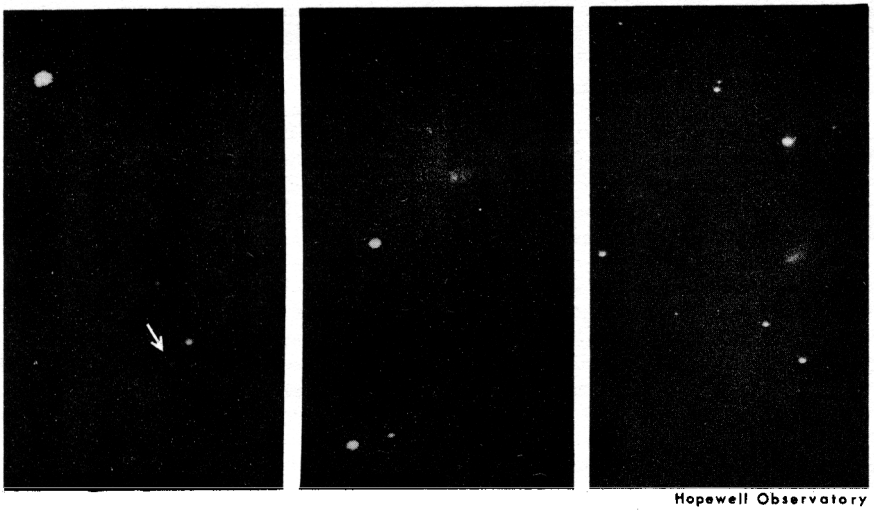
★ STAR DUST

Volume XXX November 1973 Number 3

COMET KOHOUTEK NEAR ALPO PREDICTION



Hopewell Observatory

Comet Kohoutek (1973f) had reached approximately 8.8 magnitude by the morning of October 27, determined in rather hazy sky conditions quite near the southeastern horizon. Using a 9.5-in f/4 Wright-Schmidt and a 6-in f/15 refractor, Bob Bolster and Bob McCracken have been photographing the comet. At left, above, it is shown at 10h 38m 30s -1.5° in Sextans on October 6. Bolster made the 20-min Wright exposure on Tri-X. The bright star image is 33 Sex, magnitude 6.4. In the 10-min center exposure (otherwise same) the

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NOVEMBER CALENDAR

Friday, November 2, 4:00 PM — Goddard Space Flight Center Scientific Colloquium, auditorium of Building 3. Fred L. Whipple will speak on Comet Kohoutek.

Friday, November 2, 9, 16, 23, 30, 7:30 PM — Telescope-making classes at American University, McKinley Hall Basement. Information: Jerry Schnall, 362-8872.

Saturday, November 3, 6:15 PM — Dinner with the speaker at Bassin's Restaurant, 14th Street and Pennsylvania Avenue, NW. Reservations not required.

Saturday, November 3, 8:15 PM — NCA monthly meeting at the Department of Commerce Auditorium, 14th and E Streets, NW. Program to be announced.

Monday, November 5, 12, 19, 26, 7:30 PM — Telescope-making classes at the Chevy Chase Community Center, Connecticut Avenue and McKinley Street, NW. Information: Jerry Schnall, 362-8872.

Saturday, November 10, Sunrise until 8:18 AM — The last transit of Mercury across the sun until May 7, 2003 that is visible in the United States

OCTOBER LECTURE

Dr. Stephen Maran, who is in charge of "Operation Kohoutek" at NASA, spoke to NCA on October 6 about some major American programs for observation of this comet.

Dr. Maran outlined the national program as follows: Recover comet by September 25; Pioneer 10 launched toward Mercury and Venus and carrying two comet instruments on November 3; a variety of comet measurements from high-altitude balloons during November; ultraviolet photometry from OAO-3 and major programs aboard skylab in December; observations of comet by Pioneer 8 near Jupiter, Pioneer 10 near Venus, from five Aerobee rockets, and using an aircraft-borne 36-inch telescope, in January; more observations in UV light with OAO-3 to study hydrogen atom bulk motion, in February.

Many comets have two observable tails, said Dr. Maran: a straight plasma tail and a curved, smoother, dust tail.

The two major theories of comet formation are that expounded by Fred Whipple, wherein comets formed when the planets did, and are composed of H_2O, CH_4, and CO_2; and that favored by AGW Cameron, wherein comets were formed before the planets and beyond Pluto, are formed of stellar material, and are composed of the above molecules plus more complex ones. It is hoped that studies of Comet Kohoutek in ultraviolet light will tell us if helium is also present.

Maran noted that comets have been known to disappear on their journey sunward and to split into two. The coma may flare up suddenly or shoot out a jet. A current example is 1973b (*Star Dust*, September 1973, page 4). A high-speed nucleus rotation causes a visual helix pattern in the comet head. Kohoutek is thought to be a long-period comet recently captured by the sun.

In order to prepare a comet observation program for the Skylab third mission, two hundred engineers have been working on equipment changes on a crash basis. It is hoped that disturbances in the comet tail can be correlated with those in solar wind. More data on whether comets emit radio waves is also desired.

Dr. Maran answered many questions after his lecture and later joined some of the members for further discussion over coffee.

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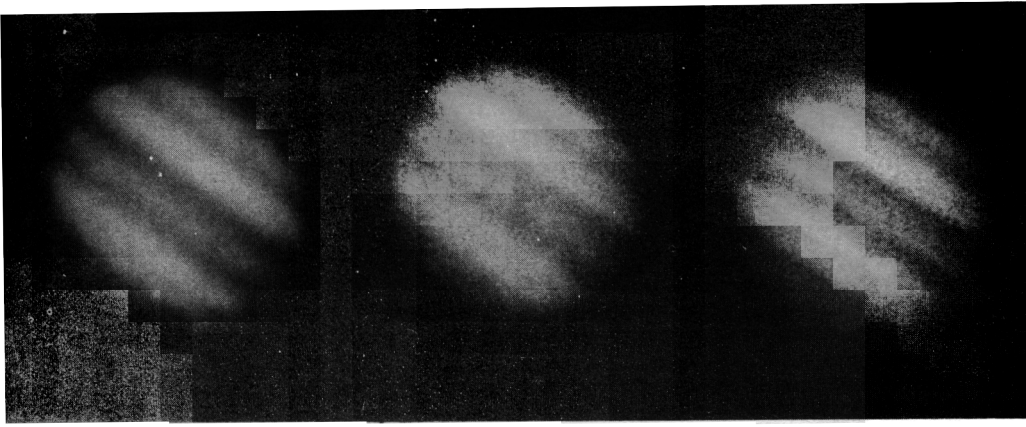

JUPITER AT THREE WAVELENGTHS

John Korintus photographed Jupiter on August 30 at approximately 0300 UT. The filters used on his 10-inch reflector were (a) light blue, (b) green, and (c) orange. For a discussion of techniques used see *Star Dust*, September 1973, page 3.

NOTES ON CURRENT RESEARCH

Lasers make gratings — The August 1973 issue of *Industrial Research* reports on the radical improvements in diffraction gratings made possible by laser holography. The grating, a basic tool of astronomical spectroscopy, did not become practical until late in the 19th century, when Rowland at Johns Hopkins University in Baltimore perfected diamond ruling engines. In 1955, Stroke and Harrison made more precise ruling of the thousands of lines per millimeter possible using an interferometer to control the ruling engine. In 1967 a group in France used two laser beams of the same wavelength at an angle to one another to produce a diffraction grating on a photosensitive, optically flat plate by means of the interference pattern produced. This technique permits 6000 lines-per-millimeter gratings 600 mm wide to be produced, impossible with classical ruling engines.

Perseid clusters? — Russell in Northern California used an f/2.8 camera with a 25^{o} prism to take 10-minute exposures of the August 11-12, 1972 Perseid meteor shower for seven consecutive hours. Of the nine spectra recorded, seven occurred between 0915 and 1015 UT on August 12. The occurrence of this flurry of bright meteors has only a 1-in-3000 probability of happening by chance, suggesting a pronounced irregularity in the meteoroid stream, heretofore thought to have a random distribution, according to Russell. The strength of the neutral oxygen line at 5577 in the green varied widely during this hour, suggesting differences in the physical properties of the meteors. *Astrophysical Journal*, September 15, 1973, page 1017.

Palomar commemorated — On June 3, 1948, the 200-inch telescope was dedicated on Palomar Mountain. The July 1973 issue of *Applied Optics* commemorates a quarter century of work by the Hale refractor with (1) a drawing by R. W. Porter on the cover, (2) reproduction of the draft of Hale's letter to the Rockefeller Foundation outlining the case for a 200-inch telescope, (3) Hale's 1928 article in *Harper's* Magazine first publicly proposing the 200-inch reflector, (4) a survey article on recent advances in astronomical optics.

NOTES FROM MEMBERS

Douglas Greene reports that the George Mason University telescope, a 12 $1/2$-inch Cassegrain, is nearing completion, and is expected to be in operation by December. Featuring remote controls and an image intensifier, the telescope will be installed on the campus, although it is expected to be hampered by light pollution.

ABSTRACTS FROM THE IAU CIRCULARS

1. October 5 — Previous predictions of the brightness of Comet Kohoutek, derived by comparison with comet 1957 III indicated that it may be 1.5 to 2 magnitudes fainter near perihelion than previously thought (−1.9 on December 24; −1.7 on January 3; +1.2 on January 13). Dr. W. Liller, Harvard College Observatory and Smithsonian Astrophysical Observatory, estimates that the tail will be relatively short: 3° on December 21; 13° on January 1; 21° on January 11; and 15° on January 21.

This listing courtesy Bob Bolster.

KOHOUTEK — *Continued*

comet had crossed into Leo, to 11h 8m 20s, −5.0°. The upper bright star is SAO 138038, mag 7.7. Following this exposure, made on October 21 at 0949-0959, the comet was visible in the refractor. On October 27 McCracken made the 20-min f/15 refractor exposure on the right. The bright star just above the comet is SAO 138188, magnitude 8.8, in Leo. It was the best out-of-focus match of those stars visible near the comet. ALPO's Charles Morris had predicted 8.7 for the 25th, and 8.4 for the 30th. Marsden of SAO predicted 7.5 and 7.9 for those dates. The latest IAU prediction was 7.9 for October 25.

North is at the top in all three photos. Tri-X was developed to ASA 2400 in Diafine, all were printed on Brovira No. 6, enlarged to the same plate scale, approximately 3.14 min / cm in this reproduction.

A bushy tail about 2 min long has developed.

* STAR DUST

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