

**Joint Call for Proposals between  
JST (Japan) and MOST (Taiwan) in the field of  
“Nanoelectronics and System Integration for AI”  
Call for Proposals**

**Closing Date:**

**31<sup>st</sup> July 2021 (1:00 Japan Time) / 30<sup>th</sup> July 2021(24:00 Taiwan Time)**

**I. General Description**

**1. New Scheme for Joint Funding of Japan-Taiwan Research Cooperation**

Japan Science and Technology Agency (JST) and the Ministry of Science and Technology (MOST) have initiated a program for joint funding of Japan-Taiwan cooperative research projects. After consultation between JST and MOST, “Nanoelectronics and System Integration for AI” was selected as the field of research to which the joint funding scheme is applied.

**2. Aim of Program and Research Field**

The aim of the program is to strengthen collaboration between Japan and Taiwan within the field of “Nanoelectronics and System Integration for AI” to achieve world-class scientific results, leading towards new innovative science and technology.

Since Japan and Taiwan have different strengths in nanoelectronics, development of innovative nanoelectronics for AI applications is expected by conducting research while making use of the strengths of both Japan and Taiwan. In consideration of the above, JST and MOST co-organized a joint workshop (<https://www.jst.go.jp/inter/program/kiban/gather/taiwan.html>) in Kyoto in June 2019 to investigate cooperative research areas which are thought to have potential for collaboration between Japan and Taiwan researchers. Based on the outcome of the workshop, “Nanoelectronics and System Integration for AI” was jointly agreed upon as the field of the joint call in 2019, and three teams were selected for three-year grant. This year, the second joint call is announced under the same scheme.

AI and its applied technologies are currently the subject of intense development competition toward earliest monetization, but they could become the basis of human society and industry for a long time. For its long-term sustainable development, new technologies that combine multiple layers of materials, devices, architectures and systems are required.

The priority research area / topics are the same as the last call as listed below. In the last call, three projects were selected based on a proposal competition among ten applicants, and all of them are dealing with new materials for electronic devices. This year, we welcome proposals complementary to the ongoing subjects, such as novel computing or sensing systems and applications taking advantage of new materials/devices, although possible proposals are not limited to these subjects and those on material/device are still appreciated.

The priority research area / topics are:

1) Innovative AI computing technologies

Currently, AI learning and inference systems require a large computing power and consume energy as well. Disruptive proposals are requested that enable efficient data processing for AI with minimum power consumption. Examples are stochastic or neuromorphic computers using novel processing unit or memory composed of new materials.

2) Intelligent sensing and communication technologies

Most AI applications start with sensing followed by data analysis and finally judgement is made to cause necessary reactions through communications among complicated systems such as to and from cloud. A novel intelligent system with a reduced complexity will be extremely attractive, if it performs the whole procedure while keeping security.

3) Innovative building technology for AI devices and systems

The present scope includes proposals for design and fabrication methods to construct AI systems in an innovative manner. Possible subjects are automatic organization of devices and circuits, and programable AI systems using reconfigurable circuits or tunable materials with novel architectures.

4) Non-traditional applications of edge AI and IoT

The scope also includes original applications of AI edge technologies that may open new area of IoT, such as reliable monitoring enabled by video/audio data processing with edge AI devices.

### **3. Prospective Applicants and Eligibility Criteria**

JST and MOST invite Japan-based and Taiwan-based researchers to submit joint proposals for cooperative research projects in the research area of focus described above. An important criterion of the proposed collaboration is that it should build on and reinforce already on-going research activities in each research group and contribute significant added value to these through Japan-Taiwan collaboration.

Please note that each applicant can only apply for one project within this call. Researchers from industry may take part in the joint collaboration according to the following conditions: Japan: as Principal Investigators or partners; Taiwan: as partners in teams headed by Principal Investigators from an academic institution or research institute.

#### **Eligibility criteria in Japan**

##### **(For Japan-based applicants only)**

- 1) Any independent researcher personally affiliated with and actively conducting research at a domestic Japanese research institution (or who would fulfil this requirement by the start of the research project), regardless of nationality, is eligible to apply.

Note: “Domestic Japanese research institution” in Japan refers to universities, independent administrative institutions, national/public testing and Research Institutions, specially authorized corporations, public-service corporations and enterprises, etc. that must satisfy predetermined requirements designated by MEXT. Please refer to the MEXT homepage for more information:

[https://www.mext.go.jp/a\\_menu/kansa/houkoku/1324571.htm](https://www.mext.go.jp/a_menu/kansa/houkoku/1324571.htm)

(in Japanese only).

- 2) The Japan-based researchers who are currently financially supported as Principal Investigator under this JST(Japan)-MOST(Taiwan) cooperative

program are not eligible to apply.

The Japan-based applicant must complete a research ethics training program conducted by the research institute with which he or she is affiliated, and then declare the completion of the program to the JST call secretariat. If it would be difficult for the Japan applicant to undertake a research ethics training program provided by his or her own affiliated institute, he or she should please contact JST to register for a program provided by eAPRIN (previously known as CITI Japan) and should complete the program before the deadline of the call for proposals. Please be advised that unless the applicant completes a research ethics program, his or her application will be deemed ineligible and rejected. For more details, please refer to the Appendix (Japanese only).

#### **4. Financial Support**

JST and MOST plan to support cooperative research projects including exchange of researchers to the counterpart research team.

JST supports expenses for Japan-based researchers, and MOST supports expenses for Taiwan-based researchers.

It is envisioned to fund up to 3 joint projects for this call depending on the number of proposals.

## **II. Support by JST**

### **1. Budget for a Cooperative Research Project**

The budget for a project may differ each year, depending on the content of activities, but the total budget for the Japan-based research team over a full research period (i.e., approx. 36 months) should not exceed 12 million yen, in principle (Example: a proposal may envisage a budget of 4 million yen for the first year, 5 million yen for the second year and 3 million yen for the final year). Overhead expenses amounting to 10% or less of the total research expenses (direct expenses) will be allowed. Overhead expenses should be provided for within the total budget.

Due to budget limitations of this programme, amounts will be adjusted each year.

## **2. Cooperative Research Period**

The cooperative research period shall be approx. 3 years in total, counting from the following start dates.

### **Support by JST:**

The starting date of the projects: 1<sup>st</sup> April 2022.

The support by JST will be 36 months and will be completed by 31 March 2025.

### **Support by MOST:**

The starting date of the projects: 1<sup>st</sup> April 2022.

The support by MOST will be 36 months and will be completed by 31 March 2025.

## **3. Details of Support**

This program is designed to support additional expenses related to cooperation with the Taiwan-based partner, such as expenses for travel and/or conducting seminars/ symposiums, with the precondition that the main research infrastructure is already ensured by each research group.

### **3.1 Contract between Applicant and JST**

Support will be implemented according to a contract for commissioned research entered between JST and a university or research institute, etc. (hereafter referred to as "institution") to which the Japan based Principal Investigator belongs.

The contract for commissioned research will be renewed each year over the cooperative research period.

Since the contract is agreed on condition that all administrative procedures related to this project shall be handled within the institution, the research leader should consult with the department in charge at his/her institution.

The contract stipulates the Article 19 of the Industrial Technology Enhancement Act (Japanese version of the Bayh-Dole Act) and the Article 25 of the Act on Promotion of the Creation, Protection and Exploitation of

Content (tentative translation) be applied to all intellectual property rights generated as results of this project, and that these can be the properties of the institution with which the research leader is affiliated.

### **3.2 Funded expenses**

Funded expenses include costs for implementation of research exchanges and performing research activities.

Funding provided within this Call is intended to enhance the capacity of the applicants to collaborate with each other. Funding will therefore be provided in support of collaborative activities and may include some of the local research that is necessary for the collaboration.

These may include:

#### (1) Expenses for research exchanges

##### 1) Travel expenses

In principle, travel expenses should be based on the rules of the institution to which the research leader belongs. When budgeting visits between the Taiwan-based and Japan-based partners, all related expenses are to be covered by the visiting side according to national rules and restrictions.

##### 2) Expenses for holding symposiums, seminars and meetings

#### (2) Expenses for research activities

##### 1) Expenses for facilities, equipment and consumables

##### 2) Expenses for personnel

Stipend for a PhD student, or stipend or salary for a post-doctoral fellow

##### 3) Others

Expenses for creating software, renting or leasing equipment, transporting equipment, etc.

#### (3) Overhead expenses

Overhead expenses amounting to 10% or less of the total research expenses (direct expenses) will be allowed. Overhead expenses should be provided for within the total budget.

Note: Please refer to the following link for the provisions regarding indirect costs:

<https://www8.cao.go.jp/cstp/compefund/shishin2.pdf> (in Japanese only).

(4) Expenses not covered/funded in the program

No expenses stated below shall be covered under this program:

- 1) Expenses related to acquiring real estate or constructing buildings or other facilities
- 2) Expenses related to procurement of major equipment
- 3) Expenses related to dealing with accidents or disasters occurring during cooperative research periods
- 4) Other expenses unrelated to implementation of this cooperative research project

Please refer to the guidance documents available at the following link for further details of eligible costs:

<https://www.jst.go.jp/contract/index2.html> (in Japanese only).

### **III . Contract between Researchers**

A contract for cooperative research MUST be entered into among institutions with which collaborating researchers are affiliated for implementing actual research collaboration. The contract for cooperative research shall include conclusions of discussions among the institutions which are entitled to intellectual property arising as a result of research collaboration, and the institutions concerned on issues regarding treatment of research information brought by researchers involved for the implementation of research collaboration, of research achievements as a result of research collaboration and of intellectual properties among the concerned institutions. Before conclusion of the contract, the Japan-based principal investigator must submit the check-list in specified form to JST and then undergo a check by JST. When concluded, JST needs to be promptly notified of the contract.

## **IV . Application**

The Japan-based and Taiwan-based applicants shall write a common application that shall be handed in both to JST and MOST in parallel. The application shall be written in English. For the Japan-based applicants, some part of the application should be also submitted in Japanese.

The application shall include:

A project description including how collaboration will be carried out, with clear statements of what roles Japan-based and Taiwan-based researchers will respectively play in the project;

- a) Description of the expected outcome of the proposed project, scientifically as well as in terms of its relevance for the industry and society;
- b) Description of the ongoing activities and specific advantages of the Japanese and Taiwanese research groups respectively have, which form the basis for the proposed joint project;
- c) Description of the expected added value by the proposed joint project, including how the competence, technology and other resources of one party would complement the other's;
- d) Description of how the project is expected to strengthen research cooperation between Japan and Taiwan over the longer term;
- e) Description of the added value expected from the multidisciplinary approach in the proposed joint project; and
- f) Description of the possible comparative advantages of the proposed joint project in comparison with other comparable activities worldwide.

### **1. Application Forms**

Part I	General Information
Part II	Abstract
Part III	Research Topic and Plan of Work
Part IV	Budget Description (for Japan-based Team)
Part V	Budget Description (for Taiwan-based Team)
Part VI	Key Professional Personnel
Part VII	Personal Background Information



- Part VIII Japanese Abstract (Japan-based applicants only)
- Part IX Compliance Checklist for Research Regulations (Japan-based applicants only)
- Part X Declaration Letter (Japan-based applicants only)

## **2. Preparation of Application Forms**

Applicants should fill in the particulars in all the application forms listed in above 1.

## **3. Submittal of Application Forms for Japan-based Applicants**

Japan-based applicants should electronically submit their application forms to JST by the deadline, through online application system, e-Rad (<https://www.e-rad.go.jp>).

## **V . Evaluation of Project Proposals**

### **1. Evaluation Procedure**

Committees consisting of experts selected by JST and MOST respectively will evaluate all proposals. Based on the results of the evaluation, JST and MOST will make a common decision regarding funding of selected proposals.

### **2. Evaluation Criteria**

The following general evaluation criteria will apply to each proposed project:

#### **1) Conformity with Program Aims and Designated Research Fields**

The proposed activity shall conform to the aims of the program and the research fields that the program designates. In addition, the applicants shall already have good research foundation for their proposed activity.

#### **2) Capability of Research Leaders**

The research leaders in Japan and Taiwan shall have the insight or experience (or potential in case of younger researchers) necessary for pursuing the activity and the ability to manage the cooperation and reach the project goals during this program's period of support.

3) Effectiveness and synergy of the joint research project

The proposed research activity shall be eminent, creative and at an internationally high level in an attempt to produce a significant impact on the development of future science and technology or to solve global and regional common issues or to create innovative technological seeds that can contribute to the creation of new industries in the future.

Moreover, the proposed research activity that is expected to create synergy through collaborative research with the counterpart institution will be preferred. Such synergy could be attained through, for example, the acquisition and/or application of knowledge, skill and/or know-how of the counterpart researcher.

4) Validity of research plan

The sharing of research activities with the counterpart research institute and the planning of research expenses shall be adequate to realize the proposed research activity.

5) Effectiveness and continuity of exchange activities characterized by the following examples shall be involved to enhance sustainable research exchange and networking.

- Nurturing of researchers through human resource exchange for several weeks
- Sustainable development of research exchange with Taiwan initiated by this activity.
- Enhancing the research network between Japan and Taiwan including researchers other than the research leader and members of this activity.
- Improving the presence of science and technology in Japan and Taiwan.

\*In order to nurture and encourage Japan-based early career researchers to get involved in international collaborative activities, it is recommended to assign a co-Principal Investigator who has not passed 10 years since completing their PhD., in the Japan-based research team.

6) Validity of exchange plan

The planning of exchange activities and their expenses with the counterpart research institute shall be adequate to realize the proposed research activity.

### **3. Announcement of Decision**

The final decision regarding supported projects is planned to be notified to the applicants not less than four weeks before the starting dates of the projects.

## **VI. Responsibilities of Research Leader after Proposal is Approved**

After the proposal is approved, the research leaders and their affiliated institutions shall observe the following when carrying out the cooperative research and utilizing supported expenses.

### **1. Annual Progress Report (Only for Japan-based Researchers)**

At the end of each Japanese fiscal year, the research leader shall promptly submit a progress report on the status of research exchange, and the institution with which the research leader is affiliated shall promptly submit a financial report on supported expenses.

### **2. Final Report**

After completion of the period of collaborative research project, the research leaders shall promptly submit to JST a final report, in addition to a financial report, on the research exchange activities. The report shall include a general summary (maximum ten A4 pages) compiled jointly by both Japan-based and Taiwan-based research groups, and Taiwan-based researchers are also requested to submit the report to MOST.

If papers describing results of research exchange are published to academic journals, societies and so on, copies of such papers should be attached to the final report.

## **VII . Additional Information and Requirements for Japan based Researchers**

Please see Appendix (available only in Japanese) for such requirements.

Japan-based applicants should contact the following for further information:



Japan Science and Technology Agency

Department of International Affairs

Junko Shiraishi (Ms.)

E-mail: kokusatw@jst.go.jp

TEL: +81(0)3-5214-7375 Fax: +81(0)3-5214-7379

Taiwan-based applicants should contact the following for further information:



MOST : Department of International Cooperation and Science Education

Hsiao-chen (Natalie) KIN (Ms.)

E-mail: jsjen@most.gov.tw

TEL: +886-2-27377047