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Dark matter triggering decofinement phase transitions in neutron stars

I show that the decay, self-annihilation or nucleonic scatters of dark matter can trigger phase transitions from a hadronic to a quark/hybrid phase in neutron stars. For certain high-density equations of state of nuclear matter and stellar mass-radius configurations, the phase transition would convert the neutron star to a black hole. Consequently, the observed existence of neutron stars and rates of gamma ray bursts set some of the most stringent limits on the microscopic properties of dark matter.

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