Predicting and Chasing Solar Eclipses

by Wayne Warren

The next meeting of the National Capital Astronomers will be held Saturday, February 7, at 7:30 P.M. in the Lipsett Auditorium of the Clinical Center (Building 10) at the National Institutes of Health (NIH). Our speaker, Fred Espenak, will be talking about "Predicting and Chasing Solar Eclipses."

Abstract
The total eclipse of the Sun is indisputably the most spectacular astronomical phenomenon visible to the naked eye. As such, it commands a great deal of attention from both astronomers and the general public. Dr. Espenak has been predicting and chasing solar eclipses around the world for more than two decades. He will discuss the NASA eclipse bulletins, future eclipses in 1998 and 1999, and he will share some of his eclipse adventures through slides and video, including his recent expedition to Mongolia in March 1997.

Biography
Dr. Fred Espenak is an astrophysicist in the Planetary Systems Branch at NASA Goddard Space Flight Center. His research specialty is infrared spectroscopy and modeling of planetary atmospheres. However, Dr. Espenak is also an authority on the prediction of solar eclipses. Since his first total solar eclipse in 1970, he has participated in more than a dozen eclipse expeditions and has made predictions on thousands of others. In 1993, Dr. Espenak introduced a new series of NASA publications containing detailed predictions, maps, and meteorological data for future solar eclipses. These Bulletins had previously been published by the US Naval Observatory. Now published through NASA in cooperation with the International Astronomical Union, the eclipse bulletins are provided as a public service to both the professional and lay communities, including educators and media. The latest bulletins in the series cover eclipses of Feb 26, 1998 and Aug 11, 1999. Both are available via the Web at: http://umbra.nascom.nasa.gov/eclipse/. Dr. Espenak has also created a web site dedicated to both solar and lunar eclipses at: http://planets.gsfc.nasa.gov/eclipse/eclipse.html.

The three photographs of the total solar eclipse of Oct 24, 1995 were taken by Fred Espenak of NASA Goddard Space Flight Center from the small town of Dundlord, India. The eclipse was unique for its low altitude (23°) and short duration (40 seconds), due to the fact that the Moon was only 1.1% larger than the Sun. As a result, the limbs of the Sun and Moon were in close proximity to each other over a rather long arc at second and third contacts.
Sun Protection in Curacao

By Leith Holloway

Because the solar eclipse occurs in February, participants on the NCA trip may think that there is little risk of getting sunburned in Curacao. That is far from the truth! On the day of the total eclipse, the sun above Curacao reaches a maximum altitude of 69 degrees at 12:50 p.m. AST (Atlantic Standard Time), which is about the time of first contact. On the other hand, at our latitude, the sun reaches this altitude sometime during the day only between May 11th and August 1st.

The closer the sun is to the zenith, the stronger are its ultraviolet (UV) rays. Furthermore, the ultraviolet-absorbing ozone layer in the stratosphere is significantly thinner in the tropics than in middle latitudes where we live. The latitude of Curacao is 12 degrees north of the Equator. As a result of this low latitude, sunburning UV rays can be up to fifty percent stronger in Curacao than in Washington, D.C.

It is not difficult to protect your skin from sunburn and other damage even in the tropics, but one has to be more conscientious about sun protection at these low latitudes. On a sunny day, a person should cover as much of his skin with clothing or SPF 15 sunscreen as practical. The clothing should be made of tightly woven material. A hat with a broad brim is preferable, but any hat is better than none.

Another consideration is the kind of skin you have. Some people, such as persons with red or blond hair, blue eyes and/or freckles are more sensitive to UV rays than others. They have to be especially careful in the sun.

Fortunately, the period of dangerous UV does not last the whole day. Early in the morning or late in the afternoon, UV from the sun and sky is rather weak and incapable of burning you. In the tropics, however, the period of dangerous UV is somewhat longer than at our latitudes.
During the total phase of the eclipse, of course, UV intensities will be negligible.

Solar radiation is strongest and most likely to burn you when the sun is 45 degrees or more above the horizon, or in other words, more than halfway between the horizon and the zenith. A simple method for finding out when this occurs during the day is to look at your shadow on a level surface. If your shadow is shorter than your height, the sun’s altitude is above 45 degrees, and its UV rays are strongest. This method is called “the shade rule.” You may have heard Bob Ryan mention this rule on his weather broadcasts on WRC-TV during the summer. I invented this rule in 1987 and have been promoting it ever since in published articles and letters to editors.

As a guide for your outdoor planning, the sun in Curaçao will be above 45 degrees altitude between about 10:10 a.m. and 3:30 p.m. during our visit there in late February. Because of the great strength of solar UV in Curaçao, it would be prudent to take steps for protecting your skin about a half hour before the start of this period (9:40 a.m.) and continue doing this until 4 p.m.

No submissions will be accepted after the 15th. This is a special condition. Since we will be in Curaçao from February 20-27, we need to mail the newsletter by the 19th. The deadline will return to its normal date in March. We would appreciate everyone’s help in this matter. Thank you.

See you in Curaçao!!

Holiday Delays Newsletter

By Alisa Joaquin

December and November were not banner months for the newsletter. Some people reported to me that they did not receive their newsletter until the day of the meeting or later. There is a reason why the deadline is set for the 15th of each month. This is so the newsletter can be done within a reasonable framework and then be mailed by the last Sunday of each month giving one full week for members to receive it. This is how it would normally be done. With the holiday season, however, the newsletter must be mailed early to ensure proper delivery. But with the combined effects of material being late and your editor’s previous announced travel plans, that did not happen.

We always strive to get your newsletter to you on time. During the holiday we mailed the newsletter using our usual schedule. We regret the inconvenience if your newsletter was late. We expressed our need that we would be out of town and we needed to mail the newsletter early before we were leaving. That did not happen.

The March newsletter will present a similar situation as your editors will be in Curaçao from February 20-27. Therefore, no material can be accepted for publication after February 15. We need your help in this matter, not only for the March newsletter, but for all future newsletters. Let’s work together and keep everything on track.

The January Review was unavailable at press time. The review will appear in a later issue of Star Dust.
National Capital Area Astronomical Events

Free Lectures at the Einstein Planetarium and Other Daily Events
National Air & Space Museum
202/357-1550, 202/357-1686, or 202/357-1505 (TTY)
Home page: http://www.nasm.edu

Other Area Astronomical Events

Other Planetariums, Observatories, and Science Centers in the Area

Montgomery College Planetarium — “African Skies”
Takoma Park, MD. February 21, 7:00 PM. (See their web site at http://myhouse.com/mc/planet.htm.)

Department of Terrestrial Magnetism Seminar Schedule — Seminars are held on Wednesdays at 11:00 am unless otherwise noted. Call to confirm 202/686-4370 ext. 4378.


Scientific Colloquia, Goddard Space Flight Center — All colloquia will be held in the Building 3 Auditorium at 3:30 PM.


“Hubble Constant: the End Game”, speaker: John Huchra, Harvard University. February 27.

Campus Observatory Open House University of Maryland — “Imaging Solar Flare Gamma Rays — How NASA Plans to do It”, speaker: Dr. Ed Schmahl. February 5, 8:00 PM.

“X-Ray Pulsars, Timekeepers of the Cosmos”, speaker: Dr. Mike Stark. February 20, 8:00 PM.

Arlington Schools Planetarium — “The Lighthearted Astronomer”. January 22-March 8, Friday and Saturday evenings 7:30 and Sunday matinees 1:30 and 3:00 PM. Admission $2.50 for adults and $1.50 for children. Call 703/228-6070 or 228-6019.

Capital Science Lectures Carnegie Institution — “Exploring the Giant Planets with the Hubble Space Telescope”, speaker: Heidi B. Hammel, Department of Earth Atmospheric and Planetary Sciences, MIT. January 20, 6:30 PM.

Check your local web sites for any other events that may be happening in the area.

No Meteor Showers listed for February

Watch this site for more information on upcoming meteor shower events.

Smithsonian Events in February


National Air & Space Museum — “George Carruthers’ Lunar Observatory”, speaker: David DeVorkin talks about George Carruthers and his contributions to the space program. February 18, 12:00 NOON.

Ripley Center — “The Hubble Space Telescope: Current Discoveries”, speaker: Astrophysicist Mario Livio in this 1 day seminar discusses the latest discoveries made by two new instruments on the Hubble Space Telescope. Cost $80, February 28, 10:00 AM-4:30 PM (lunch not included).

Astronomy at Claggett

I received this email from Donna Kerner, Bishop Claggett Center—ed.

Thanks so much for advertising our need for an astronomy expert at the Bishop Claggett Center. Jay Miller responded and did a terrific job!! He came on New Year’s Eve and many children, youth, and adults looked through his telescope. He was very pleasant, knowledgeable, and a good sport braving the cold. I plan to contact him and you for plans for our summer youth programs. We really appreciate Jay donating time to our programs here. Thanks for your help. . . . Happy New Year!!.
National Capital Astronomers, Inc.

SERVING SCIENCE & SOCIETY SINCE 1937
NCA is a non-profit, membership supported, volunteer run, public-service corporation dedicated to advancing space technology, astronomy, and related sciences through information, participation, and inspiration, via research, lectures, presentations, publications, expeditions, tours, public interpretation, and education. NCA is the astronomy affiliate of the Washington Academy of Sciences. All are welcome to join NCA.

SERVICES & ACTIVITIES:
Monthly Meetings feature presentations of current work by researchers at the horizons of their fields. All are welcome; there is no charge. See monthly Star Dust for time and location.

NCA Volunteers serve as skilled observers frequently deploying to many parts of the National Capital region, and beyond, on campaigns and expeditions collecting vital scientific data for astronomy and related sciences. They also serve locally by assisting with scientific conferences, judging science fairs, and interpreting astronomy and related subjects during public programs.

Discussion Groups exchange information, ideas, and questions on preselected topics, moderated by an NCA member or guest expert.

Publications received by members include the monthly newsletter of NCA, Star Dust, and an optional discount subscription to Sky & Telescope magazine.

NCA Information Service answers a wide variety of inquiries about space technology, astronomy, and related subjects from the public, the media, and other organizations.

YES! I’D LIKE TO JOIN THE NATIONAL CAPITAL ASTRONOMERS

Enclosed is my payment for the following membership category:

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Note: If you already subscribe to Sky & Telescope, please attach a recent mailing label. You may renew this subscription through NCA for $27 when it expires.

Make check payable to: National Capital Astronomers, Inc., and send with this form to:

The following information is optional. Please indicate briefly any special interests, skills, education, experience, or other resources which you might contribute to NCA. Thank you, and welcome to NCA!
Getting to the NCA Monthly Meeting

Metrorail Riders - From Medical Center Metro Station: Walk down the hill, pass the bus stops and turn right at the anchor onto Center Drive. Continue uphill to Building 10, the tallest building on campus (walking time about 10 minutes). Also, the J2 bus line connects the Bethesda (7:16 PM) and NIH (7:23 PM) Metro stops with Building 10 (7:25 PM).

To Bombay Dining Indian Restaurant - Take Wisconsin Avenue toward Bethesda and head right onto Woodmont. Follow Woodmont to Cordell Avenue (2 blocks south of Battery). The Bombay Dining Indian Restaurant is not far from the corner of Cordell Avenue and Norfolk (4931 Cordell Avenue). There are parking garages near the restaurant. Seats are not guaranteed after 5:00 PM.

Star Dust is published ten times yearly (September through June) by the National Capital Astronomers, Inc. (NCA), a nonprofit, astronomical organization serving the entire National Capital region, and beyond. NCA is the astronomy affiliate of the Washington Academy of Sciences and the National Capital region's representative of the International Dark-Sky Association. NCA's Phone Number 301/565-3709. Deadline for Star Dust is the 15th of the preceding month. Editors: Alisa & Gary Joaquin, 4910 Schuyler Dr., Annandale, VA 22003, 703/750-1636, E-mail: ajglj@erols.com. Editorial Advisor: Nancy Byrd Star Dust © 1997 may be reproduced with credit to National Capital Astronomers, Inc.