



DOLAN: FAST PHOTOMETRY WITH HUBBLE SPACE TELESCOPE



DR. DOLAN

The October 6 meeting of National Capital Astronomers will hear Dr. Joseph F. Dolan, NASA Goddard Space Flight Center, describe the high-speed photometer aboard the Hubble Space Telescope (HST), and its mission.

The 92-inch HST is to be launched into orbit by NASA in 1986, where it is expected to yield diffraction-limited performance -- about ten times the resolution of any earth-based telescope. It should extend the presently observed volume of the universe by a factor of 100!

The wavelength range from 110 nm in the ultraviolet to infrared will be observed.

Dolan will highlight observations planned for gravitational-lens systems.

Joseph F. Dolan received the B.S. in physics from St. Bonaventure University in 1961, the A.M. in astronomy from Harvard University

in 1963, and his Ph.D. in astrophysics from Harvard in 1966. An astrophysicist in the Laboratory for Astronomy and Solar Physics, NASA, since 1977, he was previously a National Academy of Sciences Senior Resident Research Associate at Goddard, Assistant Professor of Astronomy at Case Western Reserve University, Senior Scientist, Jet Propulsion Laboratory, and Physicist at the Smithsonian Astrophysical Observatory. He is a member of the international Astronomical Union, the American Astronomical Society, and Sigma-Xi, and has authored many papers.

OCTOBER CALENDAR -- *The public is welcome.*

Tuesday, October 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, October 5, 12, 19, 28, 7:30 pm -- Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall.

Friday, October 5, 12, 19, 28, 8:00 pm -- NCA 14-inch telescope open nights with Bob Bolster, 6007 Ridgeview Drive, off Franconia Road between Telegraph Road and Rose Hill Drive. Call Bob at 960-9126.

Saturday, October 6, 6:15 pm -- Dinner with the speaker at the Ding-How Restaurant, 1221 E Street, NW. Reservations unnecessary.

Saturday, October 6, 8:15 pm -- NCA monthly meeting at the Department of Commerce Auditorium, 14th and E Streets, NW. Dr. Dolan will speak.

Saturday, October 20, 4:00 pm until... Open house at Hopewell Observatory. See page 7 for details.

Saturday, October 27, 7:30 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: Dr. John Lohman, 820-4194.

SEPTEMBER LECTURE

At the September meeting of National Capital Astronomers, Dr. Patricia Jacobberger of the National Air and Space Museum's Center for Earth and Planetary Studies described the reduction and interpretation of data from LANDSAT and related satellites. Her emphasis was on methods of data reduction.

These methods include corrections for satellite imaging biases, removal (or, if desired, enhancement) of atmospheric contributions, image-contrast enhancement, and the use of false color. *Principal-components analysis* is another important technique, in which linear combinations of image brightness and color *differences* replace the simple use of brightness and color, and emphasize the particular distinctions sought. Combinations of these and other forms of data processing were described and applied to specific areas and problems.

We first saw images of southwestern Kansas, St. Louis, and the Washington, D. C. area. For each of these, the raw images were of very low contrast and impossible to interpret. First, haze was subtracted from each image. Then contrast was enhanced. The stored digital data represent a very long gray scale not evident in the low-contrast print. A part of the data was selected and amplified to yield a print of much enhanced contrast. Finally, false color was used to emphasize various distinctions desired: water vs. land, types of vegetation, urban land uses. The spatial resolution ranged from hundreds of meters up to 30 meters. At the highest resolutions, with effective use of false color, we could recognize familiar landmarks on the Washington, D. C. mall.

We were shown the Niger delta in Mali, West Africa. Here, neither brightness contrasts nor color differences distinguished boundaries adequately, so principal-component analysis was used, followed by contrast enhancement and the use of false color. Now rivers became conspicuous. Sand and other surface types, and even a large expanse of potsherds left by man around 1000 A.D. became clear. *Ground truth*, that is, the use of local surveys including photographs, verified the results. Ground truth is nearly essential for accurate interpretation of data from remote sensors.

Sometimes ground truth is unavailable. We saw maps of areas near the Red Sea derived solely from satellite data. These had much improved geographical locations, including terrain boundaries, over earlier maps.

Kansas was shown again. Irrigated fields, rangelands, and dry-land farms were easily distinguished. We were shown a second set of images of the same area taken a month later.

Desert regions of Egypt were shown, with more combinations of data reduction applied. One image was obscured by a dust storm, the effects of which were largely cancelled by subtraction of haze.

The main use for LANDSAT data is monitoring agriculture and other land uses. Third-World countries must and do expend large efforts for these purposes. Dr. Jacobberger, a geologist, emphasized mainly geological studies.

The question period brought out more detail: There are huge amounts of data, so only interpretations judged important are done. Wavelength resolution is only that of the few sensor wavelengths. Rivers loaded with vegetation are hard to distinguish from land vegetation. Polarization is not used. Images made near sunrise or sunset would improve terrain contrast but would degrade distinctions among land uses. Therefore, most images are taken about 9:30 am local time.

John B. Lohman

NATIONAL AIR AND SPACE MUSEUM PRESENTS THE "CANALS" OF MARS

On Saturday, October 6, at 10:00 am in the NASM Briefing Room, Dr. David DeVorkin, Curator and NCA member, will discuss the 70-year controversy between Percival Lowell and W. W. Campbell over the "canals" of Mars, and will review the Mars Mariner and Viking programs.

Following the program, telescopic views of the Sun in hydrogen-alpha will be offered on the balcony by Stanley Cawelti, Docent, and NCA Vice President.

OCCULTATION EXPEDITIONS PLANNED

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

Date	UT Time	Place	Vis Mag	Pcnt Sunlit	Cusp Angle	Min Aper
10-13-84	02:51	Scalp Level, PA	5.5	90	4N	5 cm
10-13-84	18:04	Jennerstown, PA	5.3	85	12N	5 cm
10-18-84	22:47	Duck, NC	6.1	34	11N	8 cm

ANNULAR ECLIPSE DATA REDUCTION TO BE FEATURED IN NOVEMBER

Drs. David and Joan Dunham will present reduction of data derived from the annular solar eclipse of 30 May 1984 and the status of the photosphere radius program.

Others who have observational data relative to the program and who wish to participate are invited -- and encouraged -- to do so. Contact Dr. Dunham at (301) 585-0989 (Silver Spring, MD) as soon as possible to coordinate.

NCA WELCOMES NEW MEMBERS

Frederick H. Gertler
8715 First Avenue, #906D
Silver Spring, MD 20910

Thomas W. Love and Family
1941 Rhode Island Avenue
McLean, VA 22180

Glen M. McNatt
1111 Greenway Road
Alexandria, VA 22308

Robert S. Pazak
9802 Churchill Drive
Upper Marlboro, MD

Robert S. Rand
6618 Hiddenite Court
Alexandria, VA 22310

Mr. and Mrs Henry Revane
PO Box 4000
Gaithersburg, MD 20878

Steven A. Rosenberg
9015 Honeybee Lane
Bethesda, MD 20817

Mr. and Mrs. Robert L. Volosky
1301 Scott Street # 721
Arlington, VA 22204

NCA INVITED TO HOPEWELL OBSERVATORY

Hopewell Observatory will again hold open house on 20 October from 4:00 pm until interrupted by the sunrise. Bring your prepared lunch. Coffee, tea, and soft drinks will be provided by The Hopewell Corporation. If you wish, you are welcome to bring your friends, your own telescope, and slides which we will project.

From the Beltway, go west 25 miles to the Haymarket exit on I-66, left 0.25 mile to traffic light, right on Route 55 0.8 mile to County Road 681, right on 681 3 miles to end, left on County Road 601 (dirt) 1.2 mile to County Road 629, right on 629 1 mile to small paved road on right. (Easier to see is the gate and stone facing on the left.) Turn right to top of ridge (0.3 mile), go around microwave station and continue on dirt road through woods a few hundred feet to the observatory.

Carpooling is strongly recommended. For more information call 320-3621.

WASHINGTON AREA ASTRONOMERS TO MEET

The seventh meeting of Washington Area Astronomers will be held Thursday, 18 October, in Building 26, Goddard Space Flight Center. Registration at 8:30 am will be followed at 9:00 by papers until the reception and exhibit session at 3:30 pm, with breaks for coffee at 10:15 and lunch from 12:30 to 1:45.

The registration fee is \$3.00. Foreign nationals must register at least 10 days in advance, giving country of citizenship. Make checks payable to Washington Area Astronomers and mail as soon as possible to Washington Area Astronomers Meeting, Astronomy Program, University of Maryland, College Park, MD 20742. For information, call 454-3001.

EXCERPTS FROM THE IAU CIRCULARS

1. August 27 -- J. Middleditch, Los Alamos National Laboratory, and C. Pennypacker, University of California, detected optical pulsations from the X-ray pulsar in the Large Magellanic Cloud with the 4-m Cerro Tololo reflector. The period of 50.28149 ms was slightly longer than that found in 1979.

2. August 29 -- R. Evans, McLean, NSW Australia, discovered a supernova of 14th magnitude in NGC 991.

3. September -- Henkel, Guesten, Thum, and Downes discovered the most luminous water maser ever found. The Effelsberg 100-m radio telescope was used to find the source, which is in NGC 3079, a galaxy found to be bright in the IRAS survey.

4. September -- Several observers reported that Comet Austin (1984i) showed an antitail in late August and early September. Sekanina, JPL, noted that the antitail might be brightest on September 13 when the Earth passes through the orbital plane, but would fade by October.

5. September -- Hege and Drummond, Stewart Observatory, obtained speckle interferometric observations of Pluto's satellite Charon in February with one mirror of the Multiple-Mirror Telescope. Improving the ephemeris of Harrington and Christy, they note that eclipses should be occurring in the system.

NASA GODDARD COLLOQUIUM SCHEDULED

The Goddard Scientific Colloquia will be held on Friday, October 5, 12, 19, and 26, at 3:00 pm. The first will be held in Building 26, all others in Building 3 Auditorium.

Speakers and topics are, respectively, Eric Barron: Paleogeography; Allan S. Jacobson: HEAO-3 Gamma-Ray Spectroscopy; Michael A. McElroy: Life, Climate; Joseph Ford: Chaos and Predictions.

Stop at the main gate for a pass and instructions.

FOR SALE

Edmund 450 X 60-mm refractor. George M. Christensen, 11507 Valley Road, Fairfax, VA 22033.

WANTED

Telescope: F/6 or F/8, 8-inch. Curtis W. Roelle, 3841 Salem Bottom Road, Westminster, MD 21157, (301) 848-6384.

★ STAR DUST

WASHINGTON, D. C.



Published eleven times yearly by NATIONAL CAPITAL ASTRONOMERS, INC., a non-profit, public-service corporation promoting astronomy and related sciences through lectures, expeditions, discussion groups, tours, classes, public programs, and publications. President, Geoffrey R. Chester. *Star Dust* Deadline 15th of preceding month. Information: (301) 320-3621. Material for publication: Robert H. McCracken, Editor, 5120 Newport Avenue, Bethesda, MD 20816.

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