

**Seeing the Milky Way with new eyes**

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Low-energy precision measurements in Earth-based experiments can reveal "new physics" even in complex systems, through an observed breaking of the symmetries we would expect the system to possess. The advent of the "big data" era in astronomy, as exemplified by the second data release of the Gaia space telescope, opens an analogous paradigm of discovery. We can search for symmetry breaking in samples of millions of stars, to reveal and refine aspects of the Milky Way's history and ongoing dynamics. I will illustrate the former by noting examples of experimental searches for matter-antimatter (CP) symmetry breaking and then carefully consider symmetry breaking and its implications in the Milky Way, noting that current observations reveal a Milky Way that is neither isolated nor in a steady state.

**Wilson Hall, One West**