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**Gravitational wave detectors for the coming decades** SHEILA DWYER, LIGO Hanford Observatory, Caltech, LIGO SCIENTIFIC COLLABORATION — After the first few detections of gravitational waves, the scientific community will want more frequent detections, with higher signal to noise ratios to answer some of the pressing scientific questions that will become available with this new observational tool. This talk will focus on two promising ways of improving the sensitivity of gravitational wave detectors, both of which rely on proven technologies to provide significant scientific gains. In the next several years, squeezed states can be injected into the existing detectors to reduce the quantum noise which limits their design sensitivity at most frequencies in their detection band. In the longer term, extending the length of the interferometer arms may be the most practical and powerful way to further improve the sensitivity and allow for observation of gravitational waves at cosmological distances.

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