

APRIL LECTURE

Dr. Bruce Woodgate, NASA Goddard Space Flight Center, spoke to the April meeting of National Capital Astronomers on recent work of the Solar Maximum Mission (SMM) satellite since its in-orbit repair.

The mission of the SMM is comprehensive monitoring of solar activity, particularly flares and related phenomena, with a wide range of instruments, over a period of years following the 1980 solar activity maximum. Even during the present period there are a few strong flares.

Dr. Woodgate described the April 1984 repair of the SMM from the Shuttle. It is now hoped that the mission will continue to the next solar maximum around 1990.

Flares appear to occur when two magnetic loops interconnect. In the region of the resulting large energy release particles are accelerated by a billion electron volts within a few seconds. Woodgate showed hydrogen-alpha photographs of such interconnections. All of these eruptions which result in bombardment of the geomagnetosphere by the high-energy charged particles disrupt the ionosphere, cause aurora and magnetic storms, interrupt electrical communications, interfere with navigation and geodetic mineral surveys, alter the upper-atmosphere density, and affect satellite orbits. In some cases, corrosion in pipelines has even been attributed to these effects. Hence the importance of learning to predict solar flares.

The solar corona changes form over the solar activity cycle; Woodgate showed slides of these familiar transitions. SMM found that the total solar radiance has decreased by 0.1 percent since 1980. Will the loss be restored by the next maximum?

It is well known that soft X-rays emanate from loops, and hard X-rays from coronal transients. Poor time resolution, however, precluded pre-SMM observational data of the incipient stages. Intensity and velocity are being studied now. The nature of flares also seems to change over the activity cycle. During the activity maximum many short-burst flares were observed; as activity declined, fewer but longer-lasting flares appeared. These changes may offer clues to internal solar magnetic processes involved in the origin of flares.

Gamma-ray flares were found to occur in previously unknown repetitive bursts with a period of about 155 days. The same phenomenon was later observed in the hard-X-ray spectrum with a 158-day period. Causes are being sought.

The SMM's orbital period is 96 minutes; its inclination is 26.5 from the equator. Its many sensors cover the spectral range from infrared to gamma rays. SMM is the first satellite to carry so thorough an assemblage of instruments, all dedicated to continuous, simultaneous observation of the many facets of solar activity. The program involves coordinated satellite and ground-based X-ray, ultraviolet, radio, and magnetic observations, theoretical modelling, analytic theory, and outer corona studies.

Because of its ability, unique among present spacecraft, to acquire simultaneously many kinds of data over a wide spectral range on and near the Sun, SMM will be retargeted to study Comet Halley during the period January through March 1986, when Halley is near perihelion. SMM alone can provide observations during this most interesting portion of the comet's orbit. This use was one of the important factors to justify the in-orbit repair of SMM.

J.B. Lohman and R.H. McCracken

DISCUSSION GROUP MAY 18

The use of charts, maps, and coordinate systems of both earth and sky and the commensurate accuracies required for astronomical observations will be considered by the 8:00 pm 18 May discussion group at the Department of Commerce, Conference Room D. Carl Lukac of the U.S. Naval Observatory, will moderate.

Before coming to the Observatory, Carl was an astronomer with the Army Map Service (now the Topographic Command) when AMS was surveying the world by lunar occultations. He also made extremely accurate measurements of star positions in the Pleiades Cluster. His guidance in these areas will be very valuable and much appreciated.

The discussion groups are intended to be tutorial at any level you choose. Bring your questions, comments, materials to discuss, or, simply come and learn.

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.

Date	Time	Place	Vis Mag	Pct Sunlit	Cusp Angle	Min Aper
05-26-85	03:23	Kings Dominion, VA	7.8	34	10N	5 cm
05-31-85	04:09	Dinwiddie, VA	6.2	87	13N	8 cm
Asteroidal:			Star Mag	Delta Mag	Name	
05-16-85	03:43	Mid Atl Staties	10.5	.02*	(4) Vesta	30 cm
05-16-85	06:21	Southren Fla	10.3	.02*	(4) Vesta	30 cm

*Photometric

NOMINATING COMMITTEE OFFERS SLATE

The Nominating Committee, Robert McCracken, Chairman, William P. Pala, Robert N. Bolster, Daniel G. Lewis, offers the following candidates for fiscal 1986 NCA officers:

President, Stanley G. Cawelti	Treasurer, Ruth S. Freitag
Vice President, Michael Brabanskiy	Trustee, Robert N. Bolster
Secretary, Joan B. Dunham	Sergeant at Arms, Terrance Losonsky

Others may nominate candidates by petition of 10 full members in good standing, presented to the secretary prior to the May 6 election.

NCA WELCOMES NEW MEMBERS

Terry L. Smith
12652 Willow Spring Ct.
Herndon, VA 22070

Gregory and Katherine von Hoffman
969 North Kentucky St.
Arlington, VA 22205

SOME SPACE STILL AVAILABLE FOR SUPER WEEKEND TRIP; PUBLIC WELCOME.

National Capital Astronomers will visit the National Radio Astronomy Observatory at Green Bank, West Virginia, on the weekend of May 11-12. Some space is still available for this privileged, VIP tour into places public tours don't go. Do bring your camera and plenty of film for both the unique opportunities at the Observatory and the beauty of the West Virginia mountains in the spring.

A number of telescopes will be provided for use under the dark rural sky on Saturday night; the observatory will be visited on Sunday.

We will meet our chartered bus at the Department of Commerce Building for a prompt 9:00 am departure on Saturday, May 11; Special free weekend parking arrangements have been made for participants.

Cost for members is \$62.50, for non-members, \$75.00, based on double occupancy; single supplement, \$11.00; for third person in room, \$3.00. Transportation and motel costs, but not meals, are included.

Space is limited. To reserve your place, send your check for the full amount, payable to National Capital Astronomers, mark it "Green Bank trip," and mail (or deliver at the NCA meeting) to Ruth S. Freitag, Treasurer, 1300 Army-Navy Drive, Arlington, VA 22202, to arrive before May 3, when we must make final commitment.

Those who have reserved space with partial payment should also remit the balance by May 3.

SEE HALLEY'S COMET WITH NATIONAL CAPITAL ASTRONOMERS!

What better way to see Halley's Comet at it's best--the chance of a lifetime--than with National Capital Astronomers, and at the same time to visit some of the world's most fascinating archeological and historical sites high in the spectacular Andes Mountains of South America! Special tutorials, guided tours of the southern sky (all the way to the south celestial pole!) will be included, and optional side trips will be offered.

Details will soon follow. To stay in touch, call NCA at 320-3621 (Bethesda, MD).

NASM PLANETARIUM PRESENTS FREE LECTURES, SUN VIEWING

On Saturday, May 4, at 10:00 am. NCA President Geoffrey Chester will present *The Realm of the Galaxies* in the planetarium of the National Air and Space Museum. Following the program, safe telescopic hydrogen-alpha views of the Sun will be offered by NCA Vice President Stanley Cawelti.

On Wednesday, May 22, at 7:30 pm, Tobias Owens will present *New Worlds Revealed: The Outer Solar System*, in the planetarium. Afterward, weather permitting, Stanley Cawelti will offer telescopic tours of the night sky.

EXCERPTS FROM THE IAU CIRCULARS

1. March 21 -- Shigo Horiguchi, Tokorozawa, Japan, discovered a supernova of 15th magnitude in NGC 4451.

2. April 3 -- JC Nemeč and S. Staples, Palomar Observatory, discovered a supernova in NGC 3359. They reported it to be brighter than the nucleus of the galaxy.

3. June 30 -- The Bureau International de l'Heure, Paris, announced that a leap second will be added at the end of this day.

MEETING TO TEST COMPUTER ASTRONOMY BULLETIN BOARD

The NCA Software Working Group, and others who may be interested, will meet at 2:00 pm on Sunday, 26 May, at the home of Drs. David and Joan Dunham, 9408 Ocala Street, Silver Spring, MD 20901, for a "shakedown test" of the new Astronomy Bulletin Board. Call 585-0989 evenings if you plan to attend, or for more information.

Ocala Street intersects Franklin Street 4 blocks east of Colesville Road, about a half mile inside the Beltway. From the Silver Spring Metro Station, take number 14 Ride-On bus to Franklin Street and Wire Avenue. Walk back one block to Ocala. Turn right. 9408 is the fourth house on the left.

FOR SALE

Criterion 4000 telescope, complete with tripod, 2 eyepieces, and clock drive. Cost \$600.00, will sell for \$300.00. Call M. Kamelgarn, (703) 823-1415.

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FIRST CLASS

★ STAR DUST



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WINKLER: HOW MANY KINDS OF TIME IN ASTRONOMY?



DR. WINKLER

Dr. Gernot M.R. Winkler, Chief of the Time Service, U.S. Naval Observatory, will address the May 4 meeting of National Capital Astronomers on the various kinds of time presently kept and their interrelations. How many time measures in astronomy? While the physicist is happy to have the second as the standard of time (interval), astronomers and the space engineering community are concerned with a variety of different times, only one of which has been the forerunner to the present system of standard time measurement. Dr. Winkler will give an overview and discuss the principles of time measurement. Gernot Winkler, a native of Austria, received his Ph.D. in Astronomy and Physics from the University of Graz, Austria, in 1952. After employment at the University observatory as assistant to the Director, he worked in industry. In 1956 he came to the United States and was a consultant for atomic frequency control at the Signal Corps laboratories. He held two executive positions in communications and remote-sensing research, followed by his appointment as Director of Time Service at the Naval Observatory in 1966. He participated in arctic communications research in Greenland and Antarctica. He also worked on VLF propagation where he (jointly with F. Reder) pioneered the use of atomic cesium clocks for phase-velocity measurements and as portable clocks over global distances. He has six U.S. patents and over 50 publications to his credit. He has been president of Commission 31 (Time) of the IAU and a member of Commissions 4 and 19 (Rotation of the Earth). He is an active participant in the work of URSI, IUGG, and CCIR (Study Group VII). He has been the USNO representative in the CCDS since 1967 and has been a member of various National Research Council advisory committees. He was elected a Fellow of the IEEE in 1970.

MAY CALENDAR -- The public is welcome.

- Friday, May 3, 10, 17, 24, 31, 7:30 pm -- Telescope-making classes at American University, McKinley Hall basement. Information, Jerry Schnall, 362-8872.
- Saturday, May 4, 6:00 pm -- Pre-meeting dinner at the Ding-How Restaurant, 1221 E Street, NW. Reservations unnecessary.
- Saturday, May 4, 8:15 pm -- NCA monthly meeting at the U.S. Department of Commerce Auditorium, 14th Street and Constitution Avenue, NW. Election, Dr. Winkler speaks.
- Tuesday, May 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.
- Friday, May 10, 24, 31, 8:30 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.
- Saturday, May 11, 9:00 am - Sunday, May 12 -- NCA trip to National Radio Astronomy Observatory, Green Bank, WV. See page 35.
- Saturday, May 18, 8:00 pm -- Discussion group at the Department of Commerce, Conference Room D: Accurate use of charts, etc. See page 34.
- Saturday, May 25, 9:00 pm -- *Exploring the Sky*, presented jointly by NCA and the National Park Service. Glover Road south of Military Road, NW, near Rock Creek Nature Center. Planetarium if cloudy. Information: John B. Lohman, 820-4194.
- Sunday, May 26, 2:00 pm -- Software Working Group (and others interested) meets to test new computer Astronomy Bulletin Board. Call before coming. See page 36.