★ STAR DUST

Volume XXX January 1974 Number 5

JANUARY CALENDAR

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

Friday, January 4, 5:30 PM — Exploring the Sky — A Winter Special — Presented jointly by NCA and the National Park Service. Glover Road south of Military Road, NW, near the Rock Creek Nature Center. See article on page 19.

Saturday, January 5, 6:15 PM — Dinner with the speaker at Bassin's Restaurant, 14th Street and Pennsylvania Avenue, NW. Reservations not required.

Saturday, January 5, 8:15 PM — NCA monthly meeting at the Department of Commerce Auditorium, 14th and E Streets, NW. Information: Henning Leidecker, 864-6816. (Listed incorrectly in NCA Directory.)

Sunday, January 6, 6:00 PM — Comet observations from Northern Virginia College. See page 18 for details.

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

Saturday, January 12, 3:00 PM — Visit to Hopewell Observatory for comet observations. See article on page 18.

Each clear evening, January 7 through February 8, sunset — U. S. Naval Observatory opens for comet viewing. Pass is necessary. See page 18.

DECEMBER LECTURE

Dr. Robert Chapman discussed current knowledge and problems in our understanding comets at the December 8 meeting of NCA.

He began by reviewing details of the discovery of Comet Kohoutek (1973f) with a Schmidt camera in West Germany. This comet probably will not reach brightness levels as great as those that have been predicted. Comparison photos of the comet as recorded by direct photography and by image tube were shown; the greatly shortened exposure time made possible by electronic imaging was dramatic. Comet 1973f is varying in brightness as it nears perihelion.

Comets tend to be brighter at given distance from the sun *after* perihelion than before. Details as to why are not completely agreed upon.

The nucleus of a comet is 10 to 100 km in diameter. Cometary material is mainly CO_2, methane (CH_4), water, and, most importantly, CO^+ and CN; raw material from which the solar system formed, we believe. Satellite observations reveal a vast cloud of hydrogen surrounding the coma visible from the earth's surface. Comets leave debris which forms an anti-tail, best seen when they are in the earth's orbital plane.

Of 800 comet orbits observed in detail, 600 are hyperbolic due to interaction with the gravity fields of Saturn and Jupiter. Two leading theories on the origin of comets are, (1) comets enter the solar system from a cloud of comets perhaps 1 light year distant, (2) comets coalesce from left-over orbiting solar system material. The orbits of all comets first entering the solar system are believed to be giant ellipses until perturbed by the planets.

Questions directed to the speaker centered on problems of comet origin.

NCA WELCOMES NEW MEMBERS

Margaret Curtis
1120 S. Edison Street
Arlington, Virginia 22204

George N. Kamm
6708 Trowbridge Place, SE
Oxon Hill, Maryland 20022

Angus McKellar B564
3636 - 16th Street, NW
Washington, D.C. 20010

Richard Parsons
10109 Dickens Avenue
Bethesda, Maryland 20014

ADDRESS CORRECTION

Frederick D. Cornelius
1510 N. 12th Street, #300
Arlington, Virginia 22209

NORTHERN VIRGINIA COMMUNITY COLLEGE INVITES NCA

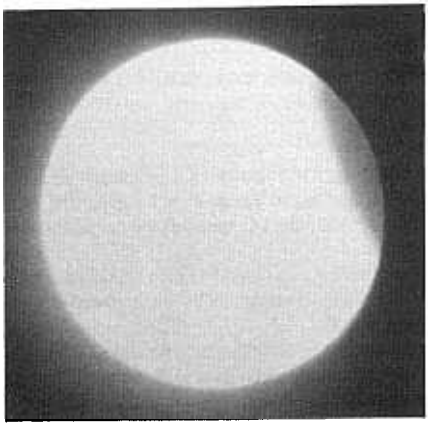
The NCA is invited to view Comet Kohoutek from the new Alexandria campus of the Northern Virginia Community College on Sunday, January 6, 1974, from 6:00 to 7:30 PM. Weather date is January 13.

From I-95, go west on Seminary Road approximately 1/4 mile past North Beauregard Street, and watch carefully for Filmore Street on the right. Turn right into the parking area and meet near the two flagpoles in front of the building.

NAVAL OBSERVATORY TO OPEN FOR PUBLIC COMET VIEWING

Each clear evening from Monday, January 7 to Friday, February 8, 1974, from sunset to comet set, the U. S. Naval Observatory will admit the public to the new 24-inch reflector on a first-come first-served basis. A pass must be obtained at the South Gate, adjacent to the New Zealand Embassy on Observatory Circle south of Massachusetts Avenue.

A PHOTOGRAPHIC STUDY OF THE DECEMBER 10 PARTIAL LUNAR ECLIPSE



Midpoint of 11% partial lunar eclipse 0144 UT December 10, 1973. Three-inch f/15 refractor prime focus, 3 seconds on High-Speed Ektachrome normally processed.

Bill Winkler used still and time-lapse photography to study visibility of the penumbra, and color inside the umbra, of this lunar eclipse, in which only 10.7 percent of the moon was within the umbra of the earth's shadow.

Results: (1) Using a 3-inch, f/15 refractor and High-Speed Ektachrome film (normally processed) at the prime focus, no color was ever shown in the umbra, even with a 3-second exposure. (A 1/200-second exposure gave a photograph similar to the visual appearance.) Visually, the umbra was a dark gray, slightly blue-tinted color. (2) Using Kodachrome Super 8 film and a 64-mm lens set to f/16 and a shutter speed of 1/30 second, an intervalometer exposed at the rate of 1 frame every 5 seconds from end of umbral eclipse until end of penumbral eclipse, 1 hour 32 minutes later. After rerunning the film back and forth several times and counting frames, Bill subjectively judges that the penumbral shadow ceased to be clearly visible 48 minutes 45 seconds before the moon completely left the penumbra, or 43 minutes 15 seconds after it completely left the umbra.

EXPLORING THE SKY — A WINTER SPECIAL

On January 4 at 5:30 PM, NCA and the National Park Service will hold a special program of Exploring the Sky featuring comet observing on Glover Road south of Military Road, NW, near Rock Creek Nature Center. Following the observing session, an indoor program featuring comets will be held in the Nature Center. If cloudy, only the indoor program will be held.

NCA TO VISIT HOPEWELL OBSERVATORY

The Hopewell Corporation will host NCA on January 12, 1974, at its Bull Run Mountain observatory site for comet observations. Bring whatever portable instruments you wish that can be car-pooled. Hot coffee, tea, and cocoa will be provided, but bring a lunch that does not require cooking, as there will be insufficient time for elaborate picnicking before comet time. (Sunset: 4:58)

There are no comfort facilities yet completed, other than some shelter from the cold provided by a small house under construction. 115v 60Hz power is available for clock drives and other apparatus.

Meet at 3:00 PM at Tyson's Corner Shopping Center in the large parking area across the drive from the corner of Woodward & Lothrop's store nearest the Clock Court Entrance, where we will regroup to minimize the number of vehicles. If you can take people and telescopes, your services will be appreciated. We should depart as soon after 3:00 PM as possible in order to arrive in time to set up before sunset. To find the parking area, either take Beltway exit 10 west (Route 7) and turn right into the Center, or take Beltway exit 11 west (Route 123) and turn left into the Center. If further information is needed, call Bob McCracken, 229-8321.

EXTRACTS FROM THE IAU CIRCULARS

1. November 24 — Mr. J. Gibson, Observatorio Austral Yale-Columbia, El Leoncito, discovered in Horologium a fast-moving 15th-magnitude object which may be a comet.

2. December 4 — Dr. J. A. Graham, Cerro Tololo International Observatory, discovered a nova of 13th magnitude in the Large Magellanic Cloud.

Comet Kohoutek:

1. November 29 — Dr. Belton, Kitt Peak, reported that an f/2 Schmidt photograph showed a tail 3°.8 long with structure, including a knot 3' x 6' located 1°.9

2. December 1 to 5 — Emissions of CH CN (Methyl Cyanide) were detected with the NRAO 11-meter radiotelescope.

4. December 3-6 — A NASA-sponsored group at the University of Wisconsin detected hydrogen-alpha emission with the Fabry-Perot spectrometer on the McMath solar telescope at Kitt Peak.

5. December 7 — A photograph taken at the Maui station of the Smithsonian Astrophysical Observatory showed a dust tail 4°.5 long and a gas tail 5° to 6° long.

This listing courtesy Robert N. Bolster.

FROM THE NASA HOTLINE AT PRESS TIME

January 1, 1974 — Skylab Astronaut Poague suggests that the diffuse brightness on the right side of the comet now approximates the brightness of the sunward spike. However, Astronaut Gibson was unable to recognize the diffused area. They report that the tail is now much longer.

The Astronauts were able to see the comet at perihelion from Skylab; it was not observable, however, with the earth-based Kit Peak solar equipment.

* STAR DUST

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. Eisele, 3310 Curtis Drive, Apt. 202, Hillcrest Heights, Md. 20023 (423-1586); Vice President, Dr. Benning Leidecker; Treasurer-membership, Lawrence Torrance. *Star Dust* production, William Winkler and Robert McCracken. Deadline: 15th of each month.