

NOVAC

THE NEWSLETTER OF THE NORTHERN VIRGINIA ASTRONOMY CLUB

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An asteroid to call my own

by Dave Skillman

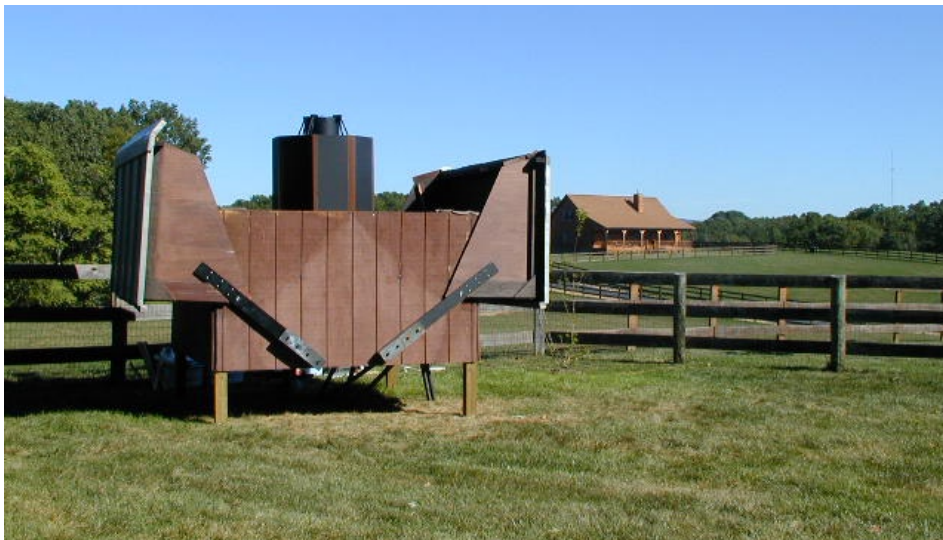
It's hard to find an asteroid to call your own these days. Starting about a decade ago professional astronomers heeded the call to survey the asteroid population for bad actors that might imperil the Earth. They search primarily for NEOs (Near Earth Objects) or PHAs (Potentially Hazardous Asteroids) but in doing this they automatically see all the other asteroids too.

These surveys typically use meter-class telescopes in prized locations and use some of the best detectors available, so they are very thorough. They have swept up almost all the asteroids down to a faintness of 19.5 magnitudes! So you either have to be very lucky or reach very faint magnitudes if you are going to find an asteroid that they haven't already seen.

A couple of years ago I finally decided to move my scope to a dark site. I had been working from my backyard in Laurel, MD. The sky brightness got worse and worse and eventually blocked my reach to faint magnitudes.

I had joined NOVAC and used the member email service to broadcast a plea for a dark site. My scope is a 26" reflector and it, and its observatory, are fully automated and can be operated over the Internet. So all I needed was someone way out in the countryside that didn't mind hosting my scope. That person turned out to be fellow NOVAC member Greg Kinne who lives out near Front Royal.

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Dave Skillman's dark site observatory, where he discovered asteroid 2006 UB62.

MESSAGE FROM THE PRESIDENT

Happy New Year!

by Phil Wherry

As I write this, it's raining outside, so I suspect that some of you have gotten some new toys recently (as many of you know, it's widely suspected that new astronomy gear is actually the proximate cause of bad weather).

2007 is NOVAC's 27th year. The club is robust and healthy by just about any measure. Our membership has grown over time to the point where we believe that we're now the largest observing club in the country. We offer a wide range of services to our members; these include access to a large number of observing sites, loaner equipment, a substantial reference library, and electronic discussion groups. Our public outreach program extends our reach even further.

These successes aren't accidental. During my relatively brief tenure as a NOVAC member, the club has been led by Ed Karch, Rob McKinney, and most recently Bob Parks. Each one of these past presidents has devoted a great deal of time and enthusiasm to the continuing success of the club. The same can be said of the many members who have served on NOVAC's Board in either an elected or appointed position, and those who have volunteered to support NOVAC projects and events. We said it at the NOVAC Volunteer Reception in December, but it bears repeating: **thank you to each of you for all of the effort in support of our club.**

Bob Parks pointed out in a recent column that the determining factor behind the club's future success rests with its ability to attract and retain volunteers. I agree.

As I write this, we're about to kick off a program to make contact with all new members within a few days after the member joins the club. We want to make sure that the new member is personally welcomed to

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Asteroid, from page 1

Greg invited me out to survey the site and I found that the D.C. skyglow was gone and that the Milky Way still existed! With Greg's good help I took a month off work and moved the scope to a corner of his yard a year ago last September. It took a few months to iron out all the bugs but I've been operating it pretty reliably for almost a year now from my home in Greenbelt, Md., just north of the D.C. beltway. I use fellow NOVACer Bob Bunge's IR weather loop to keep track of conditions at the scope.

My sky brightness in Laurel was about 1000 counts/sec/pixel. At Greg's it was about 90 c/s/px, about 2.5 magnitudes darker. Worth the 90 mile move. Back to the asteroid search!

My typical operation is to chase faint asteroids that are already known but that have drifted off their predicted ephemeris. Most of these haven't been observed in several years so my contribution is to locate them and report them to the Minor Planet Center (MPC) so that their ephemeris can be brought up to date. While I'm doing this I also check the rest of the field for unknown objects.

On the night of 10/16 I had been searching for asteroid 2004 BD6 which hadn't been seen for a couple of years. It was only slightly brighter than magnitude 20. In a single short (30 seconds) exposure I might get to magnitude 18.5 so I have to stack many images together to reach to fainter magnitudes. I didn't find 2004 BD6 that night. I tried a few nights later, on the 19th, and conditions were better. As I blinked the stacked images looking for BD6 I soon found it several arcminutes from its predicted position—I had accomplished what I set out to do. But I continued to look around the field and much to my surprise was a much brighter object about 10 arcminutes away from BD6, at about 18.5 mag.

This guy was so bright that I could see it on my individual frames. I went back to the MPC site and verified that this new object was not known. Two nights later (21st) I had a chance to verify it and indeed it was there again but a bit fainter. The following night I found it again and submitted the positions to the MPC. A day later the MPC named this new object 2006 UB62. Their report showed my three nights but one of the surveys had also reported it on 21st. Ulp! The surveys have to process so much data that they are often a week or two behind in getting their

measurements into the MPC. The race was on. The person that submits sufficient data to define an initial orbit gets the credit as the discoverer, even if some else saw it earlier. I continued to observe it and also found that my data of the 16th, although too poor at first to find 2004 BD6, was good enough to find my new object, UB62. So the length of my data arc was growing and no other surveys had reported in yet.

I kept watching the data reports each day and now the surveys were showing that they had seen it earlier than I had. One survey saw it one night (9/28), three weeks ahead of me. Then they reported they had seen it on 9/17, more than a month ahead of me. Still the discovery fell to me because their one-night-

The person that submits sufficient data to define an initial orbit gets the credit as the discoverer, even if some else saw it earlier

here, one-night-there was not enough to confidently identify those single night observations as the same object. As the weeks went on more surveys started to report seeing it after I had. So the data arc was growing. After about two weeks the MPC was able to link this object back to some data taken on two nights in the year 2001! Those two nights then were not accurate enough to predict my observations, but mine were good enough to connect to the 2001 data. So the discovery had solidified and my data points had been the crucial ones to tie all the other ones together. This gave me the credit as the discoverer and I get to name it in a few years. Much fun!

It is about a mile in diameter. The orbit turned out to be fairly elliptical ($e=0.3$) with a period of about 4.7 years. It had come to perihelion just as the Earth came closest to it. This coincidence made it much brighter than in other years and explained why it hadn't been seen much other than briefly on its last perihelion passage. If you go to neo.jpl.nasa.gov/orbits/ and enter 2006 UB62 you can run back to the discovery date (2006-10-19) and see the geometric arrangement of the Earth and the asteroid at the time I first saw it.

I continue to follow 2006 UB62. It is now almost at 21st magnitude so I struggle to detect it. Soon it will be gone again, five more years into the darkness. *

Martian devils

by Dr. Tony Phillips



Admit it. Whenever you see a new picture of Mars beamed back by Spirit or Opportunity, you scan the rocks to check for things peeking out of the shadows. A pair of quivering green antennas, perhaps, or a little furry creature crouched on five legs...? Looking for Martians is such a guilty pleasure.

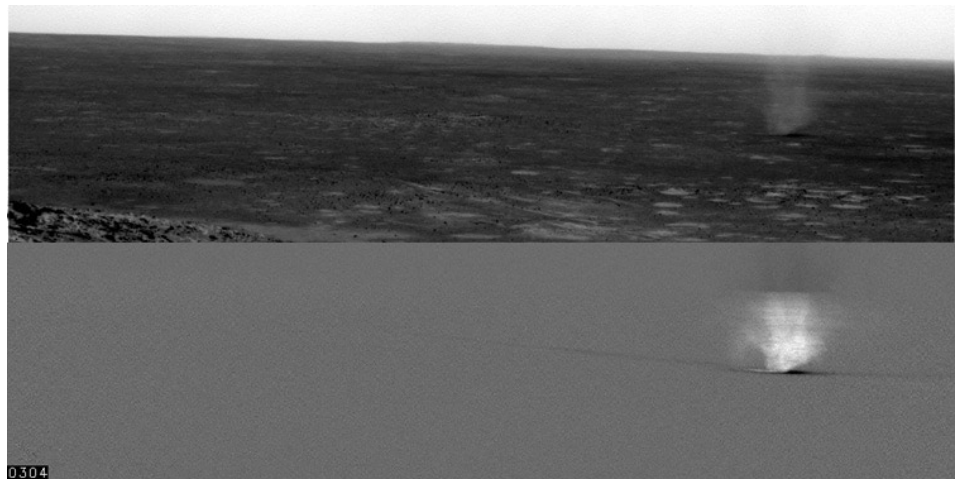
Well, you can imagine the thrill in 2004 when scientists were checking some of those pictures and they did see something leap out. It skittered across the rocky floor of Gusev Crater and quickly disappeared. But it wasn't a Martian; Spirit had photographed a dust devil!

Dust devils are tornadoes of dust. On a planet like Mars which is literally covered with dust, and where it never rains, dust devils are an important form of weather. Some Martian dust devils grow almost as tall as Mt. Everest, and researchers suspect they're crackling with static electricity—a form of “Martian lightning”

NASA is keen to learn more. How strong are the winds? Do dust devils carry a charge? When does “devil season” begin—and end? Astronauts are going to want to know the answers before they set foot on the red planet.

The problem is, these dusty twisters can be devilishly difficult to catch. Most images of Martian dust devils have been taken by accident, while the rovers were looking for other things. This catch-as-catch-can approach limits what researchers can learn.

No more! The two rovers have just gotten a boost of artificial intelligence to help them recognize and photograph dust devils. It comes in the form of new software, uploaded



The top half of this image is part of a series of images of a passing dust devil on Mars caught by Spirit. In the bottom half, the image has been filtered to remove everything that did not change from one image to the other. Notice the faint track left by the dust devil. Credit NASA/JPL/Mark T. Lemmon, Univ. of Arizona Lunar and Planetary Laboratory.

in July and activated in September 2006.

“This software is based on techniques developed and tested as part of the NASA New Millennium Program’s Space Technology 6 project. Testing was done in Earth orbit onboard the EO-1 (Earth Observing-1) satellite,” says Steve Chien, supervisor of JPL’s Artificial Intelligence Group. Scientists using EO-1 data were especially interested in dynamic events such as volcanoes erupting or sea ice breaking apart. So Chien and colleagues programmed the satellite to notice change. It worked beautifully: “We measured a 100-fold increase in science results for transient events.”

Now that the techniques have been tested in Earth orbit, they are ready to help Spirit and Opportunity catch dust devils—or anything else that moves—on Mars.

“If we saw Martians, that would be great,” laughs Chien. Even scientists have their guilty pleasures.

Find out more about the Space Technology 6 “Autonomous Sciencecraft” technology experiment at nmp.nasa.gov/st6/TECHNOLOGY/sciencecraft_tech.html, and the use of the technology on the Mars Rovers at nmp.nasa.gov/TECHNOLOGY/infusion.html. Kids can visit spaceplace.nasa.gov/en/kids/nmp_action.shtml and do a New Millennium Program-like test at home to see if a familiar material would work well in space. ★

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

President’s message, from page 1

NOVAC, and is quickly acquainted with the resources the club offers. If the new member has questions or a particular area of interest, we’d like to facilitate the process of connecting with other members who have relevant expertise. We also hope and expect that this program will improve our ability to identify new members who might have an interest in supporting the club as a volunteer.

To our existing members: I’d like to make a personal request for participation in 2007. Whether you’re an expert astronomer or an absolute novice, if you believe you’ll have even a couple of hours over the next year to donate in support of the club, I’d like to hear from you. It couldn’t be easier! Just send an email to volunteer@novac.com and say, “I’d like to help out!” In your note, please say a little bit about your interests, skills (whether astronomy-related or not), and availability. We’ll then do our best to

present you with volunteer opportunities that take advantage of your talents and that will help you make the most of your membership.

Thanks so much for helping make NOVAC such a terrific club, and my best wishes for a great 2007! ★

Pristine skies at Hopewell Observatory

by Elias Sanchez

My experience at Hopewell Observatory last fall was indeed a treat! Those guys have some amazing telescopes with high end gear for enjoying the night as well as studying the sky.

A nice crowd was present and were mesmerized by the beauty of the night sky as well as the different celestial bodies the astronomers were showing through their telescopes. Four other telescopes of different sizes were set up on the grounds of the Observatory. I didn't bring "Olga" with me, my 8" Dobsonian reflector, due to its size but I brought my Meade 4" refractor. The skies were pristine and dark, indeed. The Milky Way was visible as well a several constellations for this time of the year. Among the objects I saw and shared with others was the Andromeda Galaxy (M31), M13, and the planet Uranus.

Hopewell Observatory is at the top of the Bull Mountain in Haymarket, VA, a beautiful location. We stayed until 9:30 as the cold winds were picking up. Now, I am craving for some more observing nights. It's amazing to really see things that are thousands and billions of miles away from us something very rare under our very light polluted skies.

The Hopewell Observatory has a number



M31 through my 4 inch Meade (top) and the same galaxy from Hubble Space Telescope—what a difference, eh?



Hopewell Observatory telescope.

of telescopes for astronomers to study the sky. Below are the objects I logged from my observation with my "humble" 4" Meade telescope.

M31, the Andromeda Galaxy

The Andromeda Galaxy (also known as Messier 31, M31, or NGC 224; older texts often called it the Andromeda Nebula) is a barred spiral galaxy approximately 2.5 million light-years away in the constellation Andromeda, which lies in the northern hemisphere of the sky.

Andromeda was believed to be the largest galaxy of the Local Group of galaxies, which consists of the Andromeda Galaxy, the Milky Way Galaxy, and the Triangulum Galaxy, and about 30 other smaller galaxies. Recent observations by the Spitzer Space Telescope revealed that M31 contains one trillion stars, greatly exceeding the number of stars in our own galaxy.

The Andromeda Galaxy is easily visible to the naked eye in a moderately dark sky, though such a sky is available only in smaller towns and isolated areas reasonably far from population centers and sources of light pollution. It appears quite small without a telescope because only the central part is bright enough to be visible, but the full angular diameter of the galaxy is seven times that of the full moon.

Globular cluster M131

The other object we were able to see was M13. M13 is also called the "Great globular cluster in Hercules" and one of the most prominent globulars of the Northern celestial hemisphere. It was discovered by Edmond Halley in 1714, who noted that "it shows itself to the naked eye when the sky is serene and the Moon absent."

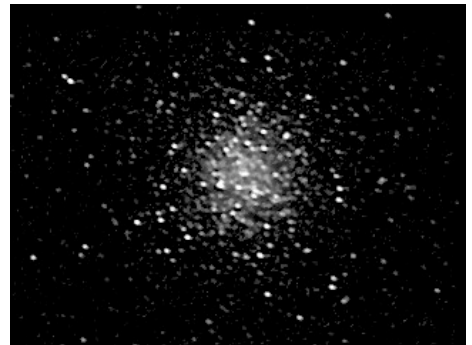


The author poses with his telescope.

At its distance of 25,100 light years, its angular diameter of 20' corresponds to a linear 145 light years—visually, it is perhaps 13' large. It contains several hundreds of thousands of stars. Towards its center, stars are about 500 times more concentrated than in the solar neighborhood.

Globular cluster M13 was selected in 1974 as target for one of the first radio messages addressed to possible extra-terrestrial intelligent races, and sent by the big radio telescope of the Arecibo Observatory. *

Hopewell Astronomical Observatory, located at the top of Bull Run Mountain near Haymarket, Virginia. Hopewell is a private, independent observatory association



M13, the great globular cluster in Hercules, through my 4 inch Meade (top) and again, from Hubble Space Telescope.

While The Neighborhood Sleeps

by Michael Lux

4:00 AM, by myself,
anxious and excited,
I lift my backyard telescope,
while the neighborhood sleeps.

Dragging butt out of warm bed
because charts and formula,
tricky to figure out,
tell me:
Io, Jupiter's closest moon,
comes around BIG Momma's backside,
at 4:23, this morning.

Been showing for four billion years, more or less,
orbiting eleven Earth waist lines, in less than a weekend,
a thoroughbred racing,
never tiring,
despite pulling and tugging by mommy's gravity,

as all children of the Universe encounter,

Clouds approaching frighten me,
even more than lingering doubts,
I screwed up the formula.

One cloud so frail and momentary,
kills eager eyes
longing for glimpses of heavenly spectacles, like comets
s t r e a k i n g ,

and moons revealing,
eclipsing Goliaths' all,

a dainty David slaying.

Telescope on tripod, finally mounted correctly,
toes numbing, back aching,
pointing and searching,

wristwatch reading five minutes to go,
no instant replays to count on,
the pressure is building,
the planet still missing.

Finally, at eyepiece edge light is streaming
growing brighter and brighter,
black curtain now lifting
like a blind man slowly seeing.

It's Jupiter, round and milky, with a pearly moon
strung on each side,
a sight always thrilling,
but especially this moment,
for tonight's headliner, Io, is still not around.

Tripling power for a much closer stare,
afraid to look away,
a strange peeping Tom, I feel like
with no one else around.

Will Io show quickly like a clock hand moving,
or come around, slowly exposing?

Suddenly, Jupiter's waistline stretching, so it'sy-bitsy,
in super slow-mo
tiny white on white,
or is it merely stray light?

A pimple budding on a surface once smooth,
an eternity later
any doubt now gone,
Jupiter's not changing,
it's Io passing!

Now alongside, the two of them touching, to Earthly eyes,
a Mutt and Jeff a thousand times over,
youngster slowly drifting away,
at first a toothpick's width is all that's between them,
twenty minutes later,
their own separate space.

Jupiter – back to normal – and a third moon on the scene,
a bonsai solar system, in motion, I'm seeing ,
Godlike I'm feeling, words can't describe,
while the neighborhood sleeps.

Keeping an informal observing log

by Eric Vondra

“At that point I gave up on the galaxy and spent the next fifteen minutes chatting with a guy named Franklin who had just moved up from Oklahoma, when the ground suddenly lit up and we caught the tail end of a huge green bolide just over the little farmhouse to the northeast.”

“The supernova was easily seen 6.2 arcseconds NP, est. mag. 14.1. Conditions: 30% overcast, high cirrus in NE quadrant, seeing 8.5/10, transparency 7.5/10, l.m. 6.5 at zenith.”

Observing logs can take many forms and exhibit varying styles, as the two examples above show. How you record your observing experiences depends upon what you enjoy most about amateur astronomy.

I encourage everyone who observes to keep some sort of record of their observations. There are several benefits, and your own preferences determine what kind of log you keep.

For me, if I include not just the eyepiece impressions, but something of the situation and peripheral events (as in the first example) I can later visualize the observing session, recall details that I thought I had forgotten, and relive the moment in all its glory, misery, frustration, triumph, or eeriness, whichever the case may be. I also enjoy comparing my current observations with

those I have made using different equipment and from different observing sites. So my log is a mixture of anecdotal experiences and eyepiece impressions.

While I don't go to the extremes of logging every scientifically relevant fact about each observation (as in the second example), I do find certain notations help to make the observation comparable to future observations. At a minimum try to record the name or designation of the object, the instrument you are using to observe, the date and time, the location, and something about the quality of the sky. *NOVAC newsletter* issue 59, May/June 1995, available on the web site, includes an article with further suggestions of what to record.

What makes a good log?

What makes a good log is up to you. Keep in mind that you may be keeping the log for many years, and some things you swear you won't forget will definitely fall by the wayside without something to jog your memory.

What was that great eyepiece that guy used to show me the Veil Nebula—and what kind of telescope was that? Just a few notes will help you relive that moment.

Could I see the outer shell of that planetary nebula in my 8" scope from the state park site? Make a note, even if it's a negative observation.

How you record your observing experience is another judgment call. Sketching what you see in the eyepiece is one component of many logs. It helps train your eye and gives you a record that can be visually compared to images or other observations. However, many people don't feel they have the skill, especially at night when it's dark, cold, windy, or dewy, or perhaps the patience to sketch as they observe.

Recording notes at the eyepiece

The same goes for writing down notes at the eyepiece. I solved this by recording my observations verbally, originally using a tape recorder and nowadays using a digital voice recorder. It's much quicker, spontaneous, and simpler to speak your impressions into a recorder than to fiddle with a notebook, pencil (which invariably gets misplaced), and red light. The primary drawback to this method is the need for transcription—some-

thing I personally loathe.

Desperate to avoid transcribing the recordings, I have looked at speech to text software (Dragon Naturally Speaking Preferred appears to be the gold standard), but reviews of its capabilities convinced me this would cramp my style too much and would require a lot of tweaking to the point where it probably wouldn't save any time or effort. So I live with transcription. The end results, despite the pain, are well worth it.

If you choose the voice recording route, I recommend you use a digital voice recorder that holds several hours of notes at its highest quality setting. Another important feature is the ability to transfer files from the recorder to your computer. If you're like me and hate transcription, it's likely you might fill up the recorder and find yourself with no space to record new notes by the next observing session. So by moving the file off to your computer, you free up the memory in the recorder and can transcribe at a later date. Not all recorders have this capability.

Another simple but very important feature is an LED light to indicate when the recorder is recording and when it is paused. Most recorders don't have a backlit screen, and even if they did, it would be difficult to read or could be an annoying light source. It's amazing how bright even dim displays are when your eyes are dark-adapted. So look for a recorder that has a small LED to indicate various operations. Mine has one which flashes red slowly when paused and is on steady when recording.

I realized how important this was after I had used an mp3 player that also records, and found that I had been pausing when I thought I was recording because there was no visual indication for night time use. It's pretty disappointing to find all you've recorded is silence after five hours of observing! After doing some research, I settled on the Olympus VN3100PC digital voice recorder. You can see my November 12, 2006 review of it on Amazon.com.

Don't forget to keep a backup!

Transcribing notes to your computer makes the most sense. You can always print out the log, but you'll have the ability to search

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Annual meeting

Tuesday, February 6 at 7:30 p.m.

Each year, on a weekday before the general meeting, the NOVAC Officers and Board of Trustees hold a special meeting open to all NOVAC members. At this meeting the proposed budget and the clubs direction and activities for the next year are discussed. We welcome the input of all members, and encourage all who can attend to do so. Please contact a board member for the date or subscribe to the NOVAC listserver.

The meeting is held at the Arlington Planetarium, 1426 N. Quincy St., Arlington 22207, 703/228-6070

The planetarium is just south of I-66 at Washington-Lee High School. The planetarium has a white dome and is in front of an office building.

“To observe, and to help others observe”

NOVAC is a non-profit, all-volunteer organization chartered to advance amateur astronomy in Northern Virginia. Members benefit from:

Access to dark sky observing sites:

NOVAC maintains agreements that provide club members with year-round access to observing sites away from city lights

Monthly meetings

Monthly meetings are held at 7 p.m. on the second Sunday of each month in Room 80 of the Enterprise Building on the campus of George Mason University. Each meeting features a lecture on an interesting topic by a local expert. See the web page or future newsletters for a schedule of speakers.

Bimonthly newsletter

The NOVAC newsletter provides information specifically for NOVAC members, as well as general interest articles on such topics as observing reports, equipment reviews, upcoming events, ATM projects, and more.

High-quality telescopes to borrow

NOVAC members may borrow one of the clubs several “loaner” telescopes at no charge. Members may choose from among three 6” reflectors, two 10” f/6 reflectors, an 8” SCT, and a hydrogen-alpha solar scope. Binoculars are also available for loan.

Club website

Up to date information about club events and activities is maintained on the club website at www.novac.com.

Large club library

NOVAC maintains a well stocked library that members may borrow from by contacting John Deriso (olgazer@verizon.net). A full list of titles is available from the club website.

Private email listserv

Members keep up with current club information by subscribing to the NOVAC email list, without fear of flame wars or spam emails.

Public outreach opportunities

Several times each year, volunteers from NOVAC present astronomy programs to schools, churches, Scout troops, and other public groups.

Membership in the Astronomical League

Through NOVAC’s membership in the Astronomical League, NOVAC members gain access to the AL’s newsletter, services, and observing programs.

Discounts on astronomy magazines and books

Subscriptions to *Sky & Telescope* and *Astronomy* magazines are offered to club members at a considerable discount. Also, astronomy books purchased through the club are eligible for a 10–25% discount.

See your *Membership Guide* for more details.



The NOVAC Newsletter is the official publication of the Northern Virginia Astronomy Club and is published six times per year. The NOVAC Newsletter is sent to members of NOVAC as a regular membership benefit.

Membership

Membership in the Northern Virginia Astronomy Club is \$30.00 per year and is open to anyone interested in astronomy or the sciences. Additional memberships at the same address without additional copies of the newsletter are \$5.00 per person. Contact:

Kent Allingham
3510 Country Hill Drive
Fairfax, VA 22030
kent.allingham@verizonbusiness.com

Change of address

All notices of change of address should be sent to Kent Allingham. Please include both old and new addresses.

Advertising

NOVAC does not knowingly accept advertising for products of inferior quality nor does it accept responsibility for the quality of advertised products.

Submissions to the newsletter

NOVAC members are invited to submit articles for publication in the NOVAC Newsletter. The editor reserves the right to edit all materials submitted. Send article submissions to the Editor, Debra Van Putten, at newsletters@novac.com.

The deadline for submissions is two weeks in advance of publication: Friday, February 16 for the March/April 2007 newsletter.

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Observing log, from page 6

the document, and you can add images (and even attach the actual recordings) in the appropriate places. As always, be sure to back up your logs either on another computer or burn them onto a disk. Make sure whatever method you use does include a backup plan. My brother started a detailed written log only to leave the notebook at his observing site. He had no backup and it was very difficult to convince him to start a new one.

I've always figured that if I live to be old enough not to be able to observe anymore, at least I'll have my logs to remind me of all the great moments I've experienced as an amateur astronomer. But the truth is, I already value them tremendously and refer to them all the time.

I've also found it extremely convenient and useful to convert observations of individual objects into text files to which new observations can be appended. Programs such as The Sky allow you to link these files to the objects on the chart, so that when you click on the object you can read your obser-

ventions.

Because I use my laptop right at the scope, I can get an immediate comparison to my previous observations, which adds a lot to the enjoyment and provides a sense of continuity to the hobby. Here you are,

observing the same object that you observed ten years ago. What has changed, what has stayed the same? You get a unique perspective on both your own life and the universe that you've sacrificed so much sleep to observe. ★

ASTROPHOTO CORNER: M42 & M43 BY BYRON BERGERT



Orion Nebula

- Taken on November 25, 2006, at the Helicopter Landing Site
- StellarVue SV80S APO
- G11G mount guided with ST402ME and CCDOPS
- Canon EOS 20DA
- 7 exposures at ISO 800 totaling 28 min.
- Processed with ImagesPlus