

Abstract for an Invited Paper  
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**All things White Dwarf: The State of Stellar Forensics at the University of Texas and Sandia National Laboratories**

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Astronomy has always been considered an observational science, in contrast with other experimental sciences like physics, chemistry, biology, and geology. This is because it has not been possible to perform experiments on the objects we observe. This situation has changed in a way that is transformational. We are now able to make macroscopic bits of star stuff in the lab: plasmas created under conditions that are the same as the plasmas in stars. Although laboratory astrophysics has long been an important part of astronomical research, what has changed is the ability to produce large enough chunks of a star that we can make measurements and perform experiments. In this way, astronomy joins her sister sciences in becoming an experimental science as well as an observational one. I will describe how this came about, the technology behind it, and the results of recent laboratory experiments. Most importantly, we will discuss how this will change our understanding of the universe and its contents. This work will shed new light on our recent discoveries involving McDonald Observatory: planets around white dwarf stars, massive carbon/oxygen variable white dwarf stars, and white dwarf-white dwarf binaries – including one detached double eclipsing system with an orbital period of 12 minutes. We should measure the rate of change of the orbital period in this system within a year and we expect it to be the highest S/N source of gravitational radiation, easily detectable with LISA or similar approaches.