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## A $G(2)$ -QCD Neutron Star

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$G_2$ -QCD, i.e. QCD with the gauge group  $SU(3)$  replaced by the exceptional group  $G(2)$ , shares many features with  $SU(3)$ . But it is accessible at finite density on the lattice, as it has no sign problem, and at the same time has a neutron.

Therefore, this theory can sustain in principle neutron star. Using the equation of state for this theory from lattice simulations, we solve the Oppenheimer-Volkoff equation and obtain the mass-radius-relation of such neutron stars.

This study shows how different phases, visible in the equation of state, influence the mass-radius relation, and therefore gives guidance for the case of full QCD and true neutron stars.

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