1082-83-36 **Geoffrey Lovelace*** (geoffrey4444@gmail.com), Gravitational-Wave Physics & Astronomy Center, Dept. of Physics, Cal. State Univ. Fullerton, 800 North State College Blvd., Fullerton, CA 92834. *Simulating compact-binary mergers containing nearly extremal black holes.*

When compact objects (black holes, neutron stars, or white dwarfs) spiral together and merge, they emit gravitational waves which are among the most promising sources for detectors such as the Advanced Laser Interferometer Gravitational-Wave Observatory (Advanced LIGO, scheduled for completion in 2015). There is a significant possibility that nearly extremal black holes (i.e., holes spinning nearly as rapidly as possible) exist and thus are among the compact-binary mergers that Advanced LIGO could detect. Numerical-relativity simulations of compact-binary mergers—necessary for predicting the emitted gravitational waveforms and for exploring the highly nonlinear, strongly warped spacetime near the holes' horizons—are particularly challenging when they contain nearly extremal black holes. In this talk, after discussing some of these challenges and current methods to address them, I will present results from recent simulations of black hole-black hole and black hole-neutron star mergers where the holes are nearly extremal. (Received May 18, 2012)