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The Stochastic Gravitational-Wave Background from Stellar Core-Collapse Events BELLA FINKEL, Skidmore College, HAAKON ANDRESEN, The Oskar Klein Centre, Department of Astronomy, VUK MANDIC, School of Physics and Astronomy, University of Minnesota — The collapse of massive stars is a dynamical, aspherical, and stochastic process which produces gravitational radiation with a waveform representative of the physics of the collapse. We estimate the stochastic gravitational-wave background arising from all core-collapse supernovae in the universe based on the gravitational wave signal predictions of recent numerical simulations. We focus on the signals from slowly and non-rotating progenitors which are expected to constitute the vast majority of stellar core-collapses, but we also compute the background expected from rapidly rotating and highly massive progenitors as extreme-case limits. Our computations are made under the assumption that each progenitor model describes all core-collapse events in the universe, so our results demonstrate the range of possible backgrounds in which the "true" background from core-collapse may lie. Our most realistic estimates are two or more orders of magnitude below the sensitivity the third-generation terrestrial gravitational wave detector Cosmic Explorer.

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