

NOVAC

THE NEWSLETTER OF THE NORTHERN VIRGINIA ASTRONOMY CLUB

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NOVAC Officers 1994

President: Bob L'Hommedieu 703-978-0946
Vice President: Ron Ferris 703-643-0811
Secretary: Marta Krause 703-281-9049
Treasurer: Brenda Clements Jones 703-527-7963

NOVAC Board of Directors 1994

Fred Holmes 703-207-9653
Doug Mistler 703-437-0513
Thomas S. Parry 703-758-8224
Bob Ridgley 703-641-5859
Bob Sandy 703-937-3993

NOVAC Newsletter Staff

Editor: Thomas S. Parry 703-758-8224
Assoc. Editor: Jon Stewart-Taylor 703-476-8949
Prod/Dist: Brenda Clements Jones 703-527-7963

Important NOVAC Numbers

NOVAC Information Hotline 703-256-8359
NOVAC RBBS (2400 Baud) 703-256-4777
Crockett Park (Gary Kwolek) 703-788-4867
Arlington Planetarium 703-358-6070

Editor's Note

by Thomas S. Parry

There is something about a new year that always fills my soul with reflection, optimism and anticipation. It is a time to reflect on past experiences and contemplate new beginnings and goals. As I write this, I was reflecting on how 1993 was among the best years for observing I can remember. I thought about the distant supernova in M81, the midday occultation of Venus, a glorious Perseid display, and the best total lunar eclipse to be seen in North America for years. I also thought about my summer trip to the Rocky Mountain states and the incredible deep sky and planetary views I enjoyed. Yes, 1993 was a great year for astronomy!

As I contemplate the upcoming events of 1994, the new year promises to be as exciting as 1993 with an annular eclipse of the sun May 10, a total eclipse visible from South America in November, a great comet collision with Jupiter predicted for July, and what should be another great Perseid shower. There is a lot to look forward to in 1994 and NOVAC anticipates some activities in connection with selected events. Stay tuned to future newsletter issues for details.

The new year brings with it a new slate of officers to the leadership of NOVAC. I am confident they will work hard to make our club an enjoyable place where members can learn, grow and develop their observing skills in a spirit of friendship. This is a great time to get involved in NOVAC's activities.

You will notice the newsletter looks different! A new year is a good time to initiate a new look. I made some recent software upgrades to make text handling and page layout design easier and more efficient. There is also an improved capability to manipulate images and

illustrations. I anticipate making continual improvements to our club publication and welcome your input and ideas. Article contributions are also sought. Observer reports, observing techniques, reports on technological developments, book and software reviews, astrophotographs--anything of interest to you that is astronomy-related is welcome. My goal is to make the newsletter informative, instructive and enjoyable for all.

Two substantive changes will be seen in the 1994 edition of the newsletter. First, there have been inquiries and questions in recent months about the NOVAC Computer Bulletin Board. In this issue, Systems Operator Blaine Korcel explains how to access it and provides an overview of the Bulletin Board's numerous capabilities. Future issues will include articles that focus in greater detail on the different capabilities of the system, how to access them and make the best use of the information available. Second, *Sky Sweep* will focus entirely on observing the Messier objects. The series will follow a seasonal theme throughout the year until all of the objects have been covered. In his first installment for the year, Kevin Jones focuses on the Messier Objects visible during the winter season.

I'm looking forward to a great observing season and participating in some terrific NOVAC activities this year. Let's all hope for clear skies and make some great NOVAC memories in 1994!

January and February General Membership Meetings

The January General Membership Meeting will feature Brenda Jones, Brent Archinal and Bob Bunge who will review their experiences at the 1993 Stellafane and Astrofest Conventions. They will show slides and share with us the many things they learned while associating with

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amateur astronomers from all over the U.S. The February meeting will be a primer on astrophotography presented by Bob Sandy. Bob is an accomplished astrophotographer whose work has appeared in several astronomy publications including *Astronomy* and *Sky and Telescope* magazines. Bob will also showcase his work with a slide presentation. These programs promise to be outstanding. **The monthly General**

Membership Meetings of the Northern Virginia Astronomy Club are held the third Wednesday of every month at 7:30 P.M. at the Arlington County Planetarium, 1426 N. Quincy Street, Arlington, VA. Admission is free and open to the public. Call the NOVAC hotline (703) 256-8359 for upcoming events, special announcements or to leave a message for additional information.

Highlights of November and December General Membership Meetings

by *Bob L'Hommedieu, Secretary*

General Meeting November 17, 1993

Myron Wasiuta called the meeting to order at 7:30 PM. Over 31 members and guests attended at the Arlington County Planetarium.

Old Business

1. Myron called for any further nominations for club officers. There were none and the nominations were closed. Elections will be held at the December Meeting.
2. After investigating the feasibility of using the Northern Virginia 4-H Education Center in Front Royal for the 1994 Northern Virginia Telescope Meet, the facility does not appear to be a suitable location for the Telescope Meet due to outdoor lighting problems.

New Business

1. Three Club members received recognition and congratulations for their achievements. Brent Archinal recently completed a book published by the Webb Society titled "Non-Existent Star Clusters of the RNGC." Jerry Wolczanski had an article published in *Astronomy Magazine* about his observing chair invention. Bob Sandy had astrophotos published in the book "Nightwatch" and in *Astronomy Magazine*.
2. Myron Wasiuta will be getting married Dec. 11, 1993. The members congratulated Myron and his new bride.
3. Preliminary efforts are under way to form a group to investigate the outdoor lighting plans for the proposed Disney America development in Prince William County.

The program for the evening was given by Tom Parry who gave a primer on telescope optics and discussed the various types of telescopes available for the first time telescope buyer.

General Meeting December 15, 1993

Bob L'Hommedieu, NOVAC Secretary, presided and conducted the meeting in the absence of the President and Vice President. Bob called the meeting to order at 7:30 P.M. Twenty-three members and guests attended at the Arlington County Planetarium.

Old Business

1. The NOVAC library will be housed at the Arlington Planetarium from now on and will be available to members for check out before and after the monthly meetings. Linda Thomas will be our librarian and one more person is needed to help out. Interested persons should call Linda or a club officer. Members are encouraged to donate books they are no longer using to the library.
2. The Air Force is interested in using amateur astronomers to help track earth satellites. All satellite observers are asked to fill out a questionnaire for their survey. Contact Bob L'Hommedieu for more information.
3. Club elections were held and our new officers for 1994 are:
President- Bob L'Hommedieu, Vice President- Ron Ferris,

Secretary- Marta Krause, Treasurer- Brenda Jones, Trustees- Fred Holmes, Bob Sandy, and Doug Mistler. Outgoing officers are: Myron Wasiuta, George Uhl, Steve Bodner, Enid Levine, and Blaine Korcel. We all wish to thank the outgoing officers for the work they have done on behalf of NOVAC.

4. The NOVAC Annual Meeting will be held Jan. 11, 1994 at 7:30 PM at the home of Brenda Jones. All members are urged to attend as the events and plans for the upcoming year will be discussed.

New Business

1. Brent Archinal and Bob Sandy showed slides of the recent total lunar eclipse and there was a general discussion of the event.
2. Jon Stewart-Taylor gave an account of the Geminid meteor shower and also announced the discovery of a Nova in Cassiopeia. It is located two degrees west of Rho Cassiopeiae.

The program for the evening was given by Col. "Pete" Worden and Dr. Mitch Nikolich formerly of the Ballistic Missile Defense Organization. They discussed many new and exciting technologies that will have a large impact on America's space efforts and will lead to better and cheaper ways to explore our universe. We saw videos and slides of some of the most promising of these new technologies and the missions planned to study the moon, asteroids and our atmosphere.

President's Column

by *Bob L'Hommedieu*

I would like to take this opportunity to thank all of our outgoing officers and trustees for their efforts on behalf of NOVAC. I know that they have worked hard to see that our club is a friendly place that welcomes beginners as well as more advanced amateur astronomers. It is my goal to see that NOVAC continues to do so.

Amateur astronomy is much more fun when there is a group of people with whom to enjoy it. There are many talented people in NOVAC who are willing to share their knowledge and skills with others. Whatever your interest in astronomy, I know that there are other club members who have similar interests and would welcome the chance to discuss them with you. Fellowship and common interests are the strengths of our club. I believe that this is the reason NOVAC attracts so many people and continues to grow.

NOVAC provides its members with a lot of services. We have meetings, observing sessions, a newsletter, discount subscriptions, loaner telescopes, a library and more. The officers try hard to give our members things that we think the members want. We need your help to be sure that NOVAC is doing a good job and meets the needs and expectations of our members. That is why I would like to encourage every interested member to attend the Annual Meeting this month. As a non-profit corporation, NOVAC is required every year to hold a stockholders meeting called the Annual Meeting. We use this meeting as an opportunity for everyone to get together to discuss the upcoming year and make plans for our activities. This is a wonderful chance to get input and help from the members. If you have ideas that would benefit our club, please come and share them with us. If you would like to see changes in our activities, please come and make suggestions. All are welcome and all are needed to see that NOVAC is the kind of club you want.

Beginning with this issue's column and continuing over several issues I will focus on observing the Messier

objects to assist those who, like me, are interested in trying to methodically observe enough of the objects to earn a Messier Certificate. A Messier Certificate is awarded to observers who have found and observed any seventy (or more) Messier objects, and a Binocular Messier Certificate is awarded to those who have located and observed any fifty (or more) Messier objects using binoculars. Observers must keep an observing log/notes of the objects seen containing dates and times of the observations, seeing conditions, aperture and power of the optical instruments used, and short descriptions of the objects. Upon completing your observations of the required number of objects, submit a copy of your observing records to the Astronomical League's Observing Awards Coordinator as outlined in the Astronomical League's newsletter, the "Reflector," in order to obtain recognition for your accomplishment.

In this issue I will spotlight the Messier objects located in and around the "Winter Circle" asterism, which encompasses the stars Rigel in Orion, Aldebaran in Taurus, Capella in Auriga, Castor and Pollux in Gemini, Procyon in Canis Minor, and finally Sirius, the brightest star in the night sky, in Canis Major. The Messier objects located in this area are M1 and M45 in Taurus, M36, M37, and M38 in Auriga, M35 in Gemini, M42, M43, and M78 in Orion, M79 in Lepus, M41 in Canis Major, and M50 in Monoceros.

I'll start with what is certainly the easiest Messier object to find, **M45**, also called the **Pleiades** or **Seven Sisters**. M45 can be seen with the unaided eye as a tight grouping of several stars located about ten degrees to the northwest of Aldebaran. This object is an open cluster containing a hundred or so stars that in cosmological terms formed relatively recently—probably about one hundred million years ago. M45 is located about four-hundred-fifty light years away from our Solar System. Because it is located relatively nearby in deep space, M45 appears large in our sky. Its diameter is almost two degrees, making binoculars ideal instruments for viewing this cluster. The Pleiades make an interesting test of sky conditions and visual acuity. Most observers can easily resolve six Pleiads with the naked eye, but there are eleven Pleiads brighter than sixth magnitude and some particularly keen-eyed observers have seen up to fourteen stars in the cluster without using any optical aid.

Moving east-northeast into the rich Auriga Milky Way, the open clusters **M38**, **M36**, and

Sky Sweep: January/February 1994

by Kevin Jones

M37 (from north to south) can be found. Each of these clusters is located at about the same distance from the Solar System, 4500 light years or so. Differences in angular size of the clusters and in the brightness of their individual stars give them distinctly different appearances through the eyepiece. M38 contains about a hundred stars and is a third of a degree in diameter. The cluster's brightest stars are 8th magnitude, making this cluster resolvable even in small binoculars. M36 is only half the angular diameter of M38 and contains half as many stars. The smaller angular size of the cluster gives M36 a higher surface brightness than M38, and so M36 appears brighter through the eyepiece. M37 is a cluster of one-hundred-fifty stars which, like M38, is a third of a degree in diameter. M37's surface brightness is about the same as M38's, but since M37 contains half again as many stars as M38 does, M37 appears to be more densely packed with stars.

Continuing to the southeast along the Milky Way, another open cluster can be seen. This cluster is **M35**, located at the "foot" of the twin Castor, in the constellation Gemini. Glowing at magnitude 5.5, M35 is a bright cluster that can be faintly glimpsed without optical aid under dark skies. It is easily visible in binoculars, although its surface brightness is even lower than the surface brightness of M36, M37, and M38, because of M35's large angular diameter of half a degree. M35 contains about one-hundred-twenty stars.

M1, the **Crab Nebula** is located about seven degrees to the west of M35. This object is a supernova remnant, the expanding shell of gases (now about six light-years across) left over from a star which exploded at this location in the sky during the year A.D. 1054. M1 glows softly at ninth magnitude and is an irregular shape five by three arcminutes in angular size. Despite M1's faint magnitude, its small size gives it a fairly high surface brightness making it visible in high-powered binoculars as a small, featureless fuzzy blob. Through telescopes, some hints of the nebula's irregular structure can be seen.

Just above the eastern end of Orion's belt is the nebula **M78**. This object is a cloud of gases called a reflection nebula that is visible only because it reflects the light from three nearby stars. M78 is a difficult and featureless object for binoculars, but is fairly easy to find using a small telescope. It is eight by six arcminutes in angular size and

shines at eighth magnitude.

Further to the south in Orion is the **Great Orion**

Nebula, M42 and M43. This nebula is an emission nebula, which is a cloud of gases visible not because it reflects starlight (as in a reflection nebula), but because radiation from nearby stars excites the gases in the nebula to the point where they actually give off visible light. The Orion Nebula is a gorgeous object for binoculars and telescopes and is even visible with the naked eye. The nebulosity extends for over a degree in angular diameter, which corresponds to an actual diameter of about forty light-years for the visible part of the nebula. M42 and M43 are bright enough for color to be glimpsed in the nebulosity through larger telescopes. Green is usually the predominant color seen but hints of red, so prominent on photographs of the Orion Nebula, are sometimes present. To differentiate between M42 and M43, M42 is the large, irregular, southern portion of the Orion Nebula, and M43 is the small, round, northern bit of nebulosity separated from the rest of the nebula by a thin dark dust lane.

In the constellation of Lepus the Hare, about fifteen degrees to the south of the Orion Nebula the small globular cluster **M79** is situated. M79 is visible in binoculars and telescopes as a fairly small (eight arcminutes across) ninth magnitude ball. Its small angular size gives it a high surface brightness, contributing to its good visibility. The component stars of M79 are faint, however, so even with large telescopes, resolution into individual stars is difficult.

The last two Messier objects discussed in this column are two more open clusters, **M41** and **M50**. These clusters are located in the vicinity of Sirius, in Canis Major and Monoceros respectively. M41, found just south of Sirius, is a sparkling, well-resolvable sixth-magnitude open cluster of fifty stars half a degree across. The individual stars in M41 are as bright as seventh magnitude so it is easily resolved into its components even with fairly small binoculars. M50, located to the northeast of Sirius, also shines at sixth magnitude, but is considerably smaller and richer than M41. M50 contains a hundred stars packed into an oval-shaped region of sky about ten by fifteen arcminutes in angular size. The component stars of M50 are ninth magnitude and fainter, making this open cluster readily resolvable only in telescopes.

If you are interested in earning a Messier or Binocular Messier Certificate, take notes while observing. After viewing these twelve Messier objects, you will be well on your way towards earning either of these certificates.

The NOVAC Remote Computer Bulletin Board System

by Blaine Korcel, Systems Operator

What on earth is a remote computer bulletin board system (BBS)? I hear it time and time again. Well, I hope I can shed some light, red preferably, on this very interesting hobby of mine. I'm sure you will find it a resourceful tool.

So what is a BBS? A BBS is a dial-up service accessed with a computer and a modem to obtain information. It's main task is to provide a controlled storage area for electronic messages (E-Mail), programs, and databases. Some offer on-line multiuser games too.

To access a BBS, you need a computer, a modem, a communications program (one usually comes with the modem), and a phone line. Your computer, using the program and modem, would dial the phone number of the BBS. After that, you simply follow the instructions given on the screen such as entering your name and a password. You better read the manual that came with your software too. That's it!

I have been running a BBS for the benefit of NOVAC for over nine years now. It originally ran on a *Leading Edge Model D*, XT class, home computer with a single phone line. It was limited in size and memory and was very slow compared to today's standards. It served it's purpose, however, until it ran out of memory and disk space.

Over the years, the system has evolved into a new species of wires, screens, spinning disks, blinking boxes and artificial intelligence. Like a cat, it has taken over the house. My room now reads "Computer Room" instead of "Bedroom" and it is very independent. Often it does stuff on it's own for no reason. I'm happy though it doesn't require a litter box nor climbs Christmas trees!

The BBS now is comprised of a conglomeration of hardware that has accumulated over the years, most of it donated or disposed of (being an electronics nut, I repaired a good deal of it). This includes, three computer systems, a 486, 386, and 286, over 28 megabytes of memory combined, 640MB of disk space, two CD-ROM drives, over 13,000 programs and files, three modems (two high speed), and three dedicated phone lines. All of this is networked together and operates interactively. The operation of the system has been mostly automated and is now self maintaining. Thank goodness! Most of my time is now spent replying to E-mail and processing satellite imagery. There certainly is not much time left for observing anymore.

Today, the age of computers has brought a wealth of information to us from all corners of the earth as well as from outer space. The NOVAC RBBS has tapped into many of these sources and makes them available to anyone for free. Here is a summary of what is available on the NOVAC RBBS:

Electronic Mail: One of the main features of the BBS is electronic mail or E-mail. Through one of the many different networks that have been established around the country, users can exchange e-mail with other users on the BBS as well as in other states or even foreign countries all free of charge. Users can also exchange E-mail in huge

national forums. Sometimes the replies can get overwhelming.

Satellite Imagery: NOVAC RBBS provides satellite imagery captured from U.S. NOAA and Russian METEOR weather satellites. Useful for planning observing sessions, vacations, or for just seeing what the clouds look like from the other side.

Satellite Tracking (ESTO): In the interest of astronomy and space, an E-mail conference is carried called ESTO and is run by the Educational Satellite Tracking Organization. This organization is involved with the observation and tracking of satellites and other space debris so that accurate orbital and positional data can be obtained and utilized by other organizations and individuals.

IAU Circulars: Detailed observations from both professional and amateur astronomers are provided in the STARNET E-Mail conference. These observations are also posted separately as ASCII files which you can transfer down to your PC for your own use. The source for these observations is the International Astronomical Union (IAU) which provides these circulars in a more timely manner for a cost to interested individuals. NOVAC can provide these for free.

Internet Access: Users can send mail messages via Internet (a worldwide network created for educational purposes by our government). Some users exchange mail with their kids away at college and others use it to pass on newsletter articles and other information. I plan to expand this interface soon to include real time file transfers from remote systems on the Internet.

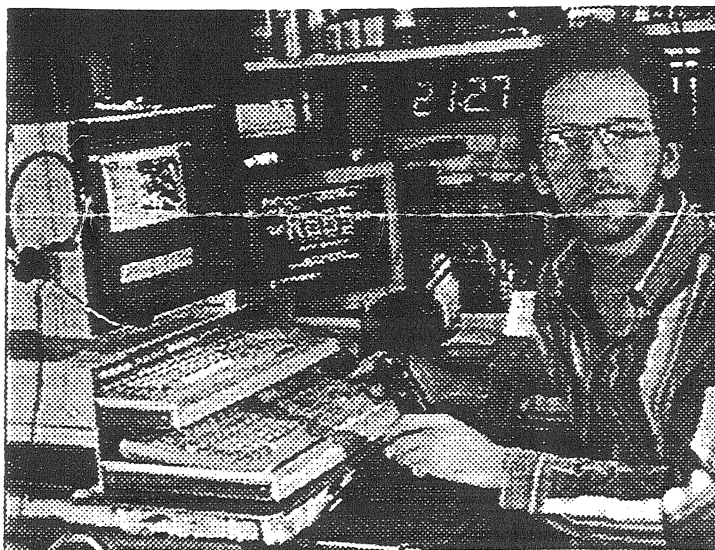
CD-ROMS: Recently, two CD-ROM drives were added to the system. Now, over 13,000 files are available for download. All of them are either shareware or public domain. You get to try them, if you like them, you send the author payment directly. Most are fully functional programs.

A future goal is to add an additional CD-ROM to the system that will allow search and query for information in hundreds of different astronomical catalogs such as RINGC, Messier and IC. I already have the CD but need to write a program to handle the immense amount of data. Anyone care to take a crack at programming?

Newsletter Repository: Users who wish to write articles for our newsletter can use the BBS as a repository. Nearly all of the club executives and board members including our editor frequently access the BBS. The editor collects all the articles and processes them for the next issue.

Forum Regarding Club Issues: Many club issues are discussed on the BBS. It allows members to bring up new ideas, ask questions, and provide some answers. I find that those who normally keep quiet in person feel more relaxed to leave E-mail messages on the system.

Viruses???? EEKS!! No Way!! In all the years of running this BBS (over 9 years) I have not run across a single computer virus.



The author seated at the NOVAC BBS System in his home

NOVAC RBBS (Continued from page 4)

Every file on the system is checked for viral infection. Your chances of picking up a virus are better buying a commercial program from a computer store!

Many upgrades are planned in the future to improve performance, access, and the availability of information to our users. I hope to include articles in the future on more specific functions of the BBS, information regarding new upgrades, and reviews of various programs available to users.

If you wish to look around the BBS you can call it up by dialing 703-256-4777. Set your communications program to 2400 baud, no parity, 8 data bits, and 1 stop bit (2400,n,8,1). If you like the BBS, NOVAC accepts donations. Although there is no charge to use the service, those who make donations get access to a less busy/faster line. Once on, leave me a comment and let me know what you would like the system to do to make your hobby more interesting. I am sure we have something here that can help you.

Sky Calendar for January-February 1994

Compiled by Thomas S. Parry

January

- 2 Earth closest to sun (perihelion)
- 4 Quadrantid Meteors
(Last quarter moon)
- 6 Jupiter shines 3 degrees N. of last quarter moon
- 11 New moon
Neptune in conjunction with the sun
- 12 Very young moon may be visible in west at sunset
Uranus in conjunction with the sun
- 14 Saturn to the lower left of thin crescent moon at sunset
- 17 Venus in superior conjunction (behind sun)
- 19 First quarter moon
- 27 Full moon
- 31 Mercury close to Saturn at dusk

February

- 1 Mercury and Saturn in conjunction 1.3 degrees apart at sunset
- 3 Last quarter moon (A.M.). Jupiter shines 3 degrees N. of moon
- 4 Mercury at greatest elongation E. of sun (18 deg.) and visible at dusk
- 9 Comet Encke at perihelion
- 10 New Moon
- 11 Very young moon visible at dusk
Mercury 2 Deg. S. of crescent moon
- 18 First quarter moon
- 21 Saturn in conjunction with the sun
- 24 Regulus to lower left of moon
- 25 Full moon
- 27 Mercury 4 degrees N. of Mars in morning sky
- 28 Jupiter stationary

Observing Report: The 1993 Geminids

by Jon Stewart-Taylor

It started when Pete Gural suggested we get together for the Geminids. The Sunday night/Monday morning maximum of the shower made the hour each way to Crockett too much, so we called a group of NOVACers from Herndon, Reston, and Sterling for an observing session at Waxpool.

Sunday arrived very cold, and this reduced the number of people who were able to join us. Bill Burton and I carpoled, arriving between 8:30 and 9:00. Pete was already there, camera clicking, as was Steve Kusterer. Al Boldt arrived a little later, and spent a lot of time observing deep-sky with his light-pollution-filter equipped binoculars. Jim and young Sarah made a brief appearance, but due to the cold (and Sarah's bedtime?) couldn't stay long. What a show everybody else missed!

The sky was very clear- the limiting magnitude was about 5.5 at zenith (estimated by counting the stars in the Great Square). Between 9:00 and 10:00 I collected 28 meteors, including quite a few bright ones, almost all Geminids. They appeared in bursts: often several would appear near the same location within a few seconds of each other. Several skipped, making a line of bright flashes. None left bright trails.

At 10:00, Pete started collecting triangulation photos. He took pictures of a particular area of the sky, carefully noting the time for each meteor. He told us Gary Goodman from the Triangulum club was doing the same. If they both got photos of the same meteor, they'd be able to compute its altitude and length (as it turns out, they did, so we're waiting for the results). From 10:00 to 11:00 the activity resembled 9:00 to 10:00, with slightly higher totals. There were no more skips, but we saw one that must have been nearly straight at us. It was very bright, made a very short arc, and lasted well over a second.

The cold started to get to us around 11:00. Several of us (not including iron-man Pete) went into cars between 11:00 and 11:15 to thaw our toes. Even inside the car I saw about 8 meteors in Canis Major, Orion,

and Lepus, looking through the windshield. I went back out around 11:30, and meteor rates were picking up. From 11:30 to 12:00 we saw about the same number as from 10:00 to 11:00.

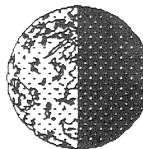
Meteor Counts

Time	Jon	Pete
9:00-10:00 P.M.	28	<i>Did Not Count</i>
10:00-11:00 P.M.	32	30
11:00-12:00 P.M.	25 (11:30-12)	35

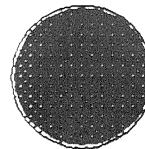
The wind strengthened, and the cold finally became too much at midnight- I gave up. Driving home, Bill and I saw occasional meteors out the windows. Despite the cold, it was a beautiful night, and a tremendous show. Anyone for the Lyrids in April?

Lunar Phases for January and February 1994

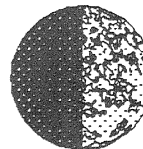
Last Quarter
January 4
February 3



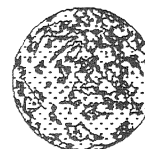
New Moon
January 11
February 10



First Quarter
January 19
February 18



Full Moon
January 27
February 25



You've been planning this observing session for weeks. It's the first free night you could get, and probably the last you'll get for several weeks more. And the weather isn't cooperating. You had your heart set on doing some astronomy tonight, and now you can't. Well, maybe you can. This column describes Foul-Weather Astronomy for Recreational Astronomers.

Baby, it's Cold Outside!

If it's too cold or too hot, take the appropriate precautions and go enjoy yourself. If it's hot, dress lightly, drink lots of fluids, and take some good insect repellent. If it's very cold, dress warmly, with lots of layers, and make sure your head is covered. Take something hot to drink. The "Backyard Astronomy" column in the February 1993 *Sky and Telescope* describes proper dress and more for cold weather observing in great detail. Hiking and outdoor stores such as Appalachian Outfitters (in Oakton) or REI are great places to get cold-weather gear. They're staffed by knowledgeable people with experience in dealing with bad weather, and they've got all kinds of neat little items like electric socks and inexpensive hand-warmers as well as staples like boots and coats.

Hot or cold, if you don't think you can stand it for several hours, go for a shorter time, or change to an observing site where you can go inside periodically for relief. With a little planning and flexibility, temperature extremes won't stop you from spending time under the sky.

Uh-Oh, Where's My Cloud Filter?

If you think it's too hazy or too cloudy, reevaluate before you give up. If there are patchy clouds, thin haze, or even just "sucker holes", you can probably get in some good observing. Chase deep-sky targets between the clouds, or change targets from deep-sky to planetary or lunar. The moon and planets can still give good views on nights which aren't as transparent as you'd like, particularly if the air is steady.

If conditions don't merit a trip to your dark-sky site, just step outside for a while. I recently spent 20 minutes observing the Pleiades through haze from my town-house front yard. Despite a limiting magnitude of about 3.5, I had a good time mapping about 25 members of the cluster through 10x50 binoculars. On the other hand, if it's really socked in, try one of the options below.

For the Records...

Rain. Sleet. Snow. Although the weather outside is dreadful, there's still lots of astronomy to do. Get out your records (you are keeping written observing records?) and review them to learn from your past experiences. They'll bring back memories of the nights they record. Write down your experiences as well as your observations. Later you can reread and remember them, or share them with other people so they can benefit from your experience. You may even be able to get articles published in a magazine or club newsletter.

If, like most of us, your record keeping tends to be hasty, this is a good time to tidy things up. Copy your observation records onto index cards, or record them in a database if you have a computer. When your observations are organized, patterns and trends are easier to see. I recently found I've learned how to see better: my records show I can see 5 more stars in M34 than I could last year.

The Best Laid Plans...

If this observing session was washed out, spend some time planning your next session. Figure out what days and times you'll have available. Find out the phase of the moon, what times it will rise and

The Recreational Astronomer: Foul-Weather Astronomy

by Jon Stewart-Taylor

set, and what constellations will be near the zenith. Study your charts and reference materials.

Investigate new areas of the sky, and look for new objects to pursue. List the objects you want to observe, and study the star patterns around them so you can find them faster. Plan star-hops, and write down directions so you don't get lost. Look over areas you're familiar with for things you've overlooked. If you need ideas, Fred Schaaf's "Seeing" books (*Seeing the Sky*, *Seeing the Solar System*, and *Seeing the Deep Sky*) contain projects to keep you busy for dozens of observing sessions.

Be Prepared.

You can do some things to make your next observing session go smoothly. Bad weather is a good time to maintain your equipment. In general the less you do to the optics the better, so if it's a lens or a mirror, don't clean it. On reflectors, you can check and adjust collimation and alignment. For all kinds of instruments, check and replace batteries, lubricate bearings, adjust tensions, and do all kinds of mechanical maintenance. If you use observing chairs, tables, or ladders, check to be sure the fasteners are snug, and nothing is wearing, fraying, or developing sharp edges. A little attention at home will pay off in the field.

A Little Night Reading

Now you've got time to do some reading, so browse through your references for general information. H. A. Ray's *The Stars* is a good place for beginners to start, as is the *Peterson's Field Guide*. Guy Ottewell's *Astronomical Companion* and *Astronomical Calendar* are good for hours of interesting reading about most aspects of astronomy. Allen's *Star Names* can be dry (it was written in 1899), but contains a wealth of interesting stories and astronomical history. You've probably got a backlog of astronomy magazines- read the articles you'd normally skip, or reread the articles you found most interesting.

While you've got your references out, find out more about the objects you've already observed. Burnham's is a wonderful place for information about most objects within reach of amateurs. It's also great for digging into constellations in detail, and contains an astonishing amount of astronomical science information.

Games Astronomers Play

There are lots of space-based games to play when you can't get out under the sky. Some of the activities described in "Family Astronomy" (NOVAC November/December 1993) are good for Foul-Weather Astronomy. If you have a computer, there are programs ranging from piloting spacecraft to other planets, through electronic planetariums, to telescope simulators. Beside the usual software outlets, you may wish to contact the Minnesota Educational Computer Consortium (MECC), and Educational Resources. Both distribute high quality educational software for IBM-compatible and Apple computers, including Astronomy titles. Both will be happy to mail you a catalog.

There are lots of board games with astronomical orientations. "Constellation Station," by Aristoplay, is one of the better ones. Others can be found in higher-quality children's bookstores (e.g. Imagination Station in Arlington) and toy stores (e.g. Imaginarium). Teacher stores such as Hammet's are also good places to look for games.

Depending on what you call play, Essco Laboratory Exercises are another option for a rainy night. These are reprints from a series in

Sky and Telescope during the 1960s. They're exactly what their name implies, and are probably intended for introductory college astronomy courses. When I bought them in 1988 they cost about \$8 for a "sampler" containing one of everything- approximately 25 exercises and 10 charts. In the first one I computed the size and shape of the moon's orbit around the earth from observations of its changing apparent size. The exercise required some simple calculations (I used a computer spreadsheet), and some careful measuring and plotting. The exercises give some insight into what "real" astronomers do, and I've enjoyed them very much.

Acknowledgments and References

For detailed information about cold-weather astronomy: *Sky & Telescope: February, 1993*.

For introductory and general reference, try *The Stars*, by H. A. Rey; *Astronomical Companion* and *Astronomical Calendar*, both by Guy Ottewill; *Peterson's Field Guide to the Stars and Planets*; *Star Names: Their Lore and Meaning* by Richard Allen.

For detailed information about constellations and individual objects, as well as general reference, the 3-volume *Burnham's Celestial Handbook* is unique.

Fred Schaaf's *Seeing the Sky, Seeing the Solar System*, and *Seeing the Deep Sky* are terrific sources for observing projects.

For computer software, try *MECC*: 800-685-MECC, or *Educational Resources*: 800-624-2926.

The *Essco Laboratory Exercises* are hidden under "Classics" in the 1993 Sky Publishing Catalog.

From now on, when the weather doesn't cooperate on observing nights, don't despair: just do some Foul-weather Astronomy. Observe anyway, review your records, make

Reflections in the Eyepiece: Getting Started in Light Pollution Education

by Robert Bunge

Editor's Note: This article is a continuation of "Fade to White: The Loss of the Night Sky" that appeared in the November/December 1993 issue of NOVAC.

Interested in improving lighting in your area? First, join the International Dark-Sky Association. They have a large collection of information sheets packed with detail, ideas and data. You will make a better speaker and information source if you know more about light pollution. Learn your own area. Look around at night. Identify locations with good and bad lighting. Find out who's responsible and let them know what you've found, good or bad. Learn who is responsible for designing street lighting in your area. If you're the bashful type send them copies of *Fade to White* or IDA handouts.

Arrange for talks at local groups, from Boy Scouts to Lions Clubs. Network. Talk to people. Chances are you know someone helping to set lighting policy somewhere. Approach schools. Talking to children will help insure that future generations will be sensitive to the issue of light pollution.

If you can't see the stars at night, call your local newspaper. Talk to a reporter about it. Send them copies of IDA information sheets. Newspapers love to print human interest stories that affect public policy. If you are outgoing and enjoy debates, contact a talk-radio show host and convince them that light pollution needs to be discussed. IDA director Crawford recommends you learn the local media and the names of the people in the city who will be making decisions, and get your input in. *After all, you are citizens and you have as much right ... as the people who are doing the lighting.*

Doing Good Lighting

It may surprise many people how they can affect the growth of light pollution. From homes and workplaces to new street lights in the community, many everyday people have a say about sources of sky glow. More often than not, you can make a difference. First, check your own house. Replacing

incandescent porch lights with low pressure sodium (LPS) can have an impact in your own community. Encourage public officials to make wise choices about nighttime lighting. Try to convince them to use LPS in full cutoff fixtures for street lighting. At least emphasize *full cutoff* fixtures. Encourage regulations controlling new lighting, requiring billboards be lit from the top, and that billboard and building lighting be turned off after midnight.

If you are involved in a lighting project (at home or at work) where professional lighting designers or electricians are involved, make sure they are members of the Illuminating Engineering Society of North America (IES). While IES supports many of IDA's positions, be sure to quiz the designer on light pollution. If they're already light-pollution educated, that's the best of all possible worlds. Otherwise educate them yourself, so that the next time somebody hires them they'll be more light-pollution aware. Insist on good lighting. Cheap fixtures may be tempting now, but you'll save money in the long run if you purchase good fixtures with the best source of light for the job.

Types of Lamps and Recommendations for Their Use

Low Pressure Sodium (LPS) -- This is the most efficient type of light, but, because it is monochromatic, it should be used where it isn't necessary to see colors: roadways, walkways, some parking areas, and large outdoor areas needing security lighting. The Ecology Store (602-327-3235) is a source of LPS fixtures. Ask for a copy of their catalogue, or talk to one of their consultants.

High Pressure Sodium (HPS) -- Should be used in sports parks, tennis courts, security areas where color is needed, and some parking lots.

Metal Halide (MH) -- Use for display lighting where color rendering is critical, and some sports lighting.

Mercury Vapor (M-V, or HG) -- This is not an energy efficient source, and is not recommended. If color is needed, use MH or HPS instead.

Incandescent, including quartz -- Not energy efficient, but okay for low-wattage applications. Good for infrared motion detector security lights that need to turn on quickly.

Timers can be used in conjunction with proper lighting for billboards, decorative lighting of buildings, outdoor scenes, and some porch lighting, to further reduce light pollution.

FOR SALE

Home Dome 10 ft. Diameter fiberglass observatory suitable for use at any location, exterior white, interior blue. One-foot high base ring, upgraded 16 roller rotation, three-feet wide viewing slot (0 to 105 degrees), all parts and sealant, weatherproof, fits refractor up to eight feet, cassegrain up to 14 inch, and dobsonian up to 18 inch. Asking price \$3650.00. Free delivery in the Washington/Baltimore area. View anytime. Phone 202-333-3745 and ask for Desmond O'Roark. Unit is not assembled and has never been used.

The goddess of clouds and lousy weather must be ticked off at someone in NOVAC. Not only was the telescope meet wiped out this year, but we have had an unusually high number of scheduled observing nights scuttled as well. Last time we had a streak like this there was a terrible witch hunt within the club. Accusations and recriminations circulated like wildfire, and during extraordinary star chamber proceedings, it was decided to run Nils Thomas out of town. Poor Nils, one of the founders of the club, now lives in exile in Roanoke. However, it seemed the weather did get better. HmMMM.

Anyhow, after yet another weather wipe out on 8 & 9 October, Sunday the 10th was a beauty. Al Boldt called Gary at Crockett Park and made arrangements for some of us to go out. That Sunday night was one of the very best I can recall at Crockett: crystal clear, crisp, breezy, and

just plain great. It was a deep sky night, a night to go after faint galaxies and nebulae. My first major objective was Stephan's Quintet,

a small group of very faint galaxies a few degrees northwest of the Great Square of Pegasus. To get there find NGC 7331 first. This is a real pretty 10th magnitude spiral galaxy that shows up well and is not very hard to locate. Start at Beta Pegasi, the upper right star of the square. Then, imagine a straight line from Beta through Eta and Pi Pegasi. Now visualize a 30, 60, right triangle with Pi and Eta being the 30 and 60 degree angles respectively. NGC 7331 is at the right angle point north of the line, exactly a Telrad circle northwest of Eta.

Once you find NGC 7331 don't go rushing away. Its pretty enough to spend some time giving it a good look. Stephan's Quintet is only half a degree southwest of 7331, in the same field of view with a low power eyepiece. The tough part is that these little galaxies won't show up under low power. They range from mag. 13.7 to 15.3, and require a good bit of magnification to distinguish them from the faint stars in the field. I know I was looking at them, but I couldn't see them. It takes a big-aperture telescope, exceptional skies, and a lot of patience to nail those little suckers down. Maybe next time.

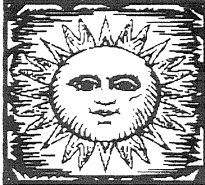
Cygnus was overhead by now, so I spent some time studying the Veil Nebula, one of the two prominent supernova remnants we can readily locate (the other is M1, the Crab Nebula). I started out with the western portion, NGC 6960. This is the part that seems to go through the star 52 Cygni. Many times this section of the Veil is overpowered by the bright star, but the sky was so transparent and the seeing so good that the star was just a pinpoint and the structure of the nebula showed up beautifully. The eastern part was spectacular. It was easy to move the telescope and follow the loop right around. I asked Brent how old the Veil was. Brent couldn't recall the figure, but for perspective, he pointed out that we know the Crab Nebula is almost 950 years old, and the Veil is enormous in contrast. Next day, I pulled out Burnham's Celestial Handbook and checked it out. The Veil is estimated to be about 30 to 40,000 years old, and about 70 light years across. We know the Crab got its start with the supernova of 1054 AD. It is about six light years in diameter and expanding at about 50 million miles a day.

Looking at the Veil triggered a planetary nebula kick for the rest of the night. Also, in the back of my mind was this size, distance, and age thing. A cross-section was called for, so I observed "itty-bitty" ones and great big ones, figuring I'd look up details the next day. By the way, all the data comes from Burnham's. This three-volume set is a must for any serious amateur astronomer's library.

NGC 7009, Aquarius: Called the Saturn Nebula because of its oval

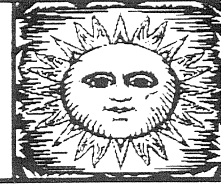
shape. Through the telescope it looks like a tiny greenish version of the ringed planet. Fairly high surface brightness, so it stands high magnification well. At 100x or so you can start making out the "ansae" or ears. Not too hard to find as it is only a couple of degrees from M73 and one degree from a fourth magnitude star. The nebula is about 3,900 light years (LY) away and approximately .5 LY in diameter.

M76, Perseus: Known variously as the Peanut, Bar Bell or Little Dumb-Bell Nebula, a bit larger than NGC 7009. Distance estimates vary from 1,750 to 2,500 LY. It is figured to be one LY across. Even though it is pretty small, it is easy to find. The nebula is right smack in the middle of a line drawn from delta Cassiopeiae and Almach (Gamma Andromedae). A fourth magnitude star is right next door to the south. M76 is probably what M27 looked like as a youngster.



Nebulous Thoughts

by Al Schumann



M57, Lyra: The famous Ring Nebula. Probably the best known and most observed planetary in the northern sky.

Shows up as a beautiful gray-green smoke ring with high surface brightness. Central star is mag. 15.4. I've gone after it with the 13-inch scope but couldn't see it. The Ring is about one LY across, approximately 1,400 LY away, and estimated to be 20,000 years old.

M27, Vulpecula: The Dumbbell Nebula. Much closer and a lot older: 48,000 years old. Take your pick on distance; various studies place it anywhere from 450 to 980 LY from us. If we accept 900 LY, the nebula would be 2.5 LY across. With low power or poor seeing it shows up as a rectangle. With good skies and a UHC filter I usually see it as an apple core.

NGC 7293, Aquarius: The Helix Nebula. This jasper is the biggest and the nearest, appearing half the size of the moon. Actually, the Helix is smaller and younger than M27. It looks larger than its 1.75 LY diameter because it is closer to us. The distance is estimated at 450 LY. Not too easy to see due to low surface brightness. Using low power only and a UHC filter helps to enhance the view a lot. Even with a filter it shows up as a dim ghostly gray circle. Located a bit more than one Telrad outer circle north and almost dead center between delta Capricorni and alpha Picis Austrini, Fomalhaut. Even though I know where it is I still have to search around for it. Fortunately, it is so big I can usually nail it in a minute or so.

That is a good cross-section to keep you busy for awhile. There are a couple more for good measure. As I was studying the Helix, Al Boldt was working on NGC 6888, the Crescent Nebula in Cygnus. It's an odd-looking arc of nebulosity about 2.5 degrees south of gamma Cygni along the neck of the swan. The crescent is probably the remnant of an old planetary, nestled among a quartet of stars. Burnham's has a photo but no details on the object. As I was packing up to leave, Al and Brent located another unusual nebula. This one was NGC 7635, the Bubble Nebula in Cassiopeia. It lies only a half degree southwest of M52, so it is pretty easy to find. I guess most of us just overlook it.

The Bubble is about three arcminutes across. Burnham suggests it is probably a planetary, but it is so oddly shaped that a nova remnant cannot be discounted. In reading up on planetaries I noted that estimating distances is quite difficult. In some cases, distance estimates varied by 100 percent or more, so you can take your pick depending on whom you want to impress. Near or far, give planetaries a shot to test your observing skills.

I wonder how long it took for old Nils to get off the last of the tar and feathers. And who's next!?

Northern Virginia Astronomy Club
Financial Statement for
January 1, 1993 to December 31, 1993

INCOME

Dues, renewals	1,384.00
Dues, new members	1,028.00
Sale of Astro League Books	292.18
Donations to NOVAC for BBS	1,052.00
Interest (Savings account)	74.44
Interest (Checking Account)	20.10
Donations to NOVAC	34.00
NVTM93: Donations(brownies)	18.40
TOTAL INCOME	3,903.12

EXPENSES

Newsletter Printing & Postage	914.23
NOVAC BBS	915.20
Purchase of Astro League Books	282.18
Insurance	264.00
Dues (Astronomical League)	235.45
Crockett Park user fee	200.00
Hotline phone charges	221.76
Equipment (club eyepieces)	135.90
NVTM93 Expenses (toilet)	65.00
NVTM93 Expenses (Printing)	11.50
Miscellaneous postage	61.39
Miscellaneous expenses	44.92
State Corp. Comm. Regist. fee	25.00
Printing (Welcome letter)	10.45
TOTAL EXPENSES	3,386.98

Income	3,903.12
Expenses	3,386.98
NET GAIN	516.14
Beginning Balance	3,218.07
Net Gain	516.14
ENDING BALANCE	3,734.21

Personal Celestial Highlights of 1993
by Bill Burton

I'm a family man now, and can't get out for observing nearly as much as I used to. In fact, I visited Crockett Park only once this year with my telescope. Nonetheless, 1993 was a memorable year for celestial events; a year defined by quality, not quantity. A telescope wasn't even necessary!

The Perseid Meteor Shower

August 12 certainly didn't look promising weatherwise, with clouds and thunderstorms threatening. But my wife Laurel Wanrow and I decided that this would be a good family activity to do with our 15-month old daughter Emmy, and at dusk we headed out to Crockett. I thought seriously about going to Sky Meadow instead, which would have been a disastrous decision considering the mob scene there, but Laurel fortunately insisted on the NOVAC site. What a pleasant scene it was, with 30 or 40 club members lying around on blankets in the warm evening air, waiting for the action to begin. We found old friends Brent and Joanne Archinal, Brenda Jones, her son Kevin, and Myron Wasiuta, who seemed to be in charge of the meteor tally and who was conducting a photographic triangulation experiment with two other far-flung observers. We spread out our own blankets, and I set up my large binoculars to investigate whether there would be thousands of very faint meteors during the storm, as some had speculated (there weren't).

Night finally came, and Emmy pointed to a star and said the word. There fell over the crowd a long expectant pause, lasting many minutes, as we waited for the first streak of light. Discontented murmuring was heard in the darkness. Suddenly a bright light appeared north of Cygnus and swept from east to west, traveling over 60 degrees before disappearing near the western horizon. "One!!!" we all shouted exultantly. This lead-off fireball was not an atypical meteor that night. By Myron's count, between 9 P.M. and 12 we saw 15 meteors of magnitude 0 or brighter, including at least six brighter than magnitude -2. Even Emmy saw one, before she fell asleep. A miraculous hole in the clouds seemed to be stationed over

Crockett Park: while lightning flashed in the distance, meteors streaked overhead. My favorites were the ones that went so far towards the western horizon that they were actually reddened by the atmosphere.

Finally around midnight the clouds won, and driving back we encountered rain before we reached Manassas. But even in such tenuous viewing conditions, these were without a doubt the brightest meteors I'd ever seen in one night. I can't quite believe the meteor-shower experts who maintain that the proportion of fireballs was only normal that evening. No storm? Who cares—I'll take quality over quantity any day.

Lunar Eclipse

Gripe as we do about the observing weather around here: too hazy, never clear on observing weekends, etc., you can't complain about our recent record of sky conditions during total lunar eclipses. By my count, the last four were met with clear skies in Northern Virginia. The eclipse of November 28-29, 1993 was perhaps the finest. It was a cold clear night with the moon high in the sky and the Earth's atmosphere now clear of the eclipse-darkening ash of Mt. Pinatubo. Alone, but armed with my 20x100 binoculars and a hand-held video camera, I got out in my backyard as the partial eclipse began at 11:40 P.M. Handycams being what they are these days, the camera focused automatically and sharply through the binoculars, and picked up the darkened part of the moon clearly in the zoom lens as well as nearby stars! I watched the grayish-brown shadow of Earth slowly march across the oddly-lit surface of the full moon, where albedo features stood out sharply in the penumbral twilight before being snuffed out. Since the moon was located in the Hyades cluster, there was an abundance of bright background stars, and I watched the dark lunar limb extinguish two stars—my first two occultations! The instantaneous disappearance of the stars was breathtaking and bespoke not only of their minute angular diameter but the lack of a lunar atmosphere as well. It seemed to take forever for the

shadow to reach the other lunar limb, but finally the moon hung there totally eclipsed, like a dark gemstone amidst the twinkling jewels of the winter constellations. There is nothing like an eclipse to make you realize how small the moon's angular diameter really is. Since the moon skirted through the lower part of the earth's shadow, the lighting during totality was never uniform, but featured a ghostly, pale white light along the lower limb and a fine, faint coppery red on the upper part of the moon. The two shades of color slowly rotated opposite each other around the moon as totality progressed. In the binoculars the moon appeared three-dimensional. As in previous eclipses, I found the last moments of totality the most beautiful and colorful. Like a divine revelation, white light slowly poured out over the darkened lunar surface.

The Great Smoky Sky

Laurel, Emmy and I spent Christmas week with her parents in Great Smoky Mountain National Park, where her father is a naturalist. We were at Cades Cove, a flat-floored valley at 1800 feet, rimmed by mountains, in the western part of the park. Although I brought my trusty large binos, I was pessimistic about the observing prospects, since last year we were clouded out for a solid week during prime-time for Comet Swift-Tuttle. This time the cove was at its most beautiful, with a white dusting of snow providing the backdrop for roaming herds of deer. My luck was also better, and one night as the waxing moon set before midnight, I set up at the eastern end of the Cove, under a truly dark sky. The winter Milky Way--how often do you clearly see that?--was an even but thin band of light stretching from Cassiopeia to Canis Major.

I swung the binoculars from open cluster to open cluster, hopping down this nearby arm of our galaxy and examining it as if with a microscope. In the 2.5-degree field each sky object appeared nicely settled amongst its surrounding stars, a perspective usually not seen in telescopes. The Orion Nebula was dazzling, and its gauzy arms stretched impossibly far from the bright turbulent core. The Double Cluster was a "twin explosion" of stars, with blue-white pinpoints of light that bored into the retina. When I stepped away from the oculars and looked up, the brilliant winter constellations leapt out at me, demanding to know why I even bothered with optical aids! The temperature dropped into the twenties. The Geminids were still active, and a green fireball exploded near the western horizon, very briefly casting a shadow. At some point, off in the distance, a lone howl started up, soon to be joined by another, and then another in a canine chorus under the starry sky. It was the red wolf, recently reintroduced to the park, sharing my astronomical interest that

NOVAC Notices

Discounts on Sky & Telescope Magazine

As a member of NOVAC you can get a subscription to Sky & Telescope for \$20.00 instead of the regular \$27.00 rate. To start a new subscription or renew an established subscription, make your check out to SKY & TELESCOPE for \$20. Note on the check if this is a new subscription or a renewal. Send your check to Brenda Jones, 883 N. Kentucky St., Arlington, Va. 22205.

You can also order any publication directly from Sky Publishing at a 10% discount. Just mention the Club Discount Plan and that you are a member of NOVAC.

Discounts on Astronomy Magazine

Your NOVAC membership entitles you to subscribe to Astronomy Magazine at the annual rate of \$16.00. That is a significant

discount over the usual \$24.00 rate. A two-year subscription costs \$32.00. To start a new subscription or renew an established subscription, make your check payable to KALMBACH PUBLISHING COMPANY for \$16.00 (one-year subscription) or \$32.00 (two-year subscription). Note on the check if this is a new subscription or a renewal. Send your check to Brenda Jones, 883 N. Kentucky St., Arlington, VA 22205. NOTE: There are no special 10% discounts offered on publications through Kalmbach Publishing.

Club Telescope Available for Use

NOVAC makes available two six-inch (f/5) Newtonian reflectors for club members to check out free of charge and use for a limited time.

The first scope is a Celestron model SP-C6 on a Super Polaris German equatorial mount and wood tripod. It will readily fit disassembled in any car and is easily transported and set-up at remote observing sites. The scope comes with an Orion Ultrascopic 10mm and Meade MA 25mm eyepieces with 1.25-inch barrel sizes. To borrow this scope you will need to show your NOVAC observing pass and leave a \$500.00 security deposit to take the scope out.

The second scope is a home-made six-inch reflector on a dobsonian mount and comes with a 25mm Kellner eyepiece. It is easy to transport to dark sky sites and easy to use. To borrow this scope you will need to show your NOVAC observing pass and leave a \$250.00 security deposit to take the scope out. If you are interested in borrowing either of these scopes, contact Bob L'Hommedieu, NOVAC President, at (703) 978-0946. He will schedule a time for you to pick the scope up at his home. Bob resides at 4415 Eastwood, Fairfax, VA 22032.

NOTE: Checks must be made payable to NOVAC. Checks used as security deposits on telescopes ARE NOT deposited and will be returned to the originator when the scope is returned. The scope may be checked out for two to four weeks at a time depending on demand.

1993 NOVAC Meeting & Observing Schedule

The schedule below lists the NOVAC General Membership Meeting and Observing Schedule for 1994. General Membership Meetings are held at the Arlington Planetarium the third Wednesday of every month. Trustee Meetings are held on an *as needed* basis, usually the Tuesday before the week of the General Membership Meeting. Non-Trustees interested in attending should contact a Club Officer or Board Member for further information. The NOVAC Observing Sessions are held at C.M. Crockett Park in Midland, VA.

	Mtgs	Observations	Observing Site Rules
January	19	7, 8, 14, 15	Crockett Park: NOVAC members may use Crockett Park for observing on nights other than those scheduled for club observing; However, YOU MUST HAVE PRIOR APPROVAL FROM PARK MANAGER GARY KWOLEK. Call (703) 788-4867 early in the day on which you wish to observe. If you reach the answering machine, leave a message saying that you are a NOVAC member and you wish to observe that night. Also, leave a telephone number where someone can reach you. If you do not receive a return call, you MAY NOT use the park. THERE ARE NO EXCEPTIONS! Use of the park is limited to NOVAC members only.
February	16	4, 5, 11, 12	
March	16	4, 5, 11, 12	
April	20	8, 9, 15, 16	
May	18	6, 7, 13, 14	
June	15	3, 4, 10, 11	
July	20	1, 2, 8, 9, 29, 30	
August	17	5, 6, 26, 27,	
September	21	2, 3, 9, 10, 30	
October	19	1, 7, 8, 28, 29	
November	16	4, 5, 26	
December	21	2, 3,	

Park management locks the entrance gate at sunset and you may use the combination shown on your Observing Pass to gain access. Do not reveal it to anyone. You must lock the gate behind

NOVAC NOTICES (Continued from page 10)

you after entering and please remember to lock it after you leave. During EDT, you must set up your equipment on the large field to the left of the park entrance. During EST, you must set up on the paved cul-de-sac 200 yds. past the gate.

No loud radios, alcoholic beverages or loose pets. Do not leave trash or debris behind. We are guests of the park and park management may revoke our observing privileges any time due to the carelessness of one person.

Directions to Crockett Park

From the Washington DC/Northern Virginia area, go west on I-66 to the 47-a exit. This is 234 South to Manassas. Continue on 234 for 2.8 miles then turn right on Godwin Drive at the "Po Folks" restaurant. Follow Godwin Dr. for 1.8 miles to where it merges with Rt. 28 West. Once on Route 28 continue driving for another 13.7 miles through the towns of Nokesville, Catlett and Calverton until you turn right on Rt. 643 toward Warrenton. There is a small country store (Mayhugh's) on the corner of the intersection. Go on about a mile up Rt. 643 to the Park Entrance road. Look for a small sign for C.M. Crockett Park on your right directing you to turn left. Once on the park entrance road, go one-half mile to the park gate.

Observing at Parsell's Field

It started at the September NOVAC general meeting, when Doug Mistler said he was interested in finding local observing sites around Herndon, Reston, and Sterling. A quick canvas of people hanging around at the end of the meeting turned up a couple of others from our area, and we agreed to get together and try out each other's local sites. After a long span of truly rotten weather (including both NVTM dates) a cold front moved through, bringing crystal-clear nights for the weekend full moon.

The weather report predicted continued good weather rest of the week. It also predicted an East wind, which normally brings drizzle, so I was worried about the weather changing. I figured we'd better not count on the clear skies lasting, and called around to see who was interested in a Monday session at Parsell's Field. Pete Gural and Linda Thomas were, so we made arrangements. Linda and I would car-pool, and Pete would meet us there.

After the 25-minute drive up the Toll Road and down Waxpool, Linda and I arrived at the field. It was around 9:00, full dark, and the Summer Milky Way was clearly visible from Cassiopeia in the northeast through Sagittarius in the Southwest. We looked around, evaluating the sky. East was pretty brightly lit (probably the ball field in Sterling), but at the zenith and to the southern, western, and northern horizons it was pretty good. While I was looking South an orange fireball made a quick trip starting around Ophiuchus's right foot down through Sagittarius. We barely got our chairs, charts, and 2 pairs of 10x50s out when Pete pulled in.

More discussion of the sky conditions ensued. Following the advice given in last issue's Sky Sweep, we counted stars in the Great Square of Pegasus. Our collective answers varied between 4 and 7, which probably says as much about the variation between our eyes as about conditions at the site. Then, while Pete set up his camera and started shooting for meteors, Linda and I started chasing fuzzies.

All of the brighter Messier objects in northern Sagittarius and Scutum were easy targets. M-27 (the Dumbbell Nebula) was lovely., and M-13 and M-92 in Hercules were very nice. The further east one went, the harder it got to find things. While M39 was still easy, and M-15 was nice, M-29 was hard to find. The Andromeda Galaxy looked like it spanned about one-and-a-half degrees in the 10x50s, but I couldn't find the Triangulum galaxy (M-33) at all.

While we were star hopping and the camera shutter clicked, Pete told us about his Perseid videotape. After watching 12 hours of tape, he'd found 6 meteors. "It's probably not the best

way to record meteors." he concluded. After a while, it became obvious that the bright area to the east wasn't just sky glow from Sterling: the 3/4 full moon was rising about an hour earlier than I was expecting it. We shifted our attention back to the western sky, while Pete told us about his pursuit of state-of-the-art video astronomy.

As the moon continued rising its light became strong enough to cast clear shadows across the grass. We gave up at around 10:30, after about an hour and 45 minutes of observing. We all agreed that it was a pretty good site and both Linda and Pete said they thought they'd bring telescopes next time. Because of the short commute, we were all home by 11:00. Not bad for a Monday night!

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**Announcing the
1994
NOVAC Annual
Meeting**

**Tuesday, January 11, 1994
at the home of Brenda Jones
883 N. Kentucky Street
Arlington, Virginia
7:30 P.M.**



**This is NOVAC's planning
meeting for 1994. All
NOVAC members are
invited to attend, meet new
club officers and give their
ideas and input on NOVAC
activities for 1994**

**Images:
The Magnificent Orion Nebula**

Photo of M-42 by Bob Sandy



*“Regions of lucid matter taking form,
Brushes of fire, hazy gleams,
Clusters and beds of worlds, and bee-like swarms
Of suns and starry streams...”*

— Tennyson

NOVAC

The Northern Virginia Astronomy Club
c/o Brenda Jones
883 North Kentucky Street
Arlington, Virginia 22205



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Bill Sartor
2034 Golf Course Drive
Reston, Virginia 20191