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Critical Collapse of Rotating Gravitational Waves: Recent Progress TONY CHU, Canadian Institute for Theoretical Astrophysics, SPEC COLLABORATION — Critical phenomena in general relativity have received much interest since Choptuik's pioneering work on the threshold of black hole formation in the collapse of a spherically symmetric massless scalar field. By considering a one-parameter family of initial data, the scalar field configuration would either collapse to a black hole or eventually disperse, depending on whether the parameter was larger or smaller than some critical value. Furthermore, it was found that the mass of the black hole formed follows a universal power-law scaling as a function of the parameter's distance from its critical value. Shortly afterwards, similar critical phenomena in the collapse of axisymmetric gravitational waves were discovered by Abrahams and Evans. In fact, it is now thought that critical phenomena are a generic feature of gravitational collapse under fine-tuning of initial conditions. However, surprisingly little is known about situations that include angular momentum. In this talk, I will describe recent progress in simulating the collapse of rotating gravitational waves, in which the waves may carry large angular momentum, and comment on the approach to the critical solutions in these cases.

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