

PHYSICS AND ASTRONOMY COLLOQUIUM

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Exploration of extreme energy density matter through neutron stars

Neutron stars are generally thought to harbor the ultimate energy density of observable cold matter. In view of this expectation, recently well-measured neutron star masses around 2 solar masses have caused quite a stir. The cause for excitement is that the presence of exotica in the form of hyperons, Bose condensates, quarks, etc., that were thought to soften the pressure vs. energy density relation - the equation of state (EOS) of neutron star matter - seems untenable.

In this talk, I'll present arguments and results based on general grounds that will aid us in determining the EOS of neutron star matter. The need for simultaneous knowledge of the radii of neutron stars for which the masses are well-measured will be highlighted. Observational and theoretical efforts underway, and promising future directions, will be pointed out.



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