

Gravitational Wave International Committee (WG.11)

report to IUPAP

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The Gravitational Wave International Committee (GWIC) was formed in 1997 to facilitate international collaboration and cooperation in the construction, operation and use of the major gravitational wave detection facilities world-wide. From 1999 until 2011, GWIC was recognized as a subpanel of PaNAGIC (IUPAP WG.4). In 2011, GWIC was accepted by IUPAP as a separate Working Group (WG.11).

GWIC meets annually, traditionally adjacent to an appropriate conference; with the pandemic we have moved to telemeetings. The most recent meeting was 23-24 September 2021, and was held as a telemeeting. Other recent meetings have been held as a telemeeting (28-29 September 2020), in Valencia (2019), Chicago (2018), Pasadena (2017), New York City (2016), Gwangju (2015), Banff (2014), Warsaw (2013), Rome (2012), Cardiff (2011), and Hannover (2010). Other business during the year is conducted via email or other electronic communication. The next meeting is scheduled for summer 2022 and may be a telemeeting or in person, the latter potentially with a LISA Symposium.

GWIC maintains a website at <https://gwic.ligo.org/> which contains an up-to-date listing of members, its by-laws, announcements of its activities, and links to other items of interest to the gravitational wave community.

GWIC Membership

The membership of GWIC represents all of the world's active gravitational wave projects, as well as other relevant communities, covering gravitational wave frequencies from nanohertz to kilohertz. Each project has either one or two members serving on GWIC depending on project size. GWIC also includes representatives from ISGRG (IUPAP AC2), International Astronomical Union (IAU) Commission on Gravitational Wave Astrophysics, and from the astrophysics/theoretical relativity community, to help facilitate communication with those bodies. One current member of GWIC (Sheila Rowan) is also a member of ApPIC (WG.10), ensuring close communications.

The GWIC Chair is elected by its membership at its annual meeting in odd years. Dave Reitze served from 2019-2021, but chose to step down due to other commitments. At our

2021 meeting, GWIC chose Jo van den Brand as its Chair, serving until 2023. This year David Shoemaker (MIT) serves as the Executive Secretary.

Each member project in GWIC determines its representatives on GWIC. Any changes in membership after our upcoming September 2021 meeting will be reported in the next report to IUPAP.

GWIC Activities September 2020 – September 2021

GWIC played several key roles in enabling the most recent Edoardo Amaldi Conference on Gravitational Waves, sponsored by IUPAP as a "class B" Conference. GWIC chose the Scientific Organizing Committee and the locale (which became the seat of the remote/online LOC given the continued COVID pandemic), and participated in the selection of talks. The meeting was hosted by the ARC Centre of Excellence for Gravitational Wave Discovery (OzGrav). The Amaldi meeting is considered by many in the gravitational wave community to be their most important international gathering. The meeting was considered a great success.

The conference is held biennially and is usually held as an in-person event, across 5 days that includes plenary talks, parallel sessions, social and networking activities, poster sessions and a conference dinner. The typical attendance is around 150-200 participants. Due to the Covid-19 Pandemic it was decided by the Scientific and Local Organising Committees to convert the conference to a 5-day virtual event, 19-23 July. The main conference sessions were run across three, 2-hourly blocks of time across each day, separated by eight hours. Block 1 was U.S.-Europe friendly time zone, Block 2 Australasian-U.S. friendly time zone and Block 3 Australasian-Europe friendly time zone. Over the 5-day conference 12 plenary talks and 174 parallel talks took place. 116 online posters were hosted. There were 517 registrants. Half the speakers, half the SOC, and and $\frac{1}{3}$ of the participants, were women. IUPAP Sponsorship was provided for the meeting, and much appreciated. 29 different countries were represented by registrants. It is clear that the online format helped in the diversity and equity of participation; of course the negative impact of no personal contact, especially for early-career participants, was keenly felt. A 'lessons learned' document was prepared to help GWIC plan for future meetings, both in-person and remote/online.

GWIC's activities in this last year have continued to be primarily focused on [third-generation ground-based observatories](#) ('3G'), via a subcommittee formed in late 2016. The charge for this subcommittee is to engage the community broadly to help formulate the best possible science case and to lay out the best path toward a robust international project. This committee has created subcommittees in several crucial areas: The Science Case, Governance, Detector R&D, Computing, and Community Engagement.

The subcommittee, with broad engagement by the community, has produced a series of reports, and has also written a number of more specialized documents for use in roadmaps in Europe and the US, and for proposals for continuing efforts.

The full reports were shared with a set of program officers and others in funding agencies internationally, and detailed comments received. A round of editing of the full report is now complete, and the final reports were approved at the September 2020 GWIC meeting. Some editorial polishing followed, and the reports are available on the [GWIC website](#) now ready for submission to the arXiv. The GWIC work was central to the success of both the European Einstein Telescope proposal to join the ESFRI Roadmap, and the completion of the US Cosmic Explorer Horizon Study prepared for the US National Science Foundation.

GWIC completed a Roadmap summary for the field, as informed by the 3G studies described above. It appeared in Nature Physics Reports ([Nature Reviews Physics](#) volume 3, pages 344–366 (2021)).

GWIC has added a new standing subcommittee associated with IGrav, an international education and public outreach organization which has participation from many of the GWIC member project collaborations and consortia. IGrav also has significant activity in the field of diversity, equity, and inclusion, and will be supporting and encouraging proactivity in GWIC member groups in that domain.

Membership of GWIC (as of September 2021)

Chair: Jo van den Brand, Dutch National Institute for Subatomic Physics (Nikhef) and VU University in Amsterdam, (GWIC, 2017–, Chair 2021–)

Cosmic Explorer: Matt Evans, MIT, 2019–

Einstein Telescope: Michele Punturo, INFN-Perugia, 2009–

European Pulsar Timing Array (EPTA): Michael Kramer, Max-Planck-Institut für Radioastronomie and Jodrell Bank Centre for Astrophysics (University of Manchester), 2009–

GEO 600: Karsten Danzmann, Albert-Einstein-Institut für Gravitationsphysik and University of Hannover, 1997–; Sheila Rowan, University of Glasgow, 2009–

IndIGO: Bala Iyer, International Centre for Theoretical Sciences (ICTS) of the Tata Institute of Fundamental Research (TIFR), 2011–; Somak Raychaudhury, Inter-University Centre for Astronomy and Astrophysics, 2017–

KAGRA: Jun'ichi Yokoyama, RESCEU, University of Tokyo, 2021–; Takaaki Kajita, Institute for Cosmic Ray Research, University of Tokyo, 2011–

LIGO: Dave Reitze, California Institute of Technology and University of Florida, 2007–; Patrick Brady, University of Wisconsin Milwaukee, 2019–

LISA Community: Kelly Holly-Bockelmann, Vanderbilt University, 2018–; Bernard Schutz, Albert-Einstein-Institut für Gravitationsphysik, 2001–; Ira Thorpe, Goddard Space Flight Center, 2016–; Stefano Vitale, University of Trento, 2001–

NANOGrav: Scott Ransom, NRAO, 2019–

OzGrav: PPTA: Matthew Bailes, Swinburne University, 2017–; Audioband: David McClelland, Australian National University, 2000–

Virgo: Giovanni Losurdo, University of Pisa, 2020–; Jo van den Brand, Dutch National Institute for Subatomic Physics (Nikhef) and VU University in Amsterdam, 2017–

Theory Community: Luis Lehner, Perimeter Institute, 2018–

IUPAP Affiliate Commission AC2 (International Commission on General Relativity and Gravitation): Beverly Berger, 2013–

IAU Commission D1 Representative: Peter Shawhan, University of Maryland, 2021–

Executive Secretary: David Shoemaker, Massachusetts Institute of Technology, 2016–