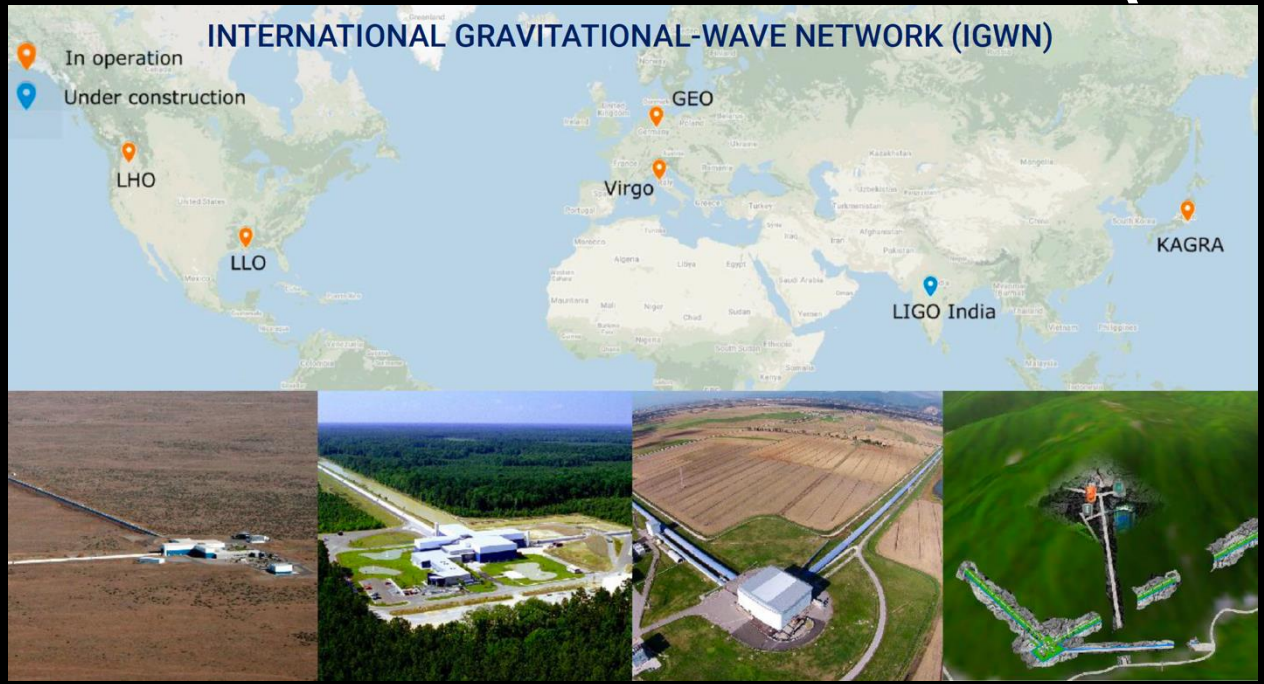
The International Gravitational-Wave Network (IGWN)



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Motivation for IGWN

- LIGO-Virgo-KAGRA leadership recognizes that a new organizational structure is needed to fully exploit the scientific potential of the LVK network

- We require a coordinated network to achieve our scientific goals:
  - A single program that establishes our scientific goals and prioritizes them according to scientific merit and resource availability
- We seek to eliminate parallel and independent (often redundant and inefficient) decision-making processes

- There are many activities that can be shared, rather than duplicated.
- IGWN seeks to:
  - To support operations of a unified network by acquiring more resources
  - To enable equitable and efficient sharing of resources
  - To seamlessly integrate infrastructure and operations across the network

IGWN Mission Statement

- From the IGWN Charter:

“The International Gravitational Wave Network (IGWN) is a self-governing consortium using gravitational-wave detectors to explore the fundamental physics of gravity and observe the universe. The IGWN works toward this goal through development, commissioning and operation of the IGWN ground-based interferometric gravitational-wave detectors through the development and deployment of techniques for gravitational-wave observation; and through interpretation of gravitational-wave data. The IGWN enables collaboration through shared research and development programs across the consortium.”

High Level IGWN Scope

- IGWN is an organization anchored by the current network of LIGO, Virgo and KAGRA gravitational-wave observatories.
- IGWN is organized around these observational facilities with member groups contributing as follows:
  - Provide technical and operational support to the observatories;
  - Investigate and develop technologies to improve the performance of the detectors;
  - Analyze the data from the observatories and publish the results;
  - Prepare and publicly release the data after an initial proprietary period;
  - Communicate the science of IGWN to the scientific community and public.
- As next generation detectors Einstein Telescope and Cosmic Explorer are built, commissioned and come online, it is the envisioned that these new facilities will become members of IGWN.

The Path to IGWN

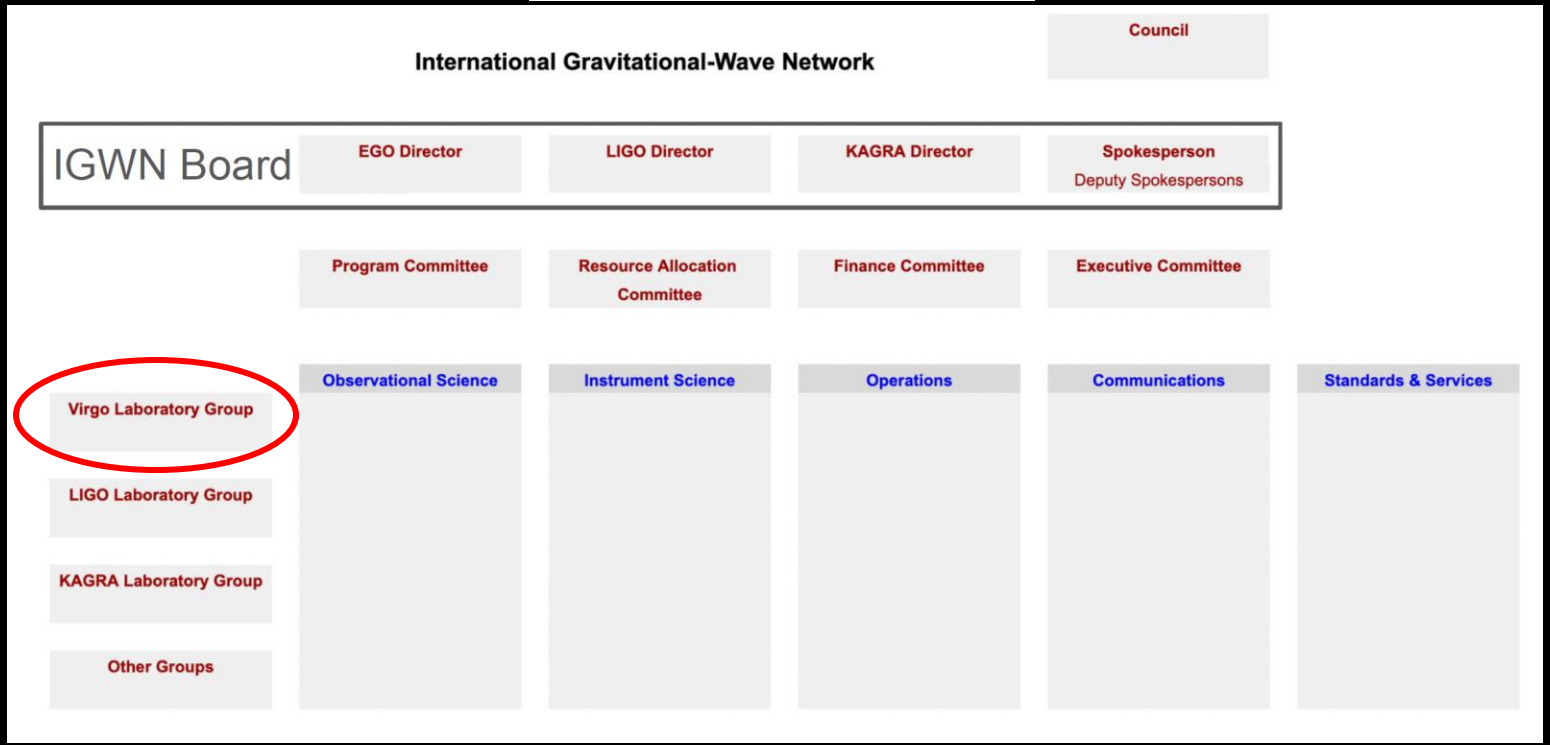
- An ‘IGWN Design Committee’ is charged (by LIGO-Virgo-KAGRA) with developing a Charter (scope and purpose) and Bylaws for the organization, to include:
  - Securing contributions to detector-related activities from member groups
  - Sharing common funds and manage resources to support IGWN activities
  - Avoiding redundancies deriving from multiple venues where decisions are taken
  - Respecting the specific needs and regional realities of the existing detectors/collaborations
- Envisioned timeline: produce a draft Charter and Bylaws to the LVK by the end of the current observing run (June 2025), with some flexibility
- Draft Charter and Bylaws shared with the collaborations and will be open for comments

The IGWN Design Committee

- Virgo members:
  - Gianluca Gemme (Virgo Spokesperson), Massimo Carpinelli (EGO Director), Viola Sordini, Franco Carbognani, Andreas Freise, Mario Martinez, Viviana Fafone, Matteo Barsuglia, Chris van den Broeck
- LSC members:
  - Patrick Brady(LSC Spokesperson), Dave Reitze (LIGO Laboratory Principal Investigator), Albert Lazzarini, Jess McIver, Stephen Fairhurst, Stuart Anderson, Sheila Rowan, David McClelland, K G Arun
- KAGRA members:
  - Masaki Ando (KAGRA Spokesperson), Takaaki Kajita (KAGRA Principal Investigator), Shinji Miyoki, Nobuyuki Kanda, Sungho Lee, Masatake Ohashi, Jun'ichi Yokoyama, Hideyuki Tagoshi, Hyung Won Lee, Ray-Kuang Lee

IGWN Organigram (Current Concept)

Joint Agency Oversight Group



IGWN Formulation Process

- IGWN Design Committee Activities
  - Meet online every ~2 weeks; continue to draft bylaws
  - Face-to-face meetings 3 - 4 times per year
- Draft IGWN Charter has been circulated to LVK for comments
  - First draft of the IGWN Bylaws to be circulated this week
- Meetings with funding agency representatives (making up the Gravitational-Wave Agencies Correspondents, GWAC)
  - NSF, ARC, CNRS, FWO, INFN, NWO-I, STFC were represented
  - Short online meeting in May; face-to-face meeting in June 2024
  - The idea of IGWN is well received and the challenge recognized
  - GWAC gave the LVK homework!
    - see the next slides
- Discussions with ET and CE representatives
  - We've had informal discussions up to now
  - Will continue to meet with CE,ET as the structure of IGWN is refined

Interaction with Funding Agencies

- Topics discussed with the agencies (11 June 2024):
- Governance - agency oversight/engagement is important!
  - How do we include agencies' oversight, engagement?
  - How can we engage other countries/agencies?
- IGWN member groups will be expected to contribute to instrumentation &/or operations
  - Sharing person-power and other resources through financial & in-kind contributions.
  - IGWN will include a financial board and resource allocation board.
  - What financial support model is possible to enable this?
- Looking at existing successful role models for international scientific collaboration (e.g. HEP experiments), are there particular ones favored by the agencies?
- R&D programs for enabling technologies are critically important to the field.

IGWN Status Today

- A draft of the IGWN Charter has been developed and circulated to LIGO, Virgo, and KAGRA Collaborations for feedback.
- A draft of the IGWN Bylaws is under development and will be circulated soon.
- The IGWN Design Committee has received a homework assignment from the GWAC:
  - *“How would IGWN make a decision regarding Virgo upgrade/entry into O5?”*
  - HW due in a presentation at EGO Council in December 2024
    - Paced by Virgo Technical Review Committee on Stable Recycling Cavities, so may be delayed.
  - The IGWN Design Committee is formulating a strategy/process for completing HW assignment.