CONTROL ID: 2817800

TITLE: The Early Planetary Research of Tobias C. Owen

ABSTRACT BODY:

Abstract (2,250 Maximum Characters) : Tobias Chant Owen (Toby) was a graduate student of G. P. Kuiper, receiving his Ph.D. in the Dept. of Astronomy, University of Arizona, in 1965. His thesis was broadly titled "Studies of Planetary Spectra in the Photographic Infrared", and primarily presented a study of the composition and other properties of Jupiter, as well as the abundance and surface pressure of CO_2 on Mars. The surface pressure on Mars was a topic of debate at that time, with a wide range of diverse observational results from several investigators. The Jupiter work in particular consisted of the analysis of Kuiper's unpublished spectra that were made with photographic plates pushed to the longest wavelength possible, about 1120 nm, with ammonia-hypersensitized Kodak Z emulsions. Toby used the long-pathlength absorption cells at the Lunar and Planetary Lab to study the spectra of CH_4 and NH_3 at pressures and temperatures relevant to Jupiter (and Saturn), as well as to search for spectral signatures of potential minor components of their atmospheres. Toby also obtained new spectra of Io, Ganymede, and Saturn and its rings, extended to the long-wavelength limit of photographic emulsions. No new molecular absorptions were found, although Owen basically confirmed Kuiper's earlier result that Saturn's rings are covered (or composed of) with H_2O ice or frost. As he pursued a broad range of problems of planetary atmospheres, Toby used existing and newly acquired spectra of the planets in the photographic and near-infrared wavelength regions, together with data he obtained in the laboratory with long-pathlength absorption cells, to resolve some outstanding issues of unidentified spectral features and to clarify issues of the compositions, temperatures, and atmospheric pressures of several bodies. This work laid the foundation for his later decades of studies of planetary atmospheres and comets with spacecraft as an active participant in many US and European missions. He was very influential in shaping the science goals of several missions, and in the interpretation of the results.

CURRENT CATEGORY: History

CURRENT : None

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INSTITUTIONS (ALL):

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Contributing Teams: (none)