★ STAR DUST

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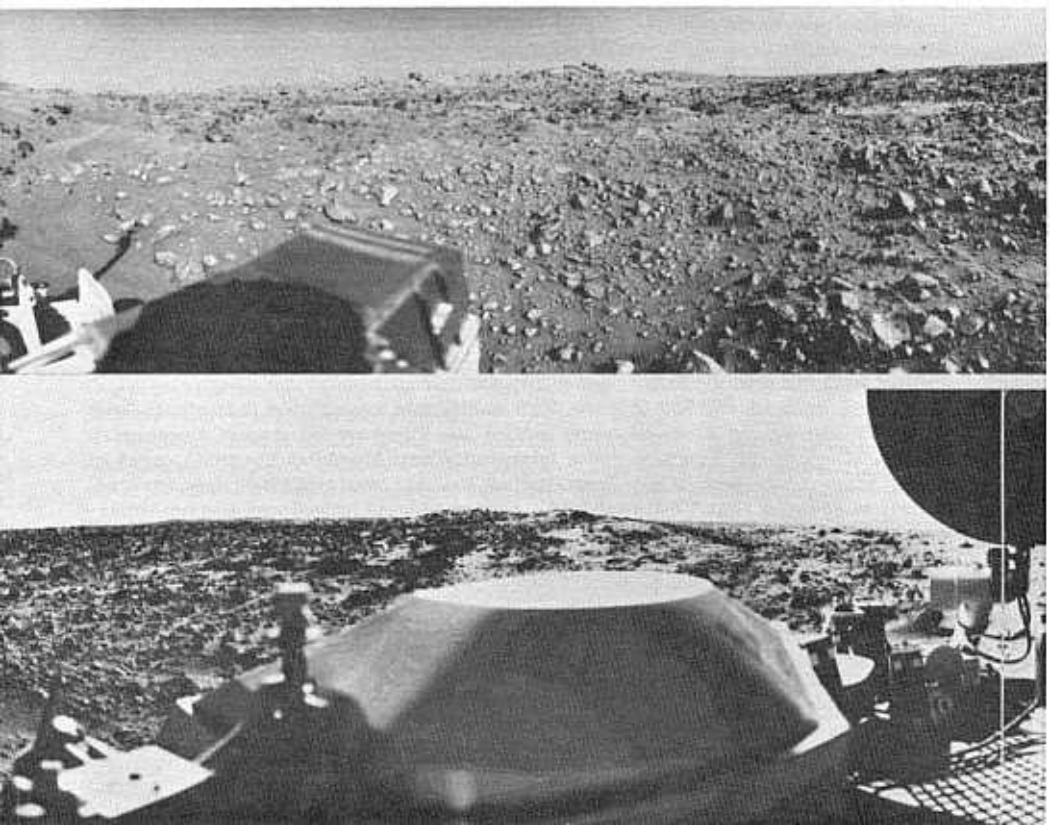
FIRST PANORAMA FROM THE MARTIAN SURFACE



Upper view, easterly; lower, southwesterly. Photos join upper right to lower left to make a 300° panorama from NASA's Viking I.

HISTORY OF STAR CHARTS TO OPEN LECTURE SERIES

At the September 11 meeting of NCA, Deborah Warner, Curator, History of Astronomy, National Museum of History and Technology, Smithsonian, will speak on the history of the development of star charts.

Deborah Warner received her B. A. in physics from the University of Chicago, and her M. A. in history of science from Harvard in 1963. She is the author of *Alvan Clark & Sons: Artists in Optics*, and has recently completed a book on *European Star Maps, 1500-1800*.

SEPTEMBER CALENDAR

Friday, September 3, 10, 17, 24, 7:30 PM — Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall, 362-8872.

Monday, September 6, 13, 20, 27, 7:30 PM — Telescope-making classes at the Chevy Chase Community Center, Connecticut Avenue and McKinley Street, NW. Information: Jerry Schnall, 362-8872.

Saturday, September 11, 6:15 PM — Dinner with the speaker at O'Donnell's Sea Grill, 1221 E Street, NW. Reservations not necessary.

Saturday, September 11, 8:15 PM — NCA monthly meeting at the Department of Commerce Auditorium, 14th and E Streets, NW. Deborah Warner speaks.

Saturday, September 25, 4:00 PM — Annual NCA picnic and workshop, Manassas Battlefield Park. See article on page 4.

Saturday, September 25, 8:00 PM — *Exploring the Sky*, presented jointly by NCA and the National Park Service, on Glover Road south of Military Road, NW, near Rock Creek Nature Center. Information: Bob McCracken, 229-8321.

JUNE LECTURE

Dr. David M. Zipoy, Associate Professor of the University of Maryland, spoke at the June 5 meeting of National Capital Astronomers on the peculiar 14th-magnitude emission-line object VV8 in Perseus.

VV8 has been classified in the Voronsov-Veljaminov catalog as a planetary nebula. The spectrum, however, displays a strong continuum not at all characteristic of planetary nebulae. Dr. Zipoy showed the numerous inconsistencies of such a model with the observations, described several other models, all unsatisfactory, proposed a model he has developed, then pointed out the difficulties with his own model.

O'Dell showed in 1956 that the VV8 continuum resembled that of a G-type (6,000K) supergiant star, strange indeed for the central star of a planetary nebula. Central pn stars are the extremely hot (50,000-100,000K) cores of young stars from which the surrounding nebular material has been ejected. O'Dell suggested that VV8 might be a binary system including a G-type supergiant. In the direction of VV8 the observed 14th magnitude would require a distance of about 50,000 light years — too far from the galaxy for a young pn central star to have moved since its formation. No evidence of orbital motion which would suggest a binary has been found in the spectrum.

Dr. Zipoy's Fourier spectrometric data show a line-strength ratio H_α:H_β greater than 7, unusually high for a planetary nebula, typically 2.7. An extreme density, about 10^7 particles per cc, would be required to produce sufficient reddening by preferential blue (Rayleigh) scattering — ten thousand times the typical pn density.

His efforts to reconcile the observations and calculations are represented in Zipoy's own model. He sees VV8 as similar to a shell star with a few modifications. The combination of parameters he invokes to fit the observations is admittedly unlikely, but plausible. Moreover, the model predicts strong radiation at longer wavelengths than have been observed, e.g., 30 microns. Such radiation must be observed from outside the Earth's atmosphere, but its absence would disprove the model. VV8 has already been observed to radiate at wavelengths as long as 18 microns.

Zipoy postulates a B-subdwarf central star surrounded by an HII region which generates the emission spectrum, in turn surrounded by a partial shell of much dust and some gas. The dust reddens the continuum from type B to G, while the gas produces the absorption spectrum.

Only a particular combination of parameters can be both reasonable and consistent with the observations. Demonstrating his calculations, Zipoy showed that the conditions can be satisfied by a central star temperature of about 30,000 K, a dust ring of about 0.1 solar mass disposed edgewise toward the Earth, having average particle sizes about 20 percent smaller than usual for such clouds, and covering about one third of the star. Ultraviolet erosion

WINKLER SEES POSSIBLE AURORA-PREDICTION AID

Analyzing the comprehensive geomagnetic data for March 1976, published in the July 1 *Journal of Geophysical Research*, William Winkler suggests an easily accessible, potentially useful aurora-prediction method.

The data show that all of the major planetary-scale magnetic activity indices were far larger on March 26, the morning of the Maryland aurora display (*Star Dust*, May 1976), than on any other day of the month. The K_p sum was 55 on the 26th, but only 36 on the next most active day. The three-hourly K_p was 7 or 8 for seven of the eight periods on March 26; at no other time of the month did it attain 7. Sunspot numbers for the several days preceeding the aurora were relatively low.

Since the K_p values are transmitted by the National Bureau of Standards radio WWV at 14 minutes past each hour, Winkler's method may provide a useful lower-mid-latitude aurora-forecasting tool. Test by continuing observations is suggested.

Details of his method and instruction in its application may be obtained from William R. Winkler, 15804 Pinecroft Lane, Bowie, MD 20716.

JUPITER UNUSUALLY ACTIVE, COSTANZO REPORTS

On August 13, 1975, at Hopewell Observatory, Daniel Costanzo remarked that Jupiter was showing "a little more activity than usual." Subsequent months proved his remark to be an understatement.

Reporting on the NCA section activities of the Association of Lunar and Planetary Observers, Costanzo relates the group's observations of major disturbances in the SEB*, NTrZ, and the GRS. He, William Winkler, and William Pala recorded a wealth of detail including many prominent white ovals, some in chains, embedded in the SEB and EZ. Remarkable changes in the GRS and RSH were also recorded.

*Nomenclature: SEB - South Equatorial Belt; NTrZ - North Tropical Zone; GRS - Great Red Spot; RSH - Red Spot Hollow. The full Jupiter nomenclature is given in your *Observer's Handbook*, available from the NCA treasurer.

Jupiter on November 1, 1975 (left), and December 24, 1975, showing major changes, including fading of the GRS. Drawings by Costanzo.

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could produce smaller than usual particle sizes. Shell star clouds often tend to concentrate in equatorial rings. Lyman alpha radiation heating the dust is converted to infrared, thus providing the basis for the prediction of ir radiation.

While some of these values are unusual, all are reasonable. It is only the required combination of unusual values that is unlikely. But VV8 is indeed an unusual object. Although Zipoy is not entirely satisfied with his model, he points out that few options are left to explain the observations. rm

NCA ANNUAL PICNIC TO FEATURE EQUIPMENT-USE WORKSHOP

In response to the recent member-interest survey, a telescope-use, observing, and astrophotography workshop will be held at the NCA picnic on September 25. Bring food, telescopes, etc. to Manassas Battlefield Park: Route 66 west to Route 234, right 1.7 miles to site on left. Bring, if available, the October 1974 and current issues of *Astronomy* magazine, and your *Observer's Handbook*. In the former, read page 22: "Which Color Film...." Also see *Star Dust*, October 1973, page 7.5: "New Film Test...," and May 1976, page 35: "Observing Techniques...."

The picnic and workshop will be held regardless of weather short of precipitation at the time: Picnic, 4:00 PM, workshop, 6:00 PM, observing, if clear, after dark. If you can offer a ride or need a ride, call William Winkler, (301) 249-7671. Rain date: October 23.

EXCERPTS FROM THE IAU CIRCULARS

1. July 2 — J. C. Kemp, University of Oregon, observed rapid variations in the brightness of V1500 Cygni with a photometer on the 208-cm reflector at Mauna Kea. The flickering was on a timescale of 1 minute, with an amplitude of 0.027 magnitude. Variations of 0.28 magnitude over 2 to 5 hours were also noted.

2. July 8 — P. J. Young, University of Texas, observed V1500 Cygni visually with 1200x at the Cassegrain focus of the 208-cm reflector at McDonald Observatory. No nebulosity as large as 0.1 second was observed, although a gas shell diameter of 0.4 second was expected from the known expansion velocity and assumed distance.

3. Comet d'Arrest (1976e) — S. Furia, Varese, Italy, reported that a plate taken August 5 with a 13-cm Schmidt camera showed a coma of 18 minutes diameter and a total magnitude of 2.5 to 3. Visual observers reported a brightness of 6.1 to 7.7 during the first week of August. Spectral observations show a continuum with superimposed emission bands from CN, C_2, C_3, NH_2, and CH.

This listing courtesy R. N. Bolster.

FOR SALE

Tasco 4.5-inch reflector, equatorial mount, wooden tripod, slow-motion control, 6- and 20-mm oculars. John Lawless, 536-5589 after 5:00 PM.

FIRST CLASS MAIL

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