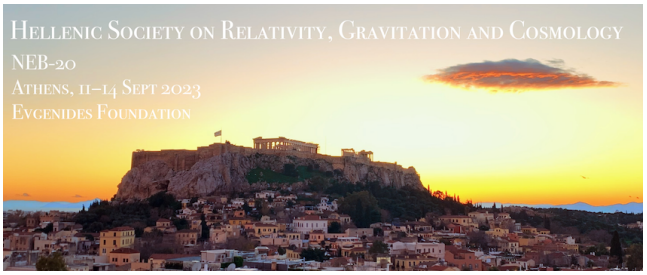

Contribution ID: **33** Type: **not specified**

High precision waveforms: the frontier in gravitational-wave source modeling

Monday, 11 September 2023 09:30 (1 hour)

Since 2015's celebrated first detection of gravitational waves from merging black holes, detectors have measured waves from nearly a hundred different events. Many current detectors are being upgraded, improving their sensitivity and broadening their sensitive wave bands; future detectors are planned which will likewise have wider bands and deeper sensitivity. These future instruments will be able to measure more cycles of detector waves, and to measure each cycle more precisely than those we measure today. Measurements with these future detectors will be able to teach us even more about their sources than current measurements — but only if theoretical modeling is able to match the advances in measurement science that make possible these improved detectors. As we measure more of the waveform with better precision, the likelihood increases that systematic modeling errors will affect our inferences about what we measure. In this talk, I will discuss the challenge of making gravitational waveforms for the future detector era, and discuss the different methods being brought to bear to solve this challenging problem. I will conclude with cautious optimism that theorists will be able to keep up with the instrument builders, and provide precise waveforms for next generation gravitational-wave astronomy.

Presenter: HUGHES, Scott (Massachusetts Institute of Technology)

Session Classification: Plenary