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Limiting the Accretion-fed Growth of Neutron Stars during Common Envelope MORGAN MACLEOD, ENRICO RAMIREZ-RUIZ, Univ of California-Santa Cruz — This talk focuses on the orbital inspiral of a neutron star (NS) through the envelope of its giant-branch companion during a common envelope (CE) episode. These CE episodes are necessary to produce close pairs of NSs that can inspiral and merge due to gravitational wave losses in less than a Hubble time. Yet, as an embedded NS spirals to tighter separations within the CE, it can also accrete from the surrounding material. Standard theories for the hydrodynamics of CE events predict that embedded NSs may gain enough mass to force their collapse to black holes. We argue that CE structure, and in particular, the density gradient across the accretion radius of the NS leads to flow morphologies that prevent the NS from gaining much mass during its CE inspiral. The modest mass gains we predict can reconcile theories of neutrino-cooled accretion onto NSs with the observed masses of NSs in close double-NS binaries.

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