

ments devoted to the passage through the asteroid belt which precedes the Jupiter rendezvous. Emphasis was placed on the anticipated contributions of these three programs to our understanding of the solar system.

In discussion Carl Sagan stressed that mission B of the Mariner Mars 1971 program is designed to have an orbital period four-thirds the Martian rotational period so that every four days the spacecraft observes the same area under the same lighting conditions. In this way intrinsic Martian albedo changes can be distinguished from effects due to the scattering phase function of surface material. He also mentioned the possibility that photographic mapping of Phobos and Deimos by the Mariner Mars 1971 mission would provide cartography of these moons superior to the best groundbased cartography of Mars.

PLANETARY PATROL – AN INTERNATIONAL EFFORT

W. A. Baum

Lowell Observatory

Abstract. An international photographic planetary patrol network, consisting of the Mauna Kea Observatory in Hawaii, the Mount Stromlo Observatory in eastern Australia, the Republic Observatory in South Africa, the Cerro Tololo Inter-American Observatory in northern Chile, and the Lowell Observatory, has been in operation since April 1969. The Magdalena Peak Station of the Mexico State University also participated temporarily. New stations are now being added at the Perth Observatory in western Australia and at the Kavalur Station of the Kodaikanal Observatory in southern India. During 1969 Mars and Jupiter were photographed through blue, green, and red filters; and the network produced more than 11 000 fourteen-exposure filmstrips with images of a quality suitable for analysis. Observations of Jupiter and Venus in 1970 are expected to add another 15 000.

All telescopes of the network have apertures in the 60-to-70 centimeter range, have been designed or modified to produce identical image scales, and are equipped with identical planet cameras that provide for the automatic recording of basic data associated with each exposure. All of the patrol observations are being calibrated, processed, edited, copied, and catalogued by the staff of the Planetary Research Center at the Lowell Observatory. The support of NASA Headquarters is gratefully acknowledged.

ACTIVITIES OF THE PLANETARY RESEARCH CENTER OF THE LOWELL OBSERVATORY

W. A. Baum

Lowell Observatory

Abstract. The research program of the Planetary Research Center at Lowell Observatory, established through the IAU, includes photoelectric measurements at the telescopes, the development of new instruments for planet observation, and the analysis of photographic images. In addition, the Center is managing the International Planetary Patrol Program (described separately).

Photoelectric observations have particularly utilized pulse counting and multichannel storage in the scanning of planetary spectra, planetary brightness profiles, planetary polarization distribution, and satellite brightness changes. The spectrum scanning and area scanning methods have been applied by Boyce to Mars and Jupiter. Hall and Riley have made photoelectric scans of Mars, Jupiter, and Saturn. Millis and Franz have used area scanning to show that the Jovian satellite Io does not brighten anomalously on its emergence from eclipse.

Present instrument development includes work by Baum, Pettauer, and Busby on a planet image stabilizer utilizing deflection coils on a cascaded image converter tube, in combination with a servo-driven tiltingplate guider.

Current or recent analyses of photographic images with our planetary image projectors include extensive measurements of the boundaries of the Martian polar caps by Martin and Fischbacher, the investigation of transient brightenings and their progressive displacements on Mars by Martin and Baum, measurements of the vertical shear in the equatorial region of the Jovian atmosphere by Layton, and positional wanderings of the Red Spot by Millis and O'Dell. With the help of micro-photometry in addition to visual estimates, studies of the Martian blue haze phenomenon and of the diurnal brightness changes of Martian clouds have been carried out by Thompson, Faure, and Boyce.

These image analyses have utilized the IAU planetary plate and film collection of the Center, which is the most extensive in the world. A typical plate or film includes a sequence of planetary images taken in rapid succession in a particular color. As of late 1970, the number of different catalogued sequences of usable quality from various sources will be as follows:

Source	Image Sequences
Patrol, 1969 + 1970	26000 +
Lowell, 1903 → 1968	10086
Lick	1902
New Mexico	1663
Meudon	1177
Table Mountain	763
Miscellaneous	800
	42000 +

This includes a high percentage of all such material that now exists. The complete facilities of the Center, including access to this collection and the associated machine-searchable IBM card catalogue, are available to all qualified investigators. As in the case of the Planetary Patrol, the support of NASA Headquarters is gratefully acknowledged.