THE ORIGIN OF COMETS. K. J. Meech[1], [1]Institute for Astronomy, 2680 Woodlawn Drive, Honolulu, HI 96822; meech@ifa.hawaii.edu.

Introduction: Comets are considered to be the least altered remnants witness to the processes and events in the solar nebula. The ultimate goal of studies of small icy solar system objects is to tie observations of their chemistry to an understanding of the distribution of material in the protoplanetary disk—understanding their origins, and ultimately to gain an understanding relevant to processes in other planetary systems.

Addressing Comet Origins: Understanding origins of comets relies on understanding the dynamical mechanisms that established the architecture of today's solar system [1-3]. Additionally, it involves understanding the chemistry in the early solar system. Compared to the dust, the volatiles were the most sensitive to temperature and radiation dependent processing [4]. Increasingly sophisticated disk chemical models are better able to describe the chemistry expected in protoplanetary disks as a function of heliocentric distance [5-7]. It is during this gas phase that a chemical fingerprint is imprinted on the dust grains that will eventually accumulate into planetesimals and get dynamically scattered and observed as today's comets.

In this overview I will present a brief synopsis of what our current understanding of comet formation is both looking at the dynamics, and the volatile and organic tracers of that process. I will put this in the context of the long-term ground-based studies of comets and new information that we are learning from recent missions [8-9].

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