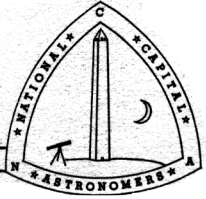


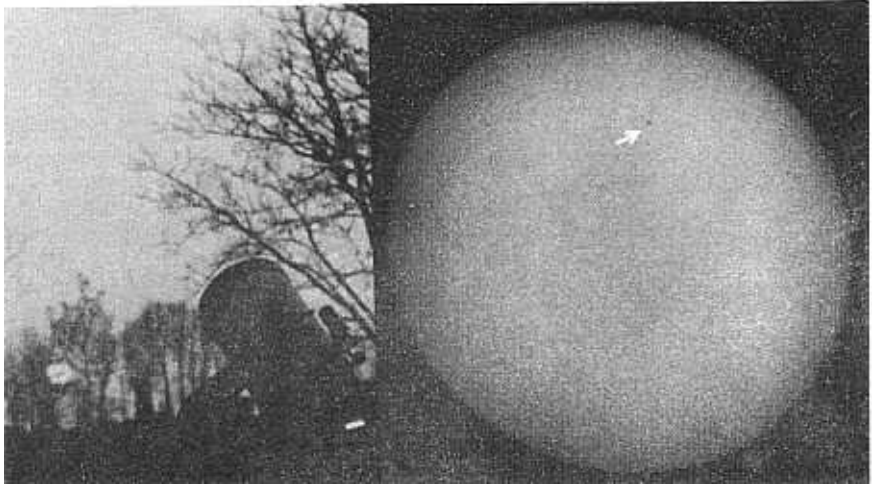
# ★ S T A R D U S T



Volume XXX

December 1973

Number 4



*The moon sets as*

*..the sun rises. and..*

## NCA OBSERVES MERCURY TRANSIT SUN

As the sun appeared over distant treetops at Manassas, Virginia National Battlefield Park on Saturday, November 10, about 15 members observed seldom-seen Mercury continue its apparent passage across the solar disk for about 1 hour 23 minutes, until fourth contact. This was the last Mercury transit this century.

Most telescopes were equipped with objective solar filters, and instruments ranged from a 3-inch refractor to an 8-inch catadioptric. Afterward, the

*Continued on page 14*

### DECEMBER CALENDAR

Monday, December 3, 10, 17, 7:30 PM — Telescope-making classes at Chevy Chase Community Center, Connecticut Avenue and McKinley Streets, NW. Information: Jerry Schnall, 362-8872.

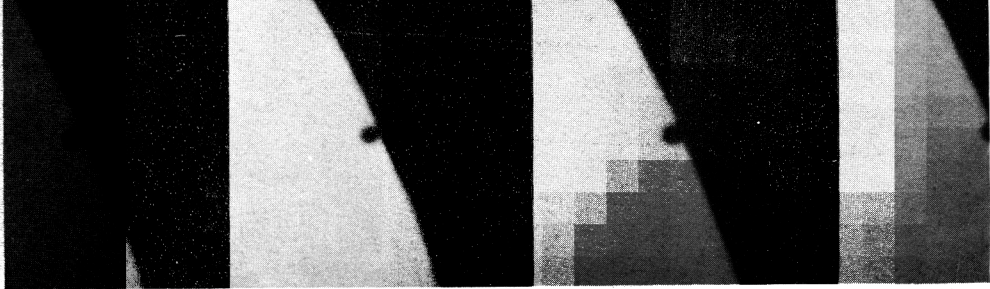
Friday, December 7, 14, 21, 28, 7:30 PM — Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall, 362-8872.

Saturday, December 8, 6:15 PM — Dinner with the speaker at Bassin's Restaurant, 14th Street and Pennsylvania Avenue, NW. No reservations required.

Saturday, December 8, 8:15 PM — NCA monthly meeting at the Department of Commerce Auditorium, 14th and E Streets, NW. Program to be announced.

Sunday, December 9, 6:09 - 7:20 PM — Partial umbral eclipse of the moon.

**NEXT NCA MEETING SATURDAY, JANUARY 5, 1974.**

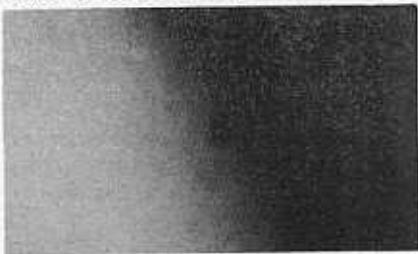


observers gathered for breakfast at a nearby restaurant.

Benson Simon captured the atmospherically-distorted solar disk shortly after sunrise, with Mercury already about three-quarters of the way across, indicated by the arrow. He used an 8-inch Celestron with a full-aperture solar filter for this 1/60-second exposure at the Cassegrain focus,  $f/10$ . The High-Speed Ektachrome was processed to ASA 400.

Benson also did the front-page moonset just before sunrise, showing his 8-inch Celestron, still set on Saturn, which he had been observing in the dawn sky. In his photograph below, some of the observers are shown, not all identified, but he identifies the instruments as (left to right) Ernest Nussbaum's Questar, Bill Winkler's refractor, Benson's Celestron 8, (with Nussbaum observing), and Morton Schiff's reflector and motion-picture camera.

Bob Bolster timed and photographed the transit from Hopewell Observatory, several miles farther west, making a third- and fourth-contact sequence shown in part here at 15-second intervals. This segment begins (left) at UT 13:15:55. Bob used a 6.4-inch Maksutov with a full-aperture B&L chromium filter of density 5, Barlow projection to 400 inches efl, and 1/8-second exposures on Plus-X, developed in Diafine to ASA 640. Scale is 4 sec per mm.



From his home in Kensington, Maryland, John Korintus photographed the transit, using his 10-inch reflector to produce the image of Mercury at the left, at UT 13:07, as the tiny planet approached third contact. He used ocular projection for this 1/8-second exposure on High-Contrast Copy film. The scale reproduced here is roughly 4 sec per mm.

### HENDRICK HUDSON DIES

Hendrick R. Hudson, a former vice president of NCA, died of a heart attack at his home in Atlanta in November. He was an active leader in NCA affairs in the early 1960's.

### SMITHSONIAN EXPERIMENTARIUM INCREASES SCHEDULE

The Viewlex planetarium projector in the Air and Space Museum on the Mall is used for public showings at 4:30 PM weekdays, and hourly on weekends starting at 11:00 AM through 4:00 PM. Call 381-6264 (June LoGuirato)

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## NOVEMBER LECTURE

Cosmic-ray research was the topic of Father Emmanuel M. Carreira's November 3 talk to NCA. Dr. Carreira spends his summers and autumns at the Catholic University Physics Department and the rest of each year at the Jesuit Pontifical University, Madrid, Spain. He teaches astronomy, photography, and philosophy.

Nutrinos may be considered direct messengers from the stars. They also are indicators of superenergetic events in the universe such as supernovae. On the average, the shielding needed to stop a neutrino, which travels at the speed of light and has no mass or charge, is 1 light year thickness of lead. A major problem in solar physics is why the deep, carbon tetrachloride-filled mine in Montana does not detect nearly as many neutrinos as it should.

Plastic and liquid scintillation counters and spark chambers record only about 100 neutrinos in two or three months. Hence, statistical work on the location of the origin of neutrinos is very limited. More productive are studies of the charged particle component of cosmic rays. 90% of the particles are hydrogen atoms, 9% are helium nuclei, and 1% are heavier nuclei. Some have energies of 100 billion electron volts. Those of less than 3 bev cannot penetrate the earth's Van Allen belts. Maximum numbers of cosmic rays come from 4-6 hours right ascension, where the Orion spur connects our arm of the Milky Way with the Perseus arm. Cosmic rays are clustered in the plane of the Milky Way.

About one supernova per year occurs in our galaxy, releasing  $10^{50}$  ergs of cosmic-ray energy. Because they travel twisting paths along the galactic magnetic field, cosmic rays appear to reach the earth from all directions. Our speaker displayed a computer analysis of  $1.3 \times 10^6$  million point observations of cosmic rays.

## NASA SYMPOSIUM HELD ON WEATHER EFFECTS OF SOLAR ACTIVITY

A conference of invited international scientists was held at Goddard Space Flight Center on November 7 and 8 to discuss possible relationships between solar activity and the weather.

The major problem is developing a theory of the physical relationship between solar activity and the earth's lower atmosphere. Walter Orr Roberts noted that solar energy inputs, particle and radiation, are three to five orders of magnitude less than atmospheric energy transformations, and Elske van P. Smith noted that even the largest solar flare is negligible as a change in the solar energy output summed over the whole disk and all wavelengths.

Lacking physical theories, workers have continued to study statistical relationships among various solar activity indicators and atmospheric changes, as they have for many decades. The newest solar indicator is the magnetic sector boundary delineating regions of oppositely directed solar magnetic field vectors near earth. There appear to be significant relationships between passage of a boundary over the earth and patterns of high-latitude sea-level pressure, as well as the world-wide number of thunderstorms.

Remarkably, this conference was dedicated to and opened by 101-year-old Dr. Charles G. Abbot, pioneer in solar radiation measurements and the first secretary of the Smithsonian Institution. (From a summary by A. James Wagner)

## PALOMAR PHOTOGRAPHS COMET KOHOUTEK

This 7-minute exposure, supplied by Dick Horwitz, was made at Palomar Observatory on October 31 by Martin McCarthy, a guest astronomer from the Vatican Observatory. No further photographic details were given.

## ABSTRACTS FROM THE IAU CIRCULARS

1. September 29 -- Dr. Tom Gehrels, Lunar and Planetary Observatory, discovered a 15th-magnitude comet (1973n) in Aries with the 122-cm Palomar Schmidt. Comet Gehrels, a periodic comet, will not become significantly brighter.

2. Comet Kohoutek -- In early November the comet was reported to be of 8th magnitude with a tail about 15 min long. Spectral emission lines have been observed with the 305-cm Lick telescope and the 182-cm Asiago Astrophysical Observatory reflector. On February 14 the nucleus may occult an 8th-magnitude star as seen from the South Atlantic Ocean area.

## FOR SALE

Telescope -- 10-inch f/8 Newtonian reflector by Cave. Electric slow motions in both axes, 2.4-inch guide telescope, 4 oculars, choice of portable or permanent pier. \$850.00. Original cost was \$11.00. John Korintus, 946-6807.

Published eleven times yearly by NATIONAL CAPITAL  
ASTRONOMERS, INC., a non-profit, public-service  
organization for the promotion of interest and education  
in astronomy and the related sciences. President:  
Dr. John A. Kaler, 3310 Curtis Drive, Apt. 307, Hillcrest Heights, Md. 20023 (423-1365)  
Vice President, Dr. Henning Laidacker; Treasurer, Robert A. Phipps; Lawrence Torrione;  
Star Map production, William Winkler and Ronald McCrumbles. Deadline: 15th of each month.