



DUNHAM TO DISCUSS ECLIPSE; ELECTION IN MAY



DR. DUNHAM

Dr. David W. Dunham, of Computer Science Corporation and President of the International Occultation Timing Association, will speak at the May 3 meeting of National Capital Astronomers. He will describe the successful observations of the recent total solar eclipse in India and recount the discovery of small variations in the solar radius from historic and recent eclipse observations.

The annual election of NCA officers will also be held at the May meeting.

David and Joan Dunham have developed techniques for accurately, and visually and photographically recording, Baily's beads as seen from locations just inside the edges of total solar eclipse paths. With Thomas Van Flandern and Alan Fiala of the U.S. Naval Observatory they have successfully observed several eclipses.

Dr. Dunham will show a film of the bead phenomenon of the recent eclipse. Comparing data from recent eclipses with those from a 1715 observation in England, Dunham has shown a probable decrease in the solar diameter of about 450 km in 264 years. This result agrees with theoretical studies by S. Sofia *et al* at Goddard Space Flight Center. Important short-term climatic variations should result from such changes.

Dr. Dunham is a member of the American Astronomical Society, the International Astronomical Union, the American Association for the Advancement of Science, the Astronomical Society of the Pacific, the American Institute of Aeronautics and Astronautics, and National Capital Astronomers.

MAY CALENDAR — *The public is welcome.*

Friday, May 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, May 9, 16, 23, 30, June 6, 8:00 PM — Observing with the NCA 14-inch telescope with Bob Bolster, 6007 Ridgeview Drive, south of Alexandria off Franconia Road between Telegraph Road and Rose Hill Drive. 960-9126.

Saturday, May 3, 6:15 PM — Dinner with the speaker at the Thai Room II, 527 13th Street, NW. Reservations unnecessary.

Saturday, May 3, 8:15 PM — NCA monthly meeting at the Department of Commerce Auditorium, 14th and E streets, NW. Dr. Dunham will speak.

Monday, May 5, 12, 19, 26, 7:30 PM — Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall, 362-8872.

Saturday, May 10 — NCA trip to the National Radio Astronomy Observatory at Greenbank, West Virginia. See page 35.

Saturday, May 17, 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: Bob McCracken, 229-8321.

APRIL LECTURE

Dr. Carroll O. Alley, Department of Physics and Astronomy, University of Maryland, spoke at the April 5 meeting of National Capital Astronomers.

Dr. Alley's talk was in three parts: first, classical and astronomical tests of relativity; second, Einstein and the special and general theories; and third, tests by terrestrial measurements, mostly of time.

The classical tests of relativity he described were, first, the Penzias-Wilson 1965 discovery of isotropic 3-K cosmic blackbody radiation, interpreted by Dicke as the remnant of the primal "big bang." Interpretation is difficult, as we must observe from inside the phenomenon; second, the recession of distant galaxies, indicating an expanding universe; third, the Crab pulsar, so compact that general relativity is necessary to explain it; fourth, Taylor's binary pulsar, whose periastron advances 4° per year, and which may emit 10^{25} watts of gravitational radiation; finally, the Weber (Maryland University) gravitational radiation detector.

Theoretical studies included, first, the collapse of sufficiently heavy stars to neutron stars, still heavier stars to black holes, these with potential wells so deep as to convert up to 30 percent of the rest mass of an in-falling body to other forms of energy (vice 0.7 percent in thermonuclear fusion); second, quasars, radiating (if as distant as redshifts indicate) at 100 times the rate of the usual galaxy, perhaps powered by a 10^{14} -solar-mass black hole; third, rotating black holes, from which an in-falling object might be ejected with an enormous energy increase by the Penrose process; fourth, explanation of the jet from the core of M87; fifth, gravitational bending of light: Eddington's eclipse experiment and radiointerferometry of quasar positions have confirmed the prediction within 1 percent. Dr. Carroll also remarked that in free space halfway to Alpha Centauri, the century since Einstein's birth would be observed to be 46 seconds longer!

Alley reviewed Einstein's life and described Grossman's great help. He recommends Banesh Hoffman's book on Einstein for an understandable discussion of relativity.

Special relativity depends on two postulates: In every inertial frame all the laws of physics appear the same; and the velocity of light is the same in all inertial frames. The resulting paradoxes are resolved by time not being absolute.

General relativity adds the *principle of equivalence* — that acceleration is locally indistinguishable from gravity. At low velocities and in weak fields the curvature of spacetime is observed mainly as curved *time*.

Experiments have always favored Einstein's relativity over its alternatives, but relativity is subtle, and Einstein himself made mistakes.

Finally, Alley interpreted purely terrestrial tests. These included Pound and Rebka's frequency-shift tests, and others in rocket probes; mountain-valley tests with atomic clocks in Italy and Japan; three tests with traveling clocks: The Naval Observatory's round-the-world flights by Hasting and Keating (*Star Dust*, May 1972); Alley's and Cutler's Chesapeake Bay flights and their Washington-based flights to and from Thule, Greenland and Christchurch, New Zealand. Retroreflectors on the Moon enable the Earth-Moon system to show the equivalence principle to hold here. The NAVSTAR satellite navigation system requires sophisticated relativistic corrections to achieve its accuracy.

Dr. Alley's talk generated a lively discussion period.

jbl

JANET PERKINS WRIGHT

It is with deep sadness that we record the passing on April 3, 1980, of Janet Perkins (Mrs. G. R.) Wright. An early president of NCA, she continued to contribute much to the vitality of the organization over the years. We'll miss "Perky." We extend our sincere sympathy to Bob and his family.

ELECTION IN MAY; NOMINATING COMMITTEE REPORTS

The Nominating Committee, James H. Trexler, Chairman, Mary Ellen Simon (ex officio), Benson Jay Simon, and Nancy Byrd, offers the following candidates for fiscal 1981 NCA Offices:

President	Mary Ellen Simon (Incumbent)
Vice President	Wolfgang Schubert (Incumbent)
Secretary	Nancy Hueper
Treasurer	Daniel Lewis
Trustee (4-year term)	Robert McCracken
Sergeant at Arms	Mark Trueblood

Additional nominations may be made by written petition by ten full members in good standing, submitted to the trustees prior to the May 5 election.

LAST CALL TO TOUR NATIONAL RADIO ASTRONOMY OBSERVATORY

Although the deadline for cancellation has passed, at this writing some space is available on the bus — a prompt call will get some on board. See April *Star Dust* for details, and call Paul Hueper at 229-7328 for your reservation.

GRAZING OCCULTATION EXPEDITIONS PLANNED

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

UT		Place	Vis	Pont	Cusp	Min
Date	Time		Mag	Sunlit	Angle	Aper
05-03-80	03:41	White Oak, MD	6.4	92	16S	10 cm
05-05-80	07:30	Doswell, VA	6.7	76	9S	10 cm
05-19-80	02:33	Pocopson, PA	7.4	24	.5N	8 cm
05-22-80	01:07	Abingdon, MD	6.8	52	5N	5 cm

NCA WELCOMES NEW MEMBERS

Donald H. Atha and Family
4100 Denfeld Avenue
Kensington, MD 20795

Robert J. Keller
4000 Tunlaw Road, NW, #921
Washington, DC 20007

*Louis W. Ibanza
4300 Old Dominion Drive
Arlington, VA 22207

James Schnabel, Jr.
5910 Cromwell Drive
Bethesda, MD 20016

Samuel A. Jeter
11608 Lockwood Drive
Silver Spring, MD 20904

Dr. Robert Suding
1161 Reston Avenue
Herndon, VA 22070

**Science Fair*
Award membership

LtC Patrick E. Walker, USANCA
7500 Backlick Road, Bldg. 2973
Springfield, VA 22150

U. S. NAVAL OBSERVATORY MAY COLLOQUIUM SCHEDULE

NCA members are invited to attend the following colloquia. All are held in Bldg. 52, room 300 at 3:30 PM. Coffee and tea are served in the foyer of Bldg. 52 at 3:10 PM.

Thursday, May 1	Dr. Donna E. Weistrop, GSFC: CCD's in astronomy
Thursday, May 15	Dr. Ben M. Zuckerman, U. MD: Extraterrestrial life
Thursday, May 29	Dr. Steven J. Dick, USNO: Early USNO history

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EXCERPTS FROM THE IAU CIRCULARS

1. March 13 — E. L. G. Bowell, Lowell Observatory, discovered a 16th-magnitude comet (1980b) in Leo near Jupiter with the 33-cm photographic telescope. Prediscovery images made on February 11 were then found. Orbital calculations indicate that Comet Bowell is 1.7 AU beyond Jupiter, and will pass 0.24 AU from the planet in 1980 December.

2. March — Harris and Gibson, Jet Propulsion Laboratory, observed several elongations of Saturn's satellite 1966 S 2, and detected possible satellites 1980 S 7, 8, and 9 with the 2.5-m reflector at Mount Wilson.

3. March 15 — Lamy and Mauron, Laboratoire d'Astronomie Spaciale, Marseilles, reported the detection of another satellite, 1980 S 10, on several plates taken with the Chiran 1-m telescope at Haute Provence.

4. April — Reitsma, Smith, and Larson, Lunar and Planetary Laboratory, confirmed 1980 S 7 and 8, and reported objects 1980 11-14.

5. April 6 — A. R. Walker, South African Astronomical Observatory, observed an occultation of a 12th-magnitude star by Pluto's satellite 1978 P 1 with a photometer on the 1-m telescope at Sutherland. The 50-second occultation indicates a minimum diameter of 1200 km. Although astrometry indicated that an occultation probably would not occur, Harrington and Christy, USNO, predicted a time of closest approach only 2.5 minutes from the observed event. rnb

NOTICE ON RENEWAL

When you renew your NCA membership later this summer, please enclose the yellow card you receive from _____ with your NCA notice and your payment. This will help to assure continuity of your subscription.

MERIAL TO CONVENE IN WILMINGTON, DELAWARE

The Wilmington Astronomical Society will host the 1980 convention of the Middle Ease Region of the Astronomical League on June 20-22. Further details will be available at the May NCA meeting or from R. H. McCracken, 229-8321.

★ STAR DUST



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