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**Perspectives on Geometrodynamics: The Nonlinear Dynamics of Curved Spacetime<sup>1</sup>**

KIP S. THORNE, California Institute of Technology

In the 1950s John Archibald Wheeler exhorted his students and colleagues to explore “Geometrodynamics,” i.e. the dynamical behavior of curved spacetime, as predicted by Einstein’s general relativity theory. Unfortunately, the research tools of that era were inadequate for the task. This has changed over the past ten years and will change further in the coming decade, thanks to two new sets of tools - numerical relativity, and gravitational wave observations, coupled to theory. In this lecture, I will review the progress and prospects for geometrodynamics, focusing especially on: 1. Geometrodynamics near singularities, 2. Geometrodynamics triggered by colliding black holes, 3. Geometrodynamics triggered by black-string instabilities in four space dimensions, and 4. Preparations for observing the dynamics of curved spacetime with interferometric gravitational wave detectors: LIGO and its international partners.

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