Introduction & Status

Hisaaki Shinkai on behalf of KAGRA collaboration

Chair, KAGRA Scientific Congress
Osaka Institute of Technology

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

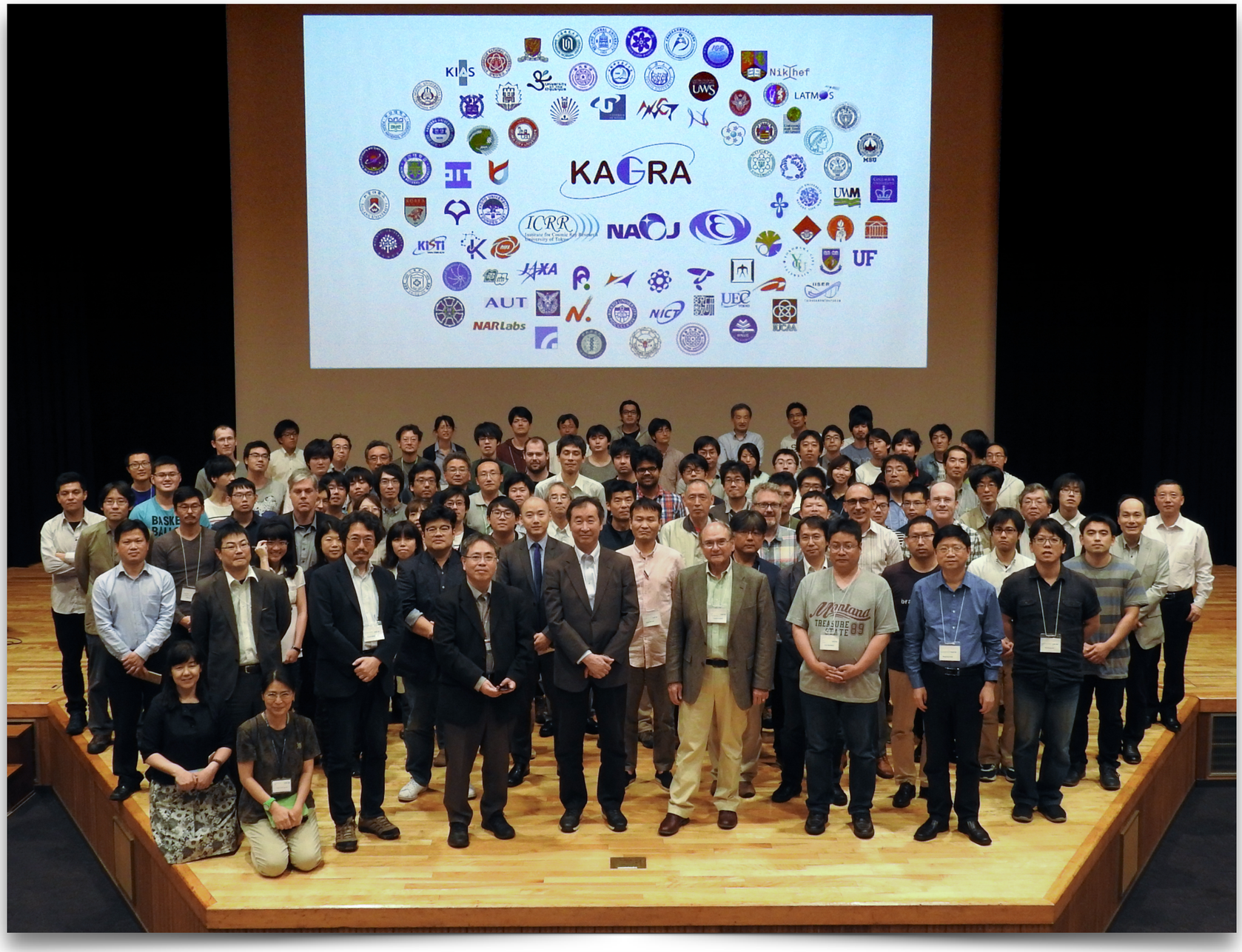
(8 B students, 73 M students, 35 D students, 10 PDs)

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 ⇨

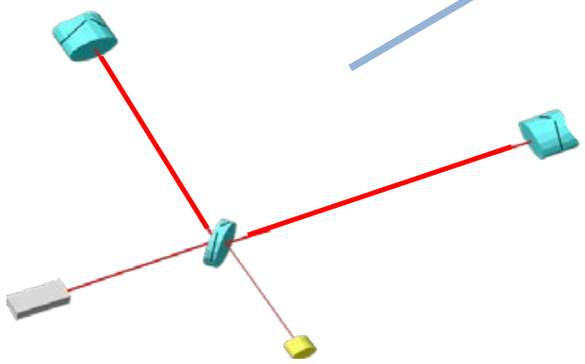
Schedule (Construction and Operation)

slide from Kajita

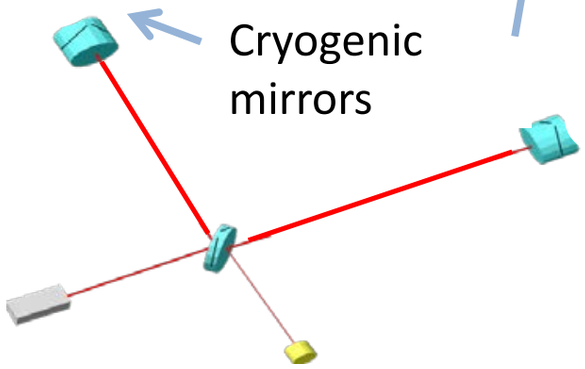
Calendar year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Project start											
Tunnel excavation											
iKAGRA											
operation											
bKAGRA			Adv. vibration isolation, optics, …								
							Cryogenic system				
operation											

phase 1

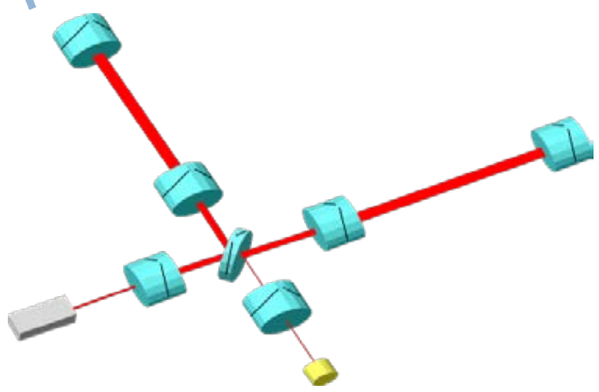
phase 2, 3, 4



iKAGRA



bKAGRA



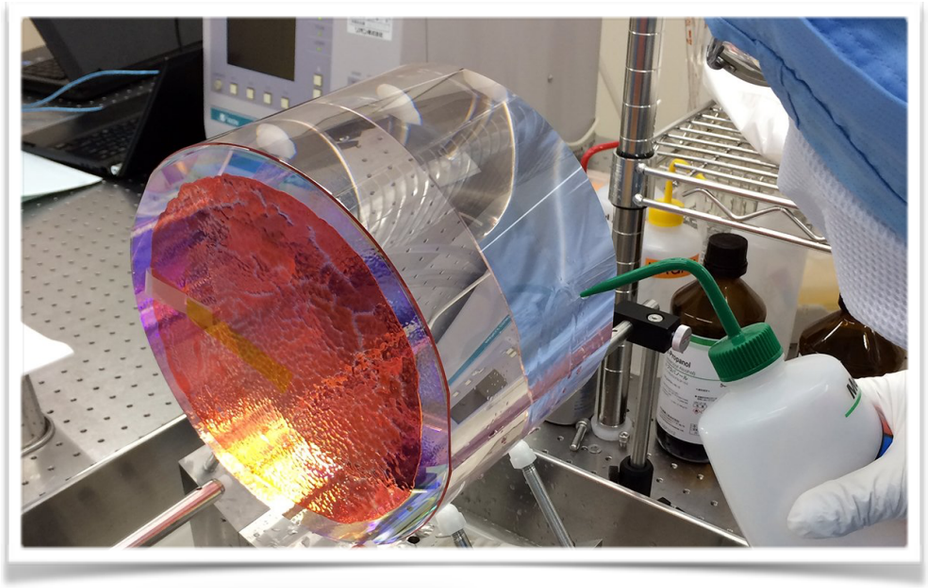
(*) The configuration in 2019 is still to be decided referring the milestones.

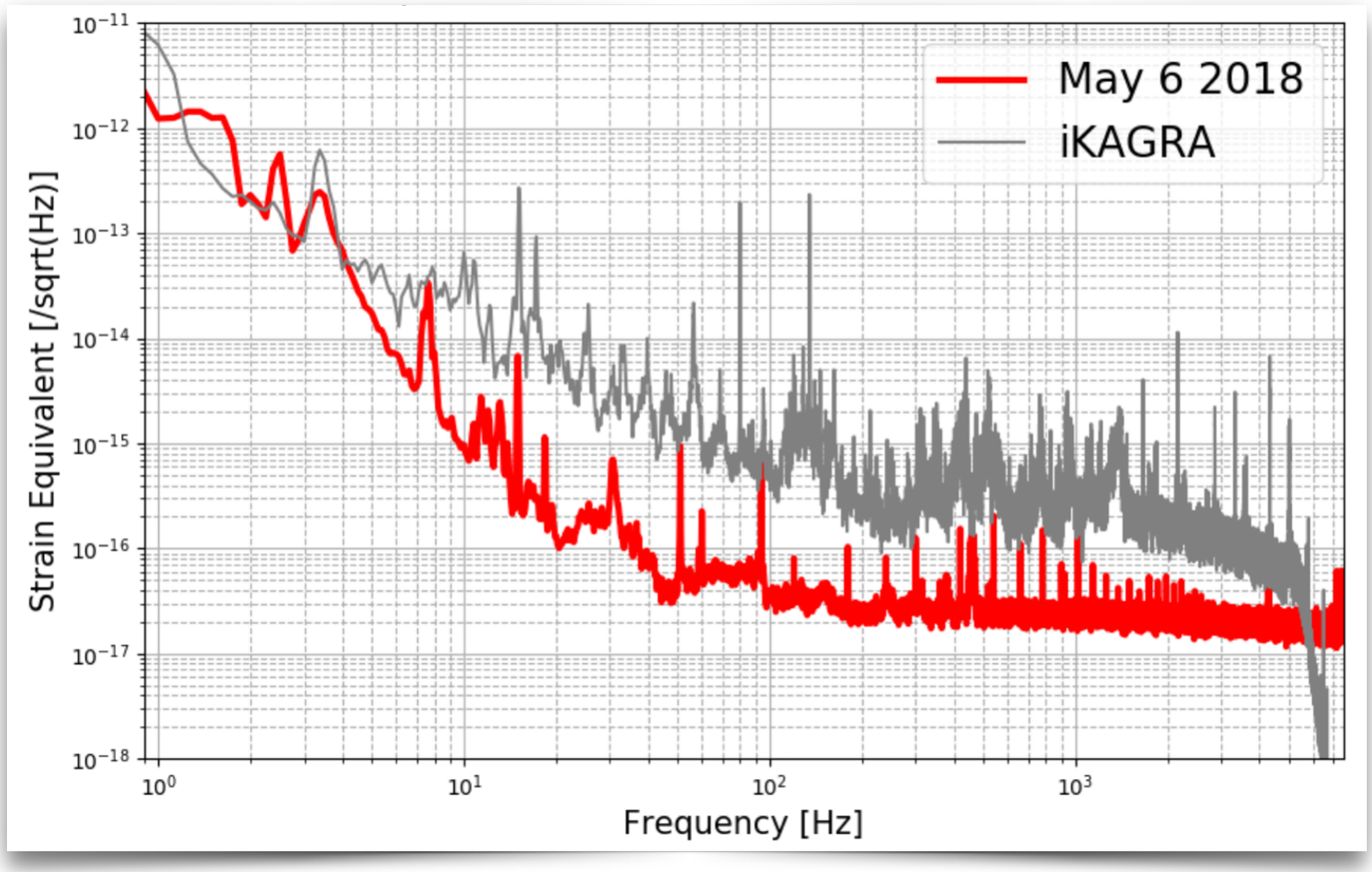
baseline KAGRA

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

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 2x10^{-17} / rHz
- PEM injection, hardware injection tests

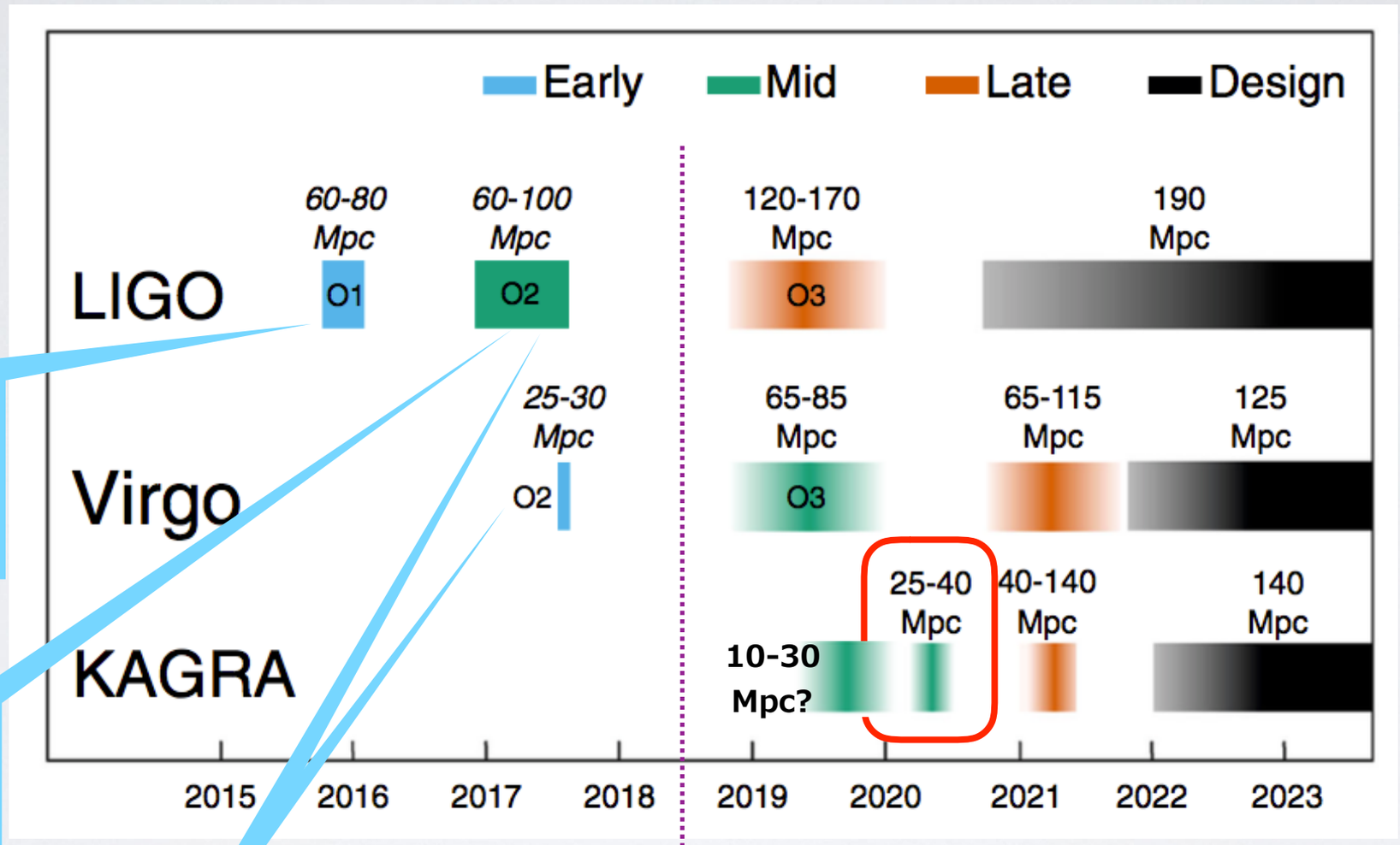




LIGO/Virgo joint observation plans

"Scenario Paper"

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



GW150914
BHBH@440Mpc
GW151226
BHBH@440Mpc

GW170104
BHBH@880Mpc
GW170608
BHBH@340Mpc

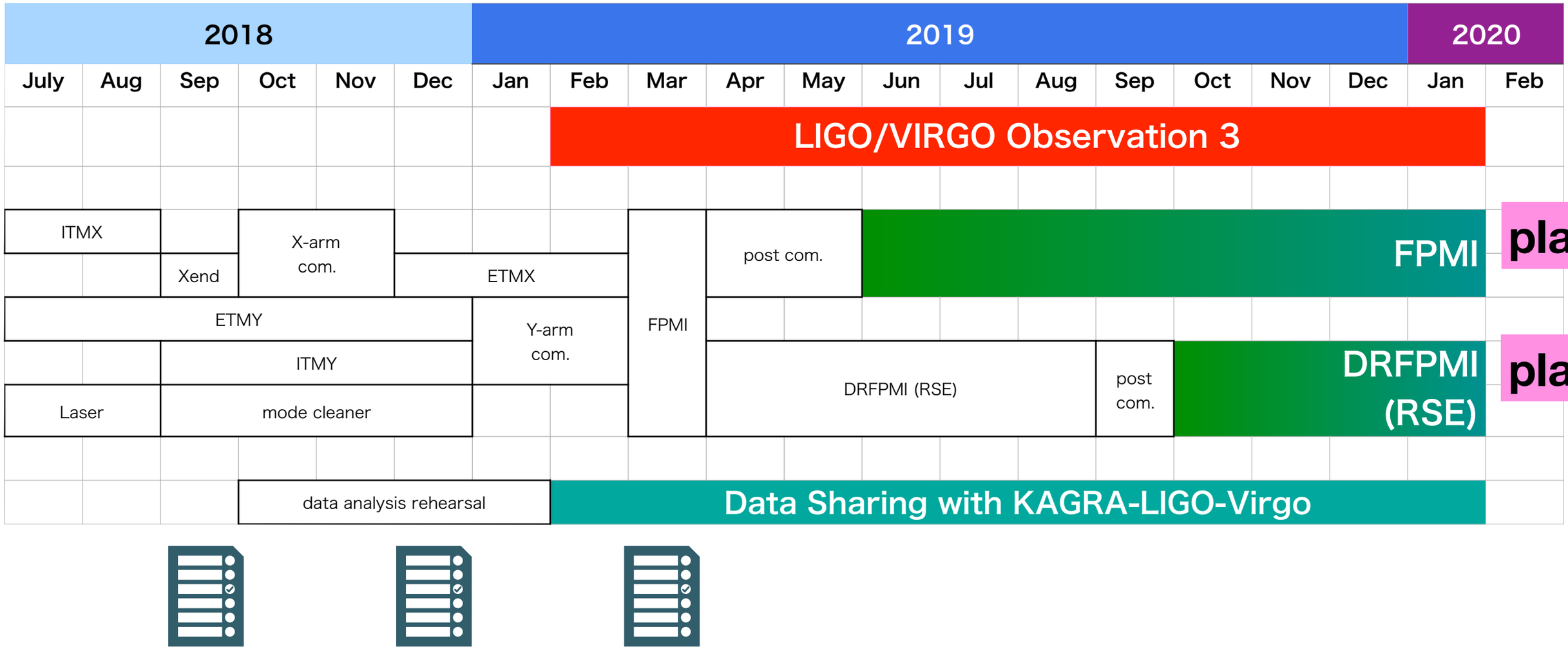
GW170814
BHBH@540Mpc
GW170817
NSNS@40Mpc

today

"We try to catch up with O3"

Roadmap of bKAGRA phase2 &3, Join LIGO/Virgo O3 run

time limited, we have to compromise



— either DRFPMI(RSE) (30Mpc, 2019 Oct?) or FPMI (10Mpc, 2019 June?)
checking points: Sep/2018, Dec/2018 and Mar/2019

Re-organizing KAGRA groups for joint observations

KAGRA

Observatory
Observatory
Observatory

Muti-Messenger Astronomy

Joint xxx Committees

LIGO
VIRGO

Outreach

education
promotion
…

Publication

talks
articles
…

Detector Science

Optics
Seismic
Lasers
Quantum
…

Data Analysis

Burst
CBC
continuous
…

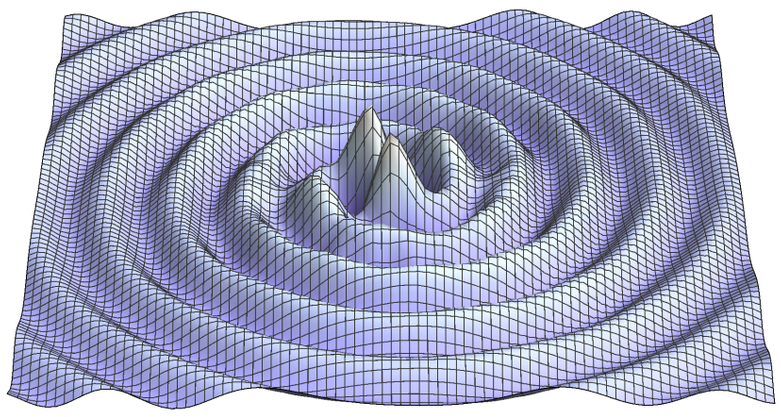
Test GR
Event Rates
Waveforms
EOS
New Sources
…

Introduction & Status

✓ 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.