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Individual neutron stars as GW sources: continuous and long-transient signals

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One of the longest-standing science targets of gravitational-wave detetors are spinning deformed neutron stars. While exceedingly weak and hence still eluding detection, “continuous waves” from such individual objects will bring a new regime of gravitational astrophysics where we can keep observing the same source over and over and perform rich multi-messenger studies. In addition, neutron stars can also emit long transient signals triggered by a variety of energetic events. Together, both new types of gravitational-wave signals promise an unprecedented probe into the structure, interior, and dynamics of the densest stellar objects in the Universe.

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