THE OXYGEN ISOTOPIC COMPOSITION OF THE SUN: IMPLICATIONS FOR NEBULA CHEMISTRY. K. D. McKeegan, Dept. of Earth and Space Sciences, University of California Los Angeles, Los Angeles, CA. 90095-1567 USA (mckeegan@ess.ucla.edu).

Introduction: We have measured the oxygen isotopic composition of the solar wind, captured and returned to Earth by NASA's Genesis mission [1]. The data demonstrate that the Earth, Moon, Mars, and bulk meteorites are depleted in ^{16}O by ~7% relative to the bulk solar system in a non-mass-dependent manner. Gas phase photochemistry, occurring either in the solar nebula or in its progenitor molecular cloud, is most likely responsible for changing the isotopic composition of planetary materials in the inner solar system prior to planetesimal accretion. Understanding how, when, and where the rocky planets acquired an isotopic composition distinct from the average composition of the dust and gas from which the solar system formed is a major challenge for the science of planetary origins.

I will review the Genesis experiment and our findings, and discuss the current understanding of the distribution of oxygen isotope compositions in the solar system based on the analysis of meteorites, interplanetary dust, and samples returned from the Sun and a Jupiter-family comet. Implications for models of the origin of the oxygen isotope effect via nebula chemistry will be discussed.

References: [1] McKeegan K. D. et al. (2011) *Science* ***332***, 1528-1532.