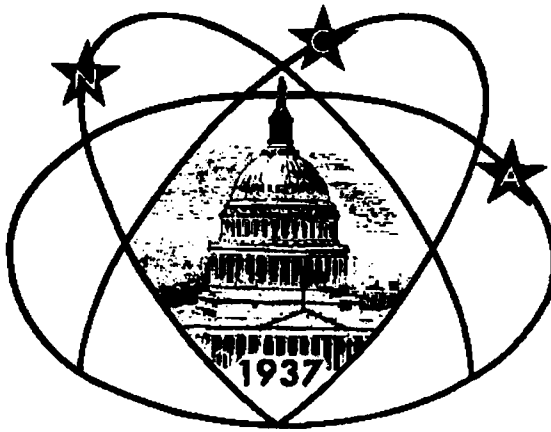


Star



Dust

National Capital Astronomers, Inc.

Phone: 301/320-3621

Volume 54, Number 4

December, 1995

ISSN 0898-7548

Understanding Active Galaxies Through Observations of Their Ionized Gas

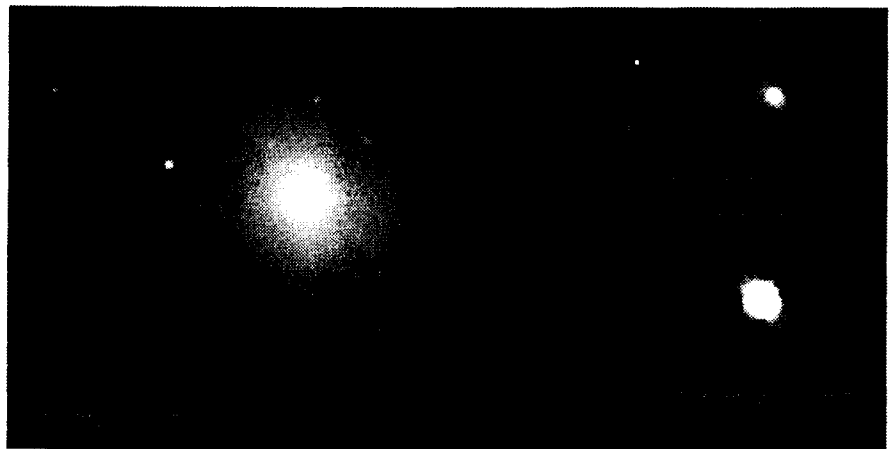
by Harold Williams

The next meeting of the National Capital Astronomers will be held, Saturday December 2 at 7:30 P.M. in the Lipsett Amphitheater of the Clinical Center (Building 10) at the National Institutes of Health (NIH). Richard Gelderman, a National Research Council National Aeronautics and Space Administration (NASA) Research Fellow at Goddard Space Flight Center (GSFC) will speak on "Understanding Active Galaxies Through Observations of their Ionized Gas," a research interest of his. Active Galaxies share many properties. Quasars, blazars, Seyfert galaxies, and radio galaxies are now collectively called active galaxies. Since the bright energy sources that powers these objects is located at the centers of the galaxies astronomers say that these galaxies possess active galactic nuclei (AGN). Kirchhoff in the early 1860's formulated three important laws about the causes and types of spectra. **Law 1:** A hot opaque object, such as a hot dense gas, liquid, or solid produces a continuous thermal spectrum—a complete rainbow of colors without any spectral lines. **Law 2:** A hot, transparent gas produces an emission line spectrum—a series of bright spectral lines against a dark background—the spectra is unique to the gas doing the emission. **Law 3:** A cool, transparent gas in front of a source of a continuous spectrum produces an absorption line spectrum—a series of dark spectral lines among the colors of the

continuous spectrum—stars produce such spectra. Highly ionized rarefied gas heated to a few ten of thousands of degrees produces an emission spectra. The speaker sent the following abstract of his talk: "In our Galaxy there are many famous nebulae which shine primarily due to optical line emission arising from ionized gas at a few tens of

thousand degrees Kelvin. In active galaxies, emission lines can play an even larger role. Gas can be ionized by hot stars associated with bursts of star formation, by being impacted by fast moving shock fronts, and by X-ray and UV photons powered by the active nucleus. Much of what we know about AGN is

See *GALAXIES*, on page 4



- A) Close-up of the nucleus of the Andromeda Galaxy (M31) reveals a point-like core ($83^\circ 5.7$ arcmin.). Note also the surrounding globular clusters. This appearance is familiar to visual observers, but is rarely seen in photographs (where the nucleus is usually over exposed). Image was logarithmically scaled and false color (seen in b/w) used to extend the dynamic range.
- B) Details very near the core are visible, particularly 3 spiral dust lanes. Modest amount of unsharp masking applied to logarithmically scaled image.
- C) 2x enlargement of core emphasizes inner dust lanes. Non-logarithmically scaled image with strong unsharp masking.

All images are from a single 5 minute exposure with ST-7 CCD (binned 2 x 2) on a C-11 in poor-to-moderate seeing—Image from Stan Moore.

(Downloaded from Compuserve's Astronomy Forum under CCD Images.)

Calendar of Monthly Events

The Public is Welcome!

Fridays, December 1, 8, 15, 22, and 29, 7:00-9:30 PM-Mirror-making classes with Jerry Schnall in the basement of McKinley Hall at American University off Nebraska Avenue, NW in Washington. Information: 202/362-8872. See article on page 4.

Fridays, December 1, 8, 15, and 29, 8:30 PM-Open nights with NCA's Celestron-14 telescope at Ridgeview Observatory; near Alexandria, Virginia; 6007 Ridgeview Drive (off Franconia Road between Telegraph Road and Rose Hill Drive).

Saturday, December 2, 5:30 PM-Dinner with the speaker, Richard Gelderman, at The Jade Palace, 7708 Woodmont, Bethesda, Maryland, before the monthly meeting. Reservations are for 5:30 PM sharp. See the map on the back page of this issue for directions.

Saturday, December 2, 7:30 PM-The December NCA meeting will feature Richard Gelderman speaking on "Understanding Active Galaxies Through Observations of their Ionized Gas." Meeting will take place at the National Institutes of Health in the Lipsett Amphitheater, Room 1c114 in the Clinical Center (Building 10). See back page for directions.

Mondays, December 4, 11, and 18, 8:30 PM-Public nights at the U.S. Naval Observatory (USNO), in Northwest Washington, D.C. (off Massachusetts Avenue). Includes orientation on USNO's mission, viewing of operating atomic clocks, and glimpses through the finest optical telescopes in the National Capital region. Information: USNO Public Affairs Office, 202/653-1541.

Tuesdays, December 5, 12, 19, and 26, 7:00-9:30 PM-Mirror-making classes with Jerry Schnall at the Chevy Chase Community Center at Connecticut Avenue and McKinley Street, NW in Washington. Information: 202/362-8872. See article on page 4

Wednesday, December 6-November "Sky Watch" column appears in *The Washington Post* "Style" section. It lists many other events for that month.

Saturday, December 9, 7:30 PM-NCA presents "Exploring the Sky", in Rock Creek Park at Military and Glover roads, NW. Information: Rock Creek Nature Center, 202/426-6829; Joe Morris (NCA), 703/620-0996. See March 1995 issue, page 4.

Saturday, December 13, Before Moonrise (Best)-Geminid meteor shower peak. Requires only unaided eyes for observing. See article in December *Sky & Telescope*, and "Meteors" section of the *Astronomical Calendar 1995*.

Saturday, December 16, Night-Waning crescent Moon provides this month's *second longest* Saturday night "deep night" period, including completely Moonless skies from dusk through Midnight EST. See explanation below.

Saturday, December 23, Night-Waxing crescent Moon provides this month's *longest* Saturday night "deep night" period. Deep night begins after Moonset very early Saturday night, and continues for rest of night. See explanation below.

Wednesday, January 3-January "Sky Watch" column appears in *The Washington Post* "Style" section. It lists many events for that month.

Saturday, January 6, 7:30 PM-The January NCA meeting will feature various NCA members speaking and demonstrating "NCA and Astronomy on the World Wide Web."

Saturday "deep night" periods-listed above for this month are continuous time intervals, of three or more hours duration, with neither daylight, twilight, nor Moonlight, that start on Saturday night before Midnight EST. They occur on two to three Saturday nights each month, and represent, for many, the most convenient times to experience the dark sky. Several relatively dark-sky sites are available for NCA members' use in Maryland, Virginia, and West Virginia. Information: Daniel Costanzo, 703/841-4765. This deep night listing was prepared by Daniel Costanzo from data generated by Jay Miller using MICA, the Multiyear Interactive Computer Almanac, created by the U.S. Naval Observatory.

Other events too numerous to mention here are listed in the publications *Sky & Telescope*, the *Astronomical Calendar 1995*, the *Observer's Handbook 1995*, and in numerous software packages. NCA members can purchase all these at a discount. To join NCA, use membership application on page 9.

The Winds of Other Words

Review by Harold Williams

Jeff Goldstein started last month's presentation to NCA by telling us a little history of the Smithsonian Institution, and then he described the division within the NASM, the Laboratory for Astrophysics, of which he is acting chairman. All of the scientists in Jeff's division are infrared spectroscopists, experimentalists. Jeff told us that working for the NASM he often feels like a kid in a candy store. Besides his infrared spectroscopic research in the winds of other planets Jeff is involved in programs within the museum like learning as a family experience and is part of a gallery development team. He told us about a new exciting IMAX film which would be Powers of Ten, but besides exploring space or distance, like the famous Charles and Ray Eames film of the same name, this film would explore powers of ten in time as well going all the way to the Big Bang and the beginning of time itself.

After this he launched into the main event of what it was like to measure the winds on other worlds and how one went about doing it. Winds in the atmosphere of Titian, a moon of Saturn that has a fairly dense atmosphere, can be measured to within 2 miles/hr on an object the Earth that is typically moving either toward or away from Titian at 8 km/sec. This is done with an infrared laser whose cavity and Lamb dip cell he brought with him to show us after the meeting in a show and tell with pieces from a partially completed new instrument under construction. The glass blowing was done by hand by highly skilled crafts-

men at the Goddard Space Flight Center (GSFC). Jeff also told us how unpleasant altitude sickness made you feel atop Mauna Kea, where you were struck by the beauty—a rock (the mountain) floating in the sky beneath you—excited by the science you were doing, but limited by the lack of oxygen. Of course, the absence of water vapor at this altitude and above make infrared observing possible since water vapor absorbs in the infrared.

Jeff set the importance of this work in terms of global circulation models of Earth and other worlds. Global circulation models of planetary atmospheres are run on supercomputers. Because the conditions are different on other worlds, but the physics is the same, comparative planetology of planetary atmospheres allows us to test these global circulation models. Venus for instance has no seasons, no life (no oxygen in the atmosphere produced by living plants), and no rapid variation in days—since its rotation period is longer than is revolution about the sun—so the changes that this makes in global circulation can be tested by observing the winds of Venus. Jeff and collaborators have used similar infrared lasers to measure the winds of Venus, but that time they used the McMath solar telescope which he showed us pictures of.

Jeff then led us in an exploration of centripetal and centrifugal forces and frames of reference. He helped us understand the Coriolis effect and the prevailing winds on planets. He did an interesting trick with the overhead that

can not be reproduced in a review. Nancy Roman ask him how the number of circulation cells in a planet were determined? Jeff answered that was a complicated matter of heating and cooling and global circulation models. But this is precisely what Jeff can often measure, how many circulation cells a planet has. Jeff also informed us that the scale length of water draining from a toilet or bath tub on the earth was really too small to observe the Coriolis effect. This I suppose is an example of people fitting their observations to the results that they expect.

The number of cells on a planet like Mars actually changes between Mar's Vernal Equinox and its Summer Solstice. Many questions remain unanswered about the circulation of the winds of worlds, but these techniques are capable of answering them.

Astronomical Calendar

The "Astronomical Calendar" for 1996, is available for \$19.95. If you wish to order a copy, please inform Wayne Warren (NCA President). The price of the calendar goes down to \$15.95 when four or more are ordered. For more information: 301/474-0814

NCA Web Site

NCA is in the process of establishing a site on the World Wide Web. Watch this space. For more information, contact Harold Williams (NCA Vice President). 231/650-1463

Asteroidal Occultation Possibilities

Date	Day	EST	Star	Mag	Asteroid	dmag	dur.	Location (uncertain)
Dec 6	Wed	0:51	SAO 96355	9.2	Hilda	4.9	13s	Southeastern US
Dec 9	Sat	19:42	SAO 111235	8.5	Io	3.1	17s	PA., Northwest MD
Dec 21	Thu	2:09	SAO 58665	9.0	Amphitrite	0.7	21s	New England
Dec 23	Sat	1:52	PPM 120763	10.0	Campania	2.4	9s	Pennsylvania

The event on December 9th is by the asteroid (85) Io, not the Galilean satellite. Finder charts are given on p. 70 of the December issue of *Sky & Telescope*. There are no favorable grazing occultations in the region during December. For more information and for joining the expedition(s), call David Dunham at 301/474-4722 or 953-5609. His E-mail is David-Dumhan@jhuapl.edu. Occultation recorded message: 301/474-4945

A Whole New Solar System

Radio signals from a dying star in the constellation Virgo led Pennsylvania State Professor of Astronomy Alexander Wolszczan to discover the first planets ever known outside the Solar System. He discovered the planets in 1991 orbiting the pulsar PSR-1257+12. He later confirmed their existence in 1994.

Wolszczan used the World's largest radio telescope, the Arecibo telescope in Puerto Rico, to time the radio signals coming from a distant tiny star in the constellation Virgo 1,300 light-years from the Sun. These measurements helped him to determine that two of the planets are similar in mass to the Earth and the other is almost the mass of the Moon.

Until Wolszczan's discovery, the only known planets were in the Solar System we call home. His work suggests that planets may be more common in the Universe than astronomers had previously thought. It also will help astronomers understand how planets, including Earth, are formed.

The planets Wolszczan found probably don't support life because the tiny star they orbit gives off no light or heat but bombards them with deadly radiation. However, his discovery increases the chances that somewhere in the Universe planets may exist that, like Earth, can support life.

GALAXIES, from page 1

due to observations of emission lines, from measuring redshifts to a picture of the parsec scale "broad line region" near the center of the activity. I will discuss some of the history of our understanding of gaseous nebulae and a few of the interesting projects that are underway today."

I was introduced to Richard Gelderman by a Goddard employee whose children came to one of my grade-specific planetarium programs. I asked him if he knew of anyone who was interested in star formation and he told me about a weekly seminar that Richard Gelderman ran at GSFC. I called Richard and he invited me to attend the seminars on Monday at noon. After attending several he ask me to

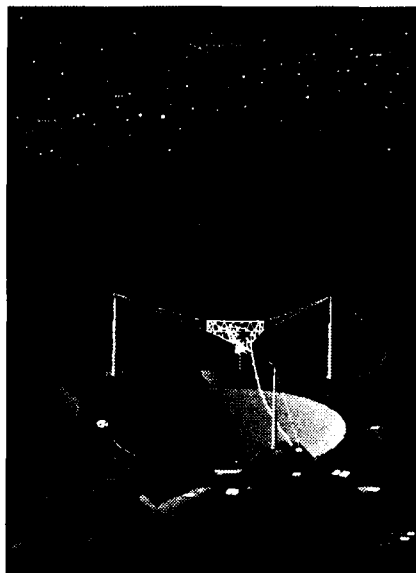


Figure 1, Location of new Solar System in Virgo with the Arecibo radio telescope in foreground

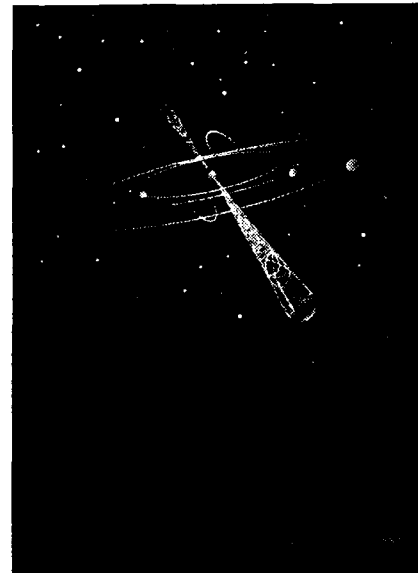


Figure 3, Hypothetical artistic view of the pulsar in all its splendor (seen here is black & white).

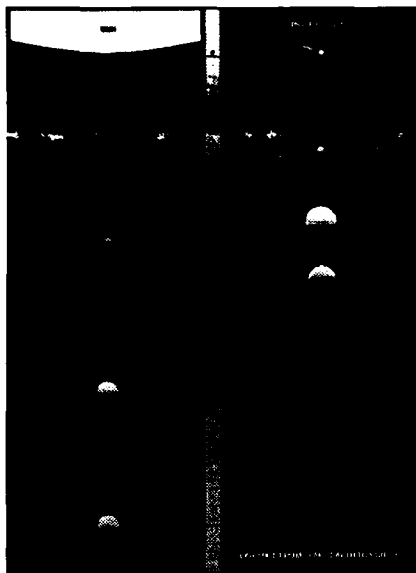


Figure 2, The new solar system and its relative size to the Inner Solar System of the Sun.

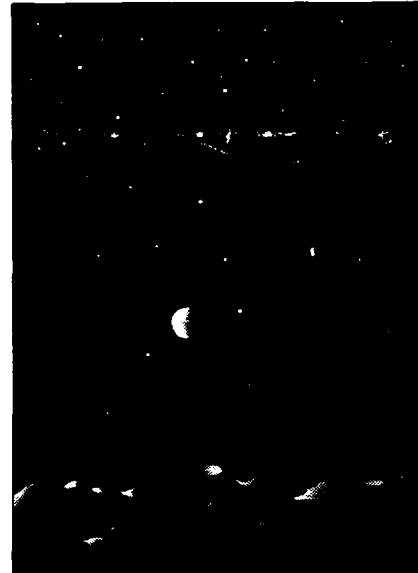


Figure 4, The view from a fictional fourth planet. Who knows, maybe there are more.

speak on star formation. This is what Richard had to say about himself:

"Richard Gelderman had to take scores of undergraduate and graduate astrophysics courses and supervise years of college astronomy night labs before he caught up with his father's self-taught astronomical knowledge. In the mean-

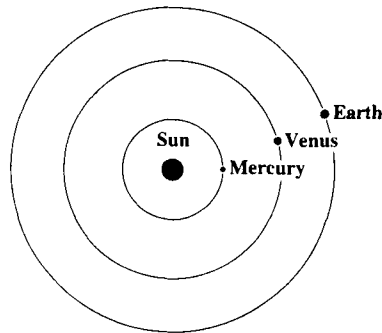
time, Richard was granted a B.S. in Physics from Virginia Tech and a Masters and a Doctorate from the University of Virginia. He is finishing up a National Research Council NASA Research Fellow at Goddard and will be taking up a faculty position at Western Kentucky University in Bowling Green, Kentucky."

Another Whole New Solar System

Reported October 20 on *Sky & Telescope* magazine's telephone information service "Skyline" (Phone: 617/497-4168—ed).

Astronomers are now fairly certain that a planet is orbiting 51 Pegasi, a Sun-like, main-sequence star of spectral type G5 situated 42 light-years from Earth. Several observers have confirmed an announcement made by Michel Mayor and Didier Queloz of Geneva Observatory two weeks ago. They found that absorption lines in the star's spectrum shift in wavelength periodically, meaning that the star's velocity toward and away from Earth changes noticeably every 4.2 days. This fast, repetitive wobble implies that a planet is tugging on 51 Pegasi and lies only 7 million kilometers away from it — equal to just 1/20 of Earth's distance from the Sun. Orbiting so close to the star, this world should be heated to 1,000 degrees Celsius, and it's likely a nearly molten ball of iron and rock. To create the observed wobble in 51 Peg's spectrum, the planet needs a mass at least half that of Jupiter. American astronomers David Latham and Robert Stefanik have also found evidence that a *second* planet circles this star much farther out — but they have yet to pin down a precise orbit or mass.

51 Pegasi is magnitude 5.5 and easily visible in binoculars (even inside the Capital Beltway). It lies almost midway between Alpha and Beta Pegasi, the western pair of stars in the Great Square of Pegasus. The star's equinox-2000 coordinates are R.A. 22h 57m, Dec. +20° 46'. By the way, despite all the news-media hoopla, this is not the first confirmed extra-solar planet; that prize goes to a pair two Earth-size bodies (and a possible Moon-size one) orbiting a pulsar in Virgo.



Our Inner Solar System



New Solar System

Diagram: The Adler Planetarium & Astronomy Museum

Internet Access

Current information about 51 Pegasi and other astronomical information can be found on the Internet at the following World Wide Web sites:

51 Pegasi, a star like the sun—G2V—with a planet URLs

- <http://astro.uchicago.edu/adler/resources/51peg>
- <http://zebu.uoregon.edu/51peg.html>

Planets around pulsar B1257+12 URL

- <http://www.astro.psu.edu/users/pspm/planets.html>

Other Web sites of interest include:

Mongtomery College's Planetarium homepage

- <http://myhouse.com/mc/planet.htm>

Educational Resources link with MC planetarium pages

- <http://myhouse.com/mc/planet/edu-res.htm> (From the links on this page you can travel quite far.)

National Capital Astronomers Experimental homepage!!!!!!

- <http://myhouse.com/NCA/home.htm>

Attention Astronomical Shoppers!

NCA membership makes a great Holiday or birthday gift. It lets that special someone in your life enjoy the periodicals *Star Dust* and *Sky & Telescope* for an entire year. Renewing an NCA gift membership means these publications can be enjoyed year, after year, after year. For further gift shopping savings, NCA membership get you a significant discount on all Sky Publishing Corporation publications and products. NCA members can get even further discounts on binoculars, telescopes, and accessories through special arrangement with NCA member, and equipment vendor, Gary Hand (Phone: 301/253-5046). And NCA experts are ready to give free and unbiased consumer advice on buying appropriate binoculars, telescopes, charts, atlases, books, software, and more. So think of NCA when you're doing astronomical gift shopping.

It pays to be an NCA member!

For more details, see the membership application page at the end of this issue.



How to See The Universe, Make A Telescope, And Get The Biggest Bang For Your Buck With The Help of Mirror-Making Classes Conducted by Dr. Jerry Schnall

Part II

by Guy Brandenburg

What are the advantages of making yourself a Newtonian reflecting telescope on a Dobsonian (Dob) mount, as opposed to just going out and buying any other type of scope?

First of all, you can produce an outstanding telescope that is easy to use, gives great views of planets, globular clusters, galaxies, the Moon, open clusters, nebulae, and the like. If you prefer to concentrate on the planets, you can make the focal ratio very long, like $f/10$. If you prefer extended views of large but faint deep-sky objects, you can instead make the focal ratio very small, like $f/4$ or $f/5$. I compromised and find that my $f/6$ and my $f/8$ do a decent job on both.

Second, the process of making the mirror, deciding what type of mount to put it on, and making the mount will give you a hands-on education in optics, astronomy, and applied mathematics that nothing else can possibly provide, and which you will never forget.

Third, you will save a bundle of money. For about the price of a department-store piece of junk you will have something that will out perform any catadioptric in its aperture size for visual use, (which cost many times as much) is of much higher quality than any of the commercial Newtonian Dobs that are on the market today costing twice as much, and can only be out performed by a fine refractor costing about ten times as much.

Fourth, once you make your own telescope, you can really be proud of something you have made with your own hands. A commercial mirror-making outfit cannot afford to do the fine-tuning (figuring) that you can and still make a profit. Yours will be better than commercial quality, if you stick with it. You will have polished a piece of glass to within a small fraction of a wave-

length of perfection using only the simplest of hand tools.

Fifth, a moderate f-ratio Newtonian reflector on a Dobsonian mount is the very easiest type of scope to take to dark-sky sites and to set up in the shortest amount of time. Simple scopes see more stars. In my opinion, the only reason to have an equatorial mount is in order to do astrophotography, and it makes assembly and disassembly of the scope much more complicated. A Dobsonian mount is simplicity itself. We should thank all those astrophotographers for the excellent, painstaking work they do, but they only see about one object per night! And they have to keep their eyeballs glued on that galaxy for minutes to hours at a time! Is that what you really want to do, too?

If instead you decide to save money by purchasing a cheap department-store telescope, you might not know what you are missing. Before you make that mistake, go to a public sky watching program and ask to look through people's scopes so you will know how to compare. Keep your receipt, too, so you can take the piece of junk back. When I try to look through one of those cheap commercial scopes now, I get aggravated because the optics are often poor and because the wiggly, jiggly mounting makes it impossible to find things in the sky. I have been told that most owners of such devices end up leaving their junky telescopes in a closet, whence they wind up in garage sales many years later. If you make your own, I doubt that will happen.

So much for the advantages. What are the disadvantages of the type of scope I described? First and foremost, it will not track the sky, so you have to keep giving it little pushes as things go out of

your field of view. This is mostly a problem on the planets, which you have to magnify highly to see really well. But since the Dobsonian mount is inherently stable, the little pushes you give will NOT make the image jiggle all over the place for 10 to 30 seconds the way they will with most refractors. You will get used to giving those little pushes and tugs. On my plywood scope, I can bang the tube hard with my fist, and the vibration is damped out within 3 or 4 seconds. As someone once said, they don't make bells out of plywood. They use brass, bronze, steel or aluminum. At a public program, you WILL have to reaim the scope after every 2 or 3 people so that Jupiter or Saturn will still be in view.

Second disadvantage: you will not be able to make long exposure photographs like you see in magazines and picture books. You will instead see what the sky really looks like in optical wave lengths in real time. The photographs you see overexpose the brighter areas to pick up details in the finer areas. Actually, if you make a really BIG Dobsonian (like 70 cm (30") or more — not a trivial task) you can see those nebulae and galaxies much the way the photographs show, sometimes even in color. But you will NOT see too much color in a 15 cm (6") reflector, except for stars. (Actually, if you build a Poncet platform or a d'Autume table to put your reflector on, it is supposedly possible to track the stars. But this is not a job for a beginner!)

Third, you will not be able to deplete your savings account buying extra gizmos, batteries, CCD cameras, computers for astrophotographic processing, tele-extendors, and the like. You won't even need a dew shield for your corrector plate or objective lens, be-

See *TELESCOPES*, page 7

Meet Leith Holloway

by Leith Holloway

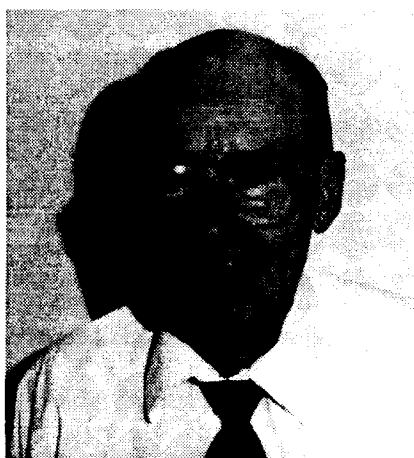
Astronomy and the NCA have been an important part of my life. I became interested in astronomy after I observed a total eclipse of the Moon on July 15, 1935 at the age of seven in my home town of Hickory, N. C. During this eclipse, I made eight drawings of the Moon as Earth's shadow crossed its face between 10:12 and 11:09 p.m. I wrote the observation times below each lunar picture.

My family moved from North Carolina to the Washington, D.C. area in 1937, and I joined the NCA in 1945 as a junior member. I graduated with honors from Woodrow Wilson High School in D.C. in 1946.

An NCA member and astronomer at the U.S. Naval Observatory, Morgan Cilley, got me interested in observing variable stars. We observed variables through the 30 cm (12-inch) refractor on top of the main building of the Naval Observatory. I also made many observations of variables on my own using the NCA's 13 cm (5-inch) refractor housed on the grounds of the observatory. I joined the American Association of Variable Star Observers (AAVSO) and remained a member for many years.

I have been interested in astronomy most of my life. I pursued it for pay once when I helped work my way through college by lecturing at the planetarium in the Boston Museum of Science from 1950 to 1952. I earned BS and MS degrees in Meteorology from the Massachusetts Institute of Technology in 1952 and 1953 respectively and spent all of my working life as a meteorologist.

After graduating from M.I.T., I worked in Philadelphia at the University of Pennsylvania for two years. In 1955, I was hired by the U. S. Weather Bureau in Washington, D. C. I rejoined the NCA soon after returning to D.C. In 1956, I volunteered to take the job of Director of the NCA Junior Division. No one else then was interested in working with the NCA Juniors, and I felt obligated to serve NCA in this way as repayment for the help and encouragement given to me by Morgan Cilley, who had died before I returned to D. C. I served about eleven years as Director



Leith Holloway, Secretary of NCA

during which I supervised more than 100 NCA Juniors.

In 1959, I was elected Vice President of the NCA and performed the job of program chairman that has always gone with this position. In 1960, I obtained a Weather Bureau scholarship for one year of postgraduate work at UCLA. This was a perfect excuse for not advancing to the office of NCA President. In 1968, I was transferred to Princeton, N. J. along with most of my colleagues in the Geophysical Fluid Mechanics Laboratory (GFDL).

At GFDL I did research in climate dynamics, a field of meteorology in which my lab pioneered. This work involves the simulation of global climate by modelling the general circulation of the atmosphere on supercomputers. You can thank our lab for the current worldwide concern about the enhancement of the greenhouse effect by the increase in atmospheric carbon dioxide and other so-called "greenhouse gases." I was the leader of the team that programmed the general circulation models used by our project at GFDL. I have been programming computers since 1957.

While living in Princeton, I belonged to the Amateur Astronomers Association of Princeton. In the fifteen years in that organization, I served as program chairman, treasurer and president in that order. I visited D.C. and attended NCA meetings many times while I lived in Princeton.

In 1983, I retired from GFDL and moved to an architecturally designed passive-solar-heated house I had built in South Walden, Vermont where I owned 89 acres of hay fields and woodland. To occupy my time in Vermont I bought my first personal computer. Using this PC, I wrote thirty popular science articles on weather and astronomy for the *Hardwick Gazette*, the local weekly newspaper. I also served as a volunteer teacher's aid for four years in the Walden school system where I taught math to seventh and eighth graders.

See LEITH, on page 8

TELESCOPES, from page 6

cause you don't have those things. If you are a camera junkie, you need a catadioptric (Schmidt-Cassegrain or Maksutov) or a refractor with a motorized equatorial mount, and a very large fraction of your income must be what economists call 'disposable.' A Newtonian Dob simply doesn't lend itself to such accessorizing.

If your burning desire is to own the very longest refractor or the largest-aperture catadioptric, immediately, so as to impress others with the size of your bank roll, then a self-made Newtonian Dob is also not for you. You should go to a local optics shop or consult a reliable mail order source, and prepare to pay what most people spend for a car. You will make those retailers very happy.

Newsletter Deadline for December *Star Dust* DECEMBER 15, 1995

*** DO NOT BE LATE!!! ***

Send submissions to Gary & Alisa Joaquin, at 7821 Winona Ct., Annandale, VA, 22003. Leave a message on voice mail 703/750-1636 or send an ASCII file via E-Mail at 71561.1747 @compuserve.com or AGJOAQ@ix.netcom.com or fax to 703/658-2233. Submissions must be on time or they may not get in.

The night skies were quite dark in northern Vermont, and I viewed the Milky Way often from my backyard. However, the winters are very cold and last too long there. Finally, the extreme weather and the isolation from family, friends, and culture prompted me to move back to the D.C. area in 1988. By that time, I had already rejoined the NCA after participating in an NCA expedition to southern Virginia on May 30, 1984. We attempted to observe an annular eclipse of the Sun, which was unfortunately clouded out at our site.

Soon after returning to D.C., I was reinstated as Junior Division Director. This position had remained vacant for the twenty years I had been living out of this area. In 1991, I was elected NCA Secretary and have held that office since then. The main requirement for this job is to own a computer since the previous secretary, Nancy Byrd, had laboriously and expertly put the NCA membership records into computer files, and no one wished to return to the former paper-record, hand methods.

To the surprise (and perhaps dismay) of some members of the NCA, I decided to write my own database program in Quick BASIC for processing the NCA membership files rather than use Microsoft EXCEL with WINDOWS software for IBM compatible computers. I thought that it would be easier and faster for me to write my own software than to figure out how to use someone else's. After spending over three years perfecting my database program, I came to two conclusions: (A) It would have been easier and faster to learn someone else's software; and (B) I made the correct decision because in writing my own software, I gained a tremendous amount of skill in programming in BASIC and had a great deal of fun in the process. I have used these skills for writing many other useful programs.

My database program prints the master copies of the NCA Directory, prepares mailing labels for *Star Dust* and NCA bills and facilitates many other jobs the Secretary must do.

The NCA Secretary's duties include much more than maintaining the society's databases. I'm one of the NCA's recruiters. I'm the answer man for other members and the public. I take the minutes of the meetings of the NCA Board of Trustees and do much more. I enjoy talking to NCA members who call me, but please remember not to call me between noon and 1 p.m. or between 6 and 8 p.m. when I am preparing and eating my meals and watching TV news and weathercasts. Thanks.

Observer's Handbook

Copies of the "Observer's Handbook" for 1996, published by the Royal Astronomical Society of Canada, will be on sale for \$12 apiece at the December 2, 1995 NCA monthly meeting and at all subsequent meetings until they are sold out. Please bring a check made out to "National Capital Astronomers" rather than cash. If you wish to buy a copy but cannot attend the meeting, please call me evenings or weekends to make other arrangements. Thanks.

Jeff Norman. (202) 966-0739

Observer, Winterize Yourself!

by Alisa Joaquin

As Earth turns and we come into the Winter season, remember to take these precautions before you go out observing.

- 1) Wear several layers of clothing. This helps to trap air and keeps the body warmer. If you ever looked closely at the coat of a dog or cat that spends the majority of its time outside, you will see that their coat is made up of layers of fur. This helps to keep it warm during the winter months.
- 2) Wear more than one pair of socks and carry extra with you just in case your feet get wet. There is nothing more uncomfortable than wet feet. You always feel warmer if your feet are dry.
- 3) One of the layers you should be wearing should be made of wool. Wool draws moisture away from the body helping you to feel warmer.
- 4) Wear liner gloves under mittens. Liner gloves at least can give you

dexterity if you have to take off your mittens, but mittens have a larger air space around the hand helping to keep warm.

- 5) Wear water resistant windbreaker jacket and pants over everything, including your coat. This will help to insulate as well as keep the rest of your winter wear dry.
- 6) If you intend to be outside more than one hour, take a thermos full of hot soup. Not only will the soup warm you but it will give you added energy for later.
- 7) If you know anyone that's from places up north or even from the Midwest, where temperatures in winter can get well below the freezing mark including subzero, talk to them. They can give you the most sound advice on keeping warm while outside. These steps should help you if you are planning on doing some observing this winter. I should know, I come from one of the coldest areas of the U.S., Nebraska.—Alisa Joaquin, ed.

NCA Welcomes these New Members!

William Dunham
(Junior member)
7006 Megan Lane
Greenbelt, MD 20770-3012

Mary E. Elgin
(Junior member)
8929 Sleaford Place
Annandale, VA 22003

Gary S. Hand
24045 Sugar Cane Lane
Gaithersburg, MD 20882

Christopher Neander
(Junior member)
3001 Stephenson Place
Washington, DC 20015

Patricia A. Reading
16440 Baden Westwood Road
Brandywine, MD 20613

National Capital Astronomers, Inc.

SERVING SCIENCE & SOCIETY SINCE 1937

NCA is a non-profit, membership supported, volunteer run, 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. All are welcome to join NCA. For information: 301/320-3621 or 703/841-4765.

SERVICES & 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. They also serve locally by assisting with scientific conferences, judge science fairs, and interpreting astronomy and related subjects during public programs.

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

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

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 about space technology, astronomy, and related sciences.

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's and young adults' interest in space technology, astronomy, and related sciences through discounted memberships, mentorship from dedicated members, and NCA's annual Science Fair Awards.

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

YES! I'D LIKE TO JOIN THE NATIONAL CAPITAL ASTRONOMERS

Enclosed is my payment for the following membership category:

- Regular
 Sky & Telescope and *Star Dust*. (\$48 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*. (\$34 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 \$24 when it expires.

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

NCA c/o Jeffrey B. Norman, 5410 Connecticut Avenue, NW, Apt. #717, Washington, D.C. 20015-2837.

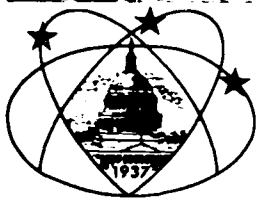
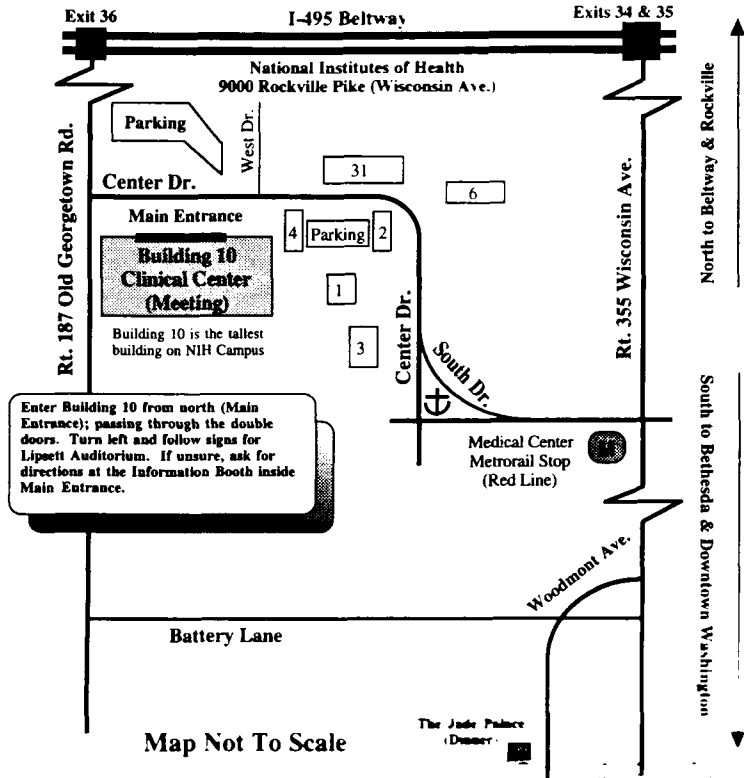
The following information is optional. Please indicate briefly any special interests, skills, education, experience, or other resources which you might contribute to NCA. **Thank you, and welcome to NCA!**

Getting to the NCA Monthly Meeting

Metrorail 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 (walking time about 10 minutes), the tallest 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).

The Jade Palace - Take Wisconsin Avenue towards Bethesda and and bear right onto Woodmont (address 7708 Woodmont). Follow Woodmont to Norfolk (five blocks south of Battery) and look for the restaurant on your right. Parking may be found on Woodmont, on the side streets, or in local parking garages. Cars may be ticketed, even on weekends. Seats are not guaranteed after 5:30 so come early. Ordering will begin at that time.

Star Dust is published ten times yearly (September through June) by the National Capital Astronomers, Inc. (NCA), a non-profit, astronomical organization serving the entire National Capital region, and beyond. NCA is the astronomy affiliate of the Washington Academy of Sciences and the National Capital region's representative of the International Dark-Sky Association. Phone Numbers: 301/320-3621 or 703/841-4765. President, Wayne H. Warren, Jr., 301/474-0814. Deadline for *Star Dust* is the 15th of the preceding month. Editors Alisa & Gary Joquin, 7821 Winona Ct., Annandale, VA 22003, 703/750-1636, E-mail-see deadline box for new address. Daniel J. Costanzo, Editorial Advisor. *Star Dust* © 1995 may be reproduced with credit to National Capital Astronomers, Inc.



National Capital Astronomers, Inc.

If Undeliverable, Return to
NCA c/o Leith Holloway, Apt. #M-10
10500 Rockville Pike
Rockville, MD 20852-3331

SUBURBAN MD P&DC 208 112195



FIRST CLASS

SUBURBAN MD P&DC 208 112195 0344 188-231

Exp. 7/96

Leith Holloway
10500 ROCKVILLE PIKE APT M10
ROCKVILLE MD 20852-3331

