

International evaluation report for Global Institute for Materials Research Tohoku: GIMRT

GIRMT has certified as one of 6 International Joint Usage/Research Center in November 2018 and the international advisory and steering committee was asked by IMR director to provide an evaluation report for the activity in FY2018-2020 based on five key questions as below.

Summary

The broad scope and varieties of the program of GIMRT contribute to collaboration and the researcher's needs. The bridge proposal scheme is effective and useful for international collaboration. There is a large percentage of international proposals and collaborations with high-profile and highly coordinated researches across the disciplines.

1. The numbers of the proposal and international fraction show the open access. The unique facilities and activities are recognized and are open for easy access. The flexibility of operation and various efforts under the covid pandemic support community.
2. The publication record, international joint papers, and high-profile outputs show the usefulness of the GIMRT program to produce significant scientific and technical outputs.
3. GIMRT program supported the research and the bi-directional international exchange of the young researchers, as shown by the fraction of the supported participants.
4. The quality of the GIMRT program is at a high international level. The program's scheme, the availability of a broad range of support for young researchers, is the GIMRT program's uniqueness.
5. We conclude that this program has been successful for international collaboration and recommend a continuation for the next term.

Recommendation for further improvement

1. The GIMRT program could be advertised more extensively and the communication about the possibilities for external users can be improved.
2. We recommend that the presence and the activity of GIMRT should be spread and announced more to both domestic and international communities using SNS.
3. Analyze the content of the publications and the contribution of GIMRT. Monitor the fraction of the international joint paper continuously.
4. Support for the young researcher is the unique and excellent points of the GIMRT program. Therefore, the continuation and the further improvement are strongly recommended.

On behalf of the committee



Somei Ohnuki
Date 9 June, 2021

Names of committee member and affiliations

- Prof. Arne Brataas, Norwegian University of Science and Technology, Norway
- Prof. Yongmin Kim, Dankook University, Korea
- Prof. Junichiro Kono, Rice University, USA
- Prof. Jens Müller, Goethe-University Frankfurt, Germany
- Prof. Somei Ohnuki, University of Science and Technology, Beijing, China
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- Prof. Yoshiki Nakanishi, Iwate University, Japan
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- Prof. Satoshi Shioiri, RIEC, Tohoku University, Japan
- Prof. Tomoyuki Akutagawa, IMRAM, Tohoku University, Japan
- Prof. Shinichi Orimo, AIMR, Tohoku University, Japan
- Prof. Tadashi Furuhashi, IMR, Tohoku University, Japan (not involved in the evaluation)

Result of the evaluation

Evaluation Item 1

Has GIMRT contributed to the development of the international collaboration in materials science and related community? Is it effective to coordinate the collaboration among IMR, oversea and domestic researchers?

Rating 87 % (calculated by number of yes/number of answer)

Yes 13/15, May be, but difficult 1/15, No answer 1/15

1. Bridge proposal scheme is effective and useful for international collaboration.

- It is very effective to coordinate the collaboration among IMR, oversea and domestic researchers including private companies.
- Bridge programs could help young researchers in Japan to be involved more in the world-wide society of their fields. It is also amazing that even young researchers who do not belong to Tohoku Univ. can get support for performing collaboration research abroad.
- Effective in generating new collaborations at all levels.
- It is particularly useful that it can support visits of collaborators from other regions of Japan at the same time as foreign researchers come to Tohoku University
- Wide range of collaboration researches from domestic to international levels has been well organized in the present system.

2. Broad scope and varieties of program contribute collaboration and researcher's needs.

- The broad scope and depth of the GIMR contribute to the international collaboration in materials science.
- The number of collaborations and proposals, for example, 22% of the RDG collaborations where overseas institutions in FY2019.
- The program provides various types for collaboration, which must fit specific needs of researchers.
- Quarterly occasion of the application and the chance of rebuttal to the referee's evaluation are quite impressive.

3. Large percentage of international proposals and the collaborations for high profile and highly coordinated multi-components researches.

- The program is effective to progress in the material science, especially in highly specific physical measurement.
- HFLSM had about 15% of its proposals from overseas in 2020. Collaborative experiments included Dresden, pulsed-field x-ray measurements at SPring-8, and measurements using the high-field superconducting magnet at IMR.
- CNSAM had more than ¼ of its proposals from overseas in 2020. It has successfully combined neutron diffraction at J-PARC with complementary muon and x-ray experiments.

Recommendations

1. The presence and the activity of GIMRT should be spread and announced more to both domestic and international communities using SNS.

- Whereas GIMRT has contributed significantly to the community, the contents of the GIMRT programs are not well known yet. I noticed much information is available in its web site, but the presence and the activity of GIMRT should be spread and announced more to both domestic and international communities using SNS, mailing lists arranged by various communities, etc.

Other comments

Difficult to evaluate for the activity of the last financial year, due to COVID-19 pandemic.

Evaluation Item 2

Do GIMRT's programs open for researchers in both domestic and overseas institutes? Does the program offer the access to IMR's unique facilities and the activities?

Rating 93 %

Yes 14/15, No answer 1/15

1. **Numbers of proposal and international fraction shows the open access.**
 - The number of the participants is a strong piece of evidence.
 - The HFLSM and CNSAM programs receive the bulk of their proposals from domestic institutions and a healthy fraction from overseas institutions.
2. **The unique facilities and activities are recognized and are open for easy access.**
 - It has opened for researchers in the field of materials science, by using unique facilities and collaborations.
 - The GIMRT collaboration programs open to the inside and outside of Japan without any barrier.
 - The GIMRT programs allow domestic and overseas researchers to access those fantastic facilities and collaborate with world-leading groups quite effectively.
 - Those researchers who have already existing collaborations with IMR may find it easier to evaluate the possibilities for joint experiments.
 - IMR has many unique facilities, such as renowned high magnetic facility, neutron facility, and supercomputer designed for materials science. Activities of individual research groups are also high in the world standard.
 - There is a wide range of options reflecting not only the research interests of the IMR faculty, but also the available user centers.
3. **The flexibility of operation and various efforts under the covid pandemic support community.**
 - Generous flexibility under the covid pandemic situation, such as extension of the research term, carry-over of the fund, and the introduction of the measuring-the-sent-samples system, indeed greatly help continuous activity and steady progress in researches of other universities and institutions.
 - GIMRT's active organization of domestic/international online workshops has also contributed to partly but significantly compensate the reduced scientific exchange and communications among the community.

Recommendations

1. **The GIMRT program could be advertised more extensively and the communication about the possibilities for external users can be improved.**
 - The status of disclosure to overseas research institutes may not be clearly inferred from the present documents.
 - It may be worth to think about how to best communicate the possibilities for external users.
 - I am not sure if the program is widely known by researchers in Japan and those overseas. Maybe it could be advertised more extensively?

Evaluation Item 3

Did GIMRT programs produce important scientific and technical outputs? Have the collaboration programs been useful for such activities?

Rating 100 %

Yes 15/15

1. **The publication record, international joint papers and the high profile outputs show the usefulness of GIMRT program to produce important scientific and technical outputs.**
 - The publication record and other activities show evidence. The proof is over 200 publications

that has been produced in a year as international joint papers.

- The success of the various collaboration tools is already reflected in the increasing number of international proposals and joint publications.
- The collaboration researches exactly progress the scientific and technical standards, which also produces important outputs
- The GIMRT programs have produced an impressive amount of activities to the benefit of the international scientific community.
- There are high-profile publications on topics such as magnetochiral dichroism in a collinear antiferromagnet and Dirac fermion kinetics in three-dimensionally curved graphene.

Recommendations

1. Analyze the content of the publications and the contribution of GIMRT. Monitor the fraction of the international joint paper continuously.

- Since a list of the accepted collaboration programs is not available, I cannot see which activities are really performed under the GIMRT collaboration programs, to be honest to say.
- I also think it is also necessary to continuously check and confirm the number of international co-authored scientific papers.

Other comments

- GIMRT is producing scientific and technical achievements, including the flexibly organizing international workshops in the pandemic.
- Considering the activities of GIMRT, I think IMR will be able to achieve more results after the pandemic.
- The useful program should be extensively progressed.

Evaluation Item 4

Have GIMRT programs offered substantial support for young researchers? Have the programs helped the growing of young researchers?

Rating 87 %

Yes 13/15, Maybe, 1/15, Difficult to evaluate 1/15

1. GIMRT program supported the research and the bi-directional international exchange of the young researches as shown by the fraction of the supported participants.

- Bridge Oversees program could help young researchers in Japan to be involved more in the world-wide society of their fields.
- The GIMRT programs give strong support at all levels, also for young researchers.
- GIMRT programs offer considerable support for young researchers including PhD student's stay at IMR. Such research stays are enormously important for the career and valuable for the personal development.
- In 2020, over 200 graduate students were supported by the program. Among the faculty participating in the program, about half are Assistant Professors.
- The international workshops have helped to expose young researchers to ground breaking subjects and, for the young Japanese to develop international contacts.
- I expect that GIMRT's activities are promoting the growth of researchers.
- High quality measurement facilities will offer a good opportunity for young people.

Recommendations

1. Support for the young researcher is the unique and excellent points of the GIMRT program. Therefore, the continuation and the improvement are strongly recommended.

- I believe this is one of the unique and excellent points of the GIMRT program, and strongly suggest to continue and improve it.
- I don't have available numbers of how many young scientists' projects are supported within GIMRT on the postdoc or PhD student level. However, based on personal experience, it was possible to have a true exchange, i.e. two-ways visit of foreign young researchers in Japan and Japanese postdocs or PhD students visiting abroad. This not only is beneficial for the young researchers personally but also for the scientific collaborations.

Other comments

- Unfortunately, in FY2020 it was not effectively put into practice because of the pandemic, even though the program was ready to do so.
- It is difficult to evaluate it the last financial year due to the COVID-19 pandemic.

Evaluation Item 5

What are the quality and the level of the GIMRT program in comparison with other international programs? Do GIMRT programs have uniqueness in the international view point?

Quality: Rating 80%

Yes 12/15, No answer 3/15

Uniqueness: Rating 67%

Yes 10/15, No 1/15, No answer 4/15

1. The quality of GIMRT program is in high international level.

- The GIMRT programs are broader in depth and breadth than other programs I am aware of and are also at a high international level.
- The quality is very high and the GIMRT program is exceptional in that it encourages multi-lateral collaboration with a strong focus on experiments.
- It is the excellent level of international collaboration program in the field of fundamental materials science. Let's say, 5 grade in 5 level.
- The unique facilities of IMR are the uniqueness even in international points of view.

2. The scheme of the program, the availability of broad range of researches and support for young researchers are the uniqueness of GIMRT program.

- While there are various international user facilities, each of them tends to be limited to a narrow range of techniques. An impressive feature of GIMRT is the broad range of high-quality research capabilities.
- I am not aware of any other international programs of this type.
- Compared to other international scientific cooperation organizations, GIMRT has been very active and more generous to its users, and as a result, it has become a very successful program.
- One of the unique things I think is that researchers in universities other than Tohoku University can organize or participate in international collaboration funded by GIMRT, which provides great opportunity for university researchers.
- Encouraging young researchers to organize international collaborations is also quite unique.

Other comments

- Here, I do not have sufficient information on other international programs.
- I am sorry that comparison with other international programs is difficult for me, for I do not have experiences, nor detailed information, on other programs.
- There is a lot of similar international programs, and its contents will be similar to each other, I could not answer a specific point of the present program.
- Honestly, I could NOT find any distinct features of this program when comparing with other international programs.
- It feels like there are a bit too many menus,
- I think the GIMRT program is excellent and one of the best collaboration programs among the usual institutions, which means the institutions not specifically focused on specific instruments such as synchrotron and neutron: they usually have nice programs.

Evaluation Item 6

Other comments (if any)

1. Management and coordination

- GIMRT's excellent "management know-how" is a very important asset for Tohoku University, so I think it is important to share it widely within Tohoku University in an appropriate way.

2. Program Scheme

- The programs and activities of GIMRT are excellent and a good model of International Joint Usage / Research Center

3. Covid-19 pandemic

- I hope that this unique program continues even in the Corona situation.
- The Covid-19 pandemic has created tremendous challenges for collaborative programs in scientific research. GIMRT has done a very good job of adjusting to the constraints and finding ways to continue collaborative research. Some reduction in productivity is an inevitable and understandable consequence.
- The flexibility in the management of the GIMRT program has been exemplary. Allowing delay in visits, as has been allowed, should allow the ground lost to the covid situation to be recovered.

4. Program continuation

- This program has been successive for the int'l collaboration, and it should be continued for the next.

5. Contribution to community

- The GIMRT also, in my view, helps disseminate advances at the IMR. For example, the cryogenic-free high magnetic field facility, as well as providing an invaluable resource for current research, should be a model for other facilities worldwide.