

# NOVAC

THE NEWSLETTER OF THE NORTHERN VIRGINIA ASTRONOMY CLUB

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## President's Message

**Tilly Smith**

Well, the year is quickly drawing to a close; and what an active year it has been. There are two major events remaining for 1999 of which you need to be aware. First is the Leonid Meteor Shower with scheduled observing for the night of November 17 at Crockett Park. Actually, I believe the action will not be visible until early A.M. the 18th, but we will all be there bundled up anyway. Please note that this is a public event at Crockett, but only for the night of November 17. We had a good turnout last year and if the weather is good, I would expect the same this year. The second event is our annual Election of Officers and Trustees, which will take place during the December General Membership Meeting to be held on December 12, 1999 at GMU at 6:00. The listing of nominees for the Officer positions and three Trustee positions are noted elsewhere in this Newsletter, so I will not list them here. However, I would like to state how pleased I am that Pete Johnson and Craig Tupper have decided to run for President and Vice President respectively. I feel both these individuals will do an excellent job of guiding NOVAC through 2000. Both have provided extremely important help and guidance to me over the past two years and I know NOVAC will be in good hands.  
// Tilly

## Official Notice

**The Annual Meeting of the Northern Virginia Astronomy Club will be held on Wednesday, January 5, 2000, 7:30 P.M. E.S.T. at the Arlington Planetarium, 1426 North Quincy Street, Arlington, VA.**

**NOVAC Programs at George Mason University**

*Pete Johnson*

**All meetings start at 6:00 P.M.**

**November 14**

How to Choose a Telescope

Pete Johnson, et. al.

**December 12**

**I. Star Parties 1999**

Member's star Party Experiences with Slides and Stories.

**II. Annual Election of Officers and Trustees**

## What's Up?

**Al Schumann**

To begin with, I need to make a correction to my last article. After the ice storm, heat wave, and drought, I thought locusts might be the next plague to hit. Scratch locusts and insert hurricanes. The leading edge of Hurricane Floyd dumped just under 18 inches of rain on the peninsula in about a day and a half. Then, when the ground was soaked to capacity, the winds arrived. Trees were uprooted all over the place. Big branches flew around wildly. The power went off almost at once, so we had to revert to the old Coleman stove, lamp, and coolers for 3 1/2 days until electric power was restored. Lynn was looking out a back window and saw a giant oak tree being uprooted by the wind. On its way down it collected a large hickory, and both

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## What's Up?, continued

(Continued from page 1)

crashed down between our house and the house next door. Neither house was hit, but the trees landed in our neighbor's driveway. One car was crushed and another was badly banged up. We had a mountain of debris to clear away and had to have a partially up-rooted walnut tree taken out. None of us in the Queens Lake area had any problem with flooding, but our hearts went out to the many folks who lost everything to high water or had houses destroyed by falling trees.

Anyhow, Jupiter and Saturn were well up in the sky at a decent hour during early October, so I made them the primary objects of attention. Both are always stunning when first seen after a long layoff. It is difficult not to be impressed by massive Jupiter, the Galilean moons, and the detail visible on the planet itself. I cranked up the C-8 to 400X and had a splendid view of the

north and south equatorial belts (N/SEB). I couldn't make out much of anything south of the SEB. The northern hemisphere had more to offer. There was a nice, slender band visible every

few seconds when the seeing allowed. Now and then I thought I could make out even a bit more band-like detail further to the north, but I wouldn't swear to it. There were a couple rounded bulges drooping down toward the equator from the NEB. The word festoon popped into my mind, but I'm not sure that is the correct designation. So far my timing has been bad for seeing the Great Red Spot.

Eventually, Jupiter's time and mine will come together. Saturn was lovely. The rings have opened up nicely, so you can get a good look at them. The Cassini Division was very clearly defined. The rings cast a noticeable shadow on the edge of the planet. Also, I had a clear view of the cloud band in the southern hemisphere. Quite impressive.

This year I have had some most enjoyable outings with the planets. Venus is a magnificent beacon which draws the eye and the telescope. Even though there isn't much to see except the phases, it is quite a show. Mars made its closest approach in May, and it was great fun scouring the surface for detail, however sparse. Then, I had an entertaining evening tracking down Uranus and Neptune, two colorful little spots in the great beyond. Add Saturn and Jupiter to the mix for a good rundown on the planets. I had a pretty good look at Earth one afternoon when I tripped over a garden hose, went assets over teakettle, and ended up with my nose buried in the grass. Talk about closest approach.

There was an article in the October issue of *Sky & Tel* on the Search for Extraterrestrial Intelligence (SETI). It went on about a massive program called SETI@home, and it

was so interesting I thought I would give it a shot. The instructions were very clear, and everything worked like a charm when I downloaded what is, in essence, a screen saver. The program works when you aren't. I was stunned to read that almost a million people have put in close to 42,000 computer years worth of analysis on the program already. As of this writing I'm still on my first work unit, so I have not yet had an opportunity to see how the data will be transmitted and another unit received. Chances are, nothing is going to come of it, but who knows. I think it was Geoff Chester who gave us a talk one night about being invited to join a team investigating Venus. Geoff said they knew what they were going to find beforehand, and they expected no surprises. One might ask, "Why bother?" They did it because there was a blank page in the vast body of knowledge

**"If you have never gone on an asteroid hunt, this is the time."**

about Venus, and someone had to check it out and fill in those blanks. I guess SETI falls into a similar category. Besides, about six years ago we also had an authoritative speaker from NASA Greenbelt who told us, in no uncertain terms, that if we did not move the world's industry into space within ten years the destruction of Earth would be irreversible. Well, there are only four years left to reach irreversibility, and we haven't done diddley! So, as long as Earth is doomed, I reckon we shouldn't pass up a chance to find some place else to go.

There are a few events coming up which have piqued my interest. On October 28 there will be a double shadow transit of Jupiter by the shadows of Io and Ganymede. Those two little fellows are going to eclipse Jupiter. Reminds me of *The Little Engine That Could*. Between November 8 and 10, the minor planet 6 Hebe will pass within 7 minutes of Alnilam, the center star in Orion's belt. If you have never gone on an asteroid hunt, this is the time. Hebe is 120 miles in diameter, and it shines at magnitude 8.7. Here's how you do it. Aim your telescope in the immediate vicinity and study the view through the eyepiece. Make a sketch of the stars you see. The next night, go back to the same place and see which star has moved. The one whose position is altered is the asteroid. Sometimes it is very difficult when you're dealing with dinky little stars, but with Alnilam right there, it should be pretty easy. Finally, on November 15, tiny Mercury will transit the sun. It will happen late in the afternoon, 4:15 p.m. E.S.T., so it will take a wide-open western horizon. Even at that, we'll be flirting with sunset, so it will be a challenge. I figure on staking out a spot on the shore of the James River. That ought to be as good as it gets. Check it out.

## President's Message, Part II NOVA Star Party Report

I just want to say a quick thanks to all those who helped work on this years NOVA Star Party. Even though the weather early in the day was quite cloudy, the clouds broke around 5:00 P.M. and the evening was clear until about 10:00 P.M. I think the event was a big success, equal in attendance to last year. By my count we had around 90+ scopes on the field at 8:30 and by the count of the Park service we had about 300 cars in the park by 8:00 P.M., which equates to about 700+ people. All in all, it was an outstanding job. My thanks to Jeff Cook, Jonathan Bein, all the presenters and all the other club members who gave of their time to make it a success. Outstanding effort.

Tilly

## Thank you, Chewning!

**From:** owner-novac@mclean1.his.com on behalf of PCT [pct@mail.his.com]  
**Sent:** Sunday, September 19, 1999 9:45 AM  
**To:** novac@his.com  
**Subject:** Leaving town...

Hi folks,

I'll be leaving town day after tomorrow for Austin, Texas. While I will continue to run the mailing list for NOVAC, I am delegating the task of responding to subscription/unsubscription requests and other day-to-day matters to another person more local than I will be. :- ) That person will be Bob L'Hommedieu (bobcat@erols.com). From now on, all requests to subscribe onto and unsubscribe off the list should go to Bob who can take care of them. It has been fun meeting many of you at Savage and elsewhere and I will miss the Savege camaraderie, no puns intended. :- )

If I am ever in town during a regular observation session window, I'll try to stop by. :- )

Meanwhile, I will strive to send to you folks regular observation reports under the clear and darker skies out West. :- ) Clear skies and good luck with the light pollution fight! Cheers,

Chewning

(NOVAC Email List Maintainer and newest NOVAC Ambassador to Texas :- )

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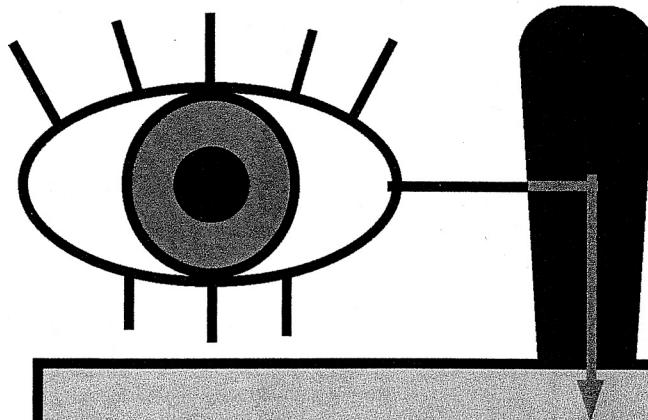
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**Election Night '99**

You must be present to vote!  
Sunday, December 12, 1999  
6:00 P.M.  
Vote for Officers and 3 Trustees.  
Nominations as of 10/12/99:

For President: Pete Johnson  
For Vice-president: Craig Tupper  
For Secretary: Kevin Brown  
For Treasurer: Pedro Martinez  
For Board Member:  
John Avellone  
Ian Kieth  
John Nasbaum

# Jeff's Observing Report

Jeff Stetekluh

Jeff's astronomical calculations are made for the Northern Virginia area. See credits at the end of this article.

The Sun	rises	sets
Oct 10	7:12 AM	6:38 PM
Nov 14	6:49 AM	4:56 PM
Dec 12	7:17 AM	4:47 PM
Jan 9	7:27 AM	5:04 PM

The Moon	
Nov 7	New Moon
Nov 16	First Quarter
Nov 23	Full Moon
Nov 29	Last Quarter
Dec 7	New Moon
Dec 15	First Quarter
Dec 22	Full Moon
Dec 29	Last Quarter
Jan 6	New Moon

Events	
Oct 31	EST starts
Nov 6	Saturn at Opposition (from Espenak)
Nov 15	Mercury at Inferior Conjunction (*)
Nov 15	Transit of Mercury across the Sun's disk, visible from Hawaii at midday and western North America in late afternoon (from S&T)
Nov 17	Leonids ZHR=100+, active Nov 14 to Nov 21 (from IMO)
Nov 28	Neptune is 1.75 degrees N-NW of Mars (†)
Dec 2	Mercury at Greatest Elong: 20.4°W (*)
Dec 5	Earliest end of evening twilight (†)
Dec 8	Earliest sunset (from S&T)
Dec 14	Geminids ZHR=120, active Dec 07 to Dec 17 (from IMO)
Dec 22	Shortest day, 9h 20m at lat. 40°N (†)
Dec 22	Winter Solstice, 2:44 a.m. EST (†)

(\*from Espenak; †from S&T)

The Planets			
Nov 14	rises	transits	sets
Mercury	7:08 AM	12:04 PM	5:01 PM
Venus	2:59 AM	8:59 AM	2:59 PM
Mars	11:26 AM	4:07 PM	8:50 PM
Jupiter	3:45 PM	10:16 PM	4:51 AM
Saturn	4:33 PM	11:19 PM	6:08 AM

	mag	diam	notes
Mercury	4.9	9.9"	
Venus	-4.3	20.8"	
Mars	0.8	5.9"	SSW, 27*
Jupiter	-2.9	48.7"	E, 13*
Saturn	1.6	20.1"	ENE, 4*

The Planets			
Dec 12	rises	transits	sets
Mercury	5:48 AM	10:46 AM	3:44 PM
Venus	3:45 AM	9:10 AM	2:33 PM
Mars	10:45 AM	3:46 PM	8:48 PM
Jupiter	1:49 PM	8:18 PM	2:51 AM
Saturn	2:37 PM	9:21 PM	4:09 AM

	mag	diam	
Mercury	-0.5	5.6"	
Venus	-4.2	16.6"	
Mars	0.9	5.4"	SSW, 31*
Jupiter	-2.7	45.4"	ESE, 34*
Saturn	1.7	19.7"	E, 25*

## The Planets

Jan 9	rises	transits	sets
Mercury	7:21 AM	11:59 AM	4:38 PM
Venus	4:41 AM	9:35 AM	2:29 PM
Mars	9:53 AM	3:20 PM	8:48 PM
Jupiter	12:00 PM	6:30 PM	1:05 AM
Saturn	12:44 PM	7:27 PM	2:15 AM

## notes

Mercury	
Venus	
Mars	35*
Jupiter	54*
Saturn	49*

(\* degrees elevation at sunset taking into account atmospheric refraction)  
(mag = apparent magnitude, diam = apparent equatorial angular diameter)

## Jupiter Eclipse Events on Principal Club Observing Nights

Nov 5	7:29 PM	Io Eclipse	End	(S -29 J 115 35)
Nov 12	9:24 PM	Io Eclipse	End	(S -52 J 159 57)
Dec 5	5:45 PM	Europa Eclipse	End	(S -11 J 121 39)
Dec 5	9:38 PM	Io Eclipse	End	(S -56 J 211 57)
Dec 12	8:24 PM	Europa Eclipse	End	(S -41 J 190 60)
Dec 12	11:33 PM	Io Eclipse	End	(S -73 J 255 37)

## References for Jeff Stetekluh's Observing Report

Sun and moon rise and set times, moon phases and Galilean moon events are calculated using my software that is based on algorithms from the book "Astronomical Algorithms" by Jean Meeus, 1991. This includes Bretagnons and Francou's VSOP87 (the 1987 version of Variations Seculaires des Orbites Planetaires) planetary theory, the Chapront ELP-2000/82 (ELP means Ephemerides Lunaires Parisiennes, although this work is not an ephemeris (a list of calculated positions), but rather an analytic theory (a series of periodic terms)) lunar theory and Lieske's theory E2 and E2x3 of Jupiter's satellites.

The Preliminary NOVAC Observing Reports are created using my software. Some of the algorithms are listed above and in the following as noted; from Espenak: Fred Espenak's Twelve Year Planetary Ephemeris: 1995 - 2006 (NASA Reference Publication 1349, available at <http://www-lep.gsfc.nasa.gov/code693/TYPER/TYPER.html>); from S&T: Sky & Telescope's Evening and Morning Highlights for Skygazers (available at <http://www.skypub.com/whatsup/whatsup.shtml>); from IMO: the International Meteor Organization calendar

# New Members - August 16 through October 12

**Kevin Brown**

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## Editor's Note

**Elliott Fein**

Please keep those letters and articles coming in!

The 10th of the month preceding publication is the cutoff. Material that I receive after the 10th will appear in a later newsletter. Copy (in ASCII, please), not previously published, for the January/February issue must be in my

hands by December 10.

When I receive copy for an article, I start to format and edit it. If later, I receive an updated copy of the full article, I need to either figure out what changed and update the article in progress, or throw away the work I've done and

start anew with the second copy. It would be much better if authors would tell me what changes they want made to the first, or if the changes are too complex for that, send me the second one and tell me the paragraph or whatever that has been changed.

# Table Mountain Star Party

Fred Matthies

Table Mountain, located in "The Other Washington" north of Ellensburg, was the site of the 12th annual star party hosted by the Table Mountain Star Party Association ([www.tmspa.com](http://www.tmspa.com)). The site is east of the Cascade Range, elevation approximately 1,800 m (6,000 ft.) and is dominated by a grassy "flat" of some ten acres and gentle slopes with groves of evergreens comprising several hundred acres. The access road, maintained by the U.S. Forest Service, is paved except for the last mile, and is single lane with paved "inter-visible" turnouts according to my Cousin George, retired forest service silvaculture specialist. George lives in Entiat on the Columbia River north of Wenatchee, and knows all the back roads. The weather had been very hot but turned cool and windy the day we drove up. Scattered cumulus clouds were present throughout the day while George and I looked at telescopes of amateurs (there were hundreds!) and visited the canopy-covered vendors' displays. George needed a collimating tool for his new Celestron Newtonian, so we acquired one and spent an hour squaring the mirrors and aligning the finder.

The party's atmosphere seemed low-key compared to Riverside and even to Stelafane, largely due to a very organized sponsor group with ample radio communication. Notably, there was no dust and very few pets; even cycle riders were held to walking speeds. Many visitors were there to view the Perseid shower, and there was much anticipation as they arranged

their chairs and blankets in circles. Supper was al fresco by Bill's Mobile Food Service, and was way above average for this kind of event; coffee was available all night. George and I catnapped after supper and wakened to deep twilight and a glorious Milky Way. Folks were already exclaiming over meteors streaking overhead; we got our binoculars. Messier objects were easy in my 9x35s, even Sagitta's M71 stood out clearly against a rich field of background stars. The 4.5-inch reflector's finder was useless because of dew, but aiming along the tube enabled us to view deep sky objects with more clarity and contrast than in my 8" in Northern Virginia. All the while the Perseids were punctuating our session, and about 10:30 p.m. a fireball heading northwest left a brilliant train that persisted more than ten minutes.

By east coast time, it was approaching 2:00 am. and drowsiness overcame enthusiasm. It was getting cold, too, and I was glad for my zero-degree sleeping bag. I seemed to be first up in the morning, still tied to my diurnal rhythm and grateful that 75-year-old Martin was there with fresh hot coffee and his special ham-and-egg breakfast sandwich. Cloud had blown in during the night and rain was predicted, so George and I departed for Ellensburg where I'd parked my rental car, to ride in his pickup. My drive through Yakima, Wapato, Toppenish, and down the incomparable Columbia Gorge to Portland was filled with memories of the best sky I've seen in the past 40 years!

# A Book Of Interest

## *The Immortal Fire Within*

The Life and Work of Edward Emerson  
Barnard (1857 - 1923 )  
by William Sheehan  
Cambridge University Press, 1995.  
ISBN 0-521-44489-6

## John Avellone

The biographer is a psychiatrist and amateur astronomer fascinated with the great visual observers of the 19th century. This is an interesting period of astronomy. The distinction between "amateur" and "professional" was more flexible than now. Further, the observing was mostly visual and often used small instruments. Not that different from NOVAC today! Sheehan terms Barnard a compulsive observer, an "observaholic", "the man who never slept". Graced with legendary keenness of sight, he studied "... everything that shines or obscures". How keen? After his discovery and tracking of the (inner) fifth satellite of Jupiter, Amalthea, it was not visually recovered for the next 20 years.

In the poverty of post Civil War Nashville, Barnard had to start working by the age of 9. At least it was at a photographic studio-a sort of "high tech" place for that day. By 1870, still working at the studio, he became interested in observational astronomy to the extent that he scrounged up the parts to make a 1" and later a 2 1/4" refractor. In 1877, he went deeply into debt to buy an excellent 5" Byrne refractor.

With this instrument and his drive to observe during any and all moments of clear night skies, he earned recognition as a comet hunter. Why he turned to comets is an interesting part of the book. The comets led to the offer of a real paying position at Vanderbilt University, then onto a full career as an observer at the new Lick Observatory and later at the even newer Yerkes Observatory.

Rather than just being dull, heavy and boring, the biography is rich in interesting details of the times (eclipse expeditions, planetary observations & sketches, the Martian canals controversy, and the initial experiments in photography of the Milky Way). Also interesting are the author's insights into the behaviors of certain astronomers. For example, Asaph Hall received sole credit for the discovery of the two satellites of Mars. Why sole credit? What about his observing assistant at the Naval observatory (Edward Holden)?

You may have to get this long (429 pages) book through inter-library loan. I did.

## Lost & Found

Found: One Televue Air Chair at Crockett Park on Friday, October 8. Would the owner please contact Alan Figgatt at 703-860-8239 or [afiggatt@erols.com](mailto:afiggatt@erols.com).

Coming to a Post Office near you, in 2000



# SCALING THE MIGHTY UNIVERSE

Marc DeFrancis

## For Young Astronomers ages 8 and up

If you've ever watched your parents fumbling with a road map in the car, you know how useful it can be to look at a map and know right away how many miles it will be before you reach the next gas station — or bathroom! In order to measure the miles, you need to know what people call the "scale" of the map. Does one inch on the map equal one mile? Ten miles?

On a map of a small city, the scale is often **1 inch = one mile**. At that scale, your house would look smaller than a grain of sand. Make the scale 10 times smaller — so that **1 inch=10 miles** — and on the same sheet of paper you can now fit a very large city with all its surrounding suburbs, say Washington, D.C. and its closer suburbs. Shrink it again 10 times, for a scale of **1 inch = 100 miles**, and several states can fit on the map (your house, meanwhile, has long since vanished into microscopic space).

Another 10-power leap in scale (**1 inch = 100 x 10 or 1000 miles**) allows you to fit one whole side of the Earth in a full-page photo. Notice that we have shrunk the world we are picturing, 4 times, 10-fold each time, since the first map. That is, we took our original city map and scaled it down 10x10x10x10 times, or 10,000 times, to get to the Earth-fitting view. Scale it down two more powers of 10, that is, x10x10, and now the Earth and the entire orbit of the Moon fit in the picture. At this scale, the whole state of Virginia is smaller than a grain of sand, the earth is like a peppercorn, and the Moon's orbit is the size (and almost the shape) of a dinner plate.

The spaces between the planets are vast when compared to the planets themselves. So if you wanted to draw a map of the whole Solar System with all its planets, even if you drew it across your entire bedroom wall the planets would have to be so small they wouldn't be much more than grains of sand. When anyone draws an accurate diagram of the Solar System, even on a large poster, the best they can do is show the orbits the planets follow. Then they look like great rings that are nearly circles, nested inside one another, with the Sun close to (but not exactly in) the center of it all.

What about the sizes of the planets? Is it possible to scale them and understand them? Certainly! My favorite way to do this is to use my own body for the scale. If you create a scale where one inch = 100,000 miles, the Sun, which is 800,000 (almost a million) miles wide would become the size of your head. At that

scale, what about the Earth? The width (diameter) of our own planet is a hundred times smaller than the width of the Sun — which means our Earth would become about the size of the little black pupil in the center of your eye. The planet Venus turns out to be about that size too. Mars is one-half that size.

The outer planets are another matter, though. Jupiter is 10 times wider than the Earth, which makes it about the size of your nose, if you're a kid and not a grownup. Saturn is smaller, more like your eye when you open it wide. Uranus and Neptune are each about equal in size to the tip of your forefinger. Pluto, alas, is so small you can't easily find it on your face or body — it's the size of a pinhead.

### Pacing the Solar System

The Moon races around our planet at the speed of a supersonic jet, about 2,000 miles per hour, yet when we look up at it we cannot seem to see it move past the background stars at all. Venus moves around the Sun much faster, at 126,000 miles per hour, yet again we cannot notice the movement with our naked eyes, not unless we compare it closely over the course of weeks.

The reason we cannot notice these movements is simple: things in space, even inside our solar system, are so far away, and the distances they are crossing are so huge, that every crossing takes weeks or months. Jupiter takes 12 years to circle the Sun!

This past month, at our annual NOVA Star Party, a bunch of us had some fun in the grassy meadow "Pacing out the Solar System". What we did was create a map of orbits in the grass, using our legs instead of a pencil, and walking the distances instead of drawing them. If we use the body scale we described earlier, with the Sun the size of your head, then one giant step (one pace) is equal to about three and a half million miles in space.

If you missed this event, you can try this in a large park nearby, or carry out part of the experiment in a big backyard. Start with something about the size of your head, say a volleyball, and place it at one end of your yard to indicate the Sun. How many paces do you suppose it takes to reach the first, hottest planet, Mercury? Mercury is about 36 million miles from the Sun, which means you need 10 paces to get there. To get to Venus from Mercury's orbit, keep walking another 9 paces. To get to Earth from Venus's orbit, keep going

yet another 7 paces. By now, standing in Earth's orbit in the grass, you have moved 26 paces from your volleyball-Sun, far enough that the Sun is not looking so huge anymore, and even Venus (the size of the pupil of your eye, remember?) would be almost invisible. It's not invisible to us in the evening sky because it reflects so much light, like a small piece of glass.

Mars is at a greater distance from us than the orbit of Venus — you need to take another 14 paces in the same direction away from the Sun to get there. But what about the giant planets? There's a lot of space and a lot of stuff between us and Jupiter. Not only Mars, but beyond Mars is the great belt of asteroids that careen dangerously (so some people say) round the Sun and occasionally drop a wild rock into a chaotic orbit of its own. To get to Jupiter from Mars, you need to take all of 95 more paces further out. By the time you get to Jupiter, you have moved 135 paces — more than the full length of a football field. Can you still see the volleyball at all? If you can, it's barely a dot, and it would be invisible from Jupiter if it were not a glaringly, brilliantly hot burning star. A good comparison might be a bright car headlight parked at the far end of the football field—that's what the Sun looks like from Jupiter.

Now, to continue this mapping project all the way to Pluto, you will have to be walking in a very, very large park. Saturn lies another 112 paces out from Jupiter, another football field away. Walk another 141 paces from there, one and a half more football fields, and you get to Uranus. Neptune is almost three more football fields past Uranus, and Pluto is two and a half more football fields from Neptune! All told, from your starting point at the volleyball Sun to the small, cold planet Pluto you need to walk a distance of nine full-length football fields, more than half a mile. If the volleyball Sun is a bright car headlight, you can get a good idea how dim it will look to a woman astronaut who has managed to travel to Pluto and can look back through her helmet visor to get a glimpse of the Sun. Traveling at the fastest speeds any spacecraft has ever gone, the speed of our Voyager planet mission, it may have taken her 10 years just to get to Pluto. The Sun, from that far edge of our Solar System, is barely visible, just a very bright star in a field of dimmer ones. And that, folks, is how big the Solar System is.

# The NOVAC Library Is Back in Business

## Craig Tupper

After yesterday's club meeting, we got the club library (in its new bookcase) moved into our new meeting room at GMU, in the small area behind the door in front. So starting in November, normal procedures for borrowing books will be in place.

I've also updated the list of materials at <http://users.erols.com/ctupper/NOVAC/library.html> to include a short description of many items, and links to on-line booksellers (Amazon, Willmann-Bell, etc.) where I could find them.

Cheers,  
Craig

(Ed. Note: the following was taken from the URL listed above, for those who don't speak Internet.)

## NOVAC: Library Listing

NOVAC maintains a library which covers a wide range of astronomy subjects. You can find a wealth of information to answer your questions, expand your observing skills, get more out of your equipment, and increase your enjoyment of Astronomy. Materials may be checked out for one month. See the Rules and Procedures below for more info.

Links to on-line editions (at Amazon.com, etc.) are provided below, where available, so that you can learn more about, or order, these books.

Books marked with an asterisk are believed to be out of print. Members should inquire about ordering through the club, as significant discounts are often available.

### Astrophotography and CCDs

Astronomical Image Processing, Berry, 1991. An introduction to the subject.

Astrophotography, Gordon, 1985.

Astrophotography, A Step-by-Step Approach \*, Little, 1986.

Astrophotography for the Amateur, Covington, 1985.

CCD Camera Cookbook, Berry, 1994. How to build your own for under \$500.

Choosing and Using a CCD Camera, Berry, 1992.

A Manual of Advanced Celestial Photography, Wallis/Provin, 1988.

Skys shooting - Photography for Amateur Astronomers \*, Mayall/Mayall, 1968.

### Binocular and Unaided Observing

Deep-Sky Objects for Binoculars \*, Kozac, 1988. Descriptions/charts for 130.

Exploring the Night Sky with Binoculars, Moore, 1986.

Find the Constellations, Rey, 1976. Great for beginners -- kids or adults.

Guide to the Stars: Exploring the Sky with Binoculars \*, Peltier, 1986.

The Starry Room: Naked Eye Astronomy \*, Schaaf, 1988. You'll be surprised what you can see.

Touring the Universe through Binoculars, Harrington, 1990.

### Computing (astronomical calculations)

Astronomical Algorithms, Meeus, 1991.

Astronomical Formulae for Calculators, Meeus, 1988.

### Encyclopedias and Atlases

Atlas of Comet Halley 1910 \*, Donn, 1986. Enormous catalog of images.

Atlas of the Solar System \*, Yenne, 1987.

A Clementine Collection: Moonglow \*, NRL, 1994. Small book of lunar images.

Hubble Atlas of Galaxies, Sandage, 1962. Oversize - bottom shelf. Photos of ~100 galaxies.

Illustrated Encyclopedia of the Universe \*, Lewis, 1983. "Comprehensive history of space exploration."

### Equipment Selection and Construction

Amateur Astronomer's Handbook, Sidgwick, 1980. "Comprehensive coverage of the telescope", only slightly dated.

Astronomical Telescopes and Observatories for Amateurs \*, Moore, 1973. Still lots of good stuff. Build Your Own Telescope, Berry, 1985. 5 complete plans.

How and Why to Make a User-Friendly Sidewalk Telescope \*, Dobson, 1995. The famous author, wooden cover.

How to Build Your Own Observatory \*, Berry, 1985. 13 examples with plans.

How to Choose Binoculars \*, Hale, 1991.

How to Make a Telescope, Texereau, 1984. Classic on newtonians, cassegrains, and mounts.

Star Ware, Harrington, 1994. Guide to buying and using. Telescope Making Magazine \*, Issues 35-46. Lotsa great ideas.

Telescopes for Stargazing \*, Paul, 1976. Overview; a bit dated.

### General Observing

Amateur Astronomer's Handbook: Guide to Exploring the Heavens \*, Muirden, 1983.

"Everything the amateur needs to know", only slightly dated.

Backyard Astronomer's Guide, Dickinson/Dyer, 1991. Equipment, observing, photography.

Burnham's Celestial Handbook, Vol. 1-3 (2 copies each), Burnham, 1978. Unique, enormous classic reference.

Cambridge Deep-Sky Album, Newton/Teece, 1984. 126 photos similar to the telescopic view, plus text and data.

Deep-Sky Observer's Handbooks, Vol. 1-8, Webb Society, 1986. Advanced info and catalogs of Double Stars, Nebulae, Star Clusters, Galaxies, Galaxy Clusters, Anonymous Galaxies, Southern Sky, and Variable Stars.

Discover the Stars.

How to Use an Astronomical Telescope, Muirden, 1985. Guide to observing.

Nightwatch, Dickinson, 1996. "An ideal first book for the backyard astronomer."

The Practical Astronomer \*, Ronan, 1981. Shows how discoveries were made, and how you can repeat them.

The Stars, Rey, 1980. Introduction, with charts. Study of Variable Stars Using Small Telescopes, Percy, 1986.

Summer Stargazing, Dickinson, 1996. Introduction, especially for the summer sky.

Turn Left at Orion, Consolmagno/Davis, 1995. 100 objects and how to find them.

Universe Guide to Stars and Planets \*, Ridpath/Tirion, 1985. Similar to Peterson's Field Guide.

The Universe Next Door \*, Holt, 1985. Mixture of observing and theory.

### History of Astronomy

Celestial Charts, Stott, 1991. Oversize - bottom shelf. Beautiful color prints of antique atlases.

Clyde Tombaugh, Discoverer of Planet Pluto \*, Levy, 1991. Good biography.

History of Astronomy, Pannekoek, 1961.

The Perfect Machine - Building the Palomar Telescope, Florence, 1994.

### Miscellaneous

10x50 Binoculars, Olympus.

Alpha Centauri, The Nearest Star \*, Asimov, 1976. Intro to (non-observational) astronomy.

The Astronomers (companion to video), Goldsmith, 1991. Intro to (non-observational) astronomy.

Cosmos, Sagan, 1980. Classic overview of science and discovery.

A Dipper Full of Stars \*, Page, 1959. "A beginner's guide to the heavens."

The Light-Hearted Astronomer \*, Fulton, 1984. Thoughtful humor for the novice or wanna-be observer.

Soul of the Night: An Astronomical Pilgrimage, Raymo, 1988. Philosophy.

The Universe and Beyond, Dickinson, 1986. Pictorial intro to (non-observational) astronomy.

### Object Catalogs

Amateur Astronomer's Catalog of 500 Deep Sky Objects, Morales, 1986.

Celestial Objects for Common Telescopes \*, Vol. 2, Webb, 1962. Classic; 4000 objects.

Meteor Showers, A Descriptive Catalog \*, Kronk, 1988. Over 80 showers.

NGC 2000.0 \*, Sinnott, 1988. 13,226 objects.

Planetary Nebulae: A Practical Guide and Handbook, Hynes, 1991. Description, exhaustive catalog, 253 charts.

Sky Catalogue 2000.0, Vol. 1 and 2, Hirshfield/Sinnott, 1982. Stars to Mag. 8;

Doubles, Variables, and Non-Stellar Objects

### Star Charts

5" Miller Planisphere. A simple and useful tool.

Finder Charts of the Bright Telescopic Objects, Watson, 1992/3. 37 objects, laminated charts.

Mag 5 Star Atlas, Edmund Scientific. Starter atlas for brighter stars and objects.

Nearby Galaxies Atlas, Tully & Fisher, 1987.

Oversize - bottom shelf. Sky charts of galaxies only (no stars). Also has companion catalog.

Nearby Galaxies Catalog, Tully, 1988. Companion to the Atlas.

Star Maps for Beginners, Levitt/Marshall, 1992. One map for each month.

Uranometria 2000.0, Vol. 1&2 (2 copies each), Tirion et. al., 1988. For advanced amateurs seeking dim prey.

Uranometria 2000.0 - Deep Sky Field Guide, Cragin, et. al. 1993.

### Video

The Astronomers, PBS. 6 episodes, 3 tapes; also companion book.

Cosmos, original PBS series, Sagan. 13 episodes, 7 tapes.

Telescope Building, Dobson. Overview.

### Library Rules and Procedures

The library opens following the monthly meeting. Books are shelved alphabetically by title. Oversized books are on the bottom shelf. When borrowing, remove the card from inside the back cover, write your name and the month/year on the card, and give the card to the librarian. NOVAC members may borrow up to 4 items for a period of one month. Please show your membership card. If you do not have your card, and your name is not on the list of members in the library, and the librarian does not know you, you may be out of luck.

Please make every effort to return items to the planetarium the following month, in person or otherwise. If items are not returned on time, the borrower will experience cloudy nights for a year, and annoying messages from the librarian. Return items to the librarian, who will replace the card and reshelve the item. Please let the librarian know of any new items you would like to see in the library. Donations are accepted, but astronomy texts and obsolete books of no historic interest are discouraged.

# Highlights of NOVAC Board Meetings and General Meetings

Kevin Brown

## September 2 Board Meeting

19:30 Tilly Smith, President, called the board meeting to order.

Tilly Smith spoke about the upcoming NOVAC officer/trustee elections in December.

Jeff Cook updated the board on status of preparations for the NOVA Star Party on October 16.

Jon Stewart-Taylor and Craig Tupper led a discussion on whether changes should be made to the NOVAC web page.

Pete Johnson discussed the upcoming general meeting programs.

Tilly Smith adjourned the meeting at 21:30.

Submitted by

Kevin Brown, Secretary

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Kevin Brown, Secretary

## October 10 General Meeting

18:05 Tilly Smith, President, called the meeting to order. The prospective and new members introduced themselves.

Tilly Smith spoke briefly about the upcoming NOVA Star Party on October 16 and the NOVAC officer/trustee elections to be held in December.

Pete Johnson gave the observing report and the sky tour. The featured constellation of the month was Pegasus.

Jeff Cook gave a detailed update for the NOVA Star Party on October 16th at Crockett Park.

For the main program, NOVAC's Marc DeFrancis gave a talk on ancient astronomy of the Lakota Sioux and the Mayans.

Tilly adjourned the meeting at 20:15.

There were 50 in attendance, 11 of whom were not members.

Submitted by

Kevin Brown, Secretary

## September 12 General Meeting

18:05 Pete Johnson, Vice President, called the meeting to order. The prospective and new members introduced themselves.

Jonathan Bein discussed the upcoming Public Outreach programs.

Pete Johnson gave the observing report.

Craig Tupper gave the sky tour using "Earth Centered Universe" software - constellation of the month was Cygnus.

Jeff Cook gave an update on preparations for NOVAC's upcoming Star Party on October 16 at Crockett Park.

Charles Olin spoke about development of the Nike site in Great Falls and the naming of this county park for observing.

For the main program, five NOVAC members showed pictures and spoke about their recent eclipse chasing trips to Europe.

Pete Johnson adjourned the meeting at 20:00.

There were 57 in attendance, six of whom were not members.

Submitted by

Kevin Brown, Secretary

## October 6 Board Meeting

19:30 Tilly Smith, President, called the board meeting to order.

Tilly Smith presented the confirmed candidates for upcoming NOVAC officer/trustee elections in December.

Tilly Smith and Jeff Cook updated the board on the status of the NOVA Star Party on October 16.

Tilly Smith and Craig Tupper led a discussion on possible changes to the NOVAC web page.

Pete Johnson discussed the upcoming general meeting programs.

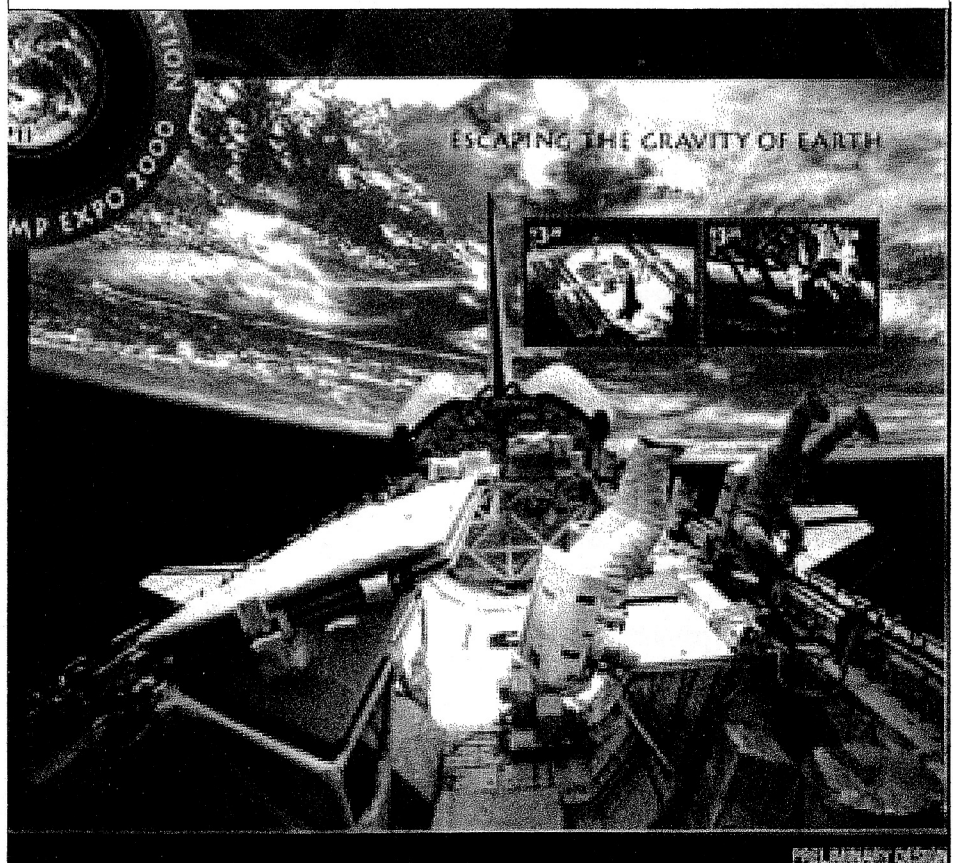
# Support the IDA

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[www.darksky.org](http://www.darksky.org)

This too, is coming to Post Office near you in the year 2000.



**NOVAC Notices and Benefits**

**Discounts on Sky & Telescope and Astronomy.**

As a member of NOVAC, you can get astronomy magazine subscriptions at a discount. To obtain *Sky & Telescope* for \$29.95 (instead of the standard \$37.95), make your check out to "Sky Publishing Co." You can subscribe to *Astronomy Magazine* for \$29.00 for one year. Make your check payable to "Kalmbach Publishing Company". In each case, note on the check: "new subscription" or "renewal." If a renewal, include your customer number. Send your check to Treasurer Pedro Martinez, Jr., 6319 Anneliese Dr., Falls Church VA 22044.

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.

**Discount on Books**

NOVAC is participating in the discount book sales program offered by Kalmbach Publishing. They will sell our members any astronomy-related book in their catalog for 25% off the list price when we send in a group order. Kevin Brown is coordinating the sales. If you are interested, please see him at a meeting, or call him at home (703) 503-9523 to place an order. Make your check payable to "NOVAC" for the price of the book minus the discount, when you place the order. We anticipate doing this 3 - 4 times a year if demand warrants.

**Club Telescopes and Binoculars**

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.

One telescope is a Celestron model SP-C6 on a Super Polaris German equatorial mount and wood tripod. The telescope comes with Orion Ultrascope 10mm and Meade MA 25mm eyepieces with 1.25-inch barrel sizes.

The other telescope is a homemade 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 a telescope you will need to show your NOVAC observing pass and leave a \$500 (for the Celestron) or \$250.00 (for the Dobson) security deposit. To borrow the Celestron, contact Doug Mistler at (703) 437-0513; for the Dobson, contact Bob L'Hommedieu at (703) 978-0946. Note: Checks must be made payable to "NOVAC".

The club also has a pair of 10x50 binoculars available for members to borrow. They are kept in the club library in the back of the planetarium, and can be checked out after the regular monthly meeting, for a period of one month. Please show your observing pass.

**NOVAC Library**

NOVAC has established a library at the Arlington Planetarium for use by NOVAC members. Books may be checked out and returned only at the monthly meetings. Members may check out books for one month at a time. To borrow books, see NOVAC Librarians Pedro Martinez or Craig Tupper at the monthly meeting.

The NOVAC library seeks book donations to the library. If you have any astronomy books or materials you are thinking of discarding, please consider a donation to the NOVAC library.

A complete list of all library holdings is available upon request.

**General Membership Meetings**

General Membership Meetings are held at George Mason University (GMU), Fairfax Campus, off Ox Road (Rt. 123) on the second Sunday of every month. To reach GMU take either Rt. 66 to Ox Rd. (South) or Braddock Rd. to Ox Rd. (North). Enter GMU at the main entrance off Ox Rd. (University Drive) and proceed to Parking Lots F, G, or H for free parking. Pay Parking is also available in the Parking Garage.

The meetings are in the Lecture Hall, next to Fenwick Library, on the North side of campus across Patriot Circle from the parking lots. Meetings start at 6:00 p.m.

Trustee Meetings are held on the first Wednesday of every month. Members who are not trustees but are interested in attending should contact a club officer or board member for further information.

**NOVAC On-line**

NOVAC maintains an e-mail mailing list. Messages sent to the list include reminders about scheduled observing sessions, announcements for unscheduled sessions, requests for quick observing session summaries, MIR observability predictions, etc. For more information, send a message to Bob L'Hommedieu, bobcat@erols.com.

**NOVAC Observing Site Rules**

**C. M. Crockett Park:** We have permission from Crockett Park to unscrew the light bulbs on the light sensor fixture on the side of the gate guard building facing the

observing field (south side).

Please leave the lights on the far side (north side) active so people can see the gate.

Weekends (Fri./Sat. only), NOVAC has unlimited access to the park for all weekends. The weekends will also be open to the public. The gate will be locked and will not be unlocked unless a NOVAC member enters the park; after which time the gate will stay open to approximately 10:00 p.m., when the Assistant Park Manager will ask the public to leave. The gate will then be locked, and should remain locked through the rest of the evening. NOVAC members may remain until they are finished with their observing sessions.

Weekdays (M-Th & Sun.), NOVAC members need to notify Assistant Park Manager Bonner Davis by e-mail (crocketcow.aol.com) or phone (540-788-4867) by 2:00 p.m. on the day they plan to observe. Assume approval unless the park notifies you in the negative. The weekdays are not open to the public. The gate should remain locked after you enter the park and throughout your observing session.

If any NOVAC member notices any member of the public violating park policy, he or she is to notify the Assistant Park Manager, who lives in the house adjacent to the end of the parking lot. During EDT, set up on the large field to the left. During EST, set up on the paved cul-de-sac 200 yds. past the gate. No loud radios, alcoholic beverages, or loose pets permitted. Please do not leave trash or debris behind. We are guests of the park; Park Management may revoke our observing privileges at any time due to carelessness of one person.

**Savage Farm Site:** Weekends (Friday/Saturday/Sunday): NOVAC has unlimited access to the park for all weekends.

Weekdays (Monday-Thursday.): For unscheduled observing sessions, contact the park manager, Paul McCray, at (703) 729-0596 or <wodtrail@erols.com> at least 24 hours in advance, and leave a message with your phone number or e-mail address. You may use the site for that session *unless* you hear from Mr. McCray stating otherwise.

No loud radios, alcoholic beverages, or loose pets. Pick up after yourself, and do not leave any trash behind. Make sure the gate is locked whenever you are in the park, and when you leave. We are guests of the NVRP and could have our access to this site revoked at any time if it is abused.

## Mickey Gordon Regional Park:

There is a light pole on the road entering the park and it is a problem near the entrance of the park. It is better to set up further back in the park, or on a lower field behind the baseball diamond to escape the light.

The park is available without notice to all members seven days a week. As sports season begins, we will post the schedule when the lighted baseball facility will be in use.

## Directions to NOVAC Observing Sites

### C. M. Crockett Park:

From the Washington, D.C./Northern Virginia area, go west on I-66 to Exit 43A in Gainesville onto Rt. 29 South toward Warrenton. After 11.8 miles on Rt. 29, stay left (toward Culpeper), to bypass Warrenton (but still on Rt. 29 S.) Go about 1 mile to the Rt. 643 exit, Meetze Road. Turn left (East) on Rt. 643. Go 7.5 miles on Rt. 643. Watch for the C.M. Crockett Park sign on your right, and turn right into the Park Entrance Road.

### Alternate directions to Crockett

From Washington, D.C./Northern Virginia, go West on I-66 to exit 44. (234 bypass around Manassas). Take 234 bypass to Rt. 28 West. Stay on Rt. 28W for about 13.7 miles, through Nokesville, Catlett and Calverton. Turn right at Rt. 643 (store on corner). Go 1 mile to Crockett Park entrance road on left.

### Savage Site:

From D.C. I-66 West to Route 17 North. Stay on Route 17 North until it intersects with Route 50 at Ashby Gap. Turn left onto Route 50 and go 1.0 mile and turn right on Route 601. Continue on Route 601 (Blue Ridge Mountain Road) and go two miles past the main gate of the FEMA installation. Turn right at the park entrance after passing the gateposts with *Belle Allee* and *Ball Alley 1875* on your right.

The park entrance on Route 601 is marked by a small NOVAC sign. As you turn into the park, go straight ahead until you reach the gate, which is secured by both a keyed padlock and a combination lock. These locks are located to your left behind the gate as you face it from the outside. The combination is on your NOVAC observing pass. **Always** lock the gate behind you. The NOVAC lock **must be locked to the keyed lock, not to the chain**, to allow emergency access by the fire department. Drive to the observing area (the stone patio next to the house). There is very limited parking at the observing area itself, so please park in the parking area on the right as you face the patio.

## Alternate Directions to Savage via the Dulles Toll Road

Take the Dulles Toll Road west to the Dulles Greenway. Take the Greenway west about 14-15 miles to where it ends at Rt. 7 near Leesburg. Stay in the left-hand lane to go to the exit for Rt. 7 West. Take Rt. 7 West for about 18 miles to Route 601, Blue Ridge Mountain Road, which is at the top of Snickers Gap and marked by a flashing yellow light on Rt. 7. Turn left onto Rt. 601 and continue 2.4 miles to the park entrance, which is on the left about two-tenths of a mile past a driveway on the left with a stone wall marked with the name "Ben Lomond." There is a white "NOVAC" sign nailed to a large tree to the right at the entrance to the somewhat rutted gravel driveway that leads to the park. Drive up to the white gate at the top of the hill. The combination for the gate is on your observing pass. The driveway curves down and around to the right to the observing area after you pass through the gate. Please lock the gate behind you and remember to use parking lights only as you approach the observing area, which is on the left as you reach the lawn in front of the old house.

Parking at the observing area itself is much more limited at Savage than at Crockett or Mickey Gordon. Try to leave an access lane to the area around the stone patio. If possible, unload your telescope and then park your car away from the area. There are plenty of places to park around the lawn and even south of the old house. This will allow those who arrive later to have access to whatever spots remain without having to lug equipment across the lawn. If you plan to leave early, please be considerate of others and either pack up away from the stone patio or avoid using backup lights when you drive down to pack up your equipment.

### Mickey Gordon Regional Park:

The park is located fifteen miles west on Rt. 50 from the intersection of Rt. 28 and Rt. 50. It is only a 20-minute drive from the Centreville area and should be a convenient site for most members in western Northern Virginia. Directions to the park: take Rt. 66 west to Rt. 28 north. Take Rt. 28 to Rt. 50 West. Go 15 miles until you see the brown Mickey Gordon Regional Park sign. Make a right on Rt. 627, Carters Farm La. Go a few hundred yards to the park entrance on the left. The park has a gate but should never be locked.

### Site Locations

Here are the locations of four observing sites as provided by NOVAC members:

- Savage: 39° 04.7' N; 77° 51.7' W
- Crockett: 38° 37' N; 77° 43' W
- Big Meadows: 38°32' N, 78°26' W
- Little Bennett Regional Park:  
39°17.0' N, 77°17.5' W

*The NOVAC Newsletter* is the official publication of the **Northern Virginia Astronomy Club** and is published six times per year at 5 Carter Court, Rockville, MD 20852-1005,

Elliott D. Fein, Editor.

The *NOVAC Newsletter* is sent to members of NOVAC as a regular membership benefit.

**Membership in the Northern Virginia Astronomy Club is \$18.00 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 \$6.00 per person. Contact Secretary Kevin N. Brown, 5755 Walnut Wood Ln.**

**Burke, VA 22015  
703-503-9523.**

All notices of change of address should be sent to Kevin N. Brown. Please include both old and new addresses.

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

NOVAC members are invited to submit articles for publication in the *NOVAC Newsletter*. The editor reserves the right to edit all materials submitted.

Article submissions, in ASCII please, may be sent to Elliott Fein at [elliott.fein@erols.com](mailto:elliott.fein@erols.com), or to Elliott's address in Rockville, given above. Questions? Call 301 762-6261, or send e-mail.

The deadline for submissions is three weeks in advance of publication, e.g., June 10 for the July/August newsletter.

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## 1999 – 2000 NOVAC Observing Schedule

**C. M. Crockett Park** Every Friday night and Saturday night  
Astronomy Day - April 8 NOVA Star Party - September 30  
NOVAC Picnic - June 24

**Savage Farm** Every Friday night, Saturday night, and Sunday night

### Prime Observing Nights

November 5, 6, 7, 12, 13, 14  
December 3, 4, 5, 10, 11, 12, 31  
January 1, 2, 7, 8, 9, 28, 29, 30  
February 4, 5, 6, 25, 26, 27  
March 3, 4, 5, 10, 11, 12, 31  
(Messier Weeks 3/1 - 3/12)  
April 1, 2, 7, 8, 9, 28, 29, 30

May 5, 6, 7, 26, 27, 28  
June 2, 3, 4, 23, 24, 25, 30  
July 1, 2, 28, 29, 30  
August 4, 5, 6, 25, 26, 27  
September 1, 2, 3, 22, 23, 24, 29, 30  
October 1, 20, 21, 22, 27, 28, 29  
November 17, 18, 19, 24, 25, 26  
December 22, 23, 24, 29, 30, 31

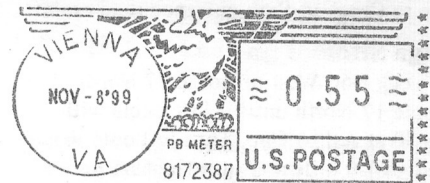
### Meteor Shower Dates for C. M. Crockett, Mickey Gordon, and Savage

November 17 Leonid meteor shower  
December 14 Geminid meteor shower  
December 22 Ursid meteor shower

# NOVAC

The Northern Virginia Astronomy Club

c/o Kevin Brown  
5755 Walnut Wood Lane  
Burke, Va. 22015-2710



**Inside:**

**What's Up?,  
Thank you, Chewning!  
And more . . .**