

Gravitational Waves: New Challenges and Opportunities

Summer Research School, July 7 – 14 2019, Gebze, TURKEY

Gravitational waves were predicted by Albert Einstein more than a century ago within his theory of general relativity. The recent detection of gravitational waves from merging binary black holes and binary neutron stars can be considered one of the greatest triumphs of pure theoretical reasoning and mathematical construction of all times. Gravitational waves carry the signatures of the warped spacetime, thus opening a new window on the exploration of the universe. The detection of gravitational waves also represents frontier technological challenges, such as advanced laser interferometers, detectors and quantum metrology, information and control systems, modeling and simulations of violent events. The Research School aims at providing an occasion to introduce graduate students and young researchers to the developments in this newly emerging and fascinating area of modern science.

Lecturers



Scott A. Hughes

Massachusetts Institute of Technology, USA



Badri Krishnan

Max Planck Institute for Gravitational Physics, Germany



Nergis Mavalvala

Massachusetts Institute of Technology, USA



Luciano Rezzolla

University of Frankfurt, Germany

Topics Covered

- Gravitational Waves in General Relativity
- Sources of Gravitational Waves in the Universe
- Modeling and Simulation of Gravitational Waveforms
- Numerical Relativity: Fundamentals and Advanced Techniques
- LIGO Detectors: Quantum Challenges and Squeezed Light Technologies
- Testing Fundamental Science with Gravitational Waves
- Multi Messenger Astronomy: Developments and Perspectives

Organizers: Alikram N. Aliev (TÜBİTAK TBAE), Tansu Daylan (MIT USA)

Deadline for Applications: June 20, 2019