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**Persistent Astrometric Deflections from Gravitational Wave Memory** DUSTIN MADISON, West Virginia University — After a burst of gravitational waves (GWs) passes through an assemblage of free-falling masses, their relative positions are permanently altered by a phenomenon commonly called "memory". Memory is of theoretical interest since it is intimately related to the asymptotic symmetries of General Relativity and is of observational interest since it is feasibly detectable by both ground-based GW detectors like LIGO and pulsar timing arrays like NANOGrav. It has been shown that large-scale, high-precision astrometric surveys such as Gaia can have comparable sensitivity to the nanohertz frequency GWs that pulsar timing arrays are working to detect and characterize. Motivated by the possibility of GW detection through precision astrometry, I will describe the pattern of astrometric deflections and proper motions caused by a GW burst with memory. These memory-induced deflections will cause weak mixing of power between multipole moments in the temperature fluctuations of the cosmic microwave background. Since memory-induced deflections persist indefinitely after a GW burst has passed over the Earth, the effect of many GW bursts with memory can accumulate and possibly grow over cosmologically-long time scales.

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