

PROJECT ARRANGEMENT
UNDER THE IMPLEMENTING ARRANGEMENT
BETWEEN
THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA
AND
THE MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE
AND TECHNOLOGY OF JAPAN
CONCERNING COOPERATION IN RESEARCH AND
DEVELOPMENT IN ENERGY AND RELATED FIELDS

CONCERNING QUANTUM INFORMATION SCIENCE

The Department of Energy of the United States of America (DOE) and the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT), hereinafter referred to collectively as "the Participants" and individually as a "Participant":

ACTING under Section 4 of the Implementing Arrangement Between the Department of Energy of the United States of America and the Ministry of Education, Culture, Sports, Science and Technology of Japan Concerning Cooperation in Research and Development in Energy and Related Fields of April 30, 2013 (hereinafter referred to as "the Implementing Arrangement"); and

DESIRING to establish a framework for cooperation between agencies in the United States and in Japan for the advancement of quantum information science in the Participants' countries,

Have decided as follows:

Section 1
Objective

1. The objective of this Project Arrangement is to facilitate scientific and technological exchanges that promote collaboration on research and development for projects involving quantum information science (QIS). In the context of this Project Arrangement, QIS refers to the rapidly evolving area of science that builds on quantum science principles to obtain and process information in ways that cannot be achieved based on

classical physics principles. QIS is based on the premise that information science depends on quantum effects in physics. QIS, including quantum science and instrumentation for next-generation computing, sensing, communication, and other fields, thus arises from the synthesis of quantum theory and information theory. It springs from the recognition that uniquely quantum phenomena can be harnessed to advance information collection, processing, and fundamental understanding in ways that classical approaches can only do less efficiently, or not at all. Current and future QIS applications differ from earlier (and ongoing) applications of quantum mechanics, such as the laser, by exploiting distinct quantum behavior that does not have classical counterparts and does not arise in non-quantum systems, including: 1) Superposition: quantum particles or systems exist across all their possible states at the same time, with corresponding probabilities, until measured; 2) Entanglement: a superposition of states of multiple particles in which the properties of each particle are correlated with the others, regardless of distance; and 3) Squeezing: a method of manipulating noise in systems that obey the Heisenberg uncertainty principle, by permitting large uncertainty in one variable to improve precision in another correlated variable.

2. This Project Arrangement is under the Implementing Arrangement, which is, in turn, subject to and governed by the Agreement Between the Government of the United States of America and the Government of Japan on Cooperation in Research and Development in Science and Technology signed on June 20, 1988, as amended and extended (hereinafter referred to as "the Agreement"). In the event of any conflict between the contents of the Agreement or the Implementing Arrangement on the one hand and the contents of this Project Arrangement on the other hand, the contents of the Agreement or the Implementing Arrangement will govern.

Section 2

Areas of Cooperation

Cooperation under this Project Arrangement supports the advancement of QIS.

Specific areas of cooperation may include, but are not limited to, the following:

1. Research and development of quantum communication, computing, emulation, devices, sensors, foundries, and materials.

2. Other related activities which may be mutually decided upon by the Participants in writing.

Section 3

Participating Organizations

Each Participant may invite other government agencies and organizations and private organizations in its country to participate in cooperative activities under this Project Arrangement, at the participating organizations' own expense and subject to such terms and conditions as the Participants may specify. For DOE, such participating organizations include DOE national laboratories, universities and other DOE-funded institutions. For MEXT, such participating organizations include Japanese national laboratories, universities and other MEXT-funded institutions.

Section 4

Forms of Cooperation

Cooperative activities under this Project Arrangement may include, but are not limited to, the following:

1. Exchange of Personnel: scientists, engineers, post-graduate and graduate students on short-term or long-term basis under Section 6 of the Implementing Arrangement.
2. Exchange and provision of samples, materials, instruments, components, and software for experiments, testing, manufacturing, and evaluation.
3. Equipment Transfer: under section 7 of the Implementing Arrangement. Unless described otherwise in writing, any equipment made available by one Participant to the other Participant for the purpose of the collaboration will remain the property of the sending Participant.
4. Development and Exchange of Technical Information and Experiences, and Collaborative Visits: The Participants will jointly or independently develop research results in the areas listed in Section 2. Data and experience developed by the Participants under this Project Arrangement will be exchanged. The Participants will arrange collaborative visits related to research and development programs for this purpose.

Section 5

Management

1. Each Participant should designate a General Coordinator to facilitate the implementation and coordination of cooperative activities under this Project Arrangement.
2. The General Coordinators may, at their discretion, invite appropriate technical staff for each specific area of cooperation listed in Section 2 to attend meetings and to serve in an advisory capacity.
3. Each General Coordinator will be responsible for the following:
 - (a) To maintain liaison with their counterpart; and
 - (b) To plan, coordinate and monitor progress of cooperative activities under this Project Arrangement.
4. The General Coordinators should meet annually or as required on such dates and at such locations as are mutually decided.

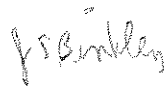
Section 6

Commencement, Modification, and Discontinuation

1. Cooperative activities under this Project Arrangement may commence upon signature and, unless discontinued under the procedures described in paragraph 3 of this Section, may continue so long as the Implementing Arrangement remains in operation.
2. This Project Arrangement may be modified by mutual written consent of the Participants, so long as the Implementing Arrangement remains in operation.
3. Cooperative activities under this Project Arrangement may be discontinued at any time by the Participants' mutual consent in writing, or at the discretion of either Participant, which should provide at least 6 months advance notification in writing to the other Participant.

Signed at Washington DC and Tokyo through Videoconference this 17th day of June 2021 in two originals.

FOR THE DEPARTMENT OF ENERGY
OF THE UNITED STATES OF
AMERICA:



Steven Binkley
Acting Director, Office of Science

April 6, 2022

FOR THE MINISTRY OF EDUCATION,
CULTURE, SPORTS, SCIENCE
AND TECHNOLOGY OF JAPAN:



ITAKURA Yasuhiro

Director General,
Science and Technology Policy Bureau