II Latin American Strategy Forum for Research Infrastructure: an Open Symposium for HECAP

SAGO – South American Gravitational wave Observatory

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July 8th, 2020
Masses in the Stellar Graveyard

in Solar Masses

LIGO-Virgo Black Holes

EM Black Holes

EM Neutron Stars

LIGO-Virgo Neutron Stars

Updated 2020-05-16
LIGO-Virgo | Frank Elavsky, Aaron Geller | Northwestern

September 14, 2015 → GRAVITATIONAL WAVE ASTRONOMY
MULTIMESSENGER ASTROPHYSICS: Simultaneous search with electromagnetic window instruments

Less than two years after the debut of gravitational wave astronomy, GW170817 marks the beginning of a new era of discovery.
2017 Nobel Prize in Physics
KAGRA is located in Kamioka mine underground
- 220km away from Tokyo
- 360m altitude
- Big laboratory area
Fig. 2 The planned sensitivity evolution and observing runs of the aLIGO, AdV and KAGRA detectors over the coming years. The colored bars show the observing runs, with achieved sensitivities in O1, O2 and O3, and the expected sensitivities given by the data in Fig. 1 for future runs. There is significant uncertainty in the start and end times of the planned observing runs, especially for those further in the future, and these could move forward or backwards relative to what is shown above. Uncertainty in start or finish dates is represented by shading. The break between O3 and O4 will last at least 18 months. O3 is expected to finish by June 30, 2020 at the latest. The O4 run is planned to last for one calendar year. We indicate a range of potential sensitivities for aLIGO during O4 depending on which upgrades and improvements are made after O3. The most significant driver of the aLIGO range in O4 is from the implementation of frequency-dependent squeezing. The observing plan is summarised in Sect. 2.5.
Finding flat sites

40 km

30 m
Finding flat sites

Credit: Evan Hall (LIGO, MIT)
Einstein Telescope

http://www.et-gw.eu/
ET collaboration

- Launched the ET letter of intent @ the 9th ET symposium (April 2018)
- At the 10th ET symposium, April 2019, we collected more than 730 signatories

Credit: Evan Hall (LIGO, MIT)
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The technologies to be pursued

3G R&D
- the current status of R&D
- Foreseeable requirements
- Paths towards these goals
- Coordination requirements


GWIC, GWIC-3G, GWIC-3G-R&D-Consortium

H. Lück, G1901698

- Facilities & Infrastructures
- Core Optics
- Coatings
- Cryogenics
- Newtonian Noise
- Light Sources
- Quantum Enhancements
- SAS & SUS
- Auxilliary Optics
- Simulation and Controls
- Calibration
Before asking money for a proposal, we need to ask fellowships and research money for creating a critical mass of researchers in Latin America with knowledge on the 3G technology. So, we need to involve Latin American students and post-docs in the present projects (LIGO, Virgo, KAGRA, LIGO India, ET, and Cosmic Explorer) and attract them and foreign post-docs with knowledge on 3G to form groups in Latin America.
LSC/GWINPE: 8 members; LSC/IIP/UFRN: 2 members; LSC/AEI: Marina Neri (Brazil); LSC/USA: Claudia Moreno (Mexico); Virgo/Italy: Iara Tostae Melo (Brazil); Virgo/Netherlands: Enzo Tapia (Chile), Virgo/Brazil: Edison Santos (Brazil); KAGRA: Fabian Peña Arellano (Peru). TOTAL: 16+
Thanks for your attention!