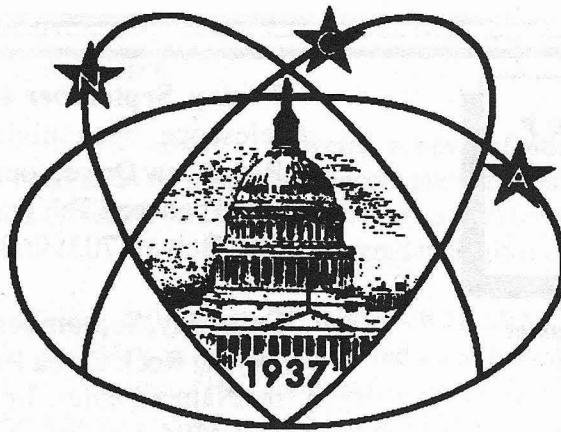


Star



Dust

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President's Welcome

John Graham

As the new president of National Capital Astronomers, I would like to welcome you to the new session. All of us share an enthusiasm for astronomy and have learned that, by looking out and studying the universe around us, we can become more familiar with our fragile environment on our planet Earth.

It is always good at this time of year to take a look at our concise mission statement. National Capital Astronomers (NCA) is a non-profit membership corporation serving the public by advancing astronomical and related sciences through research, expeditions, colloquia, conferences, seminars, publications, public interpretation, education and popularization." To carry out this mission, we participate in many activities, a couple of which I shall highlight in this article. Others are described more briefly on page 5 of this issue of *Stardust*.

Our newsletter *Stardust* is the essential link which joins our many activities together. It fulfills several roles. First, it keeps us up-to-date on the latest findings in astronomy by such means as Bob Bolster's extracts from the International Astronomical Union circulars and the reports of talks given at the monthly meetings by our guest speakers. It also serves as a means of communication between individual mem-

bers and within groups such as the team of lunar occultation observers led by David Dunham. *Stardust* often contains news of eclipse expeditions, past and planned. We welcome in this issue our new editor, Nicoletta Stephanz, and look forward to working with her to keep *Stardust* as the key means of communication within National Capital Astronomers. Submissions are always welcome but remember the deadline of the 15th day of each month for the coming issue. We have to respect this deadline because the timely distribution of *Stardust* is necessary to publi-

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Gary Hinshaw to Talk on COBE Results

by Nancy Byrd

The next meeting of National Capital Astronomers will be on September 12, 1992 at 7:30 PM at the National Institutes of Health (in the Bunim Room on floor 9 at the Clinical Center Building 10). On this occasion we shall be addressed by Dr. Gary Hinshaw, Universities Space Research Association (USRA) visiting scientist at NASA's Goddard Space Flight Center and member of the analysis team that recently reported new results from NASA's Cosmic Background Explorer (COBE) satellite. Dr. Hinshaw will talk to us about these results and their profound cosmological implications.

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September Calendar

The Public is Welcome!

Saturday, September 12, 5:30 PM - Dinner with the speaker at Frascati's Restaurant in Bethesda before the monthly meeting. Reservations are for 5:30 Sharp!

Saturday, September 12, 7:30 PM - Gary Hinshaw (Universities Space Research Association) "NASA's Cosmic Background Explorer Satellite." Meeting will be held in the Bunim Room at the National Institutes of Health. For directions refer to map and description on inside back page.

Friday, September 4, 18, 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 (703) 960-9126.

Saturday, September 19, 8:30 PM - "Exploring the Sky" at Rock Creek Park on Glover Road, NW, near the Nature Center. Information: John Lohman, 703/820-4194.

Saturday, September 26, 5:30 PM to ?? - Open House at Hopewell Observatory. See article below for directions.

Next Month:

Saturday, October 3, 7:30 PM - Dr. David Thompson (NASA Goddard Spaceflight Center) "Pulsars Quasars & Bursts - Early Results from the Compton Gamma Ray Observatory."

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Measurements from the Differential Microwave Radiometer experiment aboard COBE, taken over a year's time, have finally revealed spatial structure in the cosmic ray background observed as small irregularities bearing a characteristic statistical signature. These anisotropies, which have root mean square deviations of only 30 microkelvin from the mean sky temperature of 2.73 K (0.001 percent), had not previously been detected. The new results are consistent with an extension of the Big Bang theory of the universe called "inflation." This theory holds that an instant after the Big Bang, the universe suddenly expanded exponentially in size by many orders of magnitude, imprinting matter in the universe with a specific statistical pattern of density fluctuations. The COBE scientists believe that these ancient density fluctuations may be in evidence today as temperature variations in the cosmic ray background.

Dr. Hinshaw received his undergraduate degree with honors in physics at University of California at Berkeley in 1981. He received his Ph.D. in physics from Harvard University in 1988 where he wrote his dissertation on the statistics of gravitational lens events. After teaching at Oberlin College, in Oberlin Ohio, he came to Washington in 1990 where he joined the COBE team. We look forward to a most interesting talk from Dr. Hinshaw.

Hopewell Observatory Open House

by R.N. Bolster

NCA members, families, and guests are invited to the autumn open house at Hopewell Observatory on Saturday evening / Sunday morning September 26/27 to observe the fall Milky Way, numerous Messier objects, Saturn, Uranus, and Neptune. Mars will rise about midnight. Sunset will be at 7:01 PM, civil twilight ends at 7:27, and astronomical twilight at 8:30. If you wish, come before dark (any time after 5:30 PM) and bring your prepared picnic dinner. Coffee, tea, and cocoa will be provided by the Hopewell Corporation.

Directions:

(1) From the Beltway (I-495) go west on I-66 25 miles to Exit 40 at Haymarket onto U.S. 15. (2) Turn left on U.S. 15 at the end of the exit ramp. (3) Go 0.3 mile to traffic light, turn right onto Va. 55. (4) Go 0.8 mile to Antioch Road (Rt. 681) and turn right. (5) Go 3.2 miles to the end of Antioch Rd. and turn left onto

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Excerpts from The IAU Circulars

by R.N. Bolster

1. July 1 - R. Evans, Hazelbrook, N.S.W., Australia, discovered a supernova of 13th magnitude in spiral galaxy NGC 4411B. Several spectra obtained on July 2 indicate that it is a type-II supernova.

2. July 2 - Donald E. Machholz, Colfax, California, discovered a comet (1992k) of 9th magnitude in eastern Perseus with 27x120 binoculars. The orbital elements by Nakano show that Comet Machholz passed perihelion at 0.82 AU on July 11.

3. July 9 - William Liller, Vina del Mar, Chile, dis-

covered a nova of 8th magnitude in Sagittarius with ProPublicom photographs. Spectra obtained with the 3.6-m reflector at La Silla confirmed that it is a nova, the second discovered in Sagittarius this year.

4. July 26 - R.H. McNaught, Siding Spring Observatory, discovered a fast-moving asteroidal object (1992 OA) on a photo taken by Q.A. Parker with the U.K. Schmidt telescope. G.V. Williams, Harvard-Smithsonian Center for Astrophysics, identified the object with 1973 NA, a lost Apollo object with the highest known orbital inclination to the ecliptic (68 degrees).

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cize the colloquium to be given at the monthly meeting about 2 weeks later.

Astronomy is one of the most effective sciences for communicating an awareness of the universe to our children who will be the citizens of the 21st century and I'd like in this letter to affirm our interest in science education in our schools. Those of you who attended our June meeting will remember that we make a number of awards at school science fairs. Now that the school year is beginning, it is a good time to encourage young people to work astronomy into their science projects. Astronomy is a science in which major discoveries can still be made by just looking up at the sky, and there are many opportunities for important work to be carried out with minimal equipment. In National Capital Astronomers, we have many members who can give lots of good advice about interesting things to study and who are willing and eager to share their enthusiasm for astronomy. Starters in observing should remember our "Exploring the Sky" program conducted with the National Park Service in Rock Creek Park. (Next date is September 19.)

To really see the night sky in all its brilliance, it is necessary to go beyond the city lights and I'd like to encourage members to take advantage of the invitation by the directors of the Hopewell Corporation to an open house at the Hopewell Observatory on September 26 (rain date October 24). Details are given on page 2. The Hopewell Observatory is situated on the top of a mountain outside Haymarket, Virginia, a few miles off Interstate 66. We plan to picnic, watch the sunset and later do some observing through telescopes. This period of the year is prime observing time for the Milky Way and the ringed planet, Saturn, which many of us regard as the most

beautiful object in the whole sky, is well placed for viewing. It will be an agreeable social event as well as a stimulating scientific experience. Weather permitting, I shall be coming along on September 26 and look forward to meeting members personally there.

Because of the Labor Day holiday, our September meeting at the National Institutes of Health will be held on the *second* Saturday, September 12. We are looking forward to a talk by Gary Hinshaw about results from the Cosmic Background Explorer satellite. These findings have caused quite a sensation in the scientific world and we shall be hearing an inside account of them. The talk will be preceded by dinner with the speaker at Frascati's Restaurant, one of the nicest Italian restaurants in the Bethesda area (see back page for a map). Attending these dinners is always a good way to get to know other NCA members. Try to come to one or both of these events and join in starting National Capital Astronomers off to exciting new season.

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Waterfall Road (601). (6) Go one mile and bear right onto Rt. 629. (7) Go 0.9 mile on 629 to narrow paved road at right with an orange pipe gate. (Directly across from an entrance gate with stone facing.) (8) Turn right through pipe gates, go 0.3 mile to top of ridge, and around the microwave station. (9) Continue on dirt road through the white gate and woods a few hundred feet to the observatory. Park along the road short of the buildings.

The event will be cancelled if it is raining or hopelessly cloudy, but another one is planned for October 24. For further information call (703) 960-9126 or (301) 320-3621.

Astronomical Abstracts

by John Lohman

Nature, 30 April 1992, p. 731: "Big Bang Brouhaha"

Science, 1 May 1992, p. 612: "COBE Finds the Bumps in the Big Bang"

Nature, 30 April 1992, pp. 741 - 742: "Cosmology Back to the Beginning"

The fluctuations in the microwave background are consistent with at least some current cosmologies. Their magnitudes are far below the noise level of the system; they show that the fluctuations exist, but do not map them individually. The ultimate resolution of COBE has been reached.

Nature, 7 May 1992, p. 9: "Magellan Team Fights to Extend Mission"

NASA says **Magellan** has already met project goals and ought to be turned off. Project managers are cutting costs to keep the project alive.

Science, 6 March 1992, pp. 255 - 256: "A Rocky Watch for Earthbound Asteroids"

A NASA study is seeking ways to avert collisions [of asteroids with the earth] - but participants argue about which asteroids to watch for. [The study considers a global telescope network, and the possible use of neutron bombs.]

Science, 17 April 1992, p. 311: "Quasars: Ablaze with Gamma Rays"

The orbiting **Gamma Ray Observatory** has now found 11 quasars that give out most of their power in gamma rays.

Science, 17 April 1992, p. 312: "A 100% Certifiable Massive Black Hole?"

It is announced that it is "nearly positive" that there is a massive black hole in the center of M32.

Science, 17 April 1992, p. 321 - 333: "The Hubble Constant"

[A review article] ... Current determinations still range over nearly a factor of two; the higher values [indicating a younger universe] favored by most local measurements are not consistent with many theories of large-scale structure and stellar evolution.

Science, 17 April 1992, pp. 325 - 333: "LIGO: The Laser Interferometer Gravitational-Wave Observatory"

[Describes the planned instrument and its goals.]

Nature, 16 April 1992, p. 567: "Stardust Memories"

Minute grains of silicon carbide ... embedded in primitive meteorites turn out to be "star dust," the condensed remains of stars that existed long before our solar system ... [They] also force astronomers to consider some of the more exotic nuclear burning processes that can occur in stars.

Science, 24 April 1992, p. 439: "Last Piece of Jigsaw in Place"

Last week the giant Keck telescope was formally completed ... when the last segment of the instrument's [10-meter] mirror was gently lowered into place ... The \$94 million instrument will be tested over the next several months and is scheduled to be in full operation early next year.

American Scientist, March - April 1992, pp. 152 - 163: "Experimenting with Galaxies"

Galaxies are too massive and distant for experimental studies of their dynamics. But computer models show that galaxies wiggle, vibrate, and even "breathe". [This article also describes the computing problem.]

Scientific American, May 1992, pp. 78 - 85: "Planetary Nebulae"

These fluorescent clouds of gas represent the last gasp of dying, sunlike stars. They are helping astronomers understand stellar evolution and even the ultimate fate of the universe.

Science, 27 March 1992, p. 1637: "Do NASA Images Create Fantastic Voyages?"

NASA's published images of celestial bodies exaggerate both color contrasts and relief; the latter is particularly strong in the Magellan images of Venus. [NASA has begun to decrease the exaggeration of relief.] These exaggerations are helpful in scientific interpretation of images, but mislead the public.

Science, 27 March 1992, pp. 1685 - 1687: "The Breakup of a Meteorite Parent Body and the Delivery of Meteorites to Earth"

Antarctic meteorites may be unlike those collected elsewhere. Antarctic H chondrites result from the breakup of a parent body 8 million years ago.

CHANGE IN ANNUAL DUES STRUCTURE

The publishers of *Sky and Telescope* (S&T) have recently increased their subscription rates, but they no longer require that every member of an organization subscribe to S&T in order for the subscribers to get a discount. Because of S&T's new policy, starting on September 1, 1992, we will no longer require new or renewing NCA members to take S&T as part of their membership. Nevertheless, we will still offer S&T at a discount to those members who want it. In addition, the cost of publishing our newsletter *Stardust* has also increased, necessitating an increase in the non-S&T portion of our dues.

Therefore, starting on September 1, 1992, the annual dues for new and renewing regular members will be \$24. For Junior members (those under 18 years old), annual dues will remain at \$10. If you want to purchase S&T through NCA, the cost will be an additional \$22. You may send a single check to the secretary for both dues and magazine, as you have done in the past. We wish to remind you to please save your S&T renewal card and send it to the secretary along with your check if you want S&T. This will greatly help your volunteer officers in processing your request.

National Capital Astronomers, Inc.

is a non-profit, public-service corporation for advancement of the astronomical sciences and is the astronomy affiliate of the Washington Academy of Sciences. For information, call NCA: (301) 320-3621.

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 Meeting. (See monthly *Stardust* for time and location.) 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 monthly publication of NCA, *Star Dust*.

The NCA Public Information Service answers many as-

tronomy-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 leads 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.

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If family membership, list names of additional participating immediate family members in same household, with birthdates of all those under 18 years old: _____

Note: If you already subscribe to *Sky & Telescope*, please attach a recent mail label, or indicate the expiration date: _____. A prorated adjustment will be made. Make check payable to National Capital Astronomers, Inc., and send with this form to:

Leith Holloway 10500 Rockville Pike Apartment. M-10, Rockville, MD 20852.

The following information is optional. Please indicate briefly any special interests, skills, vocation, education, experience, or other qualifications which you might contribute to NCA

Thank you, and welcome!

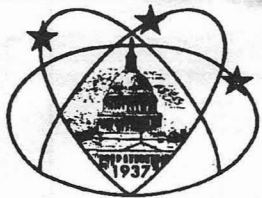
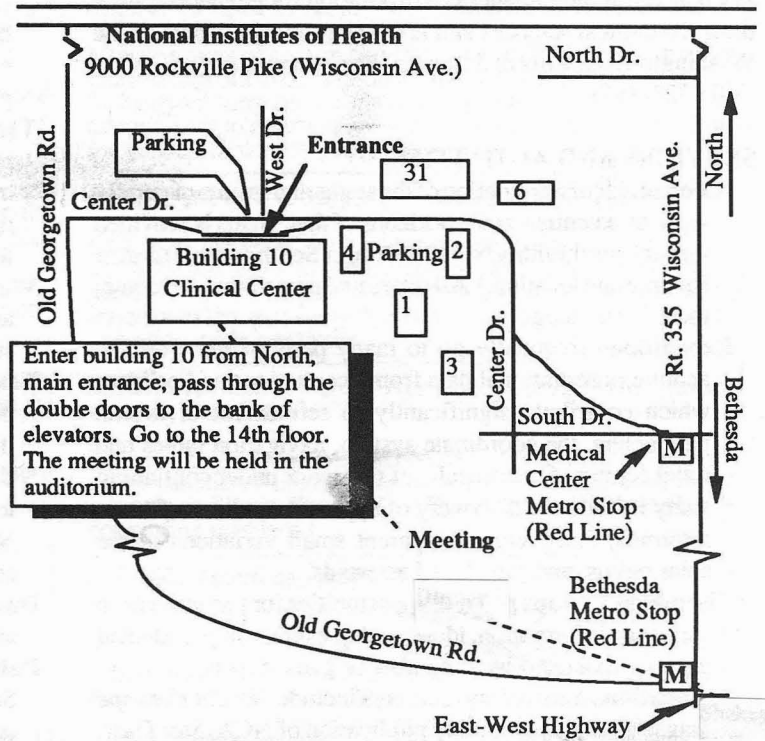
Getting to the NCA Monthly Meeting

- - I 495 Beltway - -

•Subway Riders - To get to the meeting from Medical Center Metro Stop: Walk down the hill, pass the bus stops and turn right at the anchor (onto Center Drive). Continue uphill to building 10, the largest building on campus. Also the J2 bus line connects the Bethesda (7:16PM) and NIH (7:23PM) metro stops with building 10 (7:25PM).

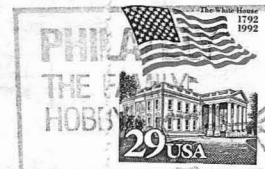
•To Frascati's: Proceed down Wisconsin Avenue toward Bethesda. Bear right onto Woodmont (or the next right onto Battery Lane), follow Woodmont across Battery, take a right onto Rugby and park. The restaurant will not guarantee seats after 5:30.

Stardust is published ten times yearly by National Capital Astronomers, Inc. (NCA), a non-profit, public-service corporation for advancement of astronomy and related sciences through lectures, expeditions, discussion groups, conferences, tours, classes, public programs, and publications. NCA is an affiliate of the Washington Academy of Sciences. President Daniel Costanzo. Deadline for *Stardust* is the 15th of the preceding month. Editor, ending this issue, Nancy Byrd 703/978-3440. See "Star Dust Has New Editor", page 1 of this issue. NCA Phone Number is 301/320-3621.



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