Attachment to the
Agreement on Academic Exchange between the Institute for Cosmic Ray Research
(The University of Tokyo)
and
the LIGO Laboratory
(California Institute of Technology)

This Attachment establishes a collaboration between the two projects, LCGT (Large scale Cryogenic Gravitational wave Telescope) and LIGO (Laser Interferometer Gravitational Wave Observatory), as stipulated in Article 2 of the Agreement on Academic Exchange between the Institute for Cosmic Ray Research (ICRR) of the University of Tokyo and the LIGO Laboratory of the California Institute of Technology (hereafter referred to as the parent Agreement). This Attachment also provides guidelines for implementing the academic exchanges between the two projects set forth in the parent Agreement. This Attachment is a living document that will be amended as needed to reflect new aspects of our collaborative efforts.

1. LCGT project aims to detect gravitational waves by a 3 km baseline laser interferometer with cryogenic mirror system placed underground at Kamioka. The collaboration members consist of researchers from a number of institutions worldwide, led by ICRR (University of Tokyo, hereafter abbreviated as UT), All members of LCGT Collaboration are to be registered as formal users of ICRR in the research for LCGT project by submitting a formal document of permission by the director or president in one's own organization to the director of ICRR. This registration is renewed every year by applying the research plan of LCGT and being approved by Advisory Committee of ICRR.

2. The Laser Interferometer Gravitational-Wave Observatory (LIGO) Laboratory is aimed at opening the field of gravitational-wave astrophysics through the direct detection of gravitational waves. LIGO detectors are using laser interferometry to measure the distortions of the space between free masses induced by passing gravitational waves. Scientists, engineers, and staff at the California Institute of Technology (Caltech) and the Massachusetts Institute of Technology (MIT) are carrying out the operation of LIGO, and are participating in the development of Advanced LIGO and future interferometer enhancements.

Caltech has prime responsibility for the LIGO Project under the terms of a Cooperative Agreement with the National Science Foundation (NSF). LIGO is a national facility for gravitational-wave research, providing opportunities for the broader scientific community to participate in detector development, observations, and data analysis. LIGO welcomes the participation of outside scientists at any of these levels.

3. The two parties affirm their strong intention to analyze data from LCGT and Advanced LIGO jointly to detect gravitational waves as a part of the global network of detectors to establish gravitational wave astronomy once the sensitivities of both detectors reach a scientifically significant level. LCGT will join the world network of gravitational wave detectors, with full reciprocal sharing of data with the LIGO collaboration, the GEO600 Collaboration and the Virgo Collaboration at a time determined by mutual agreement of all parties - LCGT, LIGO, GEO, and Virgo.

4. Each party will endeavor to provide human resources to support the academic activities of the other party by actual visits or time allocation of its staff at the request of the other party. If the first party agrees to provide such assistance, the requesting party will cover the necessary costs, including the salaries and travel expenses, for the staff provided by the first party. Agreement to activities shall be on a case-by-case basis. Each activity will be initiated by a requesting letter and confirmed by an accepting letter from the respective directors.

5. Each party will endeavor to accept visitors from the other party for short term or long term visits at the request of the other party. If the first party agrees to accept such visitors, the parties will share the necessary travel expenses, with the share depending on the mutual agreement of the two parties for each case. Agreement to visits shall be on a case-by-case basis. Each visit will be initiated by a requesting letter and confirmed by an accepting letter from the respective directors.

6. The two parties will endeavor to share software and technologies developed by each party at the request of the other party. If the developing party agrees to such sharing, any costs of such sharing will be borne by the requesting party. Agreement to share shall be on a case-by-case basis. Each instance will be initiated by a requesting letter and confirmed by an accepting letter from the respective

directors. The software and technologies developed by each party must not be transferred to third parties without the written agreement of the developing party.

7. LCGT and LIGO Laboratory will endeavor to include members of the other project on their principal advisory panels (the Program Advisory Board for LCGT and the Program Advisory Committee for LIGO). Such cross representation is intended to ensure good communication about status and plans between the two projects.

8. This Attachment is valid as long as the parent Agreement is valid. This Attachment may be replaced or rescinded at anytime on the mutual agreement of the two parties.

ICRR

T. Kajita

Director, Takaaki Kajita

Date Nov. 25, 2010

LIGO-Lab/Caltech

Jay Marx

Director, Jay Marx

Date 11/30/2010