

A Complete Sample of Low Mass White Dwarf Binaries in the SDSS Footprint

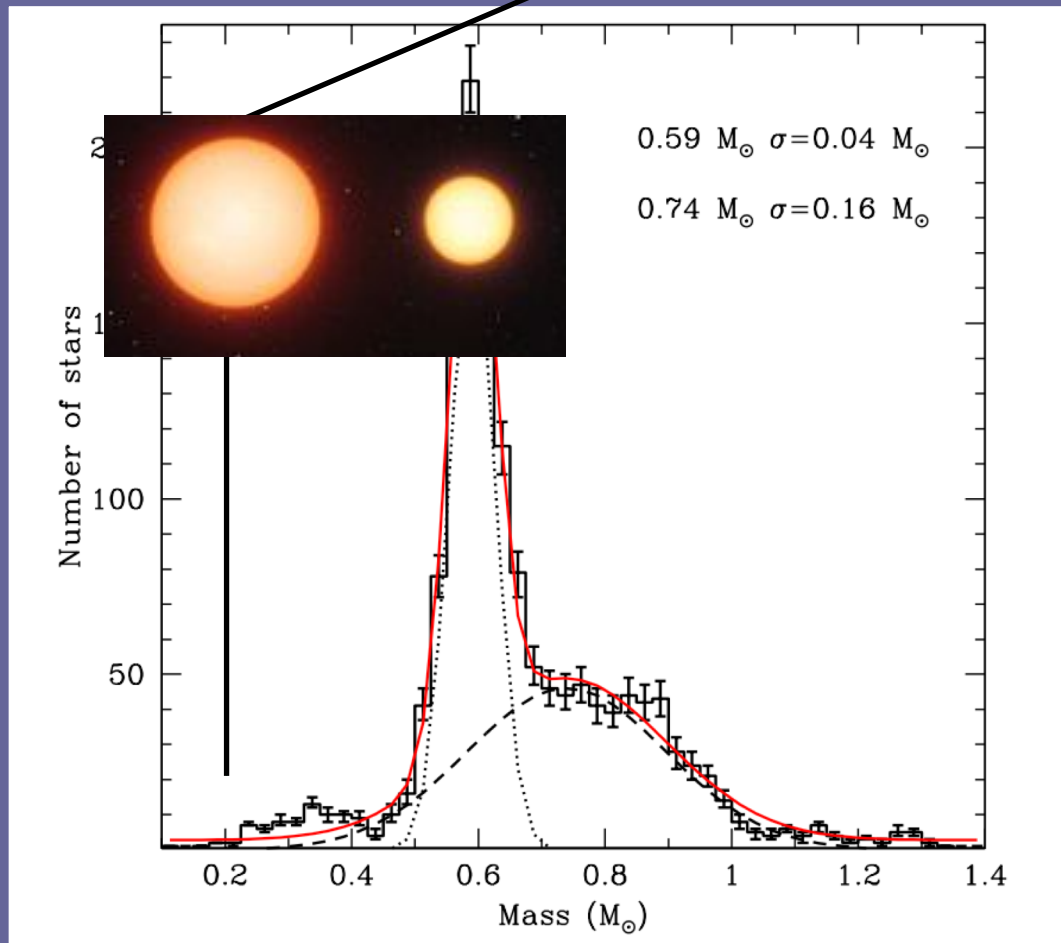
Warren R. Brown

Center for Astrophysics | Harvard & Smithsonian

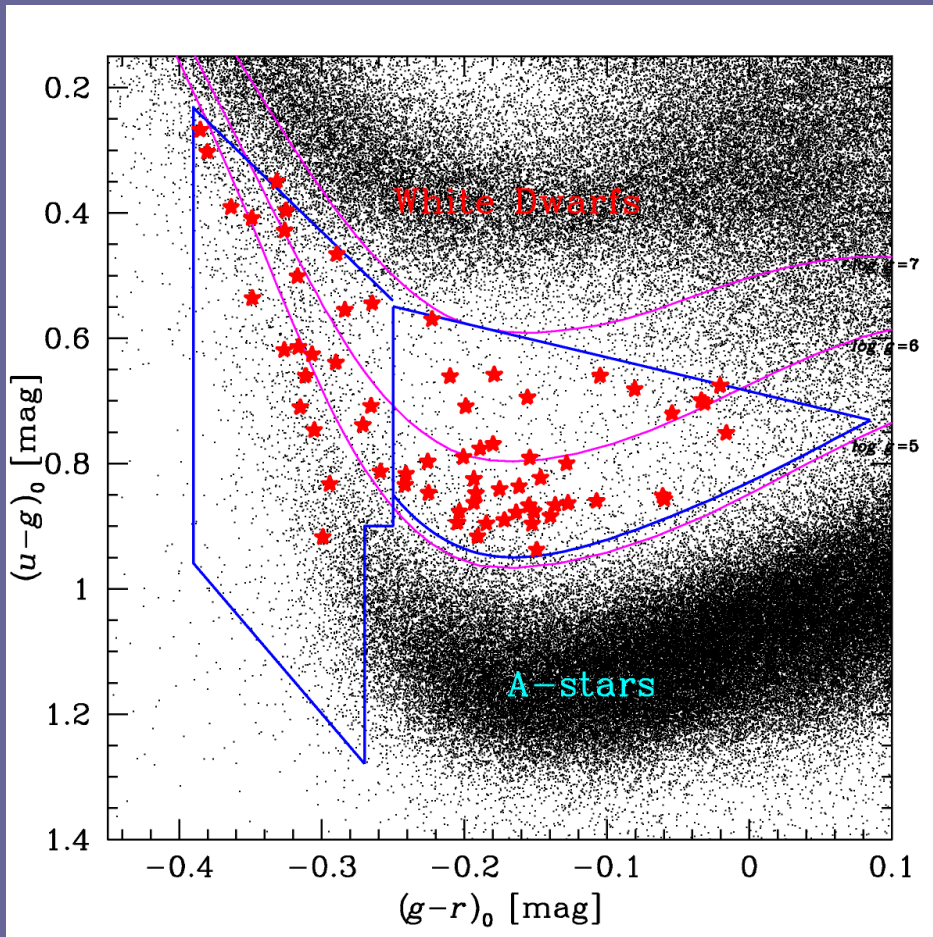
Collaborators: Mukremin Kilic, Alek Kosakowski

ELM Survey

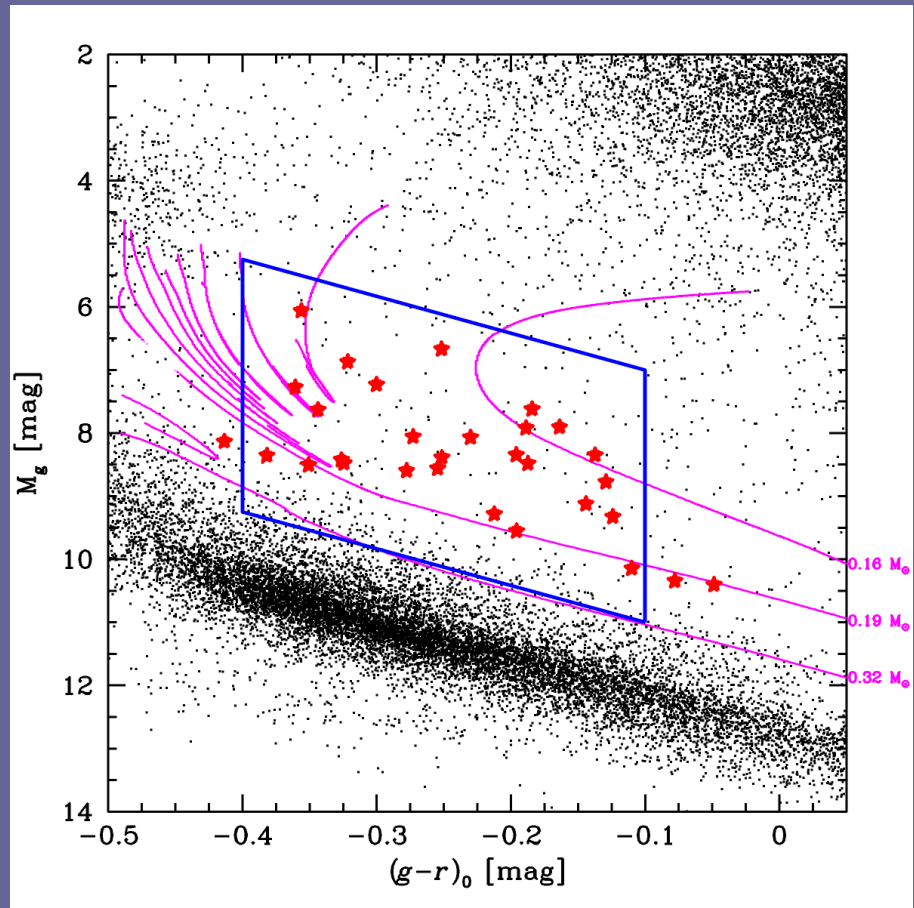
ELM = “Extremely Low Mass” $\sim 0.2 M_{\odot}$ helium-core WD



Target Selection

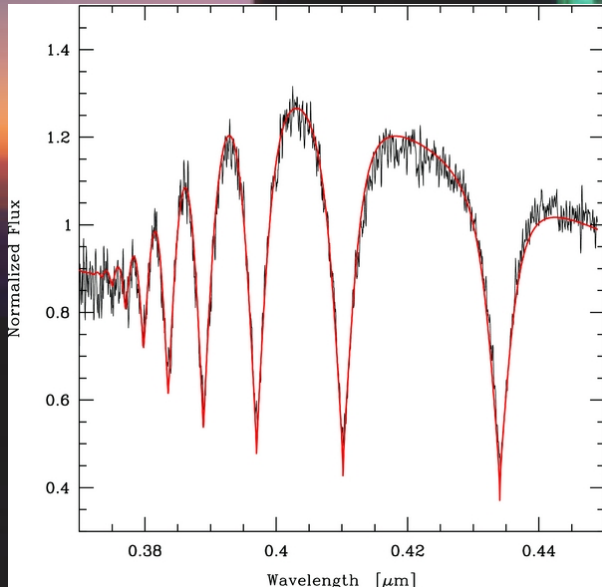
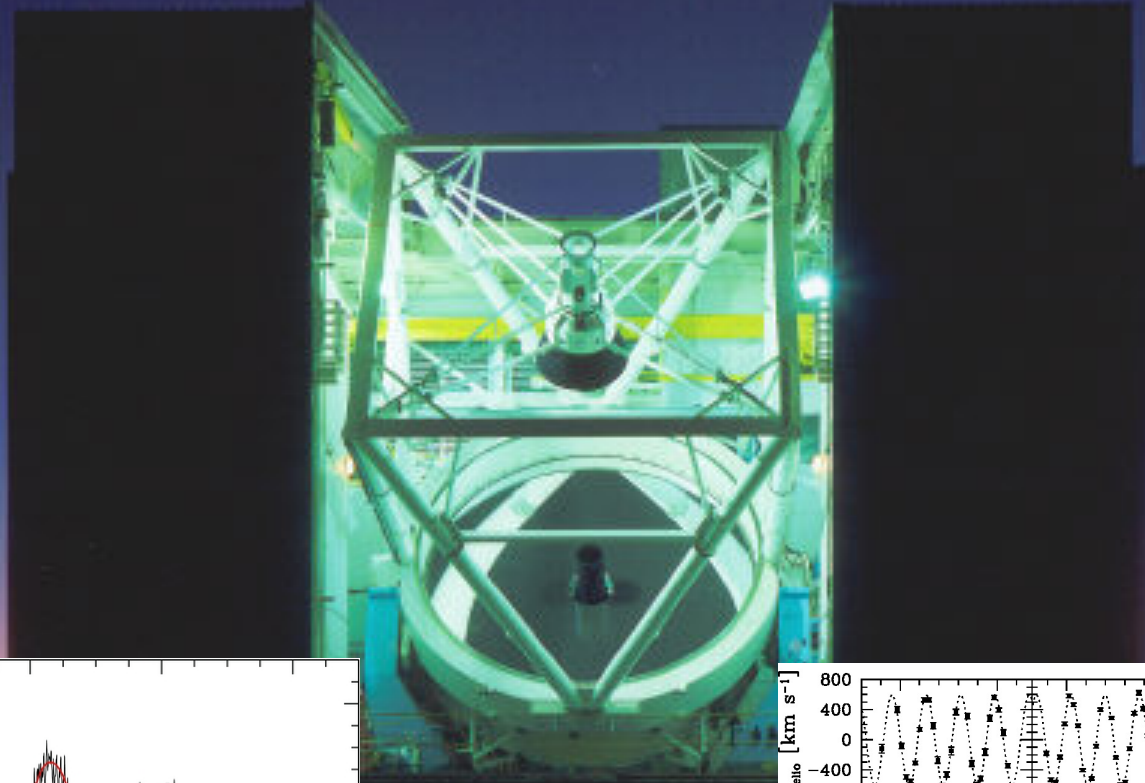


Brown, Kilic et al. 2016

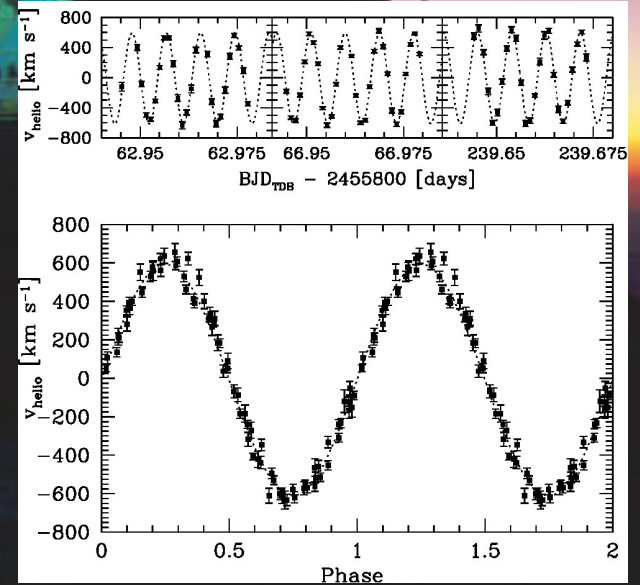


Brown, Kilic et al. 2022

Observations

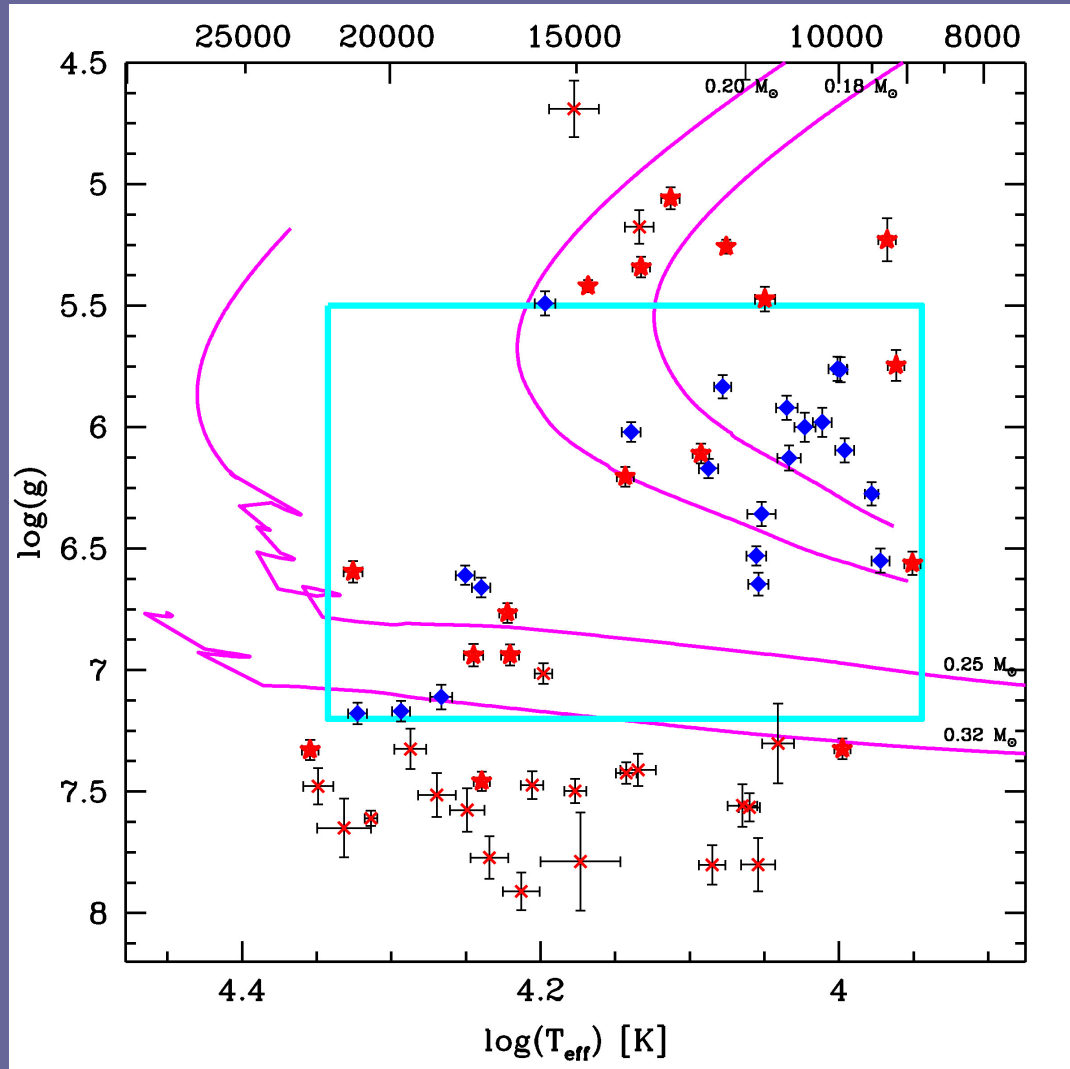


Brown, Kilic et al 2011



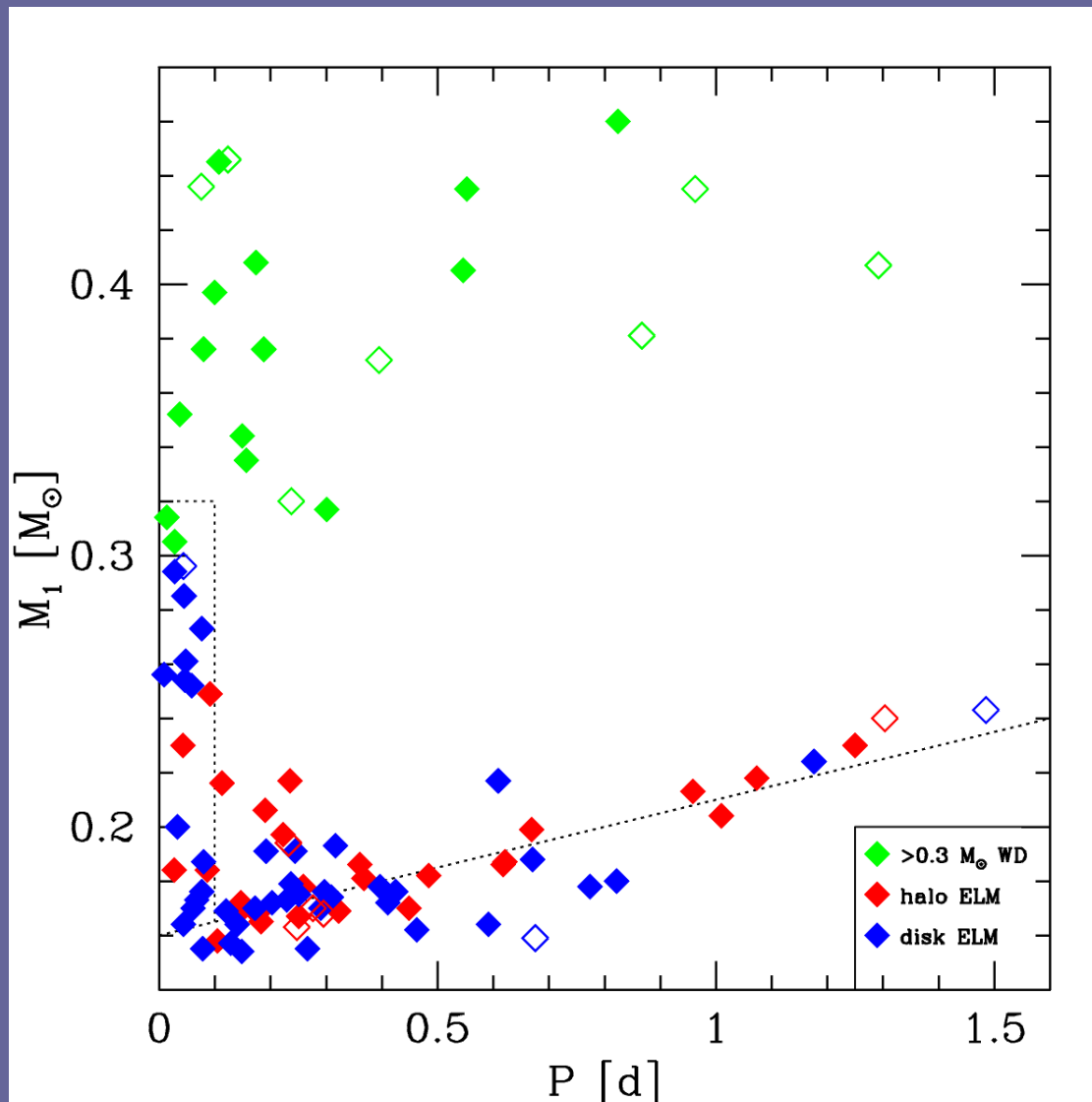
Brown, Kilic et al 2011

Result: 17 new WD binaries



Brown, Kilic et al 2022

Measurements: Links to Formation



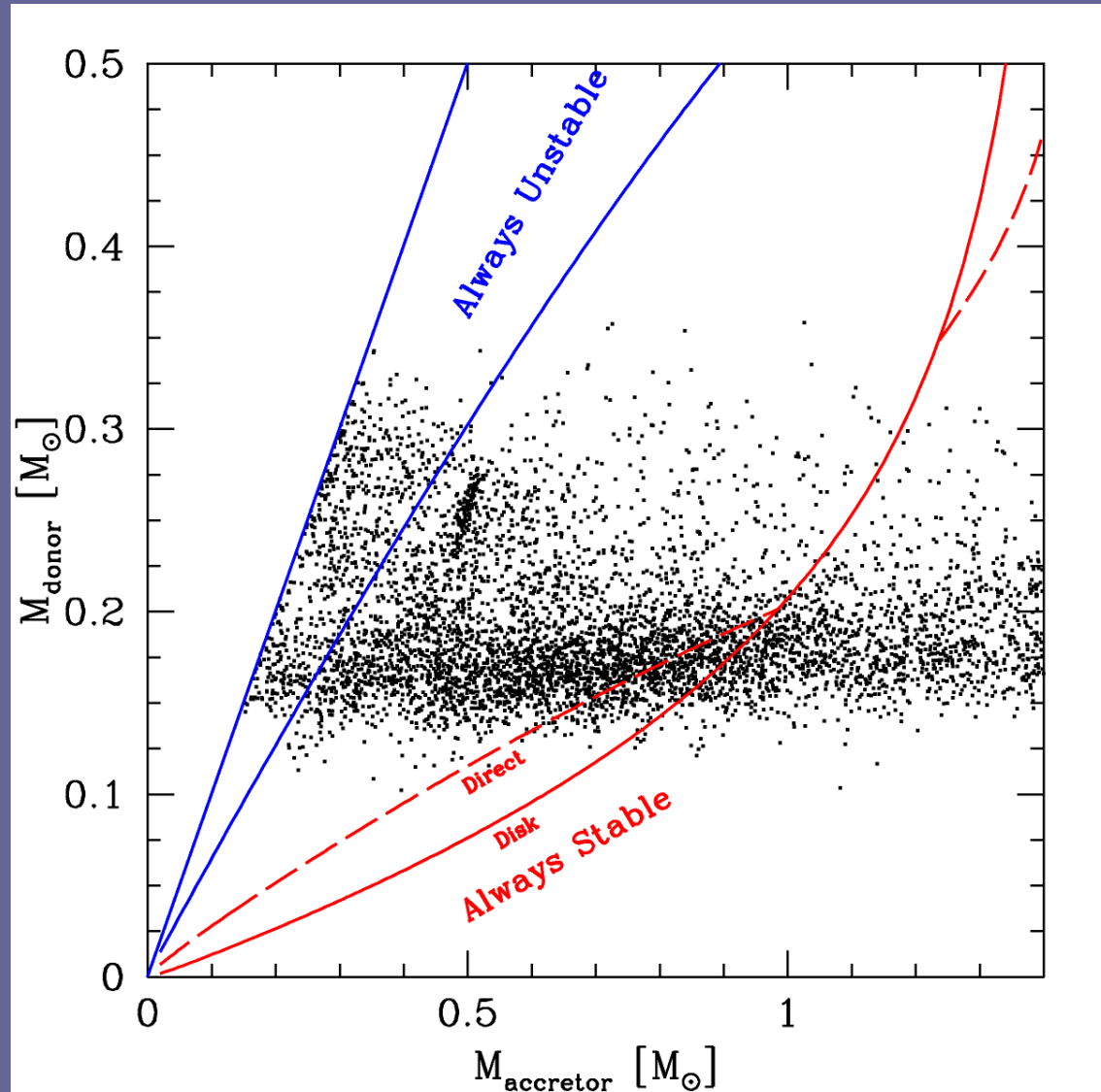
Mass Ratio: Link to Outcomes



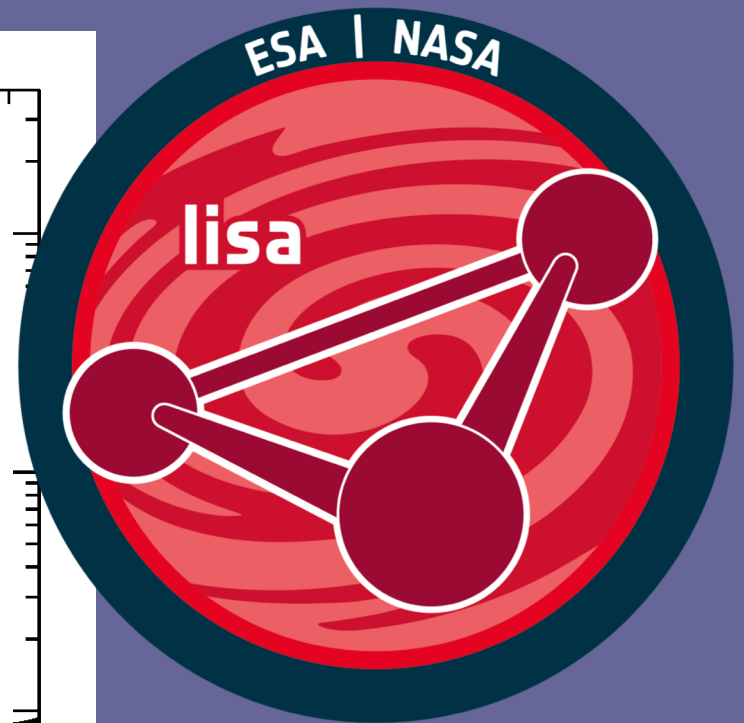
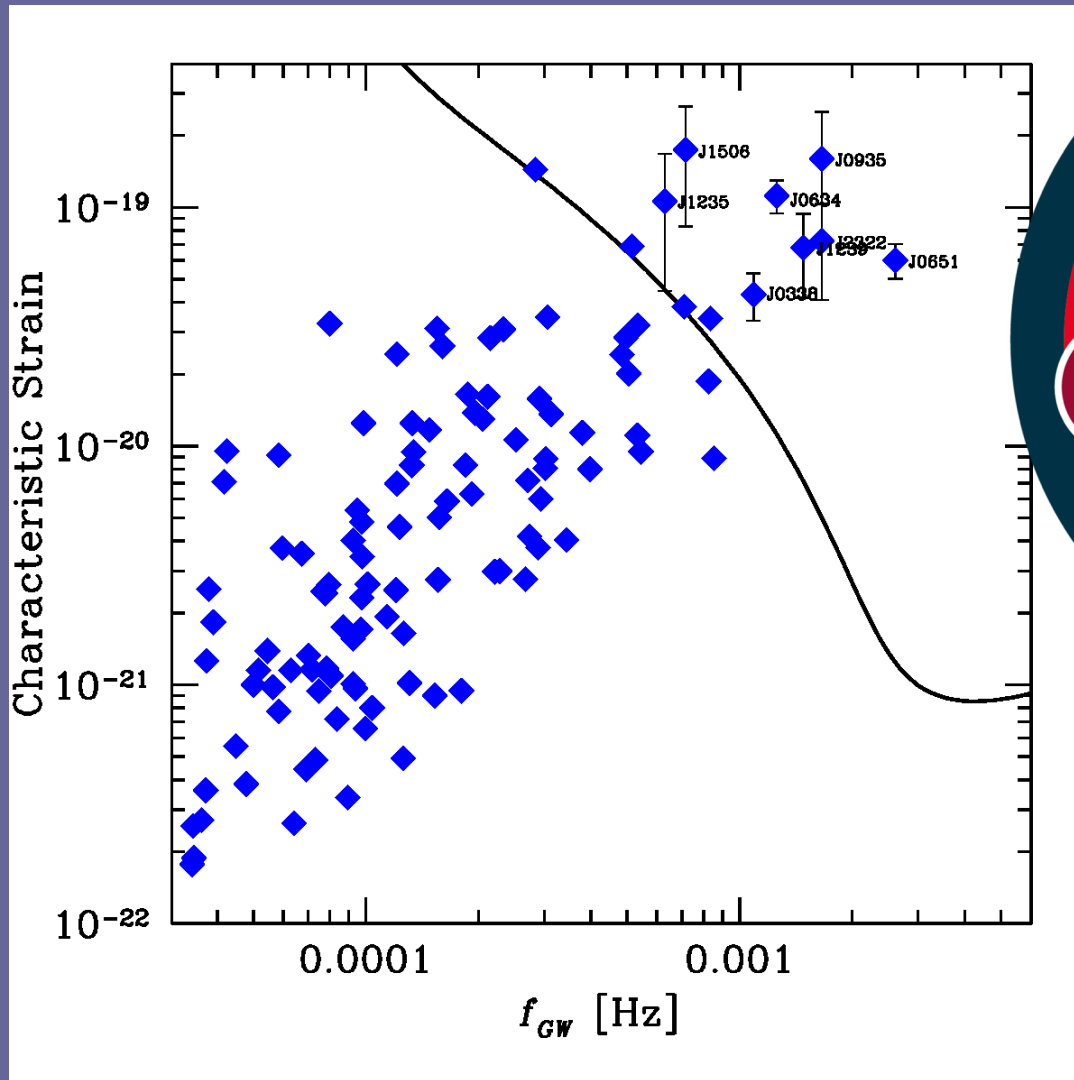
He WD
 $M \approx 0.2 M_{\text{sun}}$
 $R \approx 0.04 R_{\text{sun}}$
DONOR



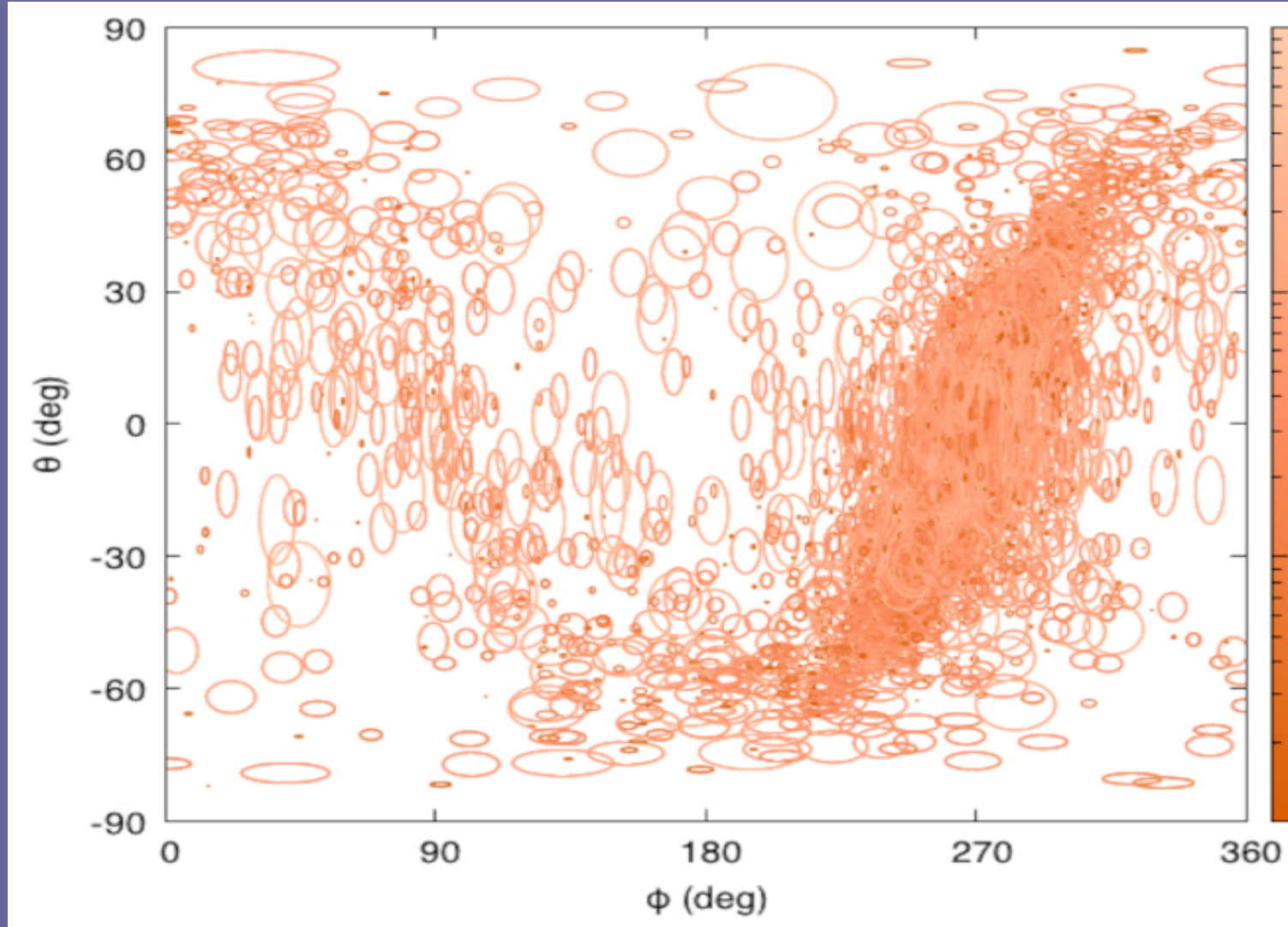
C/O WD
 $M \approx 0.8 M_{\text{sun}}$
 $R \approx 0.01 R_{\text{sun}}$
ACCRETOR



Gravitational Waves



Looking to the Future



Lamberts et al 2019