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Stability of relativistic stars

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The stable relativistic stars form a two-dimensional family parametrized by mass and spin. Radial instabilities to collapse and to explosive expansion set upper and lower limits on their mass; and an instability driven by gravitational waves may limit on their spin. Gravitational waves from unstable nonaxisymmetric modes of nascent neutron stars, old stars spun up by accretion, and the hypermassive remnants of binary mergers, are all candidates for gravitational wave detectors, but major uncertainties in the microphysics persist.