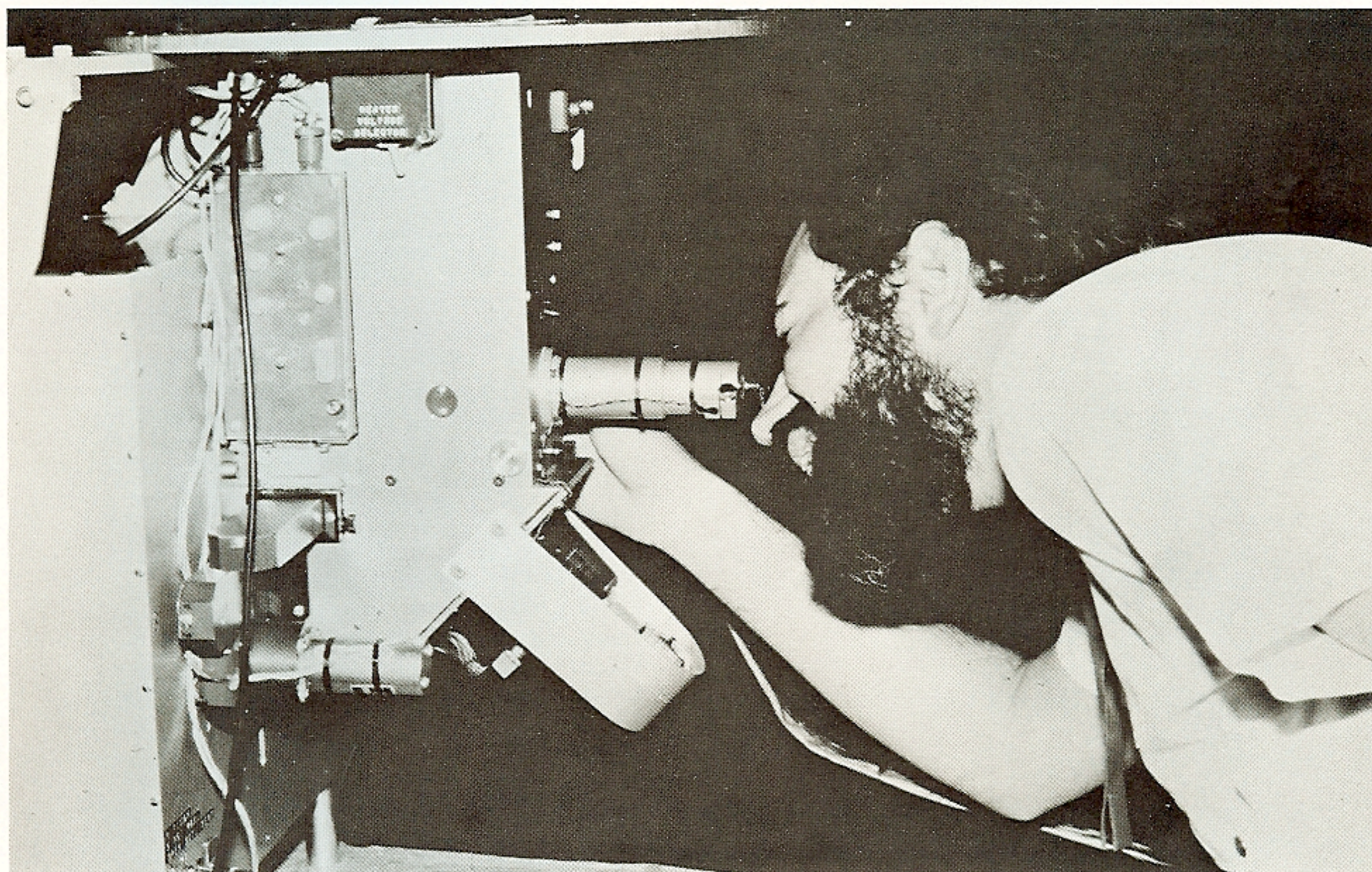


INFRARED, VISUAL, AND ULTRAVIOLET PHOTOMETRY

Dr. George Rieke heads the infrared photometry group. The diverse set of problems studied by this group includes the first estimate of the internal energy of Saturn, the discovery of dramatic differences between the upper atmospheres of Uranus and Neptune (work done with F.C. Gillett of Kitt Peak National Observatory) and the discovery of water of hydration on asteroids. An additional program in Astronomy/Steward Observatory is devoted to extragalactic studies.

Infrared, visual, and ultraviolet photometry research covers the surface properties of asteroids and satellites through near

infrared photometry and radiometry. Nearly all of the plausible surface constituents of these bodies have strong, diagnostic spectral features in the near infrared; these measurements will determine what materials cover the surfaces of the smaller moons of Saturn and those of Uranus and Neptune. The amount of water of hydration on the surfaces of asteroids ranges from 15% (by weight) in the case of Ceres to at least an order of magnitude less. Observation of a representative sample of asteroids should determine what events in the history of an asteroid lead to a large amount of surface water.



Dr. Benjamin Zellner and associates are proceeding with the eight-color survey designed to obtain spectral reflectance parameters for a thousand minor planets in the wavelength range $0.33\text{-}1.05\ \mu\text{m}$. Preliminary results show clear distinctions between asteroids of types C, S, M, E, and R, as well as significant variations within each class. The new eight-color photometer is al-

so used for observations of very faint cometary nuclei and for a variety of other stellar and planetary programs. Zellner continues with laboratory work on the optical properties of meteoritic materials for remote identification of the surface textures and compositions of minor planets, and with observations with the IUE spacecraft.

Cover photo: Composite of Jupiter and the Galilean satellites taken by Voyager I.

Back cover: View (left to right) of Steward Observatory, Flandrau Planetarium and the Gerard P. Kuiper Space Sciences Building.