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The EOS and superfluid properties of dense matter from neutron star observations¹

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Neutron stars offer a unique window into a region of the QCD phase diagram which is nearly inaccessible from experiment: matter with temperatures less than or equal to 1 MeV and densities near a few times the nuclear saturation density. In particular, observations of neutron star masses, radii, ages, and surface temperatures are providing constraints on the equation of state of dense matter and the magnitude and density dependence of the gaps. In this talk, I will briefly describe the current status on what we know about these properties of dense matter. I will also describe two of the most important frontiers in dense matter research: the EOS between 1 and 2 times the nuclear saturation density and the composition of the neutron star core.

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