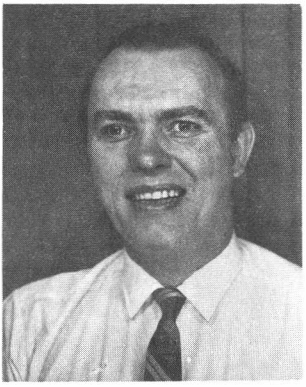
★ STAR DUST

Volume XXXIX November 1982 Number 3

WARREN RESCHEDULED: TO DEMONSTRATE SCIENCE DATA BANK



DR. WARREN

Dr. Wayne H. Warren, who was precluded by an injury from addressing the October meeting, will describe and demonstrate the Astronomical Data Center of the National Space Science Data Center at the November 6 meeting of National Capital Astronomers.

Astronomical research presents many problems appropriate to the use of machine-readable data bases to store and retrieve information.

Astronomical catalogs are both a product and indispensable tool of observational work. The recent flood of interactive computer systems has increased the value of computerized star catalogs immensely, since they can be used for automated telescope operations, fundamental research, and data reduction. The development of the large astronomical data base at Goddard Space Flight Center will be described and some applications of machine-readable astronomical data will be demonstrated through a terminal which will be linked by telephone line with the Center.

Wayne H. Warren, Jr. received the A. B. in physics from Fairleigh Dickinson University in 1968 and his A. M. (1970) and Ph. D. (1975) in astronomy from Indiana University. He is presently Head of the Analysis Group at the National Space Science Data Center, where he is responsible for the development, improvement, and dissemination of machine-readable astronomical catalogs and data, in addition to the archiving and distribution of all data from the International Ultraviolet Explorer satellite mission.

Dr. Warren is a member of the International Astronomical Union, American Astronomical Society, Astronomical Society of the Pacific, the International Occultation Timing Association, and is a co-editor of the *Astronomical Data Center Bulletin.*

NOVEMBER CALENDAR — *The public is welcome.*

Saturday, November 2, 9, 16, 23, 30, 7:30 PM — Telescope-making classes at Chevy Chase Community Center, Connecticut Avenue and McKinley Street, NW. Information: Jerry Schnall, 362-8872.

Friday, November 5, 12, 26, 8:00 PM — NCA 14-inch telescope open nights with Bob Bolster, 6007 Ridgeview Drive, south of Alexandria off Franconia Road between Telegraph Road and Rose Hill Drive. Call Bob at 960-9126.

Friday, November 5, 12, 19, 26, 7:30 PM — Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall.

Saturday, November 6, 6:15 PM — Dinner with the speaker at the Thai Room II, 527 13th Street, NW. Reservations unnecessary.

Saturday, November 6, 8:15 PM — NCA monthly meeting at the Department of Commerce Auditorium, 14th and E Streets, NW. Dr. Warren will speak.

Wednesday, November 17, 7:30 PM — NCA tours NASA Goddard Space Flight Center. See page 11.

Saturday, November 20, 8:15 PM — Special public discussion group: "How to Select, Use, and Care for a Telescope," at the Department of Commerce Auditorium, 14th and E Streets, NW. Information: 320-3621.

OCTOBER LECTURE

Dr. Wayne Warren of NASA Goddard Space Flight Center, who was to speak at the 2 October NCA meeting suffered an injury which required hospital care just before leaving home for the meeting. He has kindly agreed to address the 6 November meeting.

Drs. David and Joan Dunham and Paul Hueper demonstrated the procedure of setting up and operating a video observing station on a simulated occultation expedition.

While David and Joan assembled the electronics, the low-light video camera, timing system, and videotape, Paul assembled the C-14 telescope. The RCA 2000 "Ultricon" was mounted on the C-14, and a large monitor was connected (which would not have been on the expedition) to show a typical observation. While Joan described the entire procedure, David played a videotape made on an actual expedition, showing just what a visual observer would see during a typical graze. Multiple events were clearly visible as the star repeatedly disappeared and reappeared along the lunar profile.

The demonstration was quite realistic — except for the effects of adverse weather, rough terrain, and the other obstacles always encountered in the field — even to the breaking of a wire from a connector, which was hurriedly repaired.

Timing is decoded from the National Bureau of Standards time signals from WWV and recorded directly on the videotape. thus, by examining the images, frame-by-frame, the time of each disappearance and reappearance is determined within about 30 ms.

On these expeditions a number of observation stations are deployed across the predicted path of the graze. One of these is placed at a position to just miss the event, and one is placed to observe a total. The intermediate stations observe multiple events hich when combined delineate the lunar profile. Most of the stations are visual, and use independent WWV receivers and simple audio tape recorders for timing. The accuracy of these visual timings is limited by the reaction time of the observer, but with practice is within a fraction of a second. The entire profile serves as a cross check among observers, and is calibrated by the video record.

Although the Moon generally presents only one side to the Earth, we see it from slightly different directions during its orbit, because the orbit is not quite circular. The resulting apparent rocking motion of the Moon, called libration, allows about 5/8 of the surface to be seen from the Earth. The object of the occultation observations is to determine the precise libration at a known time in order to locate the gravitational center of the Moon on the celestial coordinate system.

The data derived from these observations find their way into a variety of applications in celestial dynamics. Their use in the preparation of navigation tables is of immediate practical importance. After many observations over long periods, they are used to update the coordinate system itself. Even the mass of the galaxy has been recalculated with the help of these data!

Planets, asteroids, and planetary satellites also occasionally occult stars and each other. Dunham follows the more important of these to many parts of the world.

Dunham's predictions, leadership, and the help of many observers have led to the discovery of apparent satellites of some asteroids. The objects have in some cases been confirmed, but orbital parameters cannot be determined until at least three observations can be made of the same object. It is for this reason that observations of asteroidal occultations are important from anywhere within a thousand miles of the predicted path. Accurate timing is essential, but not difficult. Any radio receiver capable of receiving the time signals from either WWV or CHU (Canada) along with a simple tape recorder and a telescope are all that are necessary. Of course, good eyes and reasonably fast reactions are necessary.

Those interested in trying this very useful activity should call Dr. Dunham for details at 585-0989.

Try it. Your observations may provide a decisive confirmation! rhm

OCCULTATION EXPEDITIONS PLANNED

Dr. David Dunham is organizing observers for the following grazing lunar and asteroidal occultations. For further information call Dave at 585-0989.

UT Date	UT Time	Place	Vis Mag	Pcnt Sunlit	Cusp Cusp	Min Aper
11-02-82	09:01	Bowie, MD	8.2	99	24N	20 cm
11-05-82	07:26	Garrisonville, VA	8.4	81	10N	20 cm
11-05-82	09:13	Thornburg, VA	7.0	81	5N	15 cm
11-18-82	22:20	Kitty Hawk, NC	5.1	10	-2N	5 cm
11-19-82	22:18	Ocean City, MD	1.2 (Mars)	16	-4N	2 cm
11-20-82	17:56	Largo, MD	9.3	24	6S	20 cm
11-26-82	04:32	Alcoa Center, PA	6.0	72	4S	10 cm
11-03-82	02:24	Central Garage, VA	6.5	93	13N	12 cm

ASTEROIDAL:		Star Mag	Delta Mag	Name	
11-14-82	0939	Southern Quebec	10.5	1.2	(690) Wratislavia 12 cm
11-22-82	02:41	E Cent US (DC?)	7.8	4.1	(93) Minerva 5 cm

Asteroidal events should be observed several minutes around predicted time for possible satellites. Duration of such events may be less than one second; accurate timing is essential for confirmation. Use finder charts on page 461 of November 82 *Sky and Telescope*.

NCA WELCOMES NEW MEMBERS

Mr. and Mrs. Bryan K. Burnett
6492 Little Falls Drive
Arlington, VA 22213

Fred Espenak, Code 693.1
NASA Goddard Space Flight Center
Greenbelt, MD 20771

John A. Keenan IV
1319 Kalmia Road, NW
Washington, DC 20012

Richard F. Sappington III
4603 Ashby Street, NW
Washington, DC 20012

Robert E. Schmitt
2007 Amherst Road
Hyattsville, MD 20783

Chuck Torrens
Route 2, Box 387
Catlett, VA 22019

NCA TO VISIT NASA GODDARD SPACE FLIGHT CENTER

On Wednesday, 17 November, at 7:30 PM members of National Capital Astronomers will tour several of the facilities of Goddard Space Flight Center, Beltsville, Maryland. Included will be Tracking and Data, Communications and Computer, Test and Evaluation, and the International Ultraviolet Explorer Satellite Control Center.

To join us on this event, reserve your place by calling David Hassler at 935-6527 (College Park) by Tuesday, 16 November.

SPECIAL PUBLIC DISCUSSION GROUP 20 NOVEMBER

In the late fall NCA receives many enquiries and requests for advice on the selection and purchase of telescopes and binoculars for Christmas. To help meet the need, NCA invites the public to the 20 November discussion group, "How to Select, Use, and Care for a Telescope," to be held in the Department of Commerce Auditorium instead of the usual conference room. Following a presentation of fundamentals, several types of telescopes, binoculars, and a variety of accessories will be demonstrated. Questions and discussion will be entertained. For further information, call NCA at 320-3621.

COLD WIND DISCOURAGES FEW AT NCA OUTING

After dark, the brisk, chilling gusts slowly subsided, the sky cleared, and about 20 hardy NCA members and more than a dozen telescopes remained at Manassas Battlefield Park to search the sky until nearly midnight.

Besides the NCA 14-inch Celestron, there were more than a half dozen Celestron 8's, a 10, 8, and three or four 6-inch reflectors at the 16 October event. We thank Nancy Hueper for making the arrangements for us.

EXCERPTS FROM THE IAU CIRCULARS

1. August 10 — Hamilton, McCulloch, and Royle, University of Tasmania, determined that the Vela pulsar PSR 0833-45 abruptly changed its period on this date by about 2 parts per million. Their observations were made at 635 MHz from June 17 to September 16.

2. September 12-16 — H. Ford, Space Telescope Science Institute; G. Jacoby, Kitt Peak National Observatory; and R. Ciardullo, University of California, discovered five novae in the nuclear bulge of M31. Approximately of magnitude 15 to 18, some of them showed strong H-alpha emission when examined with the Lick 3-m and Kitt Peak 4-m telescopes.

3. October 4 — M. Honda, Kurashiki, Japan, discovered a nova of 9th magnitude in Sagittarius.

4. October 12 — J. Sowell, McGraw-Hill Observatory, obtained spectra of Nova Sagittarii 1982 showing strong emission lines of H, Ca II, and Fe III, with weak absorption lines indicating an expansion velocity of 900 km/s. rnb

OBSERVER'S HANDBOOKS HAVE ARRIVED

Those who have ordered the Canadian *Observer's Handbook* may either pick them up at the November meeting for $4.50 or have them mailed for $5.25. Make checks payable to National Capital Astronomers and mail with request to Ruth Freitag, Treasurer, 1300 Army-Navy Drive, Arlington, VA 22202.

FOR SALE

Telescope — 10-inch F/5.6 Newtonian on Dobsonian mount. Price negotiable. Andrew Baines, 839-6882.

Sky and Telescope magazine — 1967-1977. Price negotiable. John Bangert, U.S. Naval Observatory, Washington, DC 20390, 254,4582.

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