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Precision Astrophysics Experiments with the Kepler Satellite

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Long photometric observations from space of tens of thousands of stars, such as those provided by Kepler, offer unique opportunities to carry out ensemble astrophysics as well as detailed studies of individual objects. One of the primary tools at our disposal for understanding pulsating stars is asteroseismology, which uses observed stellar oscillation frequencies to determine interior properties. This can provide very strict constraints on theories of stellar evolution, structure, and the population characteristics of stars in the Milky Way galaxy. This talk will focus on several of the exciting insights Kepler has enabled through asteroseismology of stars across the H-R diagram.