



## NESS TO DESCRIBE MERCURY MAGNETOSPHERE



DR. NESS

Dr. Norman F. Ness, Chief of the Laboratory for Extraterrestrial Physics, NASA, will speak at the October 5 monthly lecture meeting of the National Capital Astronomers. He will discuss the results of the first in-situ measurements of the magnetic and electric characteristics of the planet Mercury and interactions with the solar wind plasma flow, as revealed by the Mariner 10 spacecraft instruments. During the encounter, detailed measurements were made of the magnetic field, solar plasma electrons, and energetic particles.

The resemblance in size and appearance of Mercury to the moon is superficial; the undifferentiated Moon has neither a magnetic field nor a highly conducting interior. Hence, its interaction with the solar wind plasma field is minimal. No bow shock is observed. Neither

body has an ionosphere to deflect the plasma flow, but Mercury, whose high density suggests an iron core, displays a magnetic field which apparently is intrinsic, and sufficient to create the observed deflection and bow shock.

By the time we hear Dr. Ness, Mariner 10 will have made its second close approach to Mercury, and even more data may then be available!

Dr. Ness received his Ph. D. in geophysics from MIT in 1959, subsequently joined the UCLA Institute of Geophysics, and in 1961 transferred to NASA's Goddard Space Flight Center. He has been the Principal Investigator for magnetic field measurements on 15 separate spacecraft missions including 10 IMP's, 4 Pioneers, and 1 Mariner, and Project Scientist on 4 missions. Presently he is Chief of the Laboratory for Extraterrestrial Physics.

### OCTOBER CALENDAR

Friday, October 4, 11, 18, 25, 7:30 PM — Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall, 362-8872.

Saturday, October 5, 6:15 PM — Dinner with the speaker at Bassin's Restaurant, 14th Street and Pennsylvania Avenue, NW. Reservations unnecessary.

Saturday, October 5, 8:15 PM — NCA monthly meeting at the Department of Commerce Auditorium, 14th and E Streets, NW. Dr. Norman Ness speaks.

Monday, October 7, 14, 21, 28, 7:30 PM — Telescope-making classes at the Chevy Chase Community Center, Connecticut Avenue and McKinley Streets, NW. Information: Jerry Schnall, 362-8872.

*CALENDAR continued on page 6*

*CALENDAR - continued*

- Saturday, October 12, 1:00 to 3:00 PM -- Discussion on stellar spectra and the movie, *Powers of Ten*, at American University, Room 158 in McKinley Hall. Information: Dr. Henning Leidecker, 864-6816.
- Saturday, October 12, 7:30 PM -- Exploring the Sky, presented jointly by NCA and the National Park Service. Glover Road south of Military Road, NW near Rock Creek Nature Center. Information: Bob McCracken, 229-8321.
- Friday, October 18, 7:30 to 10:30 PM -- Discussion of national organizations that support astronomy, at the home of the Leideckers. Information: 864-6816.
- Saturday, October 19, 3:00 PM -- NCA annual picnic. See article below.
- Saturday, October 26, 1:00 to 4:00 PM -- Discussion of visual and photographic observation of asteroids and calculation of orbits, at the home of the Schellenbergs, 2119 Elliot Avenue, McLean, Va. Information: 538-4259.

**NCA ANNUAL PICNIC TO BE HOSTED BY HOPEWELL OBSERVATORY**

On Saturday, October 19, the annual NCA picnic will be held at the observatory site of The Hopewell Corporation in the Bull Run Mountains of Virginia. Meet by 3:00 PM at Tyson's Corner Shopping Center in the parking lot *across the road* from the southeast corner of Woodward & Lothrop's. (This is the corner of the building nearest the "Clock Court" entrance.) There we will regroup to minimize the number of vehicles for a caravan to the site; parking is limited at the observatory. If you can take people and telescopes your services will be appreciated. We will depart as soon after 3:00 as possible. To find the parking area, take either Route 7 (Beltway Exit 10) just west of the Beltway and turn left into the Center, or 123 west (Beltway Exit 11) and turn right into the Center.

Hot coffee, tea, and cocoa will be provided. 115-Volt, 60-Hertz electric power is available. There is shelter, but no sanitary facilities. Don't forget red flashlight filters. For information call Bob McCracken, 229-8321.

**SEPTEMBER LECTURE**

Dr. Adrienne Timothy, NASA Project Scientist for Skylab Apollo Telescope Mount Data Analysis, discussed early results from Skylab solar observations at the September 7 meeting of NCA.

Two new solar features revealed by short-wavelength observations from spacecraft in recent years were emphasized -- coronal holes and flare bright points.

Coronal holes appear as large dark regions in the bright corona seen in projection on the solar disk at high energy X-ray wavelengths. They are thought to be weak, divergent areas in the general solar magnetic field, and appear related to recurrent release of solar particles at 27-day intervals. These particle streams, not associated with solar flares, affect the Earth's magnetic field. They were formerly attributed to hypothesized "M-regions." Our speaker showed a spectacular time-step movie of coronal hole evolution, assembled from Skylab X-ray photographs.

Bright points show on the Sun as tiny, intense areas of X-ray and extreme ultraviolet emission just preceding a solar flare. Their discovery awaited the latest fine-pointing and high-resolution capability of spacecraft telescopes.

Dr. Timothy noted that solar astronomers desire a look at polar magnetic fields; this will be possible only when we master the high-energy technology needed to send spacecraft substantially out of the ecliptic plane.

Analysis of all the solar data from the manned and unmanned Skylab flights will require many years at current levels of funding.

Many of the questions asked of our speaker dealt with details of mission planning and data-gathering techniques.

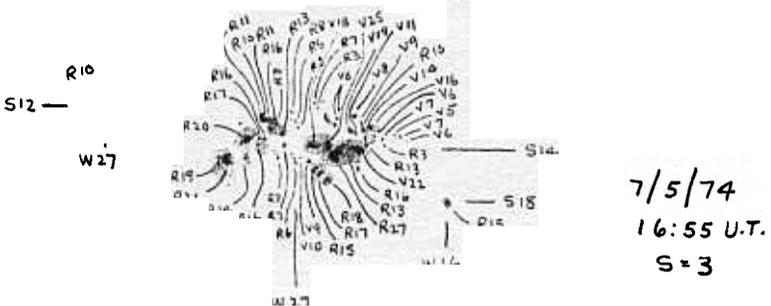
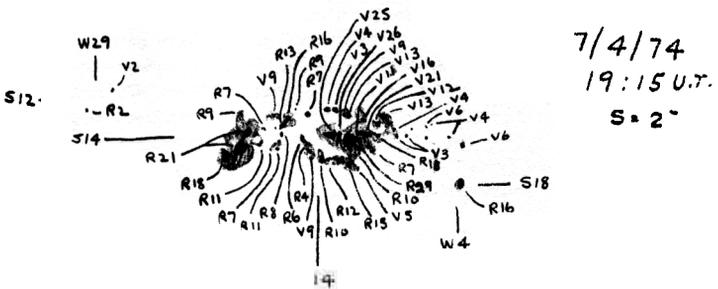
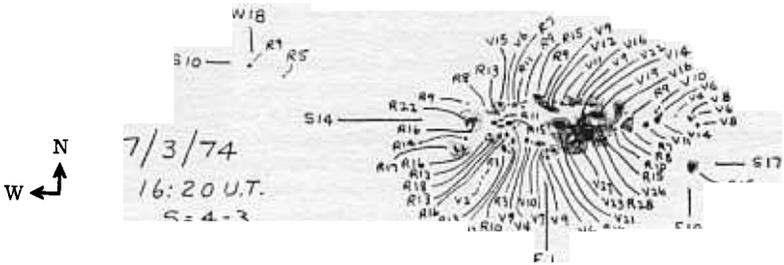
**DISCUSSION GROUPS PLANNED**

We are scheduling several discussion groups each month throughout the greater metropolitan area in schools, public libraries, and private homes. Topics will include vision, telescopes, and both local and national activities, among others. Note the calendar listings; contact Dr. Leidecker at 864-8616 to contribute (or ask for) information.

**RECORD MAGNETIC FIELD IN EARLY JULY SUNSPOT**

As noted in *Sky and Telescope* (September 1974, p 162), the large sunspot group that crossed the Sun between June 28 and July 9, 1974 had a record-tying magnetic field strength of 4,000 Gauss on July 4.

The accompanying drawings of this group and its magnetic field strength distribution were made by Tom Cragg using a Mount Wilson Observatory solar spectrograph. R and V indicate opposite field polarities as shown by right or left circular polarization of spectral line components, respectively, and larger numbers denote stronger fields. (Reproduced from the AAVSO *Solar Bulletin*, July 1974).



## EXCERPTS FROM THE IAU CIRCULARS

1. August 19 — MacConnell and Sanduleak, Warner and Swasey Observatory, discovered a 15th-magnitude nova in the Smaller Magellanic Cloud on objective prism plates taken with the Curtis-Schmidt at Cerro Tololo.

2. September — Dr. Heintz, Swarthmore College, discovered a visual companion of VW Cephei. Of magnitude 10.5, the companion is in the position  $\delta = 223^\circ$ .  $\alpha = 0^m 63$ .

## SYNOPSIS OF APOLLO LUNAR FINDINGS

In *Harvard Today*, Dr. John Wood of Smithsonian Astrophysical Observatory recently summarized five now-accepted generalizations resulting from five years' study of Apollo data.

The Moon is of Earth-like material, and is affected by many of the same processes as is the Earth.

The Moon was hot, volcanic during its formative stages.

Lunar rocks are products of a violent, complex phase of lunar evolution lasting from 4.2 to 3.3 billion years ago. Since then it has been relatively quiet. A major value of the Apollo samples is their upper age limit of 4.2 billion years. Earth rocks as old as 3.5 billion years are rare.

Lunar highland samples are neither primordial planetary material nor lava; they formed as a scum on a white-hot, 100 km-deep ocean of molten rock during formation of the Moon.

The hot-outside, cool-inside model of the early Moon is explained by the hypothesis that the planets formed by accretion of smaller bodies. As gravity increased with growth, the higher impact energies melted the surface. This phase may have lasted only a few thousand years.

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