

IMPLEMENTING ARRANGEMENT NUMBER 03

to the Guidelines for a Cooperative Program
in Physical Sciences between the
Taipei Economic and Cultural Representative Office
in the United States
and the
American Institute in Taiwan
for
The Design & Fabrication of a Superconducting Quantum Interference
Device (SQUID) Multiplexers

Article I: Purpose

This Implementing Arrangement is entered into by the Taipei Economic and Cultural Representative Office in the United States (TECRO) and the American Institute in Taiwan (AIT), hereinafter referred to as the "Parties", to implement program activities under the Guidelines for a Cooperative Program in Physical Science Between TECRO and AIT signed on January 2 and 10, 1997, hereinafter referred to as the "Agreement". AIT, through its designated representative, the U.S. Physical Measurement Laboratory, Quantum Electromagnetics Division, National Institute of Standards and Technology (NIST) in Boulder, CO, in cooperation with TECRO, through its designated representative, the Academia Sinica, shall carry out program tasks, determine priorities for future cooperative activities, and develop work programs for future activities in the area of SQUID Multiplexers.

Article II: Authorization

The activities described in this Implementing Arrangement shall be carried out under the general terms and conditions of the Agreement. The Agreement is entered into by the parties pursuant to the Taiwan Relations Act of April 10, 1979, Public Law 96-8 (22USC 3301 et seq.).

Article III: Scope of Work

Program tasks to be carried out under this Implementing Arrangement are summarized in Attachment I between NIST and Academia Sinica.

Article IV: Responsibilities of AIT

The responsibilities of AIT under this Implementing Arrangement are:

- A. To make available, through its designated representative, personnel, equipment and other assistance as may be necessary to carry out such tasks; and
- B. To provide guidance for and to facilitate and provide support for consultations between and among the designated representatives of TECRO, NIST and other appropriate agencies
- C. To make the necessary arrangements to transfer such funds received from TECRO to its designated representative, NIST, for all costs incurred in association with this Implementing Arrangement.

Article V: Responsibilities of TECRO

The responsibilities of TECRO under this Implementing Arrangement are:

- A. To make available, through its designated representative, personnel, equipment and other assistance as may be necessary to carry out such tasks; and
- B. To provide guidance for and to facilitate and provide support for consultations between and among Academia Sinica, the designated representatives of AIT and other appropriate agencies
- C. To reimburse AIT, with AIT making the necessary arrangements to transfer such funds to its designated representative, NIST, for all costs incurred in association with this Implementing Arrangement.

Article VI: Intellectual Property Considerations

The delivery of any materials under this Implementing Arrangement shall not be deemed to transfer or otherwise affect the allocation of intellectual property rights in those materials. No other intellectual property or confidential business information considerations are expected to arise in conjunction with activities to be undertaken pursuant to this Implementing Arrangement.

Article VII: Effective Date, Amendment and Termination

This Implementing Arrangement shall enter into force on the date of the last signature hereinafter and shall remain in force for four years from that date unless extended or terminated by mutual agreement. This Implementing Arrangement may be amended at any time in writing. Termination of the Agreement shall automatically terminate this Implementing Arrangement. Termination shall not affect the validity or duration of activities not fully completed at the time of termination.

IN WITNESS WHEREOF, the undersigned, being duly authorized, have signed this
Implementing Arrangement.

DONE in duplicate in the English language.

FOR THE TAIPEI ECONOMIC
AND CULTURAL
REPRESENTATIVE OFFICE IN
THE UNITED STATES:



James K. J. Lee

Deputy Representative


05-10-2018

Date

Washington, D. C.

Place

FOR THE AMERICAN INSTITUTE IN
TAIWAN:



John J. Norris, Jr.

Managing Director

02-22-2018

Date

WASHINGTON HEADQUARTERS OF
Place AIT IN ARLINGTON, VA

ATTACHMENT I to Implementing Arrangement 3

Cooperative Program on Carbon II Emission Line

Background: In order to further the research on Carbon II Emission Line, Academia Sinica seeks assistance with obtaining superconducting quantum interference device (SQUID) amplifier circuits.

Objective: Under this Implementing Arrangement AIT's designated representative, NIST shall design and fabricate cryogenic superconducting quantum interference device (SQUID) amplifier circuits, and deliver them to TECRO's designated representative Academia Sinica. These chips will be integrated into the focal plane of an astronomical camera for observations of the carbon II emission line. These observations will be used to construct a 3D image of large scale structure. The intrinsic low noise and reproducibility of these devices make them the ideal amplifier candidates (when coupled to superconducting sensors) to achieve the sensitivities required to conduct meaningful observations. The devices will be designed at NIST and fabricated in the NIST microfabrication facility.

Description: The instrument under construction is called 'TIME (Tomographic Ionized Carbon Mapping Experiment) Pilot' and is a project between AIT/TECRO, NIST, Academia Sinica and the California Institute of Technology (Caltech). The instrument integration will take place at Caltech, and as such, NIST will ship the multiplexer components directly to Caltech.

This Program is for technological cooperation between NIST and Academia Sinica, on behalf of AIT and TECRO, respectively, in the design and fabrication of cryogenic superconducting quantum interference device (SQUID) amplifier circuits.

Implementing Group:

The Quantum Sensors Group, Quantum Electromagnetics Division,
Physical Measurement Laboratory, NIST

Program Conductors: Dr. Johannes Hubmayr

Program Duration: Four Years

Annual Implementation:

(A) Upon receipt of reimbursement from TECRO, as outlined in Article V(c) of Implementing Arrangement 3, AIT will transfer \$256,260.00 USD (FIXED PRICE) to NIST as reimbursement for undertaking the activities contemplated by this Implementing Arrangement. NIST will be reimbursed for all costs incurred. The amount of \$128,130.00 USD will be paid in advance and \$128,130.00 USD will be paid upon delivery.

(B) Work to be undertaken and deliverables to be provided:

- 1) SQUID multiplexer for 8 sets, which includes: as per quote May 19, 2016 Dr. Johannes Hubmayr
- 2) 180 x Screened 11-channel SQUID multiplexer chips
- 3) 180 x Unscreened 11-channel interface chips
- 4) 64 x Screened SQUID series arrays
- 5) 8 x SSA modules

NIST will ship these deliverables to the California Institute of Technology, Cahill Center, 1200 East California Blvd., Pasadena, CA 91125. NIST and Academia Sinica will be responsible for acquiring shipping insurance.