Call for Proposals: Ensemble Grants for Early Career Researchers 2021

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The Ensemble Project for Early Career Researchers in Tohoku University will fund joint research groups consisting of researchers from several departments in order to promote collaboration among early career researchers in Tohoku University. The grants are intended to support budding academic research projects that are created through interdepartmental collaboration based on free individual ideas.

Proposals are invited to encourage new research start-ups or attempts at new developments that broaden the scope of existing research. Early career researchers are welcome to apply, but those who participate in the research group as co-investigators are not required to have any status, as long as they meet the requirements for affiliation described in the guidelines. We welcome applications based on new ideas and perspectives (not only the content of research, but also the use of facilities in other departments to improve research efficiency).

Application guidelines

1. Period of research

From June 1, 2021 (scheduled) to March 31, 2022.

2. What is funded

We will provide research funds up to 500,000 yen for about fifteen projects. After a certain period of time, the grants will be distributed to the departments of the Alliance of Research Institutes and Centers, Tohoku University, to which the principal investigator belongs from the Institute of Development, Aging and Cancer, which is the department in charge of this year.

3. Eligible research projects

Collaborative research between multiple departments. The grants are open to research in all fields. Interdisciplinary research is not a prerequisite.

4. Eligible applicants

Applicants (principal investigators) should be postdocs, research assistants, assistant professors, lecturers, and associate professors (including special appointments) who belong to each department of the Alliance of Research Institutes and Centers, Tohoku University. We especially welcome applications from early career researchers. Co-investigators other than the principal investigator are not subject to any restrictions on job title or status, but they are not eligible if it is clear that the group in more than one department will no longer be included in the majority of the research period due to graduation or completion of the course.

- Herein, the “Alliance of Research Institutes and Centers” refers to Institute for Materials Research (IMR), Institute of Development, Aging, and Cancer (IDAC), Institute of Fluid Science (IFS), Research Institute of Electrical Communication (RIEC), Institute of Multidisciplinary Research for Advanced Materials (IMRAM), International Research Institute of Disaster Science (IRIDeS), Center for Northeast Asian Studies (CNEAS), Frontier Research for Interdisciplinary Sciences (FRIS), Advanced Institute for Materials Research (AIMR), Research Center for Electron Photon Science (ELPH), and New Industry Creation Hatchery Center (NICHe), International Center for Synchrotron Radiation Innovation Smart (hereinafter the same).
- In the case of concurrently serving or concurrently serving (including the mentoring system of the Interdisciplinary Research Institute), it is not considered to be more than one department by itself, even if you are a member of a group with researchers belonging to a department of the Alliance of Research Institutes and Centers, Tohoku University, which is your main activity base.
- The applicant (principal investigator) must be able to use the university's budget management system at one of the above departments.
- Only one application per person (including the principal investigator and co-investigator) is allowed.
- If it is difficult to determine whether the composition of the members of the applicant's

representative/associate is eligible for the application, please check with the Young Ensemble Project Working Group (WG) well in advance of the deadline.

5. Selection process

In order to discover budding research and support various researches, we will screen the content of researches as a working group, and about 15 research projects will be randomly selected. After the random selection, the decision will be officially approved by the Tohoku University Research Institutes' Director Meeting.

Applications that fall under any of the following categories will not be accepted for screening.

- Applications that do not meet the eligibility and requirement in this guideline
  - e.g., the member composition does not correspond to multiple departments. If the applicant is unable to make a clear judgment by himself/herself, please check with the WG well in advance of the deadline.
  - e.g., the applicant is not a postdoctoral researcher, assistant professor, assistant professor, lecturer, or associate professor (including specially-appointed/specified professor) belonging to one of the departments of the Alliance of Research Institutes and Centers.
  - e.g., the application is more than two pages long.
- Applications that are identical or very similar to previously awarded proposals
  - If you are applying for a research proposal that may be judged to be similar to your own previously accepted research, please indicate the differences from your previous proposal in the "Differences from previously accepted proposals" section of the application form.
- Applications that do not show the minimum research content.
- Applications without justification in the necessary expense breakdown

6. Continuation of research in the next fiscal year

We will conduct a peer review at a symposium to be held around January 2022 by all participants and invited faculty members, and select two or three proposals for continuation in the next fiscal year (April 2022-March 2023, with a maximum research grant of 1,000,000 yen) in April 2022. In the next fiscal year, we plan to award about 15 new proposals (planned research period: June 2022 to March 2023, with a maximum research grant of 500,000 yen) in addition to these continuation proposals. The same proposal can be continued for up to one year (one year of new proposal plus one year of continuation).

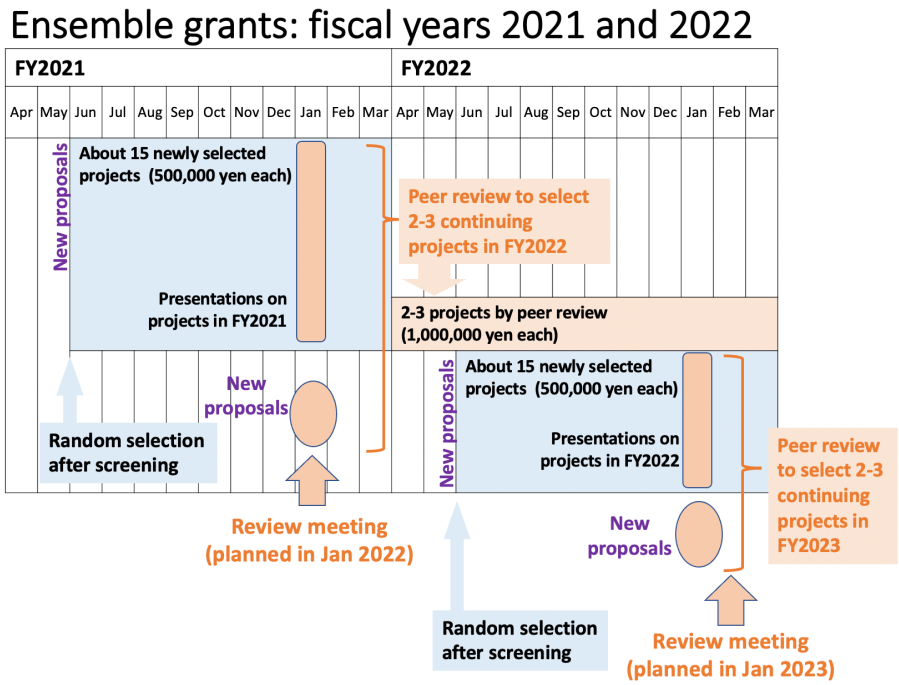

Figure 1. Selection process and periods of research

7. Application form and submission

Please prepare the application form using the distributed application form, convert it to PDF, and the prepared application should be submitted by the principal investigator using the web form below by the deadline.

https://forms.gle/5Q5M8axSALHGEvqR8

Deadline: Friday, June 4, 2021

Submissions in a different format or overdue will not be accepted.

8. Reporting

At the end of the research period, the grant awardees are required to submit a report of their research results in the prescribed format (the contents of the report are available on the website of the Ensemble Project for internal use only). They are also invited to present their research ideas and results at a symposium to be held during this fiscal year. When you publish your results, please indicate that they were supported by this program.

9. Management

You are expected to conduct your research in accordance with all the rules and instructions of the university and your department regarding safety and health management, network management, prevention of research fraud, and legal compliance. Please note that we will discontinue the support if it is judged that you have deviated from the above.

10. Notes

In the event of discrepancy between the English version and the Japanese version of the application guidelines, the Japanese version shall prevail.

If you have any questions about the application guidelines, please contact us at:

- Tohoku University Research Institutes' Ensemble Project Working Group
  ensemble_secretariat@fris.tohoku.ac.jp
- Dr. Hiroyuki Kai, Assistant Professor, Advanced Institute for Materials Research
  kai@tohoku.ac.jp

How to prepare the application

The application form should be one or two pages.

1. Research group

- The research group should be composed of faculty, researchers, and technical staff members belonging to multiple departments of Tohoku University (research institutes, centers, graduate schools, etc.). In addition to the above, external members may be included as co-investigators. Please add ◎ in front of the principal investigator's name.
- If the department to which you belong and the department in which you are mainly active are different (e.g., if you hold concurrent positions in multiple departments), please list both the department to which you belong and the department in which you are mainly active.

2. Research expenses breakdown

- Research expenses are limited to equipment, supplies, travel expenses, honoraria, and personnel expenses necessary to carry out this research. (Expenditures that are considered appropriate for running a laboratory or for other research projects are not allowed.

3. Plan of research

- If you are applying for a research proposal that may be judged to be similar to your own previously accepted research, please indicate the differences from your previous proposal in the "Differences from previously accepted proposals" section of the application form.
- Please describe the plan for one year, not assuming continuation.

4. Other research grant applications

- This grant does not restrict duplicate applications with other research funds, but if there are restrictions on other research funds, please apply with consideration.

Procedures for random selection of proposals

1 All applications will be assigned entry numbers 1, 2, 3, ..., N, starting from 1 and increasing by 1, in the order in which the applications are received.

- The entry number will be assigned at the time the application is first submitted, even if the application is resubmitted within the period or withdrawn after submission.
- The entry number will be notified to the applicant at the time of acceptance or closing of the call.

2 Screening of applications will be done by the WG based on the application guidelines. The WG determines *M*, the number of proposals to be adopted (*M* ~15). If the number of proposals that pass the screening does not significantly exceed 15, all proposals may be accepted after adjusting the amount. The screening and the decision on the number of proposals to be adopted will be made by June 10, 2021.

3 The entry numbers of the applications that passed the screening will be randomly ranked using the attached Python script (Python 3.7), and the top *M* applications will be accepted.

3.1 Let the sum of the block hashes of the first five blocks in the Bitcoin blockchain after **8:00 a.m. (Japan time) on June 11, 2021**, be the random seed *S*. Initialize the random number with `random.seed(S)`.

3.2 Prepare a list ENTRIES with the entry numbers in ascending order.

3.3 Shuffle the order of the presentation numbers ENTRIES by `number_order = random.sample(ENTRIES, len(ENTRIES))`.

3.4 In the order of number_order, *M* proposals will be accepted.

4 The list of entry numbers that have passed the screening in 2 and the random number seed used in 3.1 will be made public when the approved proposals are decided and notified.

Notes

1 A new Bitcoin block is created approximately every 10 minutes. Each time a block is created, the block height is increased by one, and the block-specific hash value (a 32-byte number) is determined. The block hash value is suitable as a random seed for random selection because it has the following properties

- It is very difficult to know the block hash to be generated in the future and to set it to the desired value (virtually impossible due to the cost of tens of millions of yen).
  → It is (virtually) impossible to predict or manipulate the results of random selection before the deadline.
- Once the block hash is determined, its value can be obtained by anyone.
  → Anyone can verify later that the random selection process is not fraudulent or erroneous by using a random seed calculated from the block hash value.

2 The attached Python script shows an example of using "the sum of five block hashes of bitcoin block height 629530-629534" as a random seed.

- The block hash value can be obtained from https://explorer.btc.com/btc/block/[block height] (e.g., for block height 629530, see https://explorer.btc.com/btc/block/ 629530).
- When you run the Python script, you will get the following results. As long as the random number seed is the same, the same result is obtained no matter how many times the script is run.

```
Entries: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17,
18, 19, 20, 21, 23, 25, 28, 29, 31, 33] (26 in total)
Random seed:
33289223846857809242230034440972413870415546845345171 40

Result
Selected entries: [1, 2, 3, 5, 7, 8, 9, 10, 11, 16, 17, 18, 21, 23,
25]
```

Python script for random selection

https://ideone.com/IrZVK5

```
import random
import platform

assert platform.python_version()[0:3] == "3.7", "Python version 3.7 must be used."

# The number of selections
NUM_SELECTED = 15
# Entry numbers that passed the screening process (example is shown)
ENTRIES = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23,
25, 28, 29, 31, 33]
assert NUM_SELECTED < len(ENTRIES), "Selection must happen"

# Block hashes from certain block heights that were previously announced:
# Below is the example by block heights 629530-629534.
hashes = [
    0x00000000000000000006F349AA480F67A2B603496DA07FD0F566680293B2D3E4,
    0x00000000000000000000E4BF1CA971D88B29D31B84751AE6BDF8F2F5F25E5D99E,
    0x00000000000000000003A91B8D6D37940269AE8DE9219176DCD6BA448CE0AC75,
    0x00000000000000000000137A2AC232E19D2163A4A28B2F1F49CCD35052579451E,
    0x00000000000000000008A17371C0F62112227C28B83DD88C5218CAD648484E7F,
]

seed = sum(hashes)
random.seed(seed)
print("Entries:", ENTRIES, "(%d in total)" % len(ENTRIES))
print("Random seed: %d" % seed)
print()

number_order = sorted(random.sample(ENTRIES, len(ENTRIES))[0:NUM_SELECTED])

print("Result")
print("Selected entries:", number_order)
```