

Abstract Submitted
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How big a bump can you make on a neutron star? BENJAMIN OWEN, Penn State — I estimate maximum elastic deformations for compact stars with exotic equations of state. Solid strange stars could sustain maximum ellipticities of 5×10^{-5} rather than 6×10^{-8} for conventional neutron stars, and hybrid stars could sustain 1×10^{-6} . Most of the difference is due to the shear modulus, which can be up to 10^{33} erg/cm³ rather than 10^{30} erg/cm³ in the inner crust of a conventional neutron star. Maximum solid strange star ellipticities are comparable to upper limits obtained for several known pulsars in a recent gravitational wave search by LIGO. Maximum ellipticities from the more robust hybrid model are on the edge of detectability by LIGO at initial design sensitivity for the same pulsars. A large shear modulus also strengthens the case for starquakes as an explanation for frequent pulsar glitches.

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