

Election; Shaffer to Report Odd Changes in 4C39.25



DR. SHAFFER

Dr. David B. Shaffer, Chief Scientist, Interferometrics, Inc. will present his observations of peculiar behavior of the apparently superluminal quasar 4C39.25, at the May colloquium of National Capital Astronomers.

The election of officers will be the only business preceding the colloquium.

In the 1980's, Shaffer's very long baseline interferometric (VLBI) observations of the quasar at milliarcsecond resolution showed the beginning of structural changes unlike those of any other source that displays the superluminal illusion.

The illusion of velocities greater than that of light is produced by high-Z (relativistic radial velocities), if the redshift is cosmological.

The moving component was between two (relatively) stationary components instead of being in the usual obvious jet. Subsequent observations have failed to find an unambiguous core in this source.

Shaffer will present observational data and offer several possible interpretations of this peculiar

source. He will also discuss what might be observed in 1991 if the moving component collided with one of the "stationary" components.

David B. Shaffer received his B.S. in physics from Carnegie-Mellon University in 1968, and his Ph.D. in astronomy from California Institute of Technology in 1974. His thesis, the Structure of Compact Radio Sources at 10.7 GHz, was based on his pioneering milliarcsecond VLBI observations. He continued his VLBI studies of compact sources, first for two years at Yale until 1975, at the National Radio Astronomy Observatory at Green Bank, WV, until 1979, then at NASA as an employee of Phoenix Corporation until 1982, when he co-founded Interferometrics, Inc. There, he has managed the development of a holographic antenna measurement system, and has used interferometry to determine Earth-satellite orbits. He has authored many journal papers, and is a member of the American Astronomical Society, the International Astronomical Union, the International Scientific Radio Union, and the Institute of Navigation.

MAY CALENDAR — *The public is welcome.*

Tuesday, May 3, 10, 17, 24, 31, 7:30 pm — Telescope-making classes at Chevy Chase Community Center, Connecticut Avenue and McKinley Street, NW. Information: Jerry Schnall, 362-8872.

Friday, May 6, 13, 20, 27, 7:30 pm — Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall, 362-8872.

Friday, May 6, 20, 27, 9:30 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 7, 5:45 pm — Dinner with the speaker at the Smithson Restaurant, 6th and C Streets, SW., inside the Holiday Inn. Reservations unnecessary. Use the 7th Street and Maryland Avenue exit of the L'Enfant Plaza Metrorail station.

Saturday, May 7, 7:30 pm — NCA monthly lecture in the Einstein Planetarium of the National Air and Space Museum, Seventh Street and Independence Avenue, SW. Enter Independence Avenue side. Dr. Shaffer will speak.

Saturday, May 14, 8:30 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: John Lohman, 820-4194.

Saturday, May 21, 7:30 pm — Discussion group on solar photography, spectral imaging, spectrohelioscopes. See page 41.

For other organizations' events of interest see elsewhere in this issue.

APRIL COLLOQUIUM

Fr. Martin F. McCarthy, Jesuit Chair, Georgetown, University, discussed his comparative study of the stellar populations in the galactic center with those of the Magellanic clouds.

McCarthy limited his study to two types of red giants: one, the M-type, shows no bands of hydrogen or helium, but does show oxygen, and molecular bands of titanium oxide, vanadium oxide, and some, lanthanum oxide. The second type, the carbon stars. Both are abundant in the Milky-Way Galaxy, but are oppositely distributed.

Carbon stars were discovered by another Jesuit astronomer, Fr. Angelo Secchi, in the 19th Century. He used a 20-cm objective prism and sketched the spectra in color. Fr. Secchi was at Georgetown University in 1848 for one year, then was called to Rome, where in 1868 he published his spectral classifications.

Using hypered EKC 1N plates, McCarthy records the infrared spectra of these late types, seeking the bands of titanium oxide at 7683-84 Angstroms, and vanadium oxide, 7400-7900 angstroms, of M6 to M10 types.

McCarthy showed the distribution of carbon stars in the galactic plane: high density in the spiral arms, very few in the galactic center. The M6 to M10 oxygen stars, on the other hand, are concentrated in the galactic center. These data resulted from the work of many astronomers during the 1950's.

Upon this work McCarthy, et al, built the present project. Using the 4-meter Cerro Tololo telescope at the prime focus, a survey was made of carbon stars and M stars in 56 telescope fields of the large Magellanic cloud and 27 fields in the small Magellanic cloud. All survey fields in both the Magellanic clouds and the milky-way galaxy were 0.1 square degree.

Many different epochs of stellar activity are discernible in the Magellanic clouds. These young, irregular, dwarf galaxies are a virtual stellar-evolution laboratory; many studies of the distribution of evolutionary traces are currently being pursued in them. McCarthy gave examples of the epochs seen in the clouds. The hydrogen regions where new stars are currently being formed are only about 20,000 to 40,000 years old; the carbon stars are believed to have resulted from explosions about 3 to 5 billion years ago; the RR-Lyrae types are about 15 billion years old.

Plotting stars of infrared magnitude 12.4 to 16.0, McCarthy's survey found that in the central regions, carbon stars outnumber the M-giants of M6 or later by 2 to 1 in the large cloud, but by 15 to 1 in the small cloud.

He compared these relative abundances with those observable in a 0.1 square degree field of Baade's window, near NGC 6522, of the central region of the Milky Way galaxy, where there are essentially no carbon stars, but many M giants.

He also noted that metal lines are very weak in the small cloud, stronger in the large cloud, and most strong in the Milky-way galactic center.

The various stellar type ratios are attributed to a combination of age and metal abundances. Very old stars are metal poor, subsequent-generation stars formed from previously-worked nebulae are richer in metals. The carbon stars are believed to be the result of supernova explosions about 3 to 5 billion years ago.

One of McCarthy's major objectives in this work is to learn more of the details of the future evolution of red giants down across the horizontal branch of the Hertzsprung-Russell diagram (luminosity vs. temperature), across the main sequence, and into the region of white dwarfs (the stellar graveyard - ed.)

Robert H. McCracken

AIR AND SPACE MUSEUM OFFERS PROGRAMS

The following free, public programs will be held in the the National Air and Space Museum during May:

Saturday, May 7, 9:30 am -- Ray Villard, Space Telescope Science Institute, will present "Space Telescope Update, in the Einstein Planetarium.

Wednesday, May 18, 7:30 pm -- Andrea Dupree, Harvard-Smithsonian Center for Astrophysics, will present "An Ultraviolet View in the Einstein Planetarium.

The Tuesday tutorial series, "Investigating Modern Astronomy," will be presented at 7:30 pm in the Einstein Planetarium: May 10, "The Large Scale Structure of the Universe," with Ron Brasher; May 17, "Pulsars, Quasars, and the Big Bang."

NCA TO ELECT FISCAL 1989 OFFICERS MAY 7

The nominating committee presents the following slate for fiscal 1989 officers: President, Walter L. Nissen (incumbent), Vice President: Kenneth R. Short, Secretary: Patricia B. Trueblood (incumbent), Treasurer: Ruth S. Freitag (incumbent), Trustee: Robert H. McCracken (incumbent), Sergeant at Arms: Eric O. Nystrom.

Additional nominations may be made by petition of 10 regular members in good standing, presented to the secretary prior to the election.

OPPORTUNITY FOR FREE ADMISSION TO IAU MEETINGS

Generally, only a limited number of invited astronomers attend the triennial meetings of the General Assembly of the International Astronomical Union. This year, the General Assembly is meeting in the United States for the fourth time. Volunteer help is needed for ushers, room monitors, messengers, etc. and will be rewarded by free admission to sessions in return for a minimum of 10 hours or two half days of volunteer time.

This is a rare opportunity to hear some of the most eminent astronomers from all over the world, make interesting and valuable contacts, and learn.

To volunteer for the Baltimore meetings of the General Assembly, 1 to 11 August, contact, before 1 June, Marguerite Ingalls at Johns-Hopkins University, (301) 338-7963 (Aaltimore), or Dr. David DeVorkin, 357-1660 (National Air and Space Museum).

To volunteer for the Washington meetings (Colloquium 112 on Light Pollution, Radio Interference, and Space Debris,) 13 to 16 August, contact, before 1 June, Robert McCracken, at NCA: 320-2621 (Bethesda).

NCA WELCOMES NEW MEMBERS

Boulay, Peter C.
1492 Roundleaf Ct.
Reston, VA 22090

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McLean, VA 22101

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8711 Ramsey Court
Springfield, VA 22151

Young, Jonathan P.
3950 Persimmon Drive
Fairfax, VA 22031

ASTRONOMY DAY ENJOYED BY THOUSANDS

Although Saturday, 23 April was mostly cloudy, many thousands visited the U.S. Naval Observatory and the Smithsonian Garber Facility, and the latter again on Sunday, 24 April, when the weather was perfect.

Jay Miller, Walter Nissen, Eric Nystrom, and Bob McCracken represented NCA at the Naval Observatory on Saturday. Stanley Cawelti reports that Keith Bell, Bob Bolster, Susan Harrison, and Eric Nystrom helped make the Garber open house a huge success. More than 17,000 people visited, and nearly all stopped to visit the NCA display and view the Sun through the five safety-equipped telescopes.

NCA thanks all those who gave their time to make these affairs enjoyable to all.

NCA HOPEWELL TRIP IN MAY CANCELLED

We regret that because of an unfortunate program conflict (business, not TV!) it is necessary to cancel the planned trip to Hopewell Observatory previously scheduled for 14 May. There seems to be no other suitable time through June, but we'll keep trying and let you know.

ASTRONOMY AND PERSONAL COMPUTERS: NCA COMPUTER WORKSHOP

The workshop held on April 16 primarily concerned astronomy software for the MS-DOS PC's that can be freely exchanged (public domain, shareware, and user supported). We demonstrated, tested, downloaded, and exchanged software to compute ephemerides, plot star fields, retrieve catalog data, and to compute time and coordinate conversions.

The major software packages, the biggest and most sophisticated, are the Floppy Almanac from the USNO, Deep Space, and ACE, all of which we have previously discussed in *Star Dust*. There are other packages, such as Procalc, a nice scientific calculator program found when Jeff Guerber demonstrated using a BBS, which includes time and Julian date computations. Other programs obtained from user groups were Cluster, software that integrates multiple stars and plots them, and a rocket-launch simulation. We obtained a package called HGCIBM that allows software that uses only the CGA for graphics to work with a Hercules graphics card. For example, the Deep Space plots, which are designed for the CGA only, can run on the Dunham's Hercules-clone supported PC. These and other software packages can be found on bulletin boards, obtained from user groups, or bought from national organizations such as PC SIG, which exists for the purpose of selling freely exchangeable software.

Obtaining and using star catalogs on a PC was a topic discussed at the workshop. Virtually all of the star catalogs now in machine-readable format can be obtained for PC's (but not from the Astronomical Data Center, so please do not ask them). The number of floppy diskettes needed to transfer the data to the PC can be very difficult to manage, so several programmers have attempted to compact the catalogs, deleting data that they do not want, in order to produce manageable files. Irv Price, for example, has created a catalog by extracting just 39 bytes of information on each star from the Yale Bright Star Catalog, producing a subset that fits on two 360-k diskettes. Eric Nystrom wanted software to define the limits of the constellations. David Dunham found an article by Nancy Roman in the *Publications of the Astronomical Society of the Pacific*, July 1987, Vol 99, page 695) that gives coordinates for the constellation boundaries. The article states that the boundary data, and a FORTRAN 77 program to use them, are available from the Astronomical Data Center in Machine-readable form on computer tape via SPAN.

David Dunham has received the Asteroid II data base, three floppy disks of data on asteroids, including a tabulation of the asteroid discoverers, the date of discovery, and the asteroid names. This data base is in the public domain, but is not widely distributed yet. It can be obtained from the Astronomical Data Center on tape, or from the ADC via SPAN, as well as from us.

Another topic discussed was viruses reported to be infecting computer systems. These viruses are program codes that are replicating, that attach themselves to legitimate software, and are designed to make themselves noticed at a point subsequent to being introduced to the computer systems. Some are supposed to be harmless, just a little joke to print a message to the user's screen. Others are less benign, and are supposed to delete files, change data, even stress certain types of displays to the point where they catch fire. However, most of the reports on viruses seem to be more hype than fact, some of them approaching outright hysteria. Hackers caught meddling in a system have more to gain by claiming to have created a virus than to admit to random trashing of other peoples' data. At the very least, they get their names in the papers and they tie the press in knots trying to describe what happened. We suspect that, while such software can be written, and probably some has been written, most of the reported viruses are anything but.

Joan B. Dunham

UNIVERSITY OF MARYLAND OPEN HOUSE SCHEDULES IN MAY

The Astronomy Program, University of Maryland, holds open house on the 5th and 20th of each month at the University's Observatory on Metzert Road in College Park. Talks and slide shows are presented, followed by telescopic sky viewing, weather permitting.

Thursday, May 5, 9:00 pm — "Active Galactic Nuclei and Quasars," Dr. W.K. Rose.

Friday, May 20, 9:00 pm — "Neutron Stars," by Dr. A.S. Wilson.

The public is invited; there is no charge, and no reservations are necessary for individuals. Groups larger than ten should call (301) 454-3001 at least 5 days prior to the program.

DISCUSSION GROUP ON SOLAR PHOTOGRAPHY, SPECTRAL IMAGING

Several members have expressed an interest in solar photography, spectroheliographs, and other instruments for solar and stellar spectral imaging.

The May 21 discussion group will offer an opportunity to exchange ideas, questions, and designs for solar (and stellar) study. Even if you aren't interested in building an instrument, come and learn about techniques for the study of the Sun in white light, hydrogen alpha, or the lines of other elements.

The group will meet at 7:30 pm at the University of DC, in Building 42, Room A06, just behind Building 44, which is on the north side of Van Ness Street, just west of Connecticut Avenue, NW, near the Metrorail Red Line Van Ness-UDC station.

Park under Building 44. (Tell the attendant you are attending a meeting.) Walk out the back of the garage a few feet to building 42. Take the elevator one floor up.

From Metrorail, as you emerge to the sidewalk, go to the left between the columns to the stairway on the left, up four short flights to the elevated walk to building 42. A06 is on the same floor.

If you have questions, call NCA: 320-3621.

DC ACM TECHNICAL SYMPOSIUM SCHEDULED AT NBS

The 27th Annual Technical Symposium of the Washington, DC Chapter of the Association for Computing Machinery, cosponsored by the National Bureau of Standards, will be held at the Bureau in Gaithersburg, Maryland, on Thursday, June 9, 1988. The program theme is **Productivity: Progress, Prospects, and Payoff**. The symposium will explore theoretical and practical issues in developing and applying technology in an information-based society.

Included papers will address processes and tools for higher software productivity, software economics, specification, requirements development uncertainty, data management standards, systems and knowledge engineering.

For registration information contact Mary Moreschi at (703) 841-5995, or write her in care of DC Chapter of ACM, PO Box 12953, Arlington, VA 22209-0953. A 10-percent discount is allowed for registration before 1 June. A special rate applies for full-time students. For other information, call Daniel Power, (301) 454-6725, or Charles Youman, (703) 883-6349.

INFLATION DRIVES NCA COSTS, DUES UP

The increases in postage and publication costs make it necessary to increase NCA dues. The new annual dues schedule, effective 1 June 1988 for new members, with next billing for renewals: Regular and family membership, \$32.00; Juniors (under 18) with *Sky & Telescope* and *Star Dust*, \$25.00; Juniors without *Sky & Telescope*, \$10.00. Only juniors have this option. All regular and family memberships receive one set of all publications. New members who already subscribe to *Sky & Telescope* will receive a prorated adjustment to the individual's membership year.

EXCERPTS FROM THE IAU CIRCULARS

1. March 12 — J. Alu, Jet Propulsion Laboratory, discovered a fast-moving asteroidal object of 16th magnitude with the 46-cm Palomar Schmidt. The orbital elements by Bardwell indicate that it is an Apollo asteroid and passed 0.042 AU from the Earth on February 26.

2. March 19 — David Levy, Tucson, AZ, discovered a comet (1988e) of 11th magnitude in Pegasus with a 40-cm reflector.

3. March 21 — D. McAdam, Telford, England, discovered a variable star of 10th magnitude maximum brightness in Andromeda on nova patrol photographs taken with a 230-mm lens. 4. March 27 — M. Wakuda Ryuyo, Shizuoka, Japan, discovered a nova of 10th magnitude in Ophiuchus on patrol photographs taken with a 200-mm lens.

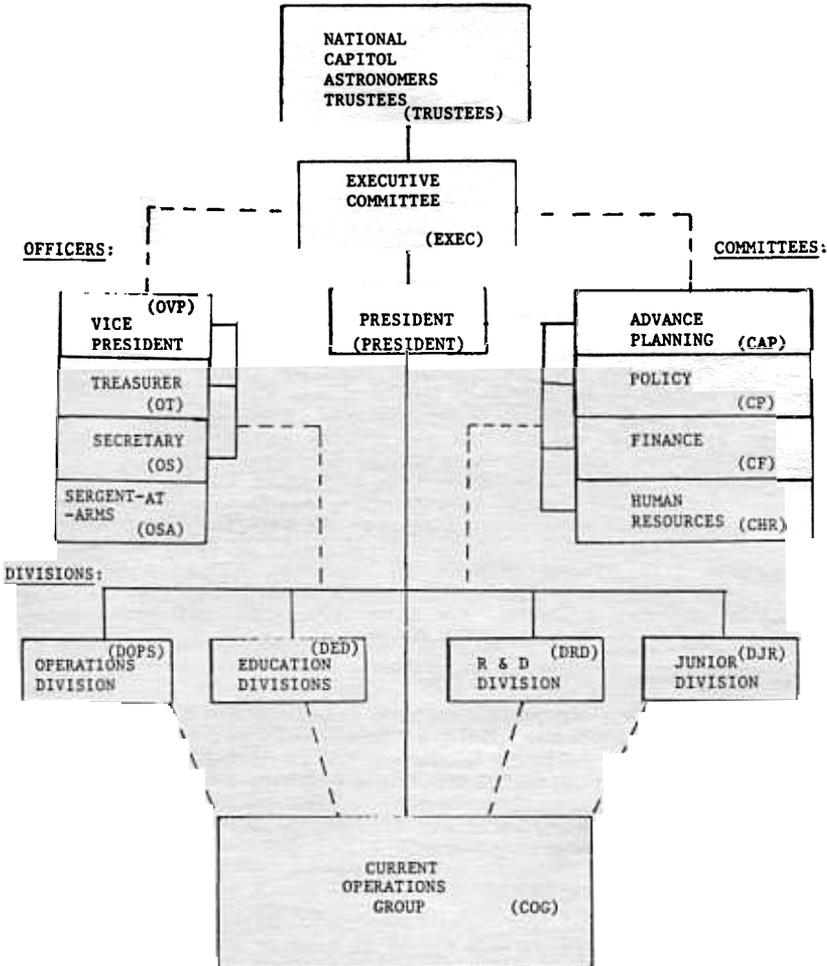
Robert N. Bolster

FOR SALE

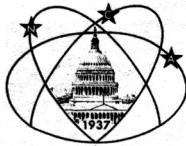
Questar 3.5- and 7-inch models, mint condition, with many accessories. Dan Shykind, 903 Burnt Crest Lane, Silver Spring, MD 20903-1316, (301) 439-7934.

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PROPOSED NCA TRANSITIONAL
ORGANIZATION STRUCTURE FOR 1987 - 1988



NOTE: Items in parentheses are the responsibility codes mentioned in the PERT chart and schedule for each task



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is a non-profit, public-service corporation for advancement of the astronomical sciences. NCA is an affiliate of the Washington Academy of Sciences.

SERVICES AND ACTIVITIES

A forum for dissemination of the status and results of current work by scientists at the horizons of their fields is provided through the monthly NCA colloquia held at the National Air and Space Museum of the Smithsonian Institution. All interested persons are welcome; there is no charge.

Expeditions frequently go to many parts of the world to acquire observational data from occultations and eclipses which contribute significantly to refinement of orbital parameters, the coordinate system, navigation tables, and timekeeping. Other results of this work under continuing study include the discovery of apparent satellites of some asteroids, discovery of apparent small variations in the solar radius, and profiles of asteroids.

Discussion Groups provide opportunities for participants to exchange information, ideas, and questions on preselected topics, moderated by a member or guest expert.

Publications received by members include *Sky & Telescope* magazine and the *NCA Star Dust*.

The **NCA Public Information Service** answers many astronomy-related questions, provides predictions of the paths and times of eclipses and occultations, schedules of expeditions and resulting data, assistance in developing programs, and locating references.

The **Telescope Selection, Use, and Care Seminar**, held annually in November, offers the public guidance for those contemplating the acquisition of a first telescope, and dispels the many common misconceptions which often lead to disappointment.

Working Groups support areas such as computer science and software, photographic materials and techniques, instrumentation, and others.

Telescope-Making Classes teach the student to grind and polish, by hand, the precise optical surface that becomes the heart of a fine astronomical telescope.

NCA Travel offers occasional tours, local and world-wide, to observatories, laboratories, and other points of interest. NCA sponsored tours for Comet Halley to many parts of the southern hemisphere.

Discounts are available to members on many publications and other astronomical items.

Public programs are offered jointly with the National Park Service, the Smithsonian Institution, the U. S. Naval Observatory, and others.

NOTE: Dues will be increased June 1, 1988; See page 41.

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