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Why “black widow” pulsar systems are important for the quest of neutron star maximum mass

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Relativistic binary systems showing the ablation of the donor star by pulsar winds have been discovered in 1988 and studied recently using FermiLat and other facilities. We discuss in this presentation the evolution of the “black widow” systems, showing that theoretical tracks reveal i) the importance of illumination feedback of X rays onto the donor star, ii) a long (several Gyr) overall timescale to arrive to the observed orbital period-donor mass plane iii) their parenthood with the younger “redback” binary systems; and iv) the large mass transfer occurred along the evolution, which justifies the recent claims of very large masses ($> 2M_{\odot}$) of the neutron stars as measured in at least three cases. We show how these features impact the supranuclear equation of state and limit compositional possibilities.

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