

STAR DUST



FEB 4 - 1970

FEBRUARY 1, 1970 ... VOL XXVII ... NO. 6



Lunar Material to be featured in Program

Approximately one hundred pounds of rocks from the lunar maria "Ocean of Storms" (Apollo 12) and "Sea of Tranquillity" (Apollo 11) are now being analyzed by geological specialists in many countries. Early results have yielded both surprise and controversy, and discussions concerning the time and circumstance of the origin of the moon wax hot. During the first week of January, the first major conference on lunar sample analysis was held in Houston, Texas.

On February 7, Dr. Edward C. T. Chao, one of the analysts studying the rocks obtained from both manned flights, will bring us up to date on the latest measurements — and the latest controversies. Dr. Chao's talk will be illustrated by some spectacular slides showing how the samples look, not only to the unaided eye, but under the tools of the modern geologist and chemist. Studies based on electron microscopy and polarization of reflected light are especially impressive. This talk has an even longer-range significance: it will show us some of the techniques later to be applied to manned and un-manned planetary flights.

Dr. Chao received his B.S. in Geology from his native country, mainland China. He joined the Geological Survey in 1949 after receiving his Ph.D. from the University of Chicago. Dr. Chao has been with the Astrogeology Branch since 1960; he specializes also in tektite origins.

BILL WINKLER

CALENDAR

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Saturday, February 7, 6:15 PM - Dinner with Dr. Chao at Bassin's, 14th and Penna. Ave. N.W.; for reservations contact Winkler at 762-5135 or Legowik at 946-8996 before 1 PM, on the 7th.

Saturday, February 7, 8:15 PM - February meeting at Department of Commerce Auditorium, 14th and E St. NW, "Preliminary Analysis of Lunar Samples from Apollo 11 and 12".

Saturday, February 14, 2:00 PM - Md.-D.C. Junior meeting at Chevy Chase Public Library, 8001 Connecticut Ave., Chevy Chase, Md. For information, contact Ray Finkleman at 933-0945.

Saturday, February 21, 8:15 PM - General discussion of final plans for the March 7th solar eclipse. Problems will be raised and solutions sought. Room 2062, Department of Commerce Building, 2nd floor.

Friday at 7:30 PM on the 6th, 13th, 20th and 27th of February, TELESCOPE-MAKING CLASSES at the Palisades Community Center, conducted by Mr. Jerry Schnall, EM2-8872.

Saturday, March 14th, the next scheduled meeting of the NCA - regular meeting delayed one week because of the solar eclipse.

Observing through the 'Five Inch' at the Naval Observatory:

Friday, Feb. 6, 8-10pm. with Larry White
Tuesday, Feb. 10, 8-10 pm. with Jim Krebs

NEW MEMBERS

Kenneth S. and Linda Dorr, Joint Membership, 12919 Moray Road, Silver Spring, Md. 20906, 942-3394.

Miss Pat Brown, Junior, 5909 Gloster Road, Washington, D.C. 20016, 229-0366.

Christopher Wells, 6216 Winston Drive, Bethesda, Md. 20034, 229-4938, Junior.

Nathaniel P. Herold, Junior, 3311 Macombs Street N.W. Washington, D.C. 20008, 244-6853.

Robert Levin, 7716 Sebago Road, Bethesda, Md. 20034, 229-3849, Junior.

Carol Walske, 1907 Windsor Road, Alexandria, Virginia, 22307, 765-1211, Junior.

Juniors' Report

On January 3, 1970 the Junior Division of the NCA held their first meeting of the new decade. It was attended by nineteen members, eleven of whom were Md.-D.C. members. Several small discussion groups formed, one discussing mirror grinding problems of 6-inch telescopes.

I would like to propose that we do away with the joint Junior Division meetings. There is no reason to meet if the meetings do not serve a useful purpose. All of the Junior Division work is done in the regions which hold their own separate meetings. I can't think of one thing that the Junior Division has done, during the seven years I have been a member, as a result of these joint meetings. I invite others to comment on this proposal. The only project the Juniors are currently working on is observing and recording observations of the Messier Objects - eventually to be published.

Although it has not been reported, Prince Georges Region juniors have been meeting. They have scheduled several sessions but clouds have foiled their observing sessions. For information call Geoffrey Hornseth, 894-5987.

The Md.-D.C. Juniors met on January 10th. We discussed an observing schedule and did a lab on determining the moon's orbit, which I may incorporate into the astronomy course I'll be teaching to fellow students at Albert Einstein High School. If anyone has an innovative method to teach some topic in astronomy, please contact me at 933-0945.

At the meeting, we agreed to observe that evening, if the sky was still clear. Five of us froze. The sky was beautiful and we did see several Messier Objects. An electric heater helped the frostbite. We plan several observing sessions during the month. At the next meeting, on February 14th, at 2:00 PM, at the Chevy Chase Public Library, 8001 Connecticut Avenue, Chevy Chase, Md., all members (and non-members) are invited to bring photographs and drawings; for information, contact me at 9330945.

Raymond Finkleman

Reviews of Recent Literature - by Norman Sperling

The New York Times Encyclopedic Almanac 1970,
New York Times Book and Educational Division,
1056p., illus., \$2.95.

The New York Times publishes a number of books as well as its famous daily. If it could instill its paper's respect for accuracy in its new 1970 Encyclopedic Almanac, that book would be much different from the edition now on the stands at \$2.95.

In 27 crammed pages of its "Stars/Planets/Space" section, the new almanac covers a number of topics never covered before in common almanacs. It gives equal amounts of text to "Stars and Galaxies", "Quasars", and "Pulsars". Lists include "Stellar and Galactic terms", "Space Age Glossary", "United States Space Programs" and "Astronauts and Cosmonauts". Illustrations include relative diameters

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Literature Review, cont.

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and distances of the planets, fundamentals of space flight, evolution of US and USSR rockets, and the flight path of Apollo XI. The Times' front page for 21 July, 1969, is reproduced as well, and the voyage, rightfully, gets extensive treatment.

ERRORS... ABOUND

Errors are legion, however, and inconsistencies abound. "Stars are the basic elements in the universe" is the topic statement of a discourse which later states "Galaxies...are regarded as the basic mass elements of the universe." That same item says "...white dwarf stars are characterized by their high luminosity..."

The table of the twenty brightest stars lists their distances and the magnitudes of their components, both absolute and apparent. Unfortunately, the headings 'absolute' and 'apparent' are reversed, rendering their data spurious since none of the stars is at ten parsecs.

The following table, "The Nearest Stars", lists 27 systems in approximately the same order as the 1970 Observer's Handbook's more extensive list. In the Handbook, new data from van de Kamp are used, mostly changing distances and luminosity relative to the sun. It is therefore hard to determine the source of the differences in the table the Almanac gives, listing only the names of the stars, their distances in parsecs, and their apparent and absolute magnitudes of the luminous components. No mention is made of the eight stars on van de Kamp's list with non-luminous companions, which is one of the most important factors such a list can point out. It also omits mention of the fact that most of those stars are red dwarfs. The list is therefore neither up-to-date nor complete. It, unpardonably, omits the mandatory listing of our sun as a star even closer than Alpha Centauri, with which it begins its list.

The explanation of magnitude belongs not at the head of this list but before magnitudes are first used in the section.

After a table of constellation names, genitives, English names or descriptions, and abbreviations, comes a table of Messier objects, up to M107. For M48 they state that it is "not identifiable", but there are simply blanks in place of descriptions for M91 and M102. Sixty-eight of the entries have an "apparent visual magnitude" and all but five have "NGC or IC" numbers, though no distinctions are made in that column for people who don't have the difference memorized.

Dr. Elske Smith's Lecture

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Dr. Elske Smith of the University of Maryland spoke on her department's laboratory exercises in astronomy. Noting that only ten percent of all Maryland students enrolled in astronomy complete laboratory courses in the subject, she placed emphasis on orienting them well with basic physics principles. The Hertzsprung-Russel diagram plays a major role, as do selected lunar-orbiter pictures, in this course's construction. For students majoring in astronomy, undergraduate astronomy is of much less importance than advanced math and physics, Dr. Smith said. Many questions about educational projects and preparation for astronomy careers were asked after the lecture.

The introductory paragraph of the brief table of the 17 members of "Our Local Group of Galaxies" is as peculiar as any dwarf elliptical it lists. "The largest members are both spiral galaxies -- our Milky Way and the Andromeda Galaxy (M31). Altogether, there are three spirals, four irregulars and ten ellipticals of which six are dwarf elliptical galaxies. The galaxies are given in the table with their apparent magnitude, distance in thousand parsecs (kiloparsecs), galactic diameter in kiloparsecs, and absolute magnitude." Would it not be more significant to say that the three spirals are the three largest members? Their phrasing implies that M33 (Triangulum) is smaller than the Large Magellanic Cloud, which their data show not to be true -- M33 is 17 kpc across; LMC is 10 kpc across. Wouldn't the extra column for type of galaxy allow the reader to count the totals for himself and know which galaxy is which? Isn't the reader at least capable of reading the headings of the columns given immediately below the introductory paragraph?

TELESCOPES LISTED

Under "Major Astronomical Facilities" are tables of reflectors down to 60 inches, including 10 under construction and 31 in use; 19 existing refractors to 24 inches; 29 existing radio telescopes and six existing "radar astronomy systems" with "peak transmitted power in kilowatts" replacing the column for "in operation since". Why are telescopes under construction worthy of listing if and only if they are reflectors? The heading, "Astronomical Phenomena: 1970," leads to false hopes of a diary of solar, lunar, planetary and meteoric events. The paltry half page of data, however, describes only lunar phases, apogees and perigees; seasons; terrestrial perihelion and aphelion; conversion of GMT to civil time for the eight US time zones; and eclipses. The GMT discussion contains the incredible statement "...the new day 'begins' at 00 hours 00 minutes (midnight) at Greenwich meridian and lasts 23 hours and 59 minutes, until one minute before the next day begins." There is no mention as to what day the unfortunate minute 23^h59^m01^s - 00^h00^m00^s belongs. If it is to be discarded altogether, the New York Times's calendar will be short more than six hours annually. The seven-line listing of eclipses says merely "March 7: total eclipse of the sun -- visible from the Americas". As this event will be visible for almost their entire market, and total or nearly so for the populous eastern US, would not a good almanac profitably spend more than one line on it?

In descriptions of planets, the Almanac says "(Venus' surface temperature is) about 800°F, or about 13 times as great as the earth's average surface temperature of 60°F." Do they not realize that difference from 0°F is not the same as a ratio of temperatures?

The table of "Satellites of the Solar System" gives distances for Jupiter's moons that are greater than the Observer's Handbook lists, yet periods that are shorter. The diameters of the Galilean satellites are larger than in the Handbook, and satellites 7 - 12 have radii in miles quoted as 6, 6, 5, 4, 5 and 4, which is a claim of far greater accuracy than current observational data will allow. Masses are expressed in pounds in figures that are obviously derived from metric values

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of fewer significant figures. This dishonesty is also found in the table of "Selected Asteroids", where radii in miles are also obvious conversions from rounded metric numbers. The text refers specifically to Icarus but the table gives name, number, radius, mass and rotation period only for Ceres, Pallas, Juno, Vesta, Hebe, Iris, Hygeia, Eunomia, Psyche, Nemausa, Eros and Geographus (sic).

The comet discussion tells us, among other things, that "Comets...are numbered in the order of their discovery for a particular year: 1970 I, 1970 II, and so forth." The year-and-small-letter designations are given in order of discovery, but Roman Numerals are assigned several years later by the IAU in order of perihelion passages.

The general impression the volume leaves is one of gimmickry. The existence of numerals seems to justify any attempts made to put them there. Any benefit of doubt yet left the perpetrators of this large and expensive Almanac is dispelled when one comes to a card at the end that proclaims, "Mail this card at once for Free Special Supplement to the New York Times Encyclopedic Almanac 1970 -- You now own the only almanac that brings itself automatically up to date. The supplement covering the period between the time of going to press (early December) and January 1, 1970, will be sent to you without cost. Simply fill in this card and mail it now."

Obviously the supplement is not free, but simply paid for long before it is received. And the allusion to being up-to-date implies that purchasers of established almanacs are being cheated because those annuals detail events from November to November instead of January to January. Maybe it has something to do with that extra minute at the end of every day

Norman Sperling, director,
Edgewood Planetarium

From the Editor

Two meetings were held over the weekend prior to publication. The NCA business and trustees meeting preceded the discussion group. The minutes of this meeting will be published next month. George Gould, James Sharpe and Bob Bolster were present. Also present were Bob Winkler, Bob Wright, S. Opie, J. Legowik, D. Freund, W. Crowley and others.

The discussion revolved about the design of the information pamphlet for prospective NCA members. The size of the present leaflet was thought to be adequate though the format and style could be improved. The content and style were discussed and all favored a more informative pamphlet, similar to that put out by Bob McCracken, but with a more conversational tone.

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An Astrophotography contest was discussed as a means of obtaining photos to illustrate the pamphlet as well as a means of recognizing the photographic capabilities of our membership. Contest rules were not formalized however. It was hoped that the new pamphlet would be ready this summer.

A second unofficial gathering was held at Col. Opie's home the following Sunday. Those attending included J. Korinthus, Mr. and Mrs. Crowley, Larry White, Ray Finkleman, and J. Legowik. Topics relating to the coming eclipse were discussed.

John Korinthus discussed solar photography with Kodak High-Contrast Copy film. Using his 10-inch reflector stopped to 2-1/4 inch, using a 35mm single lens reflex camera at prime focus, and developing in Acufine developer for 5 minutes at 68 degrees F, good negatives were obtained with shutter speeds of 1/50 second. Photography through filters, especially polarizing material was also discussed.

All members present were interested in photography of shadow bands. Methods of photography and other means of recording the phenomenon were discussed. These included several photoelectric methods similar to those shown by Bob McCracken. Methods of recording and timing the signals were also discussed. The editor would appreciate any descriptive material or any description of personal programs or techniques relating to the solar eclipse. With luck these would be published in time for perusal before the eclipse. We would be especially interested in the programs of those with extensive observational experience on the sun; e.g., Bob Wright, Bill Wiukler, etc.

J. Legowik

Academy Voting on NCA Membership

SHORT NOTES: FROM THE PRESIDENT

Good news- - - The Board of Governors of the Washington Academy of Sciences have recommended that NCA be voted into membership in the academy. The vote by the members of the academy is presently being made by a return mail ballot to their 1300 members.

It takes a 2/3 rds vote of those votes cast to elect us into membership. The deadline on the balloting is Feb. 20th, 1970. We should know for sure if we are elected by our March meeting.

One of our immediate benefits will be the addressing of our Stardust; the continuous updating of our membership list, including changes of address, and print-out of our membership list at least once a year, all at no cost to NCA. This will save us at least \$150.00 per year for every year we remain a member society of the academy.

This addressing service is done under an act of Congress, since the academy was chartered by Congress in 1898, at the National Bureau of Standards.

The cost of the mail balloting is approximately \$ 157.00, according to an estimate of postage to 1300 members and printing, and the plate, by Mrs. Ostaggi, secretary of the academy. I have approved this operating expense as a personal obligation and so stated this at our own recent Board of Directors meeting on Jan. 18th. I AM ASKING ALL OF OUR NCA MEMBERS, INCLUDING JUNIORS, TO SUPPORT ME ON THIS OCCASION BY DONATING ONE DOLLAR TO NCA TO COVER THIS

EXPENSE..... Give your contributions to Jerry or to one of the officers at the Feb. 7th meeting. If you cannot make the meeting, please mail your contribution to George E. Gould, Pres., NCA; 5308 29th Pl. Hillcrest Hts, Md. 20031.

Larger contributions made to this fund will be earmarked towards any expenses incurred at the planned reception at the Smithsonian, when our membership charter is formally turned over to your officers. This will be an outstanding event in the scientific community. The officers of the other member societies will meet with our members at that time and our Juniors will have an important function in explaining why the other societies should start to organize and promote juniors in their membership.

There will be a planned short program with an outstanding Astronomer who will give a 30-minute talk. I have tentatively set March 29th, Sunday, from 4PM to 8PM. Please let me know how this date fits in with everybody's schedule.

I have authorized Dr. John Legowik to purchase 20 to 25 rolls of special astronomical film to be used by our members to test exposures for the eclipse. The club will furnish this film to its members at no cost, with the provision that the club retains the rights of making copies of any slides and the member agrees to make the original available to the club in the future for educational purposes such as our discussion groups.

I have applied for the necessary forms from the Internal Revenue Service to apply for a ruling that our organization is a tax-exempt organization. This will allow corporations and foundations to make gifts and contributions to NCA under the tax laws. It is my goal, before my term of office is over this June, to see this organization with money in the treasury, a permanent home with a complete machine shop where our members can build their telescope mounts and setting circles at a small cost; about \$15 to \$20. Your comments, please.

See you this Saturday, Feb. 7th,

George E. Gould, President, NCA



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