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## **An Exact One-Body Approach to the Binary Problem in General Relativity**

*Friday, 12 July 2024 15:00 (20 minutes)*

To precisely model or solve the binary problem in general relativity is a formidable challenge for both astronomy and gravitational physics. We will provide an exact one-body approach for the conservative part of such a problem, which applies to the whole three stages of the binary merger process. It utilizes a rotating gravitational field comprising two joined patches as the background for the two participants of merger process, whose rotational speed is determined by the energy balance condition at infinity when the dissipation effect of gravitational wave radiation is considered. Taking the quadrupole radiation as the source of dissipation, our method yields gravitational waveforms of binary merger events highly coincident with those of EOB+NR+BHPT (Effective One Body method, Numerical Relativity, Black Hole Perturbation Theory), but with all features directly traceable to the inner structure of black holes.

**Primary author:** ZENG, Dingfang

**Presenter:** ZENG, Dingfang

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