outstanding scientific questions in each area, (2) the special capabilities within NIFS that are expected to lead the areas and (3) the opportunities for funding in each area. Responses to these questions could determine the potential in each area and answer the question, “In which areas is NIFS striving to be a world leader or a strong contributor?”

Remarks

- It could be noted that many technologies/methods created from fusion research (e.g. fusion plasma diagnostics development in the past decades) play important roles in interdisciplinary collaborating activities. Fusion research should still be promoted and emphasized in NIFS, and fusion oriented research will contribute more to collaboration with advanced academic fields.
- Projects receiving supports by the Section should be selected based on collaborative research itself and should not be selected with the main aim of obtaining external funding. Aims and means should not be confused.

<u>Perspective 2</u>

Is the Section's strategy taking advantage of and promoting NIFS's basic policy of "Interdisciplinary development of Fusion Science" from the perspective of Advanced Academic Research Coordination?

Findings/Evaluation

- The Section's strategy to promote interdisciplinary fusion science, to strengthen collaboration and to improve the academic atmosphere is taking advantage of NIFS's basic policy from the perspective of Advanced Academic Research Coordination. Moreover, the Section is promoting NIFS's basic policy from the same perspective and is highly commendable. In fact, the Section made significant supports to the budding and interdisciplinary collaborative research as well as large contributions to upgrading the linear plasma device and introduction of the new EBIT device through budget requests to the government. However, as the number of applications to the budding research and the mini projects remains limited, it is critical to cultivate and encourage new research

seeds.

- At the same time, this strategy implies that the Section is expected to play the leading role in developing the interdisciplinarity in fusion research at NIFS. Fully recognizing the aforementioned role, the Section should take initiative in analyzing the interdisciplinary research trends, finding seeds of interdisciplinary and inter-university collaborations, and developing research networks.
- Efforts of the Section in public relations (PR), such as web-based outreach for supported projects, are adequate and expected to be enhanced in collaboration with the PR office of NIFS.

Recommendations

- The Section should play more proactive roles in nurturing early-stage interdisciplinary research, planning collaborations with universities and NINS, surveying research trends in interdisciplinary fields, and building academic collaboration networks, under intensive communications with NIFS leadership or management office.
- Since budding and interdisciplinary collaborative research is targeting new academic fields, involvement of the next generation is important. Further efforts to attract young researchers and students are recommended, collaborating not only with fusion communities but also with other academic fields.

Remarks

- To improve the environment for interdisciplinary research collaborations, it is necessary to establish a feedback process based on self-evaluation of the current framework at the Section.
- To encourage more number and variety of proposals for early-stage research projects with the aim of “interdisciplinary development of fusion science”, it is meaningful to raise awareness of the Section’s activities both within and outside NIFS. Greater collaboration with NIFS's PR office is also recommended to enhance the outreach activities of the Section.
- It is difficult for the goals and effectiveness of the Section to be met on a fast time scale, since it is governed to some extent by a personnel turnover time. The significant progress that has been made should be measured against the difficulty of the task.
- One of the charges of the Section concerns the “... career paths for young researchers and human resource development.” It is crucial to find a place for young curiosity driven researchers, so that they don’t leave the field. Also, it is important for students and postdocs to be able to pursue their own ideas, as opposed to narrowly directed research on topics of immediate relevance.
- It is also a good time to consider strategizing the directions and areas that NIFS should focus on in the next phase of the US for collaborative research projects, and to make rapid progress converging towards a small number of medium and large research platforms centered at NIFS.

Perspective 3

Has AARCS established a system to support the establishment of research networks, collaboration in different fields, and promotion of international collaborative research, and is it promoting initiatives that are responsible for surveying trends, coordinating, and supporting the acquisition of external funds?

Findings/Evaluation

- It is commendable that the Section is making good efforts which have led to several specific achievements. It is, however, not so clear what contribution the Section made in planning and launching the interdisciplinary collaborative research projects.
- The Section, comprising one full-time faculty member appointed in FY2024 and seven concurrent faculty members with diverse backgrounds, has established a team to conduct collaborations with various academic fields. The planned appointment of a full-time URA staff member in FY2025 for survey of academic research trends is regarded as a commendable effort to strengthen the basic function of the Section.
- Considering possible efforts of the concurrent faculty members, however, further reinforcement of the Section is necessary to advance interdisciplinary collaborations in data science and open science, and to survey the academic research trends and to take initiatives in strategic collaborative research.
- Various supports provided by the Section for external funding applications related to interdisciplinary researches, such as NINS's networked research proposals, the Japan-China-Korea Foresight Initiative, and COE researcher's funding applications, are also commendable.

Recommendations

- The above tasks, such as establishment of research networks, collaboration in different fields, and promotion of international collaborative research are quite challenging and usually take considerable time to see the concrete outcome. Therefore, continued strong support by the Section are highly recommended. It may be important for the future strategy of NIFS development.
- To strengthen the functions of the Section in relation to development of research networks and fostering interdisciplinary collaborations, it is recommended to incorporate external members dedicated to these activities from universities or other research institutions. Discussions among members covering broad expertise could lead to the discovery of new seeds for interdisciplinary collaboration and the expansion of research networks.
- A large number of fusion companies have been started within the past few years, and a lot of investments from private sector have entered into fusion research on a remarkably short time scale. It is thus recommended that the Section and the two other sections of Fusion Science Interdisciplinary Coordination Center, NIFS, surveys a landscape of the private sector fusion development worldwide and evaluate their appropriateness and productivity for collaborations.

- It is urgent to employ or develop talented a full-time URA (University Research Administrator) without waiting for budget acquisition but with NIFS's budget to develop strategy for promoting establishment of research networks, collaboration in different fields and international collaborative research and for acquiring external funds.

Remarks

- It should be reminded that staff working on URA are in high demand at various academic institutions in recent days. Communicating with professional URAs in other institutions and universities is also valuable for exchange of information on research trends and activities and for establishment of research networks.
- The importance of interdisciplinary collaborations has widely been recognized in NINS, which has a long history of research networks and currently promotes Open Mix Lab programs. It is expected that the Section contributes to the interdisciplinary activities at NINS to take advantages of synergy effect.
- Another source of international collaboration that NIFS/NINS has already exploited are joint centers with other national laboratories. Examples are the collaboration between NINS and the Max-Planck Institute for Plasma Physics as well as the decades long US-Japan Joint Institute for Fusion Theory (JIFT) program. JIFT has promoted exchange via visits and workshops that have created many long-term international collaborations. It is recommended to seek and promote the existence of such collaborative avenues both domestic and international.

<u>Perspective 4</u>

Has AARCS specifically promoted support for collaboration and cooperation between units and universities?

Findings/Evaluation

- It is essential to establish strong collaborations with universities in Japan, not only for collaborative research itself but also for joint construction of medium and large-scale research platforms. It is excellent that nearly all projects supported by the Section involve university members.
- More specifically, the Section supports dedicated budding collaborative research and mini-projects involving researchers from universities and other institutions. Five mini-projects have been supported with one year (FY2024) budget, and another one project is supported from FY2023. Organizing workshops with RIKEN is also commendable.
- The funding allocation for the early-stage projects proposed by Units is commendable as a fundamental support before application to external funding in interdisciplinary fields. However, the relatively low number of applications for the funding of budding research and mini projects

implies room for improvement in the Section's efforts, such as enhancement of outreach activities and finding interdisciplinary research seeds.

Recommendations

- A more strategic approach might be beneficial to strengthen interdisciplinary collaborations between Units and universities so that the limited resources are spent on focused areas. This needs careful strategic planning with strong external input and support.
- The above key strategic planning should not wait for funding for a new employee. Among the NIFS staff or its university collaborators, there should already be the capacity for the important strategic planning in collaboration with the Section members.
- In parallel to the strategic approach, the Section's support of the grass-root projects should be enhanced with budget allocations for longer terms.
- The Section should also host or support more collaborative research meetings with specific goals to develop joint research plans and proposals and to create much more diverse opportunities.

Remarks

- The strategic approach could also be guided by the answers to various questions such as: What are the topics that might connect to topical interests of funding agencies in Japan? For which topics can NIFS be a national or world leader?

<u>Perspective 5</u>

Has AARCS supported the promotion of open science and is there a system in place to do it?

Findings/Evaluation

- The Section promotes open science by supporting the public share of LHD historical experimental data. This is outstanding and will make a great contribution to fusion research community in the future, opening a new opportunity for NIFS to attract international collaborators.
- The atomic and molecular (AM) database for fusion and plasma research has long been managed by NIFS. Synergy of the new EBIT device and AM database should serve for interdisciplinary research collaborations.
- The Section has also supported publication of the auroral observation data, and development of the fusion plasma database. These contributions are also excellent.
- However, organizational efforts to promote open science are not quite visible except for the data publication.

Recommendations

- In accordance with the open science policy, it would be beneficial for academic researchers to prepare a portal web site, introducing multiple database platforms operated by NIFS.
- It is suggested that making the aurora data archive easier to access with instructions for outside users will contribute to more collaborations and academic results.
- The Section is also expected to provide support for the publication of other experimental data at NIFS, such as those from experiments of fusion reactor materials and linear plasma devices. Additionally, promoting the public release of simulation codes developed at NIFS would be worthwhile as an open science initiative in accordance to the international academic trends.
- As databases become larger, more complex, and more diverse, however, talented and dedicated human resources are required. As the demand for them at academic institutions is increasing, it is recommended to invite or to employ talented people who have expertise in the properties of the data itself and how to use it for the academic research as well as the database construction. It should also be valuable to communicate with other institutions and universities to learn from each other and even to do some joint projects for open science.
- Press Release and PR activities are important for the promotion of open science. Organizational efforts in collaboration with the PR office are recommended.

Remarks

- Significance of data publication as part of open science lies not only in preserving the data accessibility but also in its potential to foster research collaborations. To enhance the impact of open data, it is crucial to collect and utilize statistical data, such as the access counts to the database and the number of data reuse. Data publication should not be an endpoint but a starting point to leverage broader and interdisciplinary engagements.

2. 外部資金

項目1 科研費に代表される外部資金の獲得状況動向はどうであるか。

所見

○ 科学研究費補助金について

・ 特別推進研究が一件採択されていることは高く評価できる。しかし、獲得水準（標準 29.1%に対し 15.8%）は低迷しており、早急な改善が必要である。JST の創発的研究支援事業や戦略的創造研究推進事業（さきがけ、CREST）についても同様である。

・ 平均採択率が 30%を超える種目（若手研究、研究活動スタート支援、基盤研究（C）など）の採択率が低いこと、7 年間で科研費の代表者を全く務めていない研究者が 30%（大半が 50 歳以上）を占めること、定常的に外部資金を獲得すべき中核研究者（教授、准教授な

ど）について科研費の基盤研究（S)、基盤研究（A)、学術変革領域研究（A）などの大型科研費の獲得件数が少ないことが懸念される

・ 若手研究、研究活動スタート支援の採択率が低いことは特に重要な問題である。次のステップである基盤研究（C）から基盤研究（B）などの上位種目の科研費、さらに JST 事業の研究費獲得が期待出来ず、将来、より大きな競争的資金を獲得することが困難となることが懸念される。

・ 応募可能な科研費の申請をしていない研究者が多く、可能申請数に対する申請実数の比率が少ないこと、また総じて競争的資金獲得に対する低い意識と技術不足が憂慮される。

・ 学術変革領域研究の領域代表者としての申請数も少ないことが憂慮される。

・ 2017 年の科研費の審査区分の変更により、プラズマ核融合分野の主な申請分野が総合工学から数物科学系（プラズマ学）となったことも科研費獲得率の低下の外的要因として考慮される。

◯ 民間からの外部資金獲得について

・ 産学連携体制の整備により、民間からの外部資金獲得が顕著に増加していることは評価する。民間との共同研究や受託研究の件数や受入金額は増加傾向にあり、特に核融合スタートアップに関するものが寄与している。

助言

◯ 科研費獲得について

・ 研究所がより積極的に申請に関与し、意識及び技術面での改善を図り、また可能な場合は必ず申請するものとする組織的な方策を講じる必要がある。研究所として、科研費に積極的に応募する雰囲気を醸成し、外部資金申請を義務付ける、申請努力に応じて賞罰を課すなどの方策が必要であると思われる。

・ 改善のための参考として、大学では以前から外部資金獲得に向けて組織的に支援環境作り、雰囲気の醸成に取り組んでいる。大学や他の研究機関で既に実施されている意識や技術面の改革方策を調査の上、参考にしてプラズマ核融合分野に適した制度を考案、実施することが望まれる。

・ コミュニティの中核をなす研究所はコミュニティを巻き込んだ大型の科研費獲得に積極的に努力すべきである。

・ 今後の体制や方策の立案において、科研費制度が新しくなったことも十分に配慮されるべきである。

・ 研究所において、外部資金獲得を目的とした運営制度の立案及び競争的資金獲得支援を組織的に実施する体制や URA の積極的活用及び研究力強化戦略室や核融合科学学際連携センターなどの担当部署の強化・整備を推奨する。

◯ 民間からの外部資金獲得について

・ 今後のさらなる発展のため組織的支援の実施を推奨する。

留意点　改革や制度の実施にあたっての留意点について以下に記す。

○ 新しい科研費制度への対応について

・ 小区分（プラズマ科学、核融合学、プラズマ応用科学、量子ビーム科学）は当該分野から審査員が選ばれるが、大区分 B（数物科学系）、中区分（プラズマ学及びその関連分野）の申請となる大型科研費に対しては申請区分の転換により広い学術分野から審査員が選出されることなどに十分に配慮すべきである。

○ 意識の側面について

・ 若手研究者は研究活動スタート支援、若手研究、挑戦的研究（開拓・萌芽）などの採択率が少ない。これらの小規模ながら研究費を獲得できる固有の機会を持つ若手研究者だけでなく、特に 50 歳以上の研究教育職員にも科研費等の外部資金がなくても研究を遂行できるという意識があること、もしくは周囲がそのような雰囲気を惹起していることが懸念される。また、実験・工学分野で基盤研究（B）の申請数は多いが採択数が少ないことは、NIFS-QST 協力研究などで基盤研究（B）程度の研究費が得られるため、真剣さを欠いた申請内容になっていることを危惧する。また、基盤研究（S）、基盤研究（A）、基盤研究（B）の不採択後はそれぞれにより規模の小さい研究種目へ変更することが多いとの分析結果から、研究教育職員に外部資金を獲得しないと研究が遂行できないとの切実感が欠如していることが推測され、意識改革の重要性を指摘する。

○ 技術的側面について

・ 採択率の低さは申請書類の作成技術が拙いことにも起因すると思われる。挑戦的研究（萌芽）の採択率が低いことはプロジェクト志向が強く、未開拓領域に挑戦する研究意識が乏しいことが懸念される。特に研究活動スタート支援、若手研究が獲得できていないことは若手への申請書類作成技術の更なる指導の必要性を物語っており、研究所がこの技術の向上に真摯に取り組むことが望まれる。

○ 申請数について

・ 挑戦的研究（萌芽）は基盤研究（A），（B）とは重複申請可能であり、もっと多くの研究者が申請できるはずである。申請数について，研究教育職員が実際に代表者として申請できる数（例えば基盤研究（A）と挑戦的研究（萌芽）は重複できる，学術変革領域研究の計画研究も重複できるのでその最大数）を満たしていないと思われる。組織として申請を義務とする取組みが望まれる。

項目2 外部資金の情報収集、着手や段階的な大型化を促す制度整備など、所員による外部資金獲得を有効に支援しているか。

所見

○ 研究所の現状について

・ 外部資金公募の情報収集や、「公募事業一覧」の作成、申請促進のためのメール配信、さらには講習会や説明会を開催するなど、外部資金公募情報の収集と公開・周知、また研究

所内での申請書類のピアレビューの実施などの多くの努力は評価する.

・ 科研費セルフチェックリストは良い試みとして評価する。しかし、単に項目をチェックするだけでは不十分であり、どうしてそのように考えるかを記述してもらう必要がある。この記述は後の分析で有用な情報となると思われる。

・ ピアレビューは有効な手段であり、一部の研究者は真剣に科研費を獲得しようと、これを活かしていることは間違いない。しかし、ピアレビューを受けているのは希望者のみで、人数は少なく、真に申請書類の改善が必要な研究者の割合や採択に有効に機能したか、など把握されていない。今後、予定されているビアーレビューの検証に期待する。

◯ 大学との比較について

・ 大学ではより多様な外部資金獲得支援システムを導入しており、トップ 30 の科研費申請採択率は 40%になるほど高まっている（10~20 年前はこの数字が 30%程度)。この事実と比較すると核融合研究所の支援は未だ不十分であると思われる。

助言

◯ 研究所の現状について

・ 現行の努力に加え、外部資金の申請数や採択率を上げるために、「有用な制度や設備が提供されているか」、「実施してきた方策が有効であるか」、「どれだけ徹底されて実施されたか」などを採択状況の時系列や科研費の採択状況に鑑み、検討することを推奨する。

・ 研究教育職員の科研費、特に大型科研費の獲得に対する意識の問題改善のために、組織的方策や支援制度が必要である。特に、若手研究者については中核研究者となる前に根本的改革を実施し早急に改善することが望まれる。

◯ 大学との比較について

・ 大学などで実施されている組織的支援、i) インセンティブの制度化、ii) 申請義務の徹底、iii) 申請技術の支援を専門とする部署の整備、などが推奨される。上記３点について、対策を早急に進めるべきである。以下に具体例の紹介を交え詳述する。

i) インセンティブの制度化

・ 大型科研費獲得課題（基盤研究（S)、基盤研究（A））に対して研究費などを含む研究環境の優遇措置を実施する。例えば、大型科研費獲得課題に代表者として応募しヒアリングなどで不採択であった場合、次年度に同じ種目もしくは上位の種目に応募することを前提として研究費を支給するなど。

・ 個人評価、さらには昇任・再任審査の項目として、外部資金獲得に関する評価の位置づけを上げる。競争的資金の申請にそぐわない業務に専念している場合などは例外規定を設ける。

・ 企業が関係した研究費を獲得している研究者をバックアップする体制を作る。単に外部資金の獲得金額に依らず、研究所が奨励及び支援することで更なる発展が見込まれる。

ii) 申請義務の徹底について

・ 年度ごとに申請可能な科研費に確実に申請する仕組みを構築すべきである（研究者全員に

その年に申請できる種目が書かれた一覧表が配布される組織もある)。一方で、業務の種類に応じて、所員の外部資金獲得に向けた余力の程度にも考慮する。申請可能であるにも関わらず申請を怠った研究者に対し研究費の削減などの罰則を施行する(科研費申請を怠った研究者の所属組織に罰則がある大学もある)など。

iii)組織としての申請技術の支援について

・ 適任者(教授やURA、最近ではAIによる評価も行っている大学もある)によるピアレビューなどの応募支援体制を組織的に整備、さらに充実する。例えば、申請者全員にピアレビュー受審を義務化するなどの組織的な仕組みを導入し、組織全体の技術の底上げに注力する。
・ 若い所員は、申請書類の作成技術が未熟である場合も多く、ある程度外部資金を獲得して習熟するまで重点的に支援する。例えば、申請書類の作成技術をわかりやすく伝えるセミナーを行う。
・ 大型科研費の場合、広い分野へのアピールが重要である。申請の適切性、方向性や戦略の妥当性、ヒアリング対策などについて適切な支援が必要である。
・ 研究者の自助努力、相互査読を推奨する。申請前に、ユニット等で申請課題に関するプレディスカッションによるブラッシュアップや研究所内で採択された課題の申請書類を閲覧できるようするなど、である。

留意点 「申請書を作成する負荷は小さくないので、ボランタリーに申請してくれる件数が増大することはあまり期待できない」と参考資料にある。ここにも項目1で述べた競争的資金獲得への意識が反映されていると思われる。意識や技術面の改革には研究者及び組織双方の努力が必要であることに留意されたい。

◯ 研究者側について

・ 外部資金の獲得が少ないあるいは採択率が低い場合、研究に対する姿勢や、外部資金獲得に対する意識などを調査し、研究を進める上で外部資金の獲得が必須であることを熟知してもらうことが必要である。また、不採択の場合に問題点の自己分析、不採択の原因や今後の方針の報告は外部資金への意識を高めるために意義がある。

◯ 組織側について

・ 研究者の実情を詳細に調査し現状を把握して、個々に応じた対応が必要である。例えば、比較的高いA評価での不採択の場合は、改善の上、継続すれば次期獲得の可能性が高い。しかしB, C評価での不採択が多い場合は適任者の積極的かつ強力な技術面での指導が必要である。

項目3　外部資金の獲得状況を分析し、改善に向けた指針と目標を策定しているか。

所見

◯ 状況分析とデータについて

・ 顕在化していた外部資金獲得における問題点を明確化するために今回の外部評価項目に取り上げた事実は評価する。

・ 研究所内の申請状況と採択状況などの外部資金の獲得状況のデータ収集は良く実施されておりデータは提示されている。

◯ 指針と目標の設定について

・ 資料では、個別の課題に対する「改善に向けた指針」として、科研費を獲得していない 30%の研究者の支援と上位種目へ挑戦すべき、と提言していることは評価する。

・ 資料に「改善に向けた目標は策定していない」とある通り、目指すべき目標や具体的な指針が策定されていない。

助言

◯ 状況分析とデータについて

・ 提示されたデータに対して、より徹底した分析を行い、研究所は問題点を強く認識して、目標（例えば、申請数、採択率、獲得金額、科研費 PI 者数など）及びその達成に向けた指針を掲げて改革を実施することが必要である。

◯ 指針と目標の設定について

・ 目標や具体的な指針の策定を早急に実施すべきである。

・ 研究者についての重要な指針としては、将来を担う若手による申請課題の採択率の向上、中堅以上の研究者の大型科研費獲得があげられる。また、目標として、例えば科研費の申請率 100%や採択率 30%の達成などがあげられる。

・ 組織としては、獲得状況の分析に基づく指針と施策を計画して対策を実施し、研究所内への結果の公表と評価を行い、次の計画に反映させることが推奨される（PDCA サイクルの活用）。1 年ごとの変化に惑わされず、状況分析と抜本的な意識、技術、支援体制の改善を継続することが不可欠である。目標と実情の差分に基づいて具体的な対策を講じることが必要であり、その意味でも指針と数値目標を早急に策定することが喫緊の課題である。

留意点　指針と目標の設定の際に注意すべき 3 点について述べる。

i) 外部資金獲得文化の醸成

・ インセンティブや積極的な支援を与えるなど、外部資金（科研費、NEDO 及び JST 事業、企業からの委託研究など）を獲得した研究者を奨励し、紹介、重宝する文化を作り上げる。外部資金獲得文化の醸成なしでは現在の草の根的活動が衰退することが憂慮される。

ii) ユニット制の活用について

・ 外部資金獲得実績をユニット活動の評価指針として重視する。所員の意識改革のためユニ

ット毎の外部資金獲得実績を公開する（部局毎の外部資金獲得状況を公開する大学もある）。

iii) 実績と経験の共有化について

・ 外部資金の獲得率改善には，技術や経験を活用することが重要である。採択率の高い研究者やレビュー経験者で構成する対策検討グループを設置する。申請する分野（中区分，小区分）毎に、特に、大型科研費獲得（学術変革領域研究や基盤研究（Ｓ）・（Ａ）等）について、採択経験者の獲得状況や戦略を分析して周知する。

項目4　大学や産業界等と協力してコミュニティ全体の外部資金獲得に貢献しているか。

所見

◯　大学や産業界との協力について

・ 大学との協力による科研費の獲得状況について実施課題数に大きな年度変動がなく良好である。

・ 所外分担者数は増加傾向にあって、コミュニティとの協働が順調にできており、研究所の貢献を評価する。

・ 大学や産業界と協力して、外部資金を獲得する実績を積み上げつつあることは大いに評価する。民間企業との共同研究を推進することは重要であり、民間企業との大型共同研究契約を結ぶ戦略の下、更なる進展に期待したい。

◯ コミュニティ全体への貢献

・ ロードマップ 2023 の申請・採択によって、コミュニティ全体として外部資金獲得に繋がる基盤構築に貢献した点は高く評価する。

助言

◯ 大学や産業界との協力

・ 学術変革領域研究などの外部資金については、学際的連携が不可欠で新学術領域の創生が求められる。ユニットやユニット間連携、あるいは共同研究を通して申請を実施することが有効であろう。

・ 産学連携については、研究所の研究者数からすれば、研究所内のシーズと社会のニーズの調査を定常的に実施し、少しの調整で繋がる相性の良い研究連携システムを迅速に構築する仕組みを作ることが可能であろう。

◯ コミュニティ全体への貢献

・ 大学共同利用機関として研究所は、「コミュニティ全体の外部資金獲得への貢献」を、分野間競争となる大型外部資金（学術変革領域研究，特別推進研究，基盤研究（S），NEDO 事業等）の申請及び獲得を研究所が中心となって推進することと捉えることが必要である。

・ コミュニティ全体の外部資金獲得については研究所の新体制（産学連携体制、ユニット制

など）の果たす役割は大きく有効に活用すべきである。個々の研究者の独自の発案に基づいた大型科研費の申請を支援するとともに、ユニット体制の利点を活かし得るネットワーク型の外部資金獲得に尽力することを推奨する。

・ 研究所や大学が有する実験装置を含む研究設備も大型資金の申請及び獲得後の計画推進の基盤となり、コミュニティ全体に貢献することを期待する。特に従来のコミュニティを超えて学際的に展開されているムーンショットなどのプロジェクトについても設備や環境の提供が図られるべきである。

・ 今後もコミュニティ全体の外部資金獲得状況を精査し、明確な目標を設定してより良い支援体制の下でコミュニティの外部資金獲得に貢献することを望む。

留意点

・ 大学共同利用機関としての研究所の役割は、基盤研究（A）や基盤研究（B）での分担者を増やすことではなく（それはそれで価値あることであるが）、当該分野の存在感を示す意味での大型科研費の獲得を支援することにある。このため、学際的展開を具現化する意味で学術変革領域研究など新たな領域創成を目指す外部資金の獲得を、代表者の所属機関を問わず支援することが必要である。短期間の準備では採択されることが難しい学際的大型資金の獲得に対し，研究所は戦略的にワーキンググループ等をつくり，時間をかけて議論する場を提供することができる。広い学術分野間の競争となる外部資金の獲得はプラズマ核融合分野の存在意義を示すものであり、研究所の多大な役割を担うことが求められる。

Annex

1: List of FY2024 NIFS External Peer Review Committee members

[External Peer Review Committee members]

	Ishida Shinichi	Deputy Director, National Institutes for Quantum Science and Technology (QST)
	Ueda Yoshio	Professor, Otemon Gakuin University
	Ozawa Tohru	Professor, Faculty of Science and Engineering, School of Advanced Science and Engineering, Waseda University
	Kaneko Toshiro	Professor, Graduate School of Engineering, Tohoku University
●	Fujisawa Akihide	Professor, Research Institute for Applied Mechanics, Kyushu University
	Fujita Takaaki	Professor, Graduate School of Engineering, Nagoya University
	Matsuoka Ayako	Professor, Graduate School of Science, Kyoto University
	Morii Takashi	Professor, Faculty of Health Sciences, Kyoto Koka Women's University
◎	Yamada Hiroshi	Professor, Graduate School of Frontier Sciences, The University of Tokyo
	Yoneda Hitoki	Professor, Institute for Laser Science, University of Electro-Communications
○ ●	Watanabe Tomohiko	Professor, Graduate School of Science, Nagoya University
	Stewart Prager	Professor, Astrophysical Sciences, Princeton University, USA
	Philip J Morrison	Professor, Department of Physics, The University of Texas at Austin, USA
	Yuntao Song	Director-General, Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China

[Specialist Committee members]

Hantao Ji	Professor, Astrophysical Sciences, Princeton University, USA

◎: Chairperson, ○: Vice Chairperson, ●: Expert Subcommittee's Chairperson

List of FY2024 NIFS External Peer Review Committee members
Expert Subcommittee on Fusion Science Interdisciplinary Coordination Center, Advanced Academic Research Coordination Section

[External Peer Review Committee members]

	Ozawa Tohru	Professor, Faculty of Science and Engineering, School of Advanced Science and Engineering, Waseda University
	Fujita Takaaki	Professor, Graduate School of Engineering, Nagoya University
	Matsuoka Ayako	Professor, Graduate School of Science, Kyoto University
●	Watanabe Tomohiko	Professor, Graduate School of Science, Nagoya University
	Stewart Prager	Professor, Astrophysical Sciences, Princeton University, USA
	Philip J Morrison	Professor, Department of Physics, The University of Texas at Austin, USA
	Yuntao Song	Director-General, Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China

[Specialist Committee members]

Hantao Ji	Professor, Astrophysical Sciences, Princeton University, USA

●: Expert Subcommittee's Chairperson

List of FY2024 NIFS External Peer Review Committee members
Expert Subcommittee on External Funding

[External Peer Review Committee members]

	Ishida Shinichi	Deputy Director, National Institutes for Quantum Science and Technology (QST)
	Ueda Yoshio	Professor, Otemon Gakuin University
	Kaneko Toshiro	Professor, Graduate School of Engineering, Tohoku University
●	Fujisawa Akihide	Professor, Research Institute for Applied Mechanics, Kyushu University
	Morii Takashi	Professor, Faculty of Health Sciences, Kyoto Koka Women's University
	Yoneda Hitoki	Professor, Institute for Laser Science, University of Electro-Communications

●: Expert Subcommittee's Chairperson

2: Backgrounds

The National Institute for Fusion Science (below as NIFS) was established in 1989 as an inter-university research institute to advance fusion research in universities in Japan.

Since 2004, NIFS has been a research institute under the Inter-University Research Institute Corporation National Institutes of Natural Sciences. Upon becoming an inter-university research corporation, a system for mid-term goals and mid-term planning spanning six years was introduced, and a system of annual evaluations regarding the progress, too, was introduced. This annual evaluation focuses primarily upon administrative management. In addition, at NIFS it has been determined that receiving external evaluations of research results is important. Under the NIFS Advisory Committee, each year an External Peer Review Committee is organized, and the members evaluate the research. The topics of evaluation and its perspectives are determined by the Advisory Committee. The evaluation is undertaken by the members of the External Peer Review Committee, which is composed of experts who are external members of the Advisory Committee and external experts who are appropriate for evaluating the topics. The External Evaluation Committee submits its evaluation results to the Advisory Committee. Then, NIFS, together with making the results public by uploading that information to the NIFS homepage, utilizes this information to improve research activities in the following years.

The topics for evaluation for the External Peer Review Committee are discussed and decided upon by the Advisory Committee, and those topics for evaluation differ each year. Most recently, in 2022 “Human Resource Development”, “International Collaboration”, and the “Department of Engineering and Technical Services”, and in 2023 “Unit System” and “Fusion Science Interdisciplinary Research Center, Industry-Academia-Government Coordination Section” were topics evaluated by external reviewers. This year, 2024 “Fusion Science Interdisciplinary Coordination Center, Advanced Academic Research Coordination Section” and “External Funding” were selected and reviewed by the external examiners.

As external members of the External Peer Review Committee this year there are eleven external members from the Advisory Committee and three members from abroad. Further, one expert is invited from abroad. Thus is the External Peer Review Committee composed, and thereby the evaluation was undertaken.

The first meeting of the External Peer Review Committee including the Experts’ Subcommittee was convened on September 11, 2024. The Committee discussed the process for moving forward with this fiscal year’s external peer review. The second meeting of Experts’ Subcommittee on the “External Funding” was held on October 16, 2024. The second meeting of Experts’ Subcommittee on the “Fusion Science Interdisciplinary Coordination Center, Advanced Academic Research Coordination Section” was held on October 21, 2024. NIFS provided a detailed explanation that utilized documents from the materials and reports based

on the perspectives. A question-and-answer session also was arranged. Extra-meetings primarily for international members were organized for “Fusion Science Interdisciplinary Coordination Center, Advanced Academic Research Coordination Section” on October 31, 2024, with participation of major members in Japan. Subsequently, the second meeting of the External Peer Review Committee and the third meeting of the Experts’ Subcommittee was held on January 20, 2025. The Committee discussed the coordination of the evaluation work and confirmed the configuration of the external peer review report based on the drafts from two sub-committees. Then, the committee elaborated the report through communications by electronic mail. Upon confirmation and examination by the External Peer Review Committee and the Experts’ Subcommittee, the external review report was finalized on February 28, 2025.

In the external evaluation regarding “Fusion Science Interdisciplinary Coordination Center, Advanced Academic Research Coordination Section”, and “External Funding” which were implemented this fiscal year, the perspectives for the evaluation were determined as follows.

Evaluation items in FY2024 External Peer Review

The external peer review of "Fusion Science Interdisciplinary Coordination Center, Advanced Academic Research Coordination Section (AARCS)" and " External Funding (EF)" is conducted in FY2024 with the evaluation perspectives set as follows. Each evaluation perspective is essentially based on the evaluation of the appropriateness and achievement of research and other activities conducted by the National Institute for Fusion Science (NIFS) as an Inter-University Research Institute, as well as the future direction and strategy in referring to the "Recommendations for the Future of NIFS", the "Recommendations for the Future Collaborative Research of NIFS" and the "Recommendations for the Future Large Research Facility Plan of NIFS" compiled by the appointed working group and endorsed by the advisory committee from FY 2021 to FY 2024, respectively.

In addition, the following points presented as "recommendations" in the previous peer review report of "Fusion Science Interdisciplinary Coordination Center, Industry-Academia-Government Coordination Section" and "Unit System” in FY2023 are also taken into consideration in this evaluation.

Recommendations from the FY2023 external evaluation

The low level of competitive funding has always been a problem in the past years. Although there is no silver bullet, each member in NIFS should learn from each other and come up with ways for external funding with taking opportunity of the on-going revolution for interdisciplinary development of fusion science. Strategic approaches are requisite depending on the dimension and the framework of

fundings. Institutional efforts to secure the budget for large-scale platforms shared with communities are also indispensable.

Perspective on “AARCS”

(1) What kind of collaboration with Advanced Academic Fields has been established through the
activities of this section?

(2) Is the Section's strategy taking advantage of and promoting NIFS's basic policy of "Interdisciplinary development of Fusion Science" from the perspective of Advanced Academic Research Coordination?

(3) Has AARCS established a system to support the establishment of research networks, collaboration in different fields, and promotion of international collaborative research, and is it promoting initiatives that are responsible for surveying trends, coordinating, and supporting the acquisition of external funds?

*1 The focus will be on evaluating the activities of the target department, but collaboration with other departments will also be evaluated.

(4) Has AARCS specifically promoted support for collaboration and cooperation between units and universities?

(5) Has AARCS supported the promotion of open science and is there a system in place to do it?

*2 Note the expectations for Fusion Science Interdisciplinary Coordination Center noted in "5. from the viewpoint of collaboration with budding or futuristic small- and medium-scale research" in "Recommendations for the Future Large Research Facility Plan of NIFS".

Perspective on “EF”

(1) What is the status of obtaining external funds represented by Grants-in-Aid for Scientific Research?

(2) Has NIFS effectively supported the acquisition of external funds by the institute's staff by collecting information on external funds and developing a system to encourage initiation and gradual increase in the grade of the funds?

(3) Has NIFS analyzed the status of acquisition of external funds and developed guidelines and goals for improvement?

(4) Has NIFS worked with universities, industry, and others to help the community as a whole to obtain external funds?