



KAGRA Collaboration Agreement Between **XXX Group** and KAGRA

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1 Purpose of the Agreement

The purpose of this document is to exchange the understandings between

XXX Group (hereinafter Group A) and **KAGRA**

on the occasion of starting the scientific observation in 2019, jointly with LIGO (in United States) and Virgo (in Europe).

While individual member, when he/she joined to the collaboration, once agreed to work together towards our scientific goals, this document is for confirming that Group A participates as a unit in all the aspects of the project including our future upgrade plans.

Group A is defined as the representative of the following groups and members.

- AA1 university, at BB1, Country
Representative: CC1, Professor
- AA2 university, at BB2, Country
Representative: CC2, Professor
- AA3 university, at BB3, Country
Representative: CC3, Professor
- AA4 university, at BB4, Country
Representative: CC4, Professor

KAGRA is defined in Section 3 in this Agreement.

2 Background

KAGRA is a 3-km laser-interferometer gravitational wave observatory at Kamioka, Gifu, Japan. The goals of the experiment include observations for gravitational wave, and studies of their physical and astronomical processes.

The KAGRA project was initially planned by the Japanese gravitational wave community in the 1990s as the successive project of TAMA, a 300-m laser-interferometer gravitational wave observatory at Mitaka, Tokyo. After many years of intense effort, the full project was funded by MEXT, JSPS Leading-edge Research Infrastructure Program in 2010.

Its on-site construction was started in 2012, and two test operations were performed in March-April 2016 (*iKAGRA*), and April-May 2018 (*bKAGRA phase-1*). KAGRA will finish its full installation in the end of March 2019, and will begin the real observation in late 2019 jointly with LIGO and Virgo.

Before starting the scientific observations, KAGRA collaboration has decided to exchange this Agreement between the participating groups in order to confirm the coming tasks of the observations and also to start planning the future upgrade of KAGRA.

3 Organization of the KAGRA collaboration

KAGRA collaboration has two levels of core organization:

1) Principal Investigator (PI)

The PI shall have overall responsibility for the project.

2-A) Executive Office (EO)

The EO shall handle all issues of a financial nature regarding the construction and experiment. The chair of EO is PI. Under EO, System Engineering Office (SEO) is organized, which controls all the KAGRA construction, commissioning and operation tasks.

2-B) KAGRA Scientific Congress (KSC)

The KSC is the decision making body of KAGRA collaborators regarding its scientific direction and strategy. KSC has the board, whose members are selected by collaboration vote in every two years. The KSC board organizes the collaboration meetings and coordinates the joint observation with LIGO/Virgo, and other groups.

Currently, KAGRA collaboration is consisted from 90 institutions/universities in 15 countries, and has over 200 active research colleagues. The three host institutions are

- Institute for Cosmic Ray Research (ICRR), The University of Tokyo,
- National Astronomical Observatory in Japan (NAOJ), and
- High Energy Accelerator Research Organization (KEK).

The main rules and regulations of the collaboration consists from (a) Guideline for joining the KAGRA collaboration [JGW-M1707082], (b) KAGRA Authorship Policy [JGW-M1503490], and

(c) KAGRA Publication Policy [JGW-M1503321], which are listed at <http://gwwiki.icrr.u-tokyo.ac.jp/JGWwiki/KAGRA/KSC#regulations>. All the collaboration members have the responsibility to observe these rules and regulations, including data-distribution policy, which will be prepared between KAGRA and LIGO/Virgo.

4 Agreements on the observations at KAGRA

Group A and **KAGRA** agreed the following issues regarding the upcoming observations (Observation 3 and 4 together with LIGO/Virgo; starting 2019 and 2021 respectively, and also for the ones after Observation 4).

1. Group A shall provide the technical and scientific personnel required to fulfill the observation. This requirement includes to participate data-taking shifts at the KAGRA site, approximately in proportion to the number of the members in **Group A**, and to complete physics/astrophysics analysis jointly with certain contributions. Details of these actions are determined separately.
2. KAGRA will provide the on-site operation cost. KAGRA will support the local expenses of the members of Group A within the available budget through the ICRR Inter-University Research program.
3. All the collaboration members have the responsibility to observe the safety rules at the KAGRA site. All the collaboration members are supposed to participate the joint research program of ICRR in advance before working as a part of the shifts, in order to be covered by the worker's accident insurance.

5 Agreements on the future upgrade of KAGRA

Group A and **KAGRA** agreed the following issues regarding the future upgrade of KAGRA facilities.

1. After the originally-planned observation (up to the observation 4 together with LIGO/Virgo) is over, KAGRA proceeds its upgrade for better sensitivity according to the discussion and conclusion by KSC and EO.
2. Group A joins the upgrade processes from the planning stages, and performs the upgrades with responsibility if Group A takes charge of a part.
3. EO and KSC will help Group A to obtain your original budget at your place or country for carrying out the related R&D, preparation and installation of the new equipments to KAGRA.

6 Effective Period of Agreement

This agreement shall be activated upon the signing below by PI of KAGRA and the representative of **Group A** . This agreement shall remain in effect for the duration of the project and shall not be canceled or modified except by the agreement between **Group A** and KAGRA. By signing below, all of the participating members of **Group A** agree to abide by the conditions of the KAGRA collaboration as described in this document.

Takaaki Kajita Date
Institute for Cosmic Ray Research, The University of Tokyo
Principal Investigator of KAGRA

Firstname Lastname Date
xxxxxx, University of xxxx
The representative of XXX Group