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Gravitational Waves Probes of Extreme Gravity Physics

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Einstein's theory has passed all tests to date in the quasi-stationary weak-field, where gravitational dynamics are weak and quadrupolar, while velocities are small relative to the speed of light. The highly non-linear and dynamical regime of the gravitational interaction, however, remains mostly unexplored. The imminent detection of gravitational waves will open a window into this regime that will allow us to confront Einstein's predictions with extreme gravity data to unprecedented levels. In this talk, I will review what physics and General Relativistic principles will be put to the test in the extreme gravity regime with gravitational waves.

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