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Higgsless simulations - A modern tool in the numerical exploration of first-order phase transitions and stochastic backgrounds of gravitational waves

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A stochastic gravitational wave background of cosmological origin is an intriguing possibility to be probed by gravitational wave detectors such as pulsar timing arrays and LISA in the near future. In this talk, I will present a novel “Higgsless” simulation to predict the stochastic gravitational wave spectrum from first-order phase transitions in the early universe. I will present results for weak-to-intermediate phase transitions, and demonstrate an application to phase transitions seeded by domain walls. Being numerically efficient and fully nonlinear, the “Higgsless” approach will pave the way for exploring previously uncharted regimes of strong phase transitions and relativistic wall velocities.

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