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Gravitational Wave Astrophysics: Early Results from Gravitational Wave Searches and Electromagnetic Counterparts

Edited by

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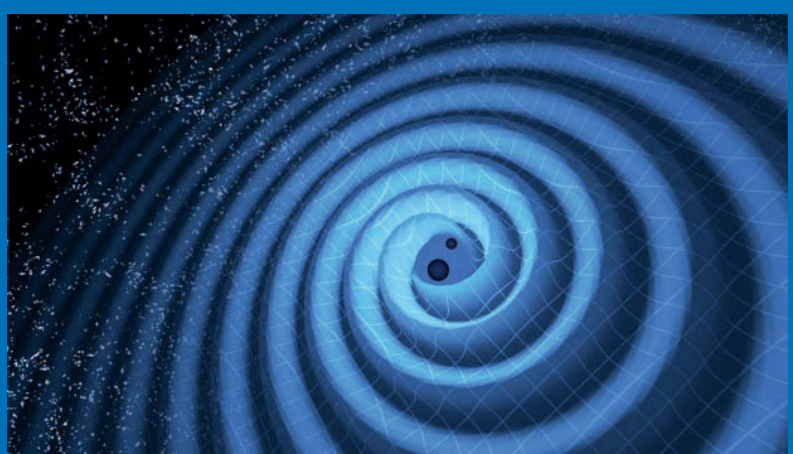
Robert Hynes



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COVER ILLUSTRATION:

Illustration of the merger of two black holes producing gravitational waves.

Photo Credit: LIGO/T. Pyle

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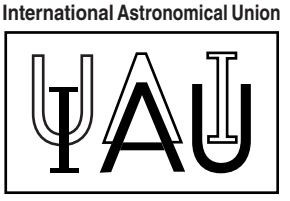

GRAVITATIONAL WAVE ASTROPHYSICS: EARLY RESULTS FROM GRAVITATIONAL WAVE SEARCHES AND ELECTROMAGNETIC COUNTERPARTS

PROCEEDINGS OF THE 338th SYMPOSIUM OF THE INTERNATIONAL ASTRONOMICAL UNION HELD IN BATON ROUGE, UNITED STATES OCTOBER 16-19, 2017

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Preface

The detection of gravitational waves in September 2015 with the LIGO detectors opened a new era in gravitational-wave astronomy. The first detection and the ones that followed have provided insights into previously unanticipated black holes of stellar size. The detection of the merger of neutron stars with LIGO and Virgo detectors, and the many electromagnetic counterparts were announced on the first day of the workshop, started a new era of multi-messenger astronomy.

Physicists and engineers working on the sensitive detectors, and physicists and astronomers working on the analysis and interpretation of the data got together in Baton Rouge to share knowledge and enthusiasm for science with gravitational waves. The conference attracted a very diverse participation with 83 participants ranging from beginning graduate students to very senior figures in the field from many countries that exchanged ideas during three days of talks.

Taking advantage of impeccable, albeit coincidental, conference timing, the conference started watching live on the screen the announcement in Washington, DC, of the discovery and follow up of the merger of neutron stars dubbed GW170817; several of the expositors in the press conference flew to baton Rouge to give talks in the conference in the next days. The conference had talks on both Earth- and space-based detectors and detection of gravitational waves using pulsar timing, as well as sources of gravitational waves and searches for those including not just binary systems but also periodic signals from rotating stars, stochastic backgrounds from unresolved sources and cosmological sources, and un-modeled sources.

In our conference banquet, we remembered sadly the passing away of Dr. Neil Gehrels, a famous and honored astrophysicist who was at the time of his death the President of the IAU Commission D.1 on Gravitational Wave Astrophysics, and a co-chair of the Scientific Organizing Committee of this conference.

It was a very timely conference for a very exciting time that organizers and participants enjoyed thoroughly, thanks to the financial and logistics support of the International Astronomical Union and Louisiana State University.

Gabriela González and Robert Hynes

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