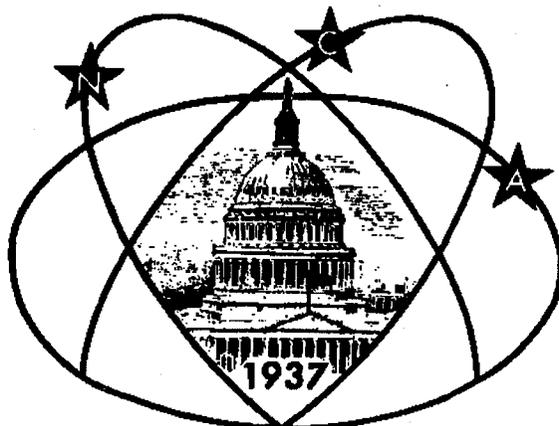


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George Wetherill to Speak on "The Peekskill Meteorite, October 9, 1992, Video Observations: An Orbit Determination"

by
Harold Williams

The next meeting of the National Capital Astronomers will be held on Saturday October 1 at 7:30 P.M., in the Lippsett Amphitheater, Room 1C114, of the Clinical Center (Building 10) at the National Institutes of Health (NIH). George Wetherill of the Department of Terrestrial Magnetism (DTM) of the Carnegie Institution of Washington (CIW) the oldest nonprofit research foundation in America, will speak on "The Peekskill Meteorite, October 9, 1992, Video Observations: An Orbit Determination." On October 9, 1992 at 7:50 P.M., on a Friday night when high school football games were being video taped by parents, coaching staffs, and local television stations, a fireball appeared over the United States visible from perhaps Texas to New Jersey where it was cloudy. It struck a women's car in Peekskill, New York and the meteorite was recovered — 12.6 kilograms. Rumor has it that the women sold the car to a museum for around \$7,000 dollars and the meteorite for around \$50,000. In America (home of the brave and chaotic), meteorites belong to the finder or perhaps landowner or renter. If you

find one, keep it and dispose of it as you wish; they are worth real money.

George heard of the video tapes. CCN had one from Raleigh, North Carolina. Washington Metro News 4 WRC had one from someone in Virginia near the Potomac who was out partying with friends (one of the few nonfootball videos). The longest duration track, around 30 seconds, was from Johnstown Pennsylvania. George said that he started to collect videos to compute the orbit because he came to the conclusion that, if he didn't do it, perhaps no one else would. He collected fifteen videos with some of the fireballs of which seven videos proved to be good for astrometric orbit determination. This is one of the few meteorites that has struck the earth that we now actually have an orbit back out into space. It became visible at an altitude of 80 kilometers above the earth.

George Wetherill is a geophysicist and planetary scientist whose publication list, excluding abstracts, book reviews, and other minor publications, is itself 15 pages long and

contains more than 165 entries. He is a member of the National Academy of Sciences and has won numerous honors from many learned societies. He is a member, and in fact a fellow, in many societies including the American Geophysical Union, Meteoritical Society, Geochemical Society, International Astronomical Union, American Astronomical Society. He has also been an officer in most of these societies at some time. He has been associate editor or editor of the *Journal of Geophysical Research*, *Annual Review of Earth and Planetary Science*, *Meteoritics*, and *Icarus*. He has been an advisor to NASA, NSF, NAS, NRC, and other numerous organizations on committees and panels. His employment and professional experience stretch from Radar Technician in the U.S. Navy during the Second World War to staff member at DTM several times and director of DTM. He was a faculty member and chairman of departments at UCLA. He was a visiting professor at Cal Tech. All of his higher education degrees are from the University of Chicago in

See WETHERILL, Page 6

October Calendar

The Public is Welcome!

Saturday, October 1, 1994, 5:30 PM - Dinner with the speaker at the Athenian Plaka Restaraunt (7833 Woodmont, Bethesda) before the monthly meeting. Reservations are for 5:30PM sharp.

Saturday, October 1, Night - October's best night for for dark-sky observing and "absorbing" ("Moon-dark" paractically all night long). So my firends, crawl out of thine cocooning hovels, flee the glowing fungoid mass of urbania, and get thee to the night country, where thou can personally experience planet Earth for what she truly is: a precious ark of life, plying the wine-dark sea ofSpace. To encouraging you, several relatively light-pollution-free sities are available for NCA members's use. Information: Daniel Costanzo, 703/841-4765.

Mondasys, October 3, 10, 17, 24, and 31, at 7:30 PM - Public nights at U.S. Naval Observatory (USNO), in Northwest Washington, D.C. (off Massachusetts Avenue). Includes orientation program on USNO's mission, viewing of operating atomic clocks, and glimpse through the finest optical telescopes in the Washington-Baltimore region. Information: USNO Public Affairs Office, 202/653-1541.

Tuesdays, October 4, 11, 18, and 25, at 7:30 PM - Telescope making classes at Chevy Chase Community Center, Connecticut Avenue and McKinley Street, NW. Information: Jerry Schnall, 202/362-8872.

Wednesday, October 5 - "Sky Watch" column by Blaine P. Friedlander, Jr. appears in *The Washington Post* "Style" section. It lists many other events for the month.

Thursday, Friday, and Saturday, October 6, 7, and 8, Early Evening Twighlight - Moon at her conveniently beautiful best as a thin waxing crescent, bathed in Earthshine, gracing the early evening twighlight sky: "the old Moon in the young Moon's arms." You can enjoy this spectacle even from the light-polluted heart of urbania. So, go outside, take a look, and celebrate the beginning of a new "moonth" (a new lunation).

Fridays, October 6, 13, 20, and 27, at 7:30 PM - Telescope making classes at American University,

McKinley Hall Basement. Information: Jerry Schnall, 202/362-8872.

Friday, October 7, 1994, 11:30 PM - Earth Night 1994: "The Autumn Sky, Nocturnal Nature, and Fall Foliage." Smithsonian Resident Associate Program (SRAP), Overnight Studay Tour (SRAP Code: 525-723), at Shennandoah National Park's Big Meadows on Virginia's Skyline Drive. If postponed due to bad weather, alternative date is following Friday, October 14, same time. Information and cost: 202/357-3030. (See article in *Star Dust*, 1993, September, p. 4.)

Friday, October 7, 1994 - Open House at Hopewell Observatory. See the boxed item on page six for more details and directions.

Saturday, October 8, 1994 9:00 PM - "Exploring the Sky" telescope viewing at the open field in Rock Creek Park nearest to the Nature Center. NCA members please bring telescopes. For more information, call John Lohman, 703/820-4194

Thursdays, October 13, 20, 27 and Number 3, 1994, 7:00 PM - Daniel Costanzo (NCA), "Astronomy O!O!O!: Life, The Universe & Everything (In Between)." A four week adult education course at Arlington Planetarium. Information and cost: 703/358-7200.

Saturday, October 14, 1994 9:00 PM - Open nights with NCA's Celestron 14-inch (0.36 meter) telescope at Ridgeview Observatory, south of Alexandria at 6007 Ridgeview Drive (off Franconia Road between Telegraph Road and Rose Hill Drive). Information: Bob Bolster at 703/960-9126.

Thursday, October 15, 1994 - Next deadline for all submissions to November *Star Dust*. Send to Gary & Alisa Joaquin, Editors at 7821 Winona Ct., Annandale, VA, 22003, or send an ASCII file via E-Mail at 71561.1747 @compuserve.com or fax to 703/658-2233.

Saturday, October 29, 1994, Night - October's second best night for dark-sky observing and "absorbing" ("Moon-dark" until around Midnight). See October 1 listing.

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Wednesday, November 2, 1994 - "Sky Watch" column by Blaine P. Friedlander, Jr. appears in *The Washington Post* "Style" section. It lists many other events for the month.

Saturday, November 5, 1994, 11:00 AM to 4:00 PM - The NCA and the Smithsonian Institution's National Air and Space Museum (NASM) present "Binoculars! Telescopes! Astronomy!: A Free Consumer Presentation." NASM, Briefing Room (see accompanying article).

Saturday, November 5, 1994—The November NCA meeting will feature Carol Ann Grady speaking about "The Beta Pictoris Phenomenon in Herbig Ae/Be and A-shell Stars."

Saturday, November 5, 1994 - November's best night for dark-sky observing and "absorbing" ("Moon-dark" practically all night long). See October 1 listing.

Saturday, Sunday, and Monday, November 5, 6, and 7, 1994, Early Evening Twilight - Moon at her conveniently beautiful best. See October 6, 7, and 8 listing.

Other events, objects, and phenomena too numerous to mention here are listed in the publications *Sky & Telescope*, the *Astronomical Calendar 1994*, and the *Observer's Handbook 1994*, plus numerous software packages. NCA members can purchase all these at a discount. To join NCA, use membership application on page seven.

The Comet, Shoemaker-Levy 9, Strikes Jupiter

Reviewed by Harold Alden Williams

On Saturday September 10, 1994 at the National Institutes of Health (NIH), Rob Landis of the Space Telescope Science Institute (STScI) spoke on the Comet Shoemaker-Levy 9's Striking Jupiter. Rob first told us a little about his Hubble Space Telescope (HST) work experience. When he first arrived in 1992 at the STScI his primary responsibilities were in the Science Planning Branch in the near-term planning schedule of HST Observations. Following the highly successful servicing mission, he was transferred to the Moving Targets (planets, asteroids, comets, and satellites of planets) Group in time to prepare for the HST Jupiter comet collision campaign. He explained how observing a moving target (one that does not stand still with respect to the fixed stars) is different from observing stars and galaxies when one can use the guide stars in the pickle-shaped off-axis Fine Guidance Sensor. He pointed out the efficiency problems of observations that are not near the poles of the telescope's orbit around the earth, because the earth occults

the view about half of the time. The situation is further complicated by the telescopes' not being able to look too near the Sun, Moon, and Earth. The telescope is orbiting Earth every 90 minutes, so not only is pointing complicated but so is the data path that takes the information from the telescope to STScI in Baltimore. Landis was recently transferred into the newly created special projects of the Public Outreach Office at STScI.

He showed us a few photographs (before and after) demonstrating the successful repair of the Hubble and mentioned *Newsweek* and *Time* hounding STScI for photos of the repair mission, which when successful was eclipsed on the cover by articles about Tanya Harding and Nancy Kerrigan — scandal evidently sells more magazines than successful space missions. Then he listed the six principal investigators of the comet collision who were given 114 orbits to observe the comet (that amounts to 7.125 days of observation, according to my calculation). Hal Weaver was the leader

of the entire campaign as well as being one of the six principal investigators, whom all also had many co-investigators. Hal Weaver was also Rob's branch chief when he was with moving targets. With Hubble's spherical aberration problem before repair, bright moving targetlike planets needed fewer extensive spherical aberration deconvolutions because of their high signal-to-noise ratio. The importance of the moving targets group increased, even though originally Hubble could not look at moving targets. It soon was used to for planetary science that would not have been done without the mirror problem.

The comet was photographically discovered on March 24, 1993, by the team of Carolyn and Gene Shoemaker and David Levy with the 0.46-meter Schmidt telescope at Mt. Palomar. On the original image it appeared "squashed." Subsequent confirmation photographs at a larger scale taken by Jim Scotti with the Spacewatch telescope on Kitt Peak

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COMET, from Page 3

showed that the comet was split into many separate fragments. The discovery of this comet was a serendipitous product of the Shoemakers' long term search for Apollo objects (near-Earth objects). Fortunately, for us, this object is not an Apollo object. In late May, 1993, it was apparent that this object was going to hit a planet, Jupiter. In fact, retrospective orbital solutions indicated that this comet was tidally disrupted by Jupiter's gravity on July 8, 1992, when it passed well within Jupiter's Roche limit and only 21,000 kilometers from Jupiter's surface; less than a third of a Jovian radius. It is thought that this comet had orbited Jupiter for a few decades, having been captured at some point in the past. Its very eccentric orbit took it one third of an astronomical unit away from Jupiter every two years. The fragments, which were spread out in a rough line three Earth—Moon distances would strike the back side (the side not facing the sun and the Earth) at the same approximate latitude on Jupiter from July 16

until July 22. Until the impacts started, there was major uncertainty as to whether any visible marks would be made in the cloud tops of Jupiter. The uncertainty was caused by the fact that even the Hubble Space Telescope could not resolve the solid nuclei of the comet but could see only the diffuse debris trail (the coma) around the nuclei. The uncertainty in size was at least a factor of one hundred. Further concern of one factor of around 5 were caused by not knowing the comet's density or real composition. As most of us now know, the comet turned out to be on the upper end of everybody's expectations and it put on a proper show to commemorate the twenty-fifth anniversary of the Apollo moonlanding by humankind. Rob even showed us one slide with real physics (equations) relating the energy of the collision to the density and size of the comet

Rob majored as an undergraduate in physics at Michigan State University, but it was a visit to Abrams Planetarium when he was five that first got him excited about learning

science. He was also a planetarium specialist at Abrams Planetarium for a number of years (when he was much older than five) and is currently writing a planetarium program with the Carnegie Science Center in Pittsburgh, titled "Through the Eyes of Hubble."

As for the beautiful slides, transparencies, and video he showed us (if you weren't at the meeting you will have to wait for the slides to be made available), go to the planetarium that is featuring the show, or download them yourself over the Internet. He not only showed us pictures from Hubble, but also from the Keck telescope in Hawaii and from other observatories around the world. I myself have downloaded more than 40 images from ftp.stsci.edu.

As usual we are indebted to NIH and to NCA member Jay Miller for arranging to meet at NIH, where he works, and double indebted because of the use of the nice Lippsett Amphitheater room necessary for good video projection.

Capital Science Lectures 1994 — 1995

Each year, the Carnegie Institution of Washington invites eight distinguished scientists to speak about new developments in their fields to general audiences. These illustrated presentations are free and open to the public.

Tuesday, October 18, 1994, 6:30 PM
Dean Hamer - "Genes and Human Sexuality"

Tuesday, November 15, 1994, 6:30 PM
Thomas R. Cech - "RNA Catalysis and the Origins of Life"

Tuesday, December 13, 1994, 6:30 PM
Eugene Shoemaker - "When Comets Meet Planets"

Tuesday, January 31, 1995, 6:30 PM
Michael Robinson - "The Joy of Bology: A Life of Research into Animal Behavior"

Tuesday, February 28, 1995, 6:30 PM
Roald Sagdeev - "Chaos in Real Systems: The Limits of Predictability and Control"

Tuesday, March 28, 1995, 6:30 PM
Haresh C. Shah - "Earthquake Risk Management—A Global Perspective"

Tuesday, April 18, 1995, 6:30 PM
Virgil L. Sharpton - "Large Body Impacts in The History of Earth"

Tuesday, May 16, 1995, 6:30 PM
Wendy Freeman - "Measuring the Expansion of the Universe"

For more information on the 1994-95 Capital Science Lectures or on the Carnegie Institution of Washington, call Ms. Sherrill Berger, 202/265-2752. To optain tickets by mail, call 202/328-6988.

“Binoculars! Telescopes! Astronomy!: A Free Consumer Presentation” — NCA Volunteers Needed

by Daniel J. Costanzo

NCA Public Relations Officer (PRO)

Purchasing a pair of binoculars or a telescope for astronomical use is just like any other product: let the buyer beware. Advertisements promise the Universe, but barely deliver the Moon. A “bargain” is just as risky as any other “great deal”, but with proper selection, use, and care, astronomical instruments can provide a lifetime of service and enjoyment.

Yet, before every Christmas, NCA inevitably receives numerous inquiries from the public about choosing astronomical instruments for gifts. In addition, after every Christmas, NCA receives more inquiries about use and care of instruments received as gifts. Unfortunately, not everyone knows of NCA’s free expert help. Sadly, much of this otherwise fine (and not so fine) equipment ends up in the proverbial attic or trash heap, souring more citizens to ever personally experiencing the wonders of the Universe. Ultimately, this could translate into curtailment of already tenuous taxpayer support for space technology, astronomy, and related sciences. If only NCA could have caught them in time.

In an attempt to break this tragic cycle, several years ago NCA’s Robert H. McCracken started annual free public presentations timed for early in the Christmas buying season. Now, after a two year hiatus, NCA has arranged with the Smithsonian Institution’s National Air and Space Museum (NASM) to hold this presentation on Saturday, November 5, from 11:00 a.m. to 4:00 p.m. Continuing the long tradition of these presentations, NCA’s experts will provide guidance, dispel myths, and equip the uninitiated to wisely choose, use, and care for

binoculars and telescopes. After a basic discussion and demonstration, they will offer hands-on experience with representative types of optical equipment.

This year’s presentation will be held in NASM’s Briefing Room located on their lowest floor. To reach it, first enter NASM’s Main Hall, from either entrance. Next, go to the information/security desk and take the “down” escalator located right behind this desk. The Briefing Room is at the bottom of the escalator. The presentation starts shortly after NASM’s “Monthly Sky Lecture” ends. No reservations are necessary. Nor is it necessary to arrive by 11:00 AM. Just show up any time between 11:00 a.m. and 4:00 pm.

For more information about attending, contact **Cheryl Bauer (NASM) at 202/357-1529**. Please tell friends, colleagues, and neighbors about it. For only through maximum publicity will NCA reach the largest audience.

This presentation is a great opportunity for NCA to continue our fruitful relationship with NASM in joint service to science and society. NASM’s assistance in allowing NCA to hold this event in the

planet’s most popular museum is a great honor. Yet, for this presentation to be a success, we need NCA volunteers with interest, expertise, and/or sample astronomical instruments. All types of sample telescopes and binoculars are needed, plus sample accessories, atlases, books, periodicals, and catalogs. Those who want to bring portable computers for demonstrating appropriate software are also welcome. NASM can arrange free parking in their basement lot for any volunteers. The presentation ends early enough to allow NCA members plenty of time to attend that evening’s monthly NCA dinner and meeting.

To volunteer, please contact **Daniel Costanzo (NCA) at 703/841-4765**. Your assistance will be greatly appreciated by NCA, NASM, and the public at large. Your help is needed now more than ever. Besides gaining new NCA members, your time and effort may even inspire a future Nobel Prize winner. NCA already helped at least one young scientist reach that goal - Walter Gilbert, co-winner of the 1980 Nobel Prize in Chemistry, started out as an NCA Junior member. It can happen, thanks to NCA.

Montgomery College’s Public Planetarium

Exciting public planetarium programs are offered at Takoma Park’s own planetarium. Astronomy is one of the few sciences accessible to any inquiring mind. All programs begin at 7:00 p.m. There is no admission charge.

Saturday, October 22, 1994 — “Splendors of Star Formation.”

The planetarium is located on Fenton Street on the Takoma Park campus of Montgomery College. It is attached to the Science South building on the ground level and has a conspicuous silver-colored domed roof.

physics except his first one, a Ph.B. in general studies. His writing is so outstanding that it has been included in literature anthology collections. His lectures are extremely engaging. His use of poetry in his writing is well known. His *Who's Who in America* sketch ends with "Seek him that maketh the Pleiades and Orion, and turneth the shadow of death into morning" (Amos 5:8).

His interest in science predates the sixth grade, but his specific interest in meteorites, a reoccurring theme throughout his life, dates to Elise Olivier, a pretty sixth-grade girl. Elise's father was Charles P. Olivier, who wrote the only book on meteors worth reading from Schiaparelli's nineteenth century until 1923. George wanted to impress Elise so he bought the professor's book at a remaindered sale. He attempted to converse with Elise about her father's book, but she was not very interested in the book or George. She did tell her father about a nerdy boy in her class that had read his book, whereupon the professor called George up and gave him a list of all of the mistakes and revisions in the book. George told me that this taught him a useful lesson: that professors make mistakes, too.

Important Numbers For Information

Smithsonian Sky Watchers' Report

Non-technical information recording on astronomical events, objects, and phenomena in the Washington, D.C. region's sky. Updated weekly. 202/357-2000

Sky & Telescope's "Skyline"

Moderately technical information recording on latest in space technology, astronomy, and related sciences. Updated weekly, or sooner if necessary. 617/497-4168

McDonald Observatory's "Star Date"

Non-technical information on space technology, astronomy, and related subjects. Broadcast weeknights, around 8:00 PM, by listener-supported public radio station WAMU FM 88.5

U.S. Navel Observatory's Time Service

Accurate Eastern Time (in 24 hour mode) and Universal Time given every few seconds. Excellent for synchronizing clocks and watches. 202/653-1800

NOAA "Space Weather" Indices

Highly technical, but quite useful recording on Solar activity and its effect on Planet Earth. From the National Oceanic and Atmospheric Administration (NOAA). Updated every three hours. 303/497-3235 (anytime) or WWV at 2.5, 5, 10, 15, and 20 MHz (18 minutes after every hour)

Weather, Sunrise/Sunset, & UV Index

Recording of latest weather forecast out to five days, plus Sunrise/Sunset times, and forecasted Solar ultraviolet radiation index. Covers Washington, DC and vicinity.

Hopewell Observatory Open House

NCA members, families, and guests are invited to the autumn open house at Hopewell Observatory on Friday evening / Saturday morning October 7/8 to observe the autumn sky, numerous Messier objects, and Saturn. Sunset will be at 18:44, astronomical twilight ends at 20:13, and the Moon sets at 20:32. If you wish, come any time after 6:00 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 Road and turn left onto 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. For further information call (703) 960-9126 or (301) 320-3621.

National Capital Astronomers, Inc.

Serving Science & Society Since 1937

NCA is a non-profit, membership supported, 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 (WAS). All are welcome to join NCA. For information, call NCA: (301) 320-3621.

SERVICES AND 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. Expeditions include observation of occultations and eclipses, plus discovery results on asteroids and variation in the Solar radius. Locally, NCA volunteers assist at international scientific conferences, judge science fairs, and interpret astronomy and related subjects during public programs.

Discussion Groups exchange information, ideas, and questions on preselected topics, moderated by a 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 sciences from the public, the media, and other organizations.

Consumer Presentations on selection, use, and care of binoculars and telescopes, provide myth-breaking information, guidance, and demonstrations for those contemplating acquiring their first optical instrument for observation.

Dark-Sky Protection efforts educate society at large about the serious environmental threat of light pollution, plus seek ways and means of light pollution avoidance and abatement. NCA is an organizational member of the International Dark-Sky Association (IDA), and the National Capital region's IDA representative.

Classes teach about subjects ranging from basic astronomy to hand-making a fine astronomical telescope. NCA's instructors also train educators in how to better teach astronomy and related subjects.

Tours travel to dark-sky sites, observatories, laboratories, museums, and other points of interest around the National Capital region, the Nation, and the World.

Discounts are available to members on many publications, products, and services, including *Sky & Telescope* magazine.

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

NCA Juniors Program fosters children and young adults interested in space technology, astronomy, and related sciences through discounted membership rates, mentorship from dedicated members, and NCA's annual Science Fair Awards.

Fine Quality Telescopes up to 14-inch (36-cm) aperture are available free for member's use. NCA also has access to several relatively light-pollution-free sites in Maryland and Virginia.

PLEASE ENROLL ME IN NATIONAL CAPITAL ASTRONOMERS MEMBERSHIP

Regular

Sky & Telescope and *Star Dust*. (\$46 per year)

Star Dust only (\$24 per year)

Junior (Only open to those under age 18) Date of birth: _____

Junior members pay a reduced rate.

Sky & Telescope and *Star Dust*. (\$32 per year)

Star Dust only (\$10 per year)

First name Middle Last name Telephone

Street or Box Apartment City State Zip

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 mailing label. You may renew this subscription through NCA for \$22 when it expires.

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

NCA c/o Jeffrey Norman Apt. 717, 5410 Connecticut Avenue, NW, Washington, D.C. 20015.

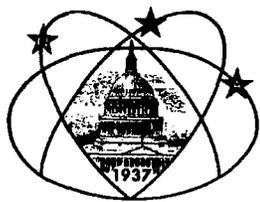
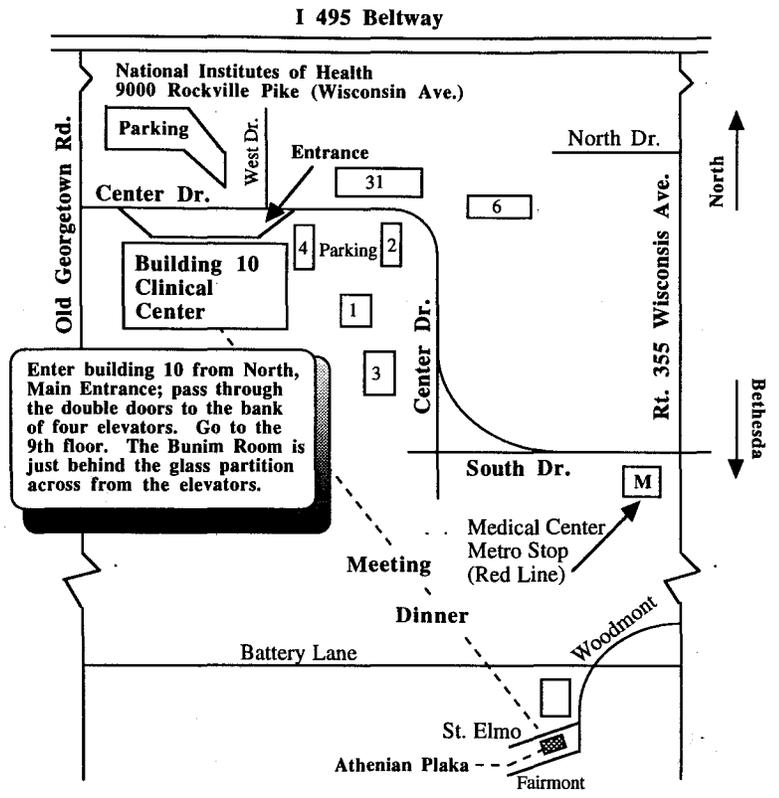
The following information is optional. Please indicate briefly any special interests, skills, vocation, education, experience, or other resources which you might contribute to NCA. Thank you, and welcome to NCA!

Getting to the NCA Monthly Meeting

Subway Riders - 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 (7:16 PM) and NIH (7:23 PM) Metro stops with Building 10 (7:25 PM).

Athenian Plaka - Take Wisconsin Avenue toward Bethesda and bear right onto Woodmont (or take the next right onto Battery Lane). Follow Woodmont to St. Elmo (3 blocks south of Battery) and look for the restaurant on your left (between St. Elmo and Fairmont, address 7833 Woodmont). Parking may be found on Woodmont and in a local parking lot (the restaurant claims free parking). Seats are not guaranteed after 5:30.

Stardust is published ten times yearly (September - June) by National Capital Astronomers, Inc. (NCA), a non-profit, member supported public-service corporation dedicated to advancing space technology, astronomy, and related sciences through lectures, expeditions, participation, and information, via research, lectures, presentations, publications, expeditions, tours, public interpretation, and education. Deadline for *Stardust* is the 15th of the preceding month. Editors Alisa & Gary Joaquin, 7821 Winona Ct., Annandale, VA 22003, 703/750-1636/71561.1747 @compuserve.com. NCA's Phone Number is 301/320-3621.



National Capital Astronomers, Inc.

If undeliverable return to
 NCA c/o Leith Holloway, Suite #M-10
 10500 Rockville Pike
 Rockville, MD 20852-3331



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DR. WAYNE H WARREN, JR
 8001 BRETT PLACE
 GREENBELT MD 20770-3001