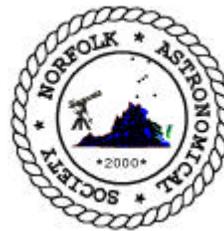




NORFOLK SKIES



The Official Newsletter of the new Norfolk Astronomical Society

Glendon L. Howell, Editor

Volume I; Number 11

November 2001

Meetings And Events For November 2001

| Date | Activity |
|---------------|---|
| Tues., Nov. 6 | The Limits Of Automation , free Sigma Series lecture given by Dr. Nancy Leveson, 7:30 PM at the Virginia Air & Space Center, Hampton. |
| Fri., Nov. 9 | NAS Observing Session , 8 PM to midnight at Glen's parents home, Gates Co., NC. RSVP if you plan to attend (485-4242) |
| Wed., Nov 14 | Tidewater Regional IDA Meeting & Outdoor Lighting Workshop , held at the Nauticus National Maritime Museum in Norfolk. See announcement in this issue. |
| Sat., Nov. 17 | Leonid Meteor Storm Watch , site TBA. See announcement in this issue. |
| Mon., Nov..19 | NAS Regular Meeting , 7 PM, at MRO Computers & Astronomy, 1620 Cedar Rd, located at the intersection of Cedar Road and Dominion Blvd in Chesapeake. |

Local Planetarium Shows

STORIES OF THE STARS will be shown **Thursdays, November 1, 8, 15 and 29**, from 8 to 9 PM at the Chesapeake Planetarium, 300 Cedar Road. The program explores sky mythology. Telescope outing immediately after the show, weather permitting. Admission free. For reservations call 547-0153.

THE X-TRA TERRESTRIAL FILES (Sept. 22 – Nov. 11) will be shown weekdays at 2:30 PM, and at 11 AM, 1:30 PM, and 3:30 PM Saturday, and at 1:30 PM and 3:30 PM Sundays at the Virginia Living Museum Planetarium, 524 N. J.Clyde Morris Blvd, in Newport News. The program explores the theories and science behind the search for extra-terrestrial life in our vast universe. Admission \$3.00. For information call 595-1900.

Tidewater Regional IDA Meeting

The third annual Tidewater Regional IDA Meeting & Outdoor Lighting Workshop is tentavely set for Wednesday, November 14 at the Nauticus National Maritime Museum in Norfolk. Speakers are being lined up and are likely to include Phil Ianna the Chairman of Va-IDA, Chris Luginbuhl of the US Naval Observatory in Flagstaff, local marine biologist Johnny Noles, and representatives from CPTED (Crime Prevention Through Environmental Design) and Scenic Virginia.

Leonid Meteor Storm Watch

There is the strong potential for a Leonid Meteor Storm to occur about **5 AM Sunday, Nov. 18**. Glen Howell is coordinating gathering information from all over the state and around on weather conditions and where other clubs will be set up in the event the weather turns bad in our area. Members may travel to clear skies if necessary. If you are interested in participating, contact Glen by phone (485-4242) or email him at glendonhowell@compuserve.com.

Black Forest Star Party 2001

By Ron A. Robisch <rrobisch@dandp.com>

I normally spend the September new moon stargazing from the friendly skies of the No-Frills Star Party in Maryland. In addition to being relatively close to home, it also attracts several good friends and fellow amateurs from NAS and BBAA, as well as my dog Ernie's favorite stargazing buddy, Dee Diffrient (If you've ever had Dee's home cooking you know why Ernie's a big fan!) This September, however, unfortunately, was quite different. After the fear, shock, grief, and anger of the preceding week, I was more than ready to take a breather for a couple of days. However, going to Tuckahoe was not on the agenda this year, as I was ostensibly called into service on the same weekend to assist my father-in-law, Steve Morley, with a major home improvement project: to re-build the front porch on an old farmhouse he owns in Potter County, PA. But wouldn't you know it, the Black Forest Star Party at nearby Cherry Springs State Park (CSSP) happened to be that weekend, too. "Aw, shucks. Guess I'll have to bring my telescope too..."

My plan was simple: help Steve during the daylight hours on Saturday and again Sunday morning, and observe on Friday and Saturday nights. I didn't leave much room for sleep in that schedule, but given the blue skies and clear forecast, I wasn't going to worry about a little detail like that yet. I met up with Steve on Friday evening in Galeton, PA, maybe 10 or 15 miles away from CSSP. Sunset was rapidly approaching, leaving me little time to waste if I wanted get set up in daylight. Having been born and bred in Potter County, Steve led the way over to CSSP.

Upon arrival, we were instantly amazed at the magnitude of this star party. This gathering easily rivaled the Mason-Dixon Star Party in size -- and this was only the 3rd year of BFSP's existence! The field was reasonably flat, surrounded at a distance by trees which allowed for very decent horizons, and easily large enough for the 380 people in attendance. I'm not sure if Steve had ever seen so many people at one place in Potter County!

The skies were quickly becoming a deeper and deeper azure, so we hastened to look around and find a place to set up. I had heard earlier in the week that Roy Diffrient might be attending, so we quickly combed through the field in search of his conspicuous, red 18" Dobsonian. After about 10 minutes I came to 2 conclusions: 1) Roy was nowhere to be found, and 2) Even if was there, he'd be very tough to find; the way that people at this party set up was, in a word, chaotic. Unlike some other star parties where people set up their tents and telescopes in aisle after aisle with room to drive your car along each row; here it was just a massive jumble of vehicles, equipment, and humanity. Don't get me wrong, there was plenty of room -- I had no problem finding a place to park and set up my scope -- it was just impossible to systematically cover the whole field to find someone. We did run into the Harrisburg Astronomical Society's Dave Mitsky and spoke to him briefly, but with light fading, we quickly made our way back to get ready to stargaze. I picked out a spot next to a nice man named Brian who owned a 14.5" homemade truss Dob. Not being the type to stay up past about 8:30pm, Steve soon left Cherry Springs in favor of a warm bed, and I was pretty much on my own for the rest of the night. That's actually one of the nice things about observing with "only" an 8 inch telescope, nobody takes much notice of you and you're free to do some serious observing even at a large star party.

As the brighter stars began to poke through daylight's veil, I had my Meade 2080 SCT set up and targeted on Arcturus in the west to check my collimation. Despite SCT's reputation of almost "never" needing collimation adjustments, I have found that whenever I bounce that tube around in my Geo Metro, the collimation almost always could use some improving. Sure enough, Friday night was no exception.

I should take a moment to mention a word about the weather: absolutely, positively couldn't-ask-for-better, knock your socks off gorgeously clear! (OK, so that was 11 words and a contraction. The weather couldn't be justly described with merely one word.) Oh, and cold! Ice would form before the night was over...

I began the night with the famous globular cluster M13 in Hercules. I like to begin with something easy and beautiful, and besides, it wasn't totally dark yet. Next, I swung southward to Mu Sagittarii, about 2 deg. south of the M24 starcloud. From there I starhopped as follows:

- NGC 6568 (Uranometria p. 339) - a decent open star cluster. Large, easy, with about 100 stars visible. Consistent density and actually fairly consistent star brightness - no blaring attention-grabbers.

- Sharpless 2-35 - emission neb about 1 deg north and slightly east of Mu Sgr. There was no sign of this nebula in my scope. Anyone able to grab this in a large aperture scope?
- NGC 6578 - pn just 10 minutes southeast of Sh 2-35. Appeared close to stellar, faint, and near a close pair of stars which are brighter without an OIII filter, but dimmer than 6578 with it. Good at 127x.
- NGC 6589 and NGC 6590 - I wasn't really expecting to see this pair of neighboring reflection nebulae, but I was pleasantly surprised. My notes read:
 - N6589 - pretty bright, has 1 star associated with it.
 - N6590 - same FOV as 6589. Easy, brighter and bigger than 6589. Possible faint stars within it. I later checked my Deep Sky Field Guide which states that 6589 has not one star, but rather a pair of 10th mag stars separated by 20", within it. 6590 has a pair of 11th mag stars. My guess is that these would look really nice side by side in a larger telescope.
- M28 - gc in Sgr. Great! Bright, resolved, concentrated.
- M17 - Omega Nebula (Sgr). Wow! Look at the duckie! (Yeah, I know what you're thinking, it's a *swan*.)
- M74 - g in Pisces. L, f, uniform in brightness in the middle 50-60%, but then irregular or mottled. Spiral?
- Veil Nebula in Cygnus - High overhead and from this dark site, I knew this should be among the best views I'd ever get with my 8", and it sure was! I find the background starfield so rich that I prefer the views without the OIII over the views with it. At 8" aperture, there just aren't enough stars getting through the OIII.
 - At 50x:
 - at NGC 6992&95 - pretty faint. Gorgeous filaments!!!
 - at NGC 6974&79 - pf, also very nice.
 - at 52 Cyg - vf

I'll admit I may have gotten sloppy as I scanned around this area - so perhaps I mixed up the regions (I say this because I had never before recorded any notes for the 6974&79 region.)

It was around 1 AM at this point and I decided it was time for the coveted cajun burger from May's Munchables! I ate one for you, too, Kent! Nothing quite hits the spot like a good cajun burger!

Next, I moved on to some planetary nebulae suggestions from Kent:

- NGC 6790 (U p. 251) - pn in Aquila. Easy, bright, quite tiny, almost stellar, bluish. Part of a triangle, and it becomes brighter than the stars with OIII employed.
- NGC 6760 - a nearby gc in Aql. Probably good, but just hit the trees as I got to it. Viewed it a couple of times in 1998, though, once at home in Maryland and once up in Potter County: Easy, unresolved except for 1 star on NE edge of cluster.
- NGC 6804 - pn in Aql. At 50x, f, about 2' diameter dim glow. Not stellar. OIII was not very helpful. Don't know why I didn't think to kick up the power.
- NGC 6803 - pn in Aql. Nearly stellar. Further south of the 2 objects which are in the approx location. Blinking with OIII needed to verify.
- M15 - gc in Peg. I always love returning to this gem. One of my most memorable observations ever was of M15 in the 30" SCT at the top of Fan Mountain near Charlottesville, VA.

It was now nearing 2:30 AM, and a few black clouds were encroaching. I decided to walk around a bit. I met a guy named Ray from New Jersey who showed me what he called the Little Veil, NGC 6888 in Cygnus, in his 10" Dob. It was a really cool, thick ring surrounding a diamond of stars. As the sky quickly clouded over, I decided I'd definitely put it on list of objects for Saturday night.

Due to the deteriorating sky conditions, I decided it would be a good time to pack it in and try to get some sleep so that I'd be ready for the next night. But first I grabbed a bowl of clam chowder from May's Munchables!

Saturday night turned out to be a carbon copy of Friday night, and I mean that in the blackest sense of carbon. Some of the people that come to CSSP regularly claim that these 2 nights were not really as good as it can get, but after having observed in Potter County at Steve's farmhouse a couple dozen times over the last 10 years, I would say that I don't think I've ever observed telescopically in darker skies!

In the interest of getting some sleep, I decided to park my car outside of the observing area so that I might drive back to the house at some point that night. So, I roughed it without power. (Actually, if I

really wanted it, there was plenty of electricity to be had. There are numerous poles throughout the field with electrical outlets.)

I began back with Kent's pn list:

- NGC 6749 - pn in Aql. Not sure of it. Saw many possibilities, all mainly stellar. Back on 8/1/98 I picked this one up from home, but I noted it as vf.
- NGC 6741 - pn in Aql. Part of it is very bright but nearly stellar. Using the OIII, I was able to pick out this object, but its location did not seem to quite match the position shown in Uranometria, p. 251. I thought the pn coincided with the southern star of 2 that are plotted in the atlas. Anyone else come to this conclusion?
- NGC 6888 - emission nebula in Cyg. Little Veil or Crescent Nebula. This is the one Ray had suggested. Really cool! Nice donut shape. Brightest on west side, then on the east, then north. Southern part is vvf - only got hint of it. Beautiful arcing seen, especially along NE part. Good with 50x, best at 127x with my 16mm Nagler II. Visible with OIII, but not as good of a view.

Despite the continuing great weather, I decided to pack it in at this point right around midnight. I had long drive ahead of me the next day, and I wanted to get up early enough to be of some use to my father-in-law on Sunday morning. But, wow! What a great weekend for a star party! I sincerely hope that the Black Forest Star Party and the Tuckahoe No-Frills Star Party will be on different weekends in the future. It's truly a shame to not be able to attend both!

2001 Virginia Association of Astronomical Societies Convention

By Kent Blackwell

The 2001 VAAS convention was held at Virginia Western Community College's Whitman Auditorium in Roanoke, VA on Saturday, October 13. Each year a different Virginia astronomical club sponsors the event, and this year the Roanoke Valley Astronomical Society took on that responsibility. We thank those in the club who made it all possible, in particular, John Goss, the VAAS coordinator this year.

Six lecturers rounded out a very informative and productive day. First up was Dr. Brett Taylor talking about wormholes and time travel. Next, Eric Douglas discussed impact structures on the moon and other worlds. Mike Good talked about discovering extra-solar planets.

After lunch I spoke about observing October deep-sky objects, which hopefully would be a precursor to an observing session planned that evening on the Blue Ridge Parkway. I had high hopes to be able to view some of the objects about which I spoke, especially since Kelly Proffitt, an amateur near the Tidewater, VA area had brought his brand new Obsession 20" f/5 Dobsonian. Later Dr. Roger Chevalier gave a concise discussion about exploding stars, followed by a discussion of good and bad lighting by Ted Ake.

The day was rounded off by one a favorite activity of these conventions, the drawing of door prizes. This year's prizes included donations from the Lumicon, Ted Ake, the Planetary Society, Kalmbach Publishing, Roanoke Valley Astronomical Society, Software Bisque, Orion, TeleVue, and included a grand prize of a 8.8mm Meade Ultra-Wide eyepiece from Meade Instruments. Congratulations to the winners, and special thanks to Greg Dillion. Greg won *The Sky* computer program from Software Bisque. When the grand prize was drawn he once again had the winning ticket, but suggested another raffle ticket be drawn in fairness to others.

Plans for an evening observing session were thwarted by clouds, which seemed to increase more and more as the day went on. By the end of the convention the sky remained mostly cloudy. Attendees were given the option of driving to the observing location in case the skies cleared. While waiting for the sky to get dark I went to dinner with Bob Hitt, Ray Moody, Glen Howell and a friend whom I hadn't seen in 20 years, Bill Dickinson. After dinner the sky looked worse so most of us decided to head for home. I spend the night near Roanoke, hoping it might clear but it never did. Nevertheless, the VAAS Convention was still fun. It's always nice to get together with other amateurs, if not under the starry sky at least at such conventions. As we parted several said they would see me again the following weekend at the East Coast Star Party in Coinjock, NC, a private star party I host twice annually.

Thanks again to the Roanoke Valley Astronomical Society and to Virginia Western Community College for allowing us to hold the convention in their beautiful Whitman Auditorium.

The Thrill Of The Meteor Chase: The 1998 Leonids

By Glendon L. Howell

It was cloudy Monday night and weather prospects weren't looking too good for our area to witness the peak night of the Leonid meteor shower. Not taking any chances on missing out on a possible meteor storm, I had already made contacts with other observers via email (John Goss from Roanoke, VA, John Dilday from down below Raleigh, NC, and member Ron Robisch who now lives in Monrovia, MD). Each had provided me with information on sites where observers would be that night should I need to head out of town. I had paid attention to radio, TV, and internet weather forecasts all day, many of which conflicted, though some were indicating the mountain cities of Virginia might be clear that morning. I put out yet another email to the three seeking what their current conditions and predictions were about 6 PM and eagerly waited for any response.

Charles Allewelt called me in the mean time. He too was frustrated with the bleak weather situation. I invited him to join me should I decide to make a mad dash out of town. He was interested if I could manage to locate clear skies and so I told him I would call back later once I knew more. By 7 PM, John Goss had responded from Roanoke to say that his forecast was calling for clearing after midnight. A call to Charles and he was on his way over.

We finally left Tidewater about 9 PM and headed up I-664 to I-64 to Charlottesville. It was raining by now and it continued to rain until about half way to Richmond. As we continued on we noticed the clouds finally breaking up about half way between Richmond and Charlottesville, with the sky totally clear by the time we reached the latter. It was also getting windy and colder.

Trying to save some mileage and time, I decided to detour down US 29 to Lynchburg, which was a great route until we hit Lynchburg. We finally made it onto US 460 about 1:30 AM. Now we were seeing thick banks of fog. We continued on 460 then made yet another mistake by following signs for the Blue Ridge Parkway instead of continuing down on 460 when we reached Bedford.

We entered the Parkway at Peaks of Otter, and had to drive yet another 50 miles down the Parkway to get to milepost 139, the Cahas Mountain Overlook where we expected to join members of the Roanoke Valley Astronomical Society (RVAS). Around every curve we had to slow down for deer in the road, but the scenery from the mountain even at night was beautiful and once in a while we'd spot a fireball while still driving.

We finally arrived at the Overlook about 3:15 AM, where we joined RVAS members Gary Close, Frank Baratta, and a few others. Fireballs were flying everywhere and we were seeing several meteors each minute. Charles and I set up cameras on tripods to try to record a few on film but it was hard to set up when there were cries of "wow, there goes one through ...". It was cold and windy that night and Charles and I had a terrible time keeping our lenses clear of fog, but at least Charles had thought to bring his 12v dew-zapper which helped tremendously! Both of us know we had several meteors pass through our camera fields that night, but the dew was so troublesome some of them were probably messed up by it. Some of the RVAS members were actively counting the Leonids and some had been there since midnight. When they quit about 6 AM, the count stood at around 650 Leonids sighted that night in only 6 hours!

The show was quite spectacular and without a doubt the best meteor shower display I have ever seen, though it was still far short of a meteor storm. To top it off, we saw the zodiacal light reach up to Leo as a pyramid from the eastern horizon, plus enjoyed a beautiful thin crescent moonrise with earthshine, accented by fireballs and a beautiful sunrise too! Then, after catching probably less than an hour's sleep, we hit the road again for home, traveling down 460, and getting back about 12:30 PM.

The next night, which was clear here, I drug myself out again, this time to my parent's home in Gates Co, NC. I was so tired I missed packing my telescope tube and had to return for it before I got all of the way there. I finally made it there about 11 PM where Scott Justis was already set up and preparing to do some photography.

As tired as I was, it took me twice as long to set up as usual but I managed it and mounted two cameras to the telescope, one piggyback with a 50mm lens and the other prime focus on my Jaeger's 6-inch f/5 refractor on a Losmandy G11 mount. I shot several prime focus shots of M42, the horsehead, Rosette, and the Pleiades while simultaneously shooting 50mm shots of Orion, Monoceros, Canis Major, Taurus, and Leo hoping to catch some more Leonids and I think I did, but Leonids were much less active

than the night before, and we only saw perhaps 2-3 dozen the whole night. Needless to say, I slept quite well that morning after packing back up as twilight approached!

Several days later on the Sky & Telescope web site www.skypub.com, I learned that the peak of the Leonids came about 16 hours earlier than had been predicted for this year. This favored western Europe and Africa, and the Canary Islands. There had been no storm this year, only a very strong display, and Charles and I had managed to witness the end of it! RVAS President John Goss and his wife had seen it too, though they had not joined us at the Overlook. At the peak, he was estimating 3-10 meteors per minute! Now, I look forward to next year!!!

Calendar Confusion

By William N. "Chuckwagon" Gray
From "Between The Stars", February 1978

In prehistoric times, a simple sundial was sufficient for keeping track of the seasons. The Sun moved south as winter approached, and then north again in the spring.

But with the advance of agriculture and religion, the need of some system for keeping track of the passing days was evident. All the ancient civilizations developed such a system, called a calendar, and they all seemed to have the same problem with it. It kept getting out of line with the seasons, and had to be adjusted each year.

The early Roman calendar, from which our present one is derived, was divided into 10 months with the number of days in each varying from 20 to 35. Any discrepancies were taken care of at the end of the year, by adding or subtracting the necessary number of days. This is how it looked:

| The Original Roman 10 Month Calendar | |
|--------------------------------------|-----------------------------------|
| 1 - Martius (March) | 6 - Sextilis (6 th) |
| 2 - Aprilis (April) | 7 - September (7 th) |
| 3 - Maius (May) | 8 - October (8 th) |
| 4 - Junius (June) | 9 - November (9 th) |
| 5 - Quintilis (5 th) | 10 - December (10 th) |

It is easy to see that this was a rather awkward system and could lead to much confusion. And it did. Now it was known that the year had 365 days (roughly) but what was needed was some method of dividing it into parts that could be easily determined. So they decided to use the only thing they had that operated on a visible schedule --- the Moon!

The cycle of the Moon from New to Full and back to New took just about 30 days. But it would take 12 of these cycles to make a year which meant that 2 extra months would have to be added to their calendar (13 moon cycles came to over a year).

So, in 704 B.C., they added the 2 months to their calendar and after setting the number of days in each, this is how it came out. Note that the year still began in March, at the Spring (Vernal) Equinox.

| The Roman 12 Month Calendar - 704 B.C. | |
|--|-------------------------|
| 1 - Martius - 31 days | 7 - September - 29 days |
| 2 - Aprilis - 29 days | 8 - October --- 31 days |
| 3 - Maius --- 31 days | 9 - November -- 29 days |
| 4 - Junius -- 29 days | 10 - December - 29 days |
| 5 - Quintilis 31 days | 11 - Januarius 29 days |
| 6 - Sextilis 29 days | 12 - Februarius 29 days |

This calendar had a total of 356 days. As this was 9 days less than the necessary 365 days, an additional month was inserted every second year to correct for it.

Now this also appears to be confusing, but it really worked out reasonably well, and as such this calendar was used for almost 700 years. It might have lasted longer, except for the actions of some Roman officials. These officials ignored one of the cardinal rules of those who govern. This rule (now

known as Randolph's Law) clearly states "Never needlessly disturb a thing at rest." They began to extend the length of the months in order to prolong their term of office, or to delay an election. This goes to show that governments haven't changed too much since Roman times.

By the time Julius Caesar came to power in 48 B.C. they had the calendar out of line by 80 days, which was no mean feat when you start to think about it. Now Julius Caesar was an able administrator, and to him, such a situation was intolerable, and he immediately set out to correct it. With the assistance of an astronomer from Alexandria, Egypt named Sosigenes (there is a crater on the Moon named after him), Caesar made the following changes.

First, to account for the displaced 80 days, he decreed that the year 46 B.C. would consist of 445 days! This would bring the calendar back in step, but would also earn for that year the epithet "The Year Of Confusion".

Then, since the year was really $365 \frac{1}{4}$ days long, he had every year to consist of 365 days with an extra day added every fourth year to February (the last month). We do the same today, and call it our "Leap Year".

Also, he ordered that the year should begin on the first New Moon after the Winter Solstice (Jan. 1) instead of at the Spring (Vernal) Equinox in March. This is why the numbered months today have the wrong number (September, October, etc.). When all of this was done, he reset the number of days in each month, and in order to put his name on it (9th calendar) he renamed one of the months after himself Julius (July) and gave it 31 days.

Later on, after Julius Caesar's death, his successor Augustus Caesar would rename another month after himself Augustus (August). But as that month only had 30 days, and in order that his month should have as many days as Julius's month, he shortened February to get the necessary day.

Now these were drastic changes, but Sosigenes, the astronomer knew what he was doing, and the result was the first really workable calendar. In fact, it worked so good that it has been in use for almost 2000 years. It has gone through century after century, without a change, and is the same calendar we use today. It is known as the Julian Calendar.

But, there is one small item that everyone seemed to have overlooked. It seems that the year is not exactly $365 \frac{1}{4}$ days long. Actually it is 11 minutes 14 seconds less than this. Now that is not very much, and over a short period of years it made little difference. But after several centuries it mounted up, and again it began to be noticed that the calendar was falling behind the seasons. In 400 A.D. it was out of line by 3 days. In 900 A.D. it amounted to 7 days, and by 1500 A.D. it had grown to 10 days!

In order to correct the situation, Pope Gregory, in 1582 ordered that 10 days would be dropped in that year. People went to bed on the night of October 4 and woke up on the morning of October 14. And to prevent such a situation from arising again, he provided that the beginning of every fourth century would be a Leap Century (1600 and 2000) while the years 1700, 1800, and 1900 instead of being Leap Years would be common years. This would take care of the 3 days the calendar was off every 400 years.

As a result of these corrections, it became known as the Gregorian Calendar, and was immediately accepted in all the Catholic countries. But the Protestant countries were not so quick to comply with it. They refused to accept the Pope's authority to do it. England and her colonies waited almost 200 years before making the change in 1752 and by then their calendar was wrong by 11 days. Other countries waited even longer. Now it seems that even the Gregorian Calendar is still too long by 26 seconds each year, and so at some eventual date, yet another correction will be needed.

The Astronomical League's Planetary Observers Club

Emailed out with this issue is an electronic copy of the Astronomical League's Planetary Observers Club booklet. The Astronomical League offers many such programs to its member societies, and members are encouraged to hone their observing skills and work toward a framable certificate from the AL by following the observing guidelines of these AL Observe programs. More such programs will be included in future emailed newsletters. For those who are not able to receive their newsletters by email, contact Glen (485-4242) to obtain a copy of any program of interest.

Norfolk Astronomical Society Astronomical Calendar

| October 2001 | November 2001 | December 2001 |
|--|---|---|
| S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 | S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 | S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 |

All times are EST

<http://groups.hamptonroads.com/NAS/>

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|--|--|--|--|--|---|--|
| 28 | 29 | 30 | 31 | 1 | 2 | 3 |
| | | | | 12:41 AM Full Moon (Hunters Moon) | 7:00 AM Venus 4 degrees N of Spica 9:00 PM S. Taurid meteor shower | 2:00 AM Mercury 0.7 degrees N of Venus 5:00 PM Saturn 0.6 degrees S of Moon |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1:00 PM Mars 2 degrees S of Neptune | 1:16 AM Moon occults SAO 77971 (+6.7) | 2:00 AM Jupiter 1.7 degrees S of Moon 7:30 PM "The Limits Of Automation" lecture at VASC | 12:48 AM Moon occults SAO 79948 (+7.2) | 1:13 AM Moon occults SAO 80631 (+7.6) 5:21 AM Last Quarter Moon | 4:29 AM Moon occults SAO 98988 (+9.0) 8:00 PM NAS Observing Session | |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 12:00 PM Moon reaches perigee | 8:00 PM N. Taurid meteor shower | 5:06 AM Moon occults SAO 139548 (+7.0) | 9:00 AM Tidewater Regional IDA meeting at Nauticus (tentative) | 1:40 AM New Moon | | 8:00 PM Leonid Meteor Storm Watch |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 5:00 AM Leonid Meteor Shower | 7:00 PM NAS Regular Meeting at MRO | 4:00 PM Neptune 3 degrees N of Moon | 2:00 PM Mars 3 degrees N of Moon 9:00 PM Uranus 4 degrees N of Moon | 6:21 PM First Quarter Moon | 11:00 AM Moon reaches apogee | |
| 25 | 26 | 27 | 28 | 29 | 30 | 1 |
| | 5:00 AM Mars 0.8 degrees S of Uranus | 12:00 PM Asteroid Vesta reaches opposition 11:21 PM Moon occults SAO 110390 (+5.6) | | 11:38 PM Moon occults SAO 93650 (+6.0) | 3:49 PM Full Moon 7:34 PM Saturn occulted by the Moon (reappears at 8:36 PM) | |