SES15-2015-000145

Abstract for an Invited Paper
for the SES15 Meeting of
the American Physical Society

The dawn of gravitational-wave astronomy[1]

MARCO CAVAGLIA, Univ of Mississippi

In 1916 Albert Einstein demonstrated that the theory of general relativity allows for wave-like solutions. Although there is indirect proof of the existence of gravitational waves, their direct detection eluded us for a hundred years. The Advanced Laser Interferometer Gravitational-wave Observatory (LIGO) is the world leading scientific experiment for the detection of astrophysical gravitational waves. The Advanced LIGO instruments became operational in September 2015 and are now collecting data at unprecedented sensitivities. It is widely expected that Advanced LIGO will soon provide the first direct detection of gravitational waves. Detection and measurement of gravitational waves will open the way to new astronomical observations and probe fundamental physics. This will be a momentous event that will mark the beginning of a new field: gravitational-wave astrophysics. In this talk I will present an overview of LIGO science and discuss the prospects of this nascent field.

[1]On behalf of the LIGO Scientific Collaboration