

# ★ STAR DUST



Volume XXX

Summer 1974

Number 11

*Pleiades*

Hopewell Observatory

## AUGUST CALENDAR

- Friday, August 2, 9, 16, 23, 30, 7:30 PM -- Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall, 362-8872.
- Monday, August 5, 12, 19, 26, 7:30 PM -- Telescope-making classes at Chevy Chase Community Center, Connecticut Avenue and McKinley Street, NW. Information: Jerry Schnall, 362-8872.
- Friday, Saturday, August 9, 10 -- Stellafane annual telescope-makers' convention at Springfield, Vermont. Information: Bob McCracken, 229-8321.
- Saturday, August 17, 9:00 PM -- Exploring the Sky, presented jointly by NCA and National Park Service. Glover Road south of Military Road, NW, near the Rock Creek Nature Center. Information: Bob McCracken, 229-8321.
- Each Saturday and Sunday, 4:00 PM -- Rock Creek Nature Center Planetarium features the summer sky in a public program. Minimum age, 7 years. Other programs are presented for children under 7 years old. Information: Nature Center, 426-6829.

## JUNE LECTURE

Dr. Newell Trask of the U. S. Geological Survey spoke to NCA on Mariner 10 photography of Mercury at the June 1 meeting. Such views can give clues to early Solar System history. In his review of similarities and differences between Earth, Moon, and Mercury Trask noted that Mercury is 20 percent of Earth's diameter but its density is about equal to that of the Earth. Although the Moon and Mercury have the same integrated optical properties, the Moon has a lower density (3.3) than Mercury (5.5).

Mariner 10 was launched in November 1973, observed Comet Kohoutek in ultraviolet light, passed Venus on February 5, 1974, and used the latter's gravitational field as a booster to pass closer to Mercury on March 29. It will return to Mercury's vicinity on September 22. The resolution of the best of the 2,000 Mariner photographs of Mercury was 3.4 km, compared to 1 km for the best Earth-based pictures of the Moon.

Several of the largest craters on Mercury are 200 km in diameter, and the Mariner 10 TV Science Team has recommended several names to the appropriate IAU committee. One basin is 1300 km in extent. However, only one-third of the planet was photographed by Mariner. No dark maria were found. The scarps on Mercury are larger than those on the Moon or Mars. The magnetic field detected on Mercury and its other physical properties suggest that the planet formed as an iron core surrounded by 300-400 km of silicate rock. Yet, the planetary magnetic field detected may be merely solar-wind induced, for no blocking atmosphere is present.

Mercury, Moon, and Mars all have craters and large basins thought to have formed very early in their histories, and vast plains of melted material that formed later.

If Mercury had a satellite 5 km in diameter and of the same albedo as the planet, Mariner 10 would have detected it, Dr. Trask said.

Our speaker's slides included superb mosaics of the visible hemisphere on approaching and departing the planet, and details of various geological features.

## THE COVER

*Pleiades* -- This sparkling, out-of-season asterism, as refreshing as the tinkle of ice cubes in a midsummer night's drink, was photographed (in season) by R. N. Bolster at Hopewell Observatory using the 9.5-inch Wright-Schmidt. He exposed Tri-X film 60 minutes at  $f/4$  (37-inch focal length) and processed to ASA 2400 in Diafine. This reproduction was enlarged six times from the film.

## APOLLO LAUNCH COMPLEX 39 A NATIONAL MONUMENT



*Apollo 11 Astronauts Neil A. Armstrong, Edwin E. Aldrin, Jr., and Michael Collins unveil a Launch Complex 39 commemorative plaque on the fifth anniversary of the launching of the First Lunar Landing Mission in ceremonies at the Kennedy Space Center, Florida, on July 16, 1974. NASA photo*

### PLEIADES POSITIONS BEST KNOWN

In 1969 Eichhorn, Googe, Lukac (now of the U. S. Naval Observatory), and Murphy announced their determination of the positions of 502 stars in the Pleiades cluster to an accuracy of 0.01 second of arc — the most accurate stellar position determinations in the sky. These stars are within a  $1.5^\circ$  square centered on  $\eta$  Tau (Alcyone).

Such a catalog is valuable in differential diffraction studies, calibration of long-focus telescopes and of lunar photographs, evaluation of lunar occultation data, and investigations of internal motions of the cluster. The accuracy of the 502 stellar positions was increased over normal long-focus astrometry in three ways:

1. More data were used. Sixty-five images of each star were measured on a total of 14 plates taken with the objective-diffraction-grating-equipped telescopes.
2. Much more sophisticated mathematical models of the relationship between measured and standard coordinates were used.
3. An overlap algorithm was used that relates each plate measurement of stellar position to a reference star and to all other measurements of that star in the 65 exposures, rather than only the reference star.

Thirteen of the plates were taken with the University of Virginia 26-inch refractor and one with the Wesleyan University (Connecticut) 20-inch refractor.

This work was published in the *Memoirs of the Royal Astronomical Society*, Volume 73 (1970).

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## EXCERPTS FROM THE IAU CIRCULARS

June 26 — C. T. Kowal discovered a fast-moving 15th-magnitude object apparently an Apollo-type asteroid, on plates taken with the 122-cm Schmidt telescope at Palomar.

## NEW MEMBER WELCOMED TO NCA

Edward A. Hunter  
6705 Caneel Court  
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## ADDRESS CHANGES

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## PROGRESS?

An editorial note from *Icarus*, May 1974:

"Some recent issues of *Icarus* have been delayed because of the energy crisis in Britain, where *Icarus* is printed. It is an ironic and sobering comment on our times that reports of the latest scientific results obtained by interplanetary spacecraft are being hand-composited by candlelight."

## \* STAR DUST



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