Introduction & Status

Hisaaki Shinkai on behalf of KAGRA collaboration

Chair, KAGRA Scientific Congress
Osaka Institute of Technology

2018-06-29 at KAGRA International Workshop at Seoul, Korea
KAGRA Kamioka Gravitational Observatory

former name LCGT = large cryogenic gravitational telescope

3km Laser Interferometer, Cryogenic

Mozumi control office. (15 min)

Toyama City (60 min)

1000m under the summit of the Mt.

358m above the sea level.

http://gwcenter.icrr.u-tokyo.ac.jp/en/
KAGRA collaboration: as of June 2018

385 collaborators
   (8 B students, 73 M students, 35 D students, 10 PDs)
90 institutes
15 countries
   (Australia 5, China 35, France 1, German 1, India 3, Italy 17, Japan 253,
    Korea 23, The Netherlands 1, Poland 2, Russia 1, Taiwan 34, UK 2, USA 10, Vietnam 2)

PI: Takaaki Kajita

Face-to-Face meeting
at Osaka City Univ.
May 2018 ⇦
### Schedule (Construction and Operation)

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- Phase-1 operation (Apr 28 — May 6) finished
- Phase-2 starts on May 7.

(*) The configuration in 2019 is still to be decided referring the milestones.
bKAGRA phase-1 operation (Apr 28 - May 6, 2018)

- All vacuum
- Cooled ETMY (18K for 30 days).
- Duty cycle (88.6% first 5 days; 26.8% May 3 & 4; 59.8% May 5 & 6)
- Longest lock was >10 hrs
- Sensitivity $2 \times 10^{-17} / \text{rHz}$
- PEM injection, hardware injection tests
LIGO/Virgo joint observation plans

"Scenario Paper"

Living Rev Relativ (2018) 21:3
https://doi.org/10.1007/s41114-018-0012-9

"We try to catch up with O3"

GW150914
BHBH@440Mpc

GW151226
BHBH@440Mpc

GW170104
BHBH@880Mpc

GW170608
BHBH@340Mpc

GW170814
BHBH@540Mpc

GW170817
NSNS@40Mpc

2018-06-29 at KAGRA International Workshop at Seoul, Korea
Re-organizing KAGRA groups for joint observations

- **KAGRA**
  - Multi-Messenger Astronomy
  - Outreach
  - Detector Science
  - Data Analysis
  - Joint xxx Committees
  - Publication

- **LIGO**
- **VIRGO**

**Activities**
- Observatory
- Outreach
- Publication
- Education
- Promotion
- Talks
- Articles
- Test GR
- Event Rates
- Waveforms
- EOS
- New Sources

**Keywords**
- Optics
- Seismic
- Lasers
- Quantum
- Burst
- CBC
- Continuous
- ...
✓ Phase-1 test operation finished.
✓ Decided to join O3 of LIGO/Virgo.
✓ Preparing hard & soft, Re-organizing structure.

GW physics and astronomy in 2019 will be with more precise data, and new phase.