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Computing in large scale experiments

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On September 14 2015 Advanced LIGO made the first observation of a gravitational-wave signal. It is expected that many more observations will be made in the coming years, providing a new way of observing the Universe. The analysis of LIGO data that enables such observations requires the use of numerous large-scale computing facilities around the world. In this talk we describe the computational challenges of searching for and inferring the physical parameters of gravitational-wave signals buried in data taken by gravitational-wave interferometers. We also discuss some of the most computationally expensive science targets for LIGO, describing how these are balanced against existing computational resources and innovative solutions to maximize the computing available to us. Finally, we explore how the computational requirements of gravitational-wave astronomy will evolve as the sensitivity, bandwidth and number of gravitational-wave observatories increases.