COLLOQUIUM

The Road Ahead: Challenges for Future Gravitational Wave Detectors

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The first detections of gravitational waves from coalescing black holes and neutron stars in 2015 and 2017 have only started the field of gravitational-wave astronomy. More sensitive detectors are needed if one wants to explore a larger part of the observable universe and answer questions ranging from astrophysical evolution to cosmology and fundamental physics. Going from here I will highlight the main limitations and challenges to overcome on the way to build more sensitive detectors.

Newtonian noise, thermal noise, and quantum noise are three prominent noise sources to name.

And of course: LARGE detectors do not hurt either (except the budget…). I will also briefly discuss other potential uses of gravitational wave detectors, and I hope we can listen to how the universe would sound, imagining a noise-free detector!