SKYSCRAPERS INC.

the Skyscraper

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Amateur Astronomical Society of Rhode Island ★ 47 Peeptoad Road ★ North Scituate, Rhode Island 02857 ★ www.theSkyscrapers.org

Seagrave Memorial Observatory is open to the public

weather permitting

Saturdays 7pm - 9pm

Please note that the observatory may be inaccessible for several weeks following a winter storm. See web site for updates.

North Scituate Community Center

All of our winter meetings (Dec-Mar) are held at the Community Center. From Seagrave Observatory, the Community Center is the first building on the right side going south on Rt. 116 after the intersection of Rt. 6 Bypass (also Rt. 101) and Rt. 116. Parking is across the street.

In this issue…

January Meeting with Scott Tracy & Gerry Dyck

Friday, January 8, 7pm
North Scituate Community Center

Skyscrapers' monthly meeting will have two long time Skyscrapers' members as guest speakers—Gerry Dyck and Scott Tracy. Their topic will be on variable star observing

Having a Front Row Seat to Stellar Cataclysms
Scott Tracy

My part of the talk will focus going over the basics of "doing variables" - how star charts are acquired and visual comps are made, and reported. I will briefly mention how this data can be accessed on the American Association of Variable Star Observers (AAVSO) website. My focus will be dwarf novae, and not a long laundry list of intrinsic and extrinsic variables (though those will be mentioned as offerings on the broad menu of variable star observing opportunities).

I will be showing some shots of my observatory as well as AAVSO information. I will also discuss the CCD and photometry that AAVSO observers do as well.

My Backyard Connection to the Universe
Gerry Dyck

My talk to Skyscrapers is called "My Backyard Connection to the Universe." It outlines the work I do for the AAVSO and highlights several exciting times when my observations have been important to professional observers. I hope it might inspire one or more members to follow my footsteps.

Executive Committee Meeting

Wednesday, January 6th at 7pm
Ladd Observatory
210 Doyle Avenue
Providence

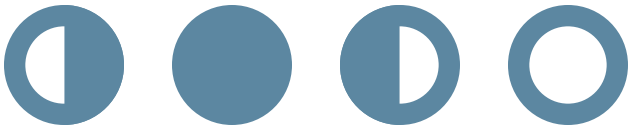
All members are welcome to attend.

Spectroscopy Workshop

Saturday, January 9th at 7pm
Seagrave Observatory
weather permitting

If you would like to attend, please contact Bob Horton at stargazerbob@aol.com or call 401-556-8091.

Phases of the Moon



Other notable events: Perihelion occurs on the 2nd. Quadrantid meteors peak on the 3rd. Mercury is at inferior conjunction on the 4th. Venus is at superior conjunction on the 11th. Mercury is at greatest western elongation (25°) on the 25th. Mars is at opposition on January 29.

President's Message

Bob Horton

What a great turnout we had for our holiday party! Even though the weather that night produced a wintry mix of rain and snow, so many of you braved the elements to enjoy the camaraderie of your friends in Skyscrapers. Thanks again to everyone for bringing such a wonderful sundry of delicious food. On behalf of Skyscrapers, I would also like to extend our sincerest appreciation to our speaker, Marcia Bartusiak, for making the trip from Boston to provide us with such a great evening program.

The winter months here present a challenge to any plans we make for activities at Skyscrapers. Although we may have clear nights, there will be times when our property will become inaccessible due to snow and ice, sometimes for extended periods of time. Regardless, we still plan for activities, both for the public and our membership. Just remember to check our web site for updated announcements.

In collaboration with Brown University's Dept. of Physics, Skyscrapers will be hosting a Spectroscopy Workshop on January 9th, starting at 7pm. Professor Ian Dell'Antonio will be instructing us on the operation of a SBIG spectroscope attached to our 16" telescope. With this spectroscope we will examine the absorption and emission lines of various stars and nebulae. Should we be clouded out on this date, we have reserved January 23rd as a rain date. Mark these dates on your calendar. This will be a fun and informative workshop that you will not want to miss.

The planet Mars reaches opposition in late January, and we should have some great observing opportunities from now until late March. At our last meeting, Al Hall presented a short talk about observing and sketching Mars. As explained in his talk, by taking the time to make drawings, you end up training your eyes to notice minute details, many of which go unnoticed by the more casual observer. As a member of Skyscrapers, you have the opportunity during any of our open nights to use some excellent telescopes, especially the 8¼" Alvan Clark refractor. Now is your chance to enjoy some wonderful views of the Red Planet.

Perhaps you are interested in becoming a key holder so that you can more greatly enjoy the use of our facilities? If so, please consider attending the next meeting of the Observatory Committee, to be held at Seagrave Observatory on Saturday, January 16th at 5pm. At this meeting you will learn what is involved in getting trained on how to operate the various telescopes, and what the responsibilities of being a key holder are. If you would like more information, please contact one of the trustees.

Clear Skies,
Bob Horton

Observatory Committee Meeting

Saturday, January 16th at 5pm
Seagrave Observatory

The Observatory Committee will meet on Saturday, January 16, 2010 at 5pm. We will meet at Seagrave Observatory, unless snow conditions make access difficult. If we need to move the meeting to another location, or reschedule for another date, we will send out an e-mail announcement.

In order to fulfill Skyscrapers obligation to educate the membership and the public on astronomy, we are seeking input from members to suggest ways to encourage participation at our Public Nights and Star Party events.

Current key holders are strongly encouraged to attend. If you have another obligation on this date, please kindly contact one of the Trustees in advance.

We are also looking to expand our ranks, so all members interested in being trained on the operation of our telescopes and equipment in order to qualify for keys are especially encouraged to attend.

Sincerely,
The Board of Trustees,

Jim Brenek, jbrenek@cox.net
Steve Siok kathys5@cox.net
Tom Barbish labtjb@verizon.net

The Skyscraper is published monthly by Skyscrapers, Inc. Meetings are usually held on the first Friday of the month. Public observing is usually held every Saturday night at Seagrave Memorial Observatory, weather permitting.

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Directions
Directions to Seagrave Memorial Observatory are located on the back page of this newsletter.

Submissions
Submissions to The Skyscraper are always welcome. Please submit items for the newsletter no later than January 18 to Jim Hendrickson, 1 Sunflower Circle, North Providence, RI 02911 or e-mail to jim@distantgalaxy.com.

E-mail subscriptions
To receive The Skyscraper by e-mail, send e-mail with your name and address to jim@distantgalaxy.com. Note that you will no longer receive the newsletter by postal mail.

Meteor Showers of 2010

Dave Huestis

I always look forward to preparing this column on the meteor shower prospects for the upcoming year. Prior to conducting my research on these annual shooting star displays I usually have no clue as to what the basic observing conditions will be, such as Moon phase and time of peak activity. Only after I have consulted up to six sources of information can I report to you if the new year will be like that old Wide World of Sports opening: "the thrill of victory or the agony of defeat."

The "victory" would be like 2009 when both the Moon and weather did not spoil many of the major meteor showers. The "defeat" is the years in which either one of these conditions conspired to prevent us from meteor observing.

Unfortunately during 2010 the best of the shooting star displays will suffer somewhat from lunar interference. The only exceptions will be the April Lyrids and December Geminids, when the First Quarter Moon will set around midnight, and the August Perseids when a waxing crescent Moon will set within an hour of sunset.

However, despite interfering moonlight for most of the others, I still encourage you to go out to see if you can observe a meteor or two during the less than favorable nights. Why? Because you never know when clouds are going to ruin any observing opportunity!

And for those of you who may be new to meteor watching, contrary to what some may believe, you do not require a telescope to observe meteors. Though you might get lucky and see one through binoculars or a telescope, the chances are astronomical since you would be pointing at one very small and specific area of the sky! All you need are clear skies and a good pair of eyes to scan the heavens for shooting stars.

We start out 2010 with so-so conditions for the Quadrantids meteor shower on January 2-3. A bright waning gibbous Moon (just 3 days past full – December 31) will certainly reduce the number of meteors one can observe during this shower's peak from midnight until dawn. However, the radiant point for these very fast (25.5 miles per second), and often blue shooting stars is in the northern sky, near the end of the Big Dipper's handle. Though low above the horizon early in the evening, the radiant will be at its highest elevation just before dawn.

To maximize your observing opportunity you should try to block the Moon's direct light with a building while scanning from the north to a point directly overhead (zenith). Despite the Moon's presence you should see the number of Quadrantids rise to their peak. They are also noted for blazing halfway across the sky.

Clip and save the 2010 meteor shower prospects chart below and use it to plan your observing schedule for the coming year. I will highlight the specifics of each shower in my monthly columns throughout the year. Good luck with your meteor observing efforts.

Besides a few good meteor showers we will welcome the return of Mars (mid to late January) to our list of planets to observe. While Mars will get no closer than 61,721,726 miles from the Earth on January 27, 2010, the larger telescopes at the local observatories will be able to reveal some detail. And a couple of months later (late March, early April) we will be treated to a fine view of the sixth planet from the Sun, Saturn, and his now opening ring system (they were edge-on last September 4th). Viewing dates and times will vary by observatory due to local tree-lines and blocking buildings.

In addition, while there are four eclipses in 2010 (two solar and two lunar), we will only see the December 21, 2010 total lunar eclipse. Here in Southern New England the eclipse will be observed in its entirety, beginning at 12:28 am and ending at 6:06 am. Totality will last from 2:40 am until 3:54 am. I'll provide further details closer to the event date.

While the winter months can be very cold in the unheated domes at Seagrave Observatory (http:/www.theskyscrapers.org) in North Scituate and Ladd Observatory (http://www.brown.edu/Departments/Physics/Ladd/) in Providence, these facilities do remain open year-round provided snow or ice does not force closures. Please check their respective websites for any cancellation notices before venturing out for a visit.

Let's hope 2010 provides more victories than defeats for all your observing adventures.

Happy New Year!

Shower	Dates	Moon
Quadrantids	Jan 2-3	Waning Gibbous
Lyrids	April 21-22	First Quarter
Eta Aquarids	May 5-6	Last Quarter
Lyrids	June 14-16	Waxing Crescent
Delta Aquarids	July 27-29	Waning Gibbous
Capricornids	July 29-30	Waning Gibbous
Perseids	Aug 11-13	Waxing Crescent
Orionids	Oct 20-21	Full
Leonids	Nov 16-17	Waxing Gibbous
Geminids	Dec 13-14	First Quarter

Observing Reports 2009 Geminids

Dave Huestis, observing from Pascoag, RI

The prediction for the 2009 Geminid meteor shower called for a potential increase over and above the normal peak rate of from 60 to 100 meteors per hour. That peak was to occur around midnight on the night of December 13-14.

As usual, the weather forecast for that time frame originally called for heavy rain showers from Sunday (13th) afternoon until Monday (14th) morning. With that in mind it would have been logical to observe the night before, though the number of meteors would be much lower.

The problem was that Saturday (12th) night into Sunday morning the local temperature was around 17.5 degrees, with a strong wind that put the feel-like temperature in the teens (at least up in Pascoag, RI.) Despite that I stepped out onto my still snow covered (about 4-inches) porch around 11:55 pm.

The sky was cloud free, and I easily had a limiting magnitude of at least 5.5 at zenith. Immediately I observed one, then two, then three meteors in rapid succession. Though I had dressed for the cold, it didn't take long for me to get really chilled. Within about 10-15 minutes I had counted six Geminids.

I would have loved to stay out there, but the cold and wind chill proved too much (yes, I got cold … and I was wearing more than my summer shorts and flannel shirt!) I quit at about 12:10am.

At one point Bob Horton had called to say that the Clear Sky Chart showed that the skies would now be clear around 2:00 am on Monday morning. Even the local weather guys said the rain would clear out early, but sometimes the clouds will linger.

So I decided I would get up around 2:00 am to see if indeed the skies were clear.

Before I was going to go to bed I decided to look outside to check the sky conditions. It was completely clear. The temperature was a balmy 38 degrees, but I still dressed warmly so I could spend a couple of hours watching for "burning rocks" to fall from the sky.

I began my observing run at 11:30 pm. Immediately I observed a couple of short meteors, about 2nd or 3rd magnitude. Then I'd see one or two that were as bright as Procyon, with longer duration. Most were white in color. Only a couple during my entire observing time showed any hint of color. Some went through Orion, Taurus, Leo and the Ursa Major. Though I did have a handful that reached just about magnitude -1 with an occasional one second or two train of dust, I did not experience any fireballs or bolides.

During the first hour (11:30 pm – 12:30 am) I counted a total of 19 Geminids. During the second hour (12:30am – 1:30 am) that rate had increased to 28. It appeared the rate was rising, but I decided to call it quits. 47 meteors in two hours of observing surpass what I've seen during the last year due to weather conditions and interfering Moon phases. I checked the temperature when I went inside. It had only dropped to 36 degrees.

For once we finally experienced a shower of meteors and not rain or snow! What a great way to spend an early morning.

Bob Napier, observing from North Scituate, RI

I observed 19 Geminids over a 45 minute time between about 3:00 and 3:45 AM Dec. 14. My view was restricted since I viewed toward Providence through a window from inside - too cold to stand outside.

About one third of the 19 meteors were between about 0 and -1 magnitude and were visible for about and estimated two thirds the distance from zenith to horizon. The rest were in the 2nd or 3rd magnitude range with much shorter trails.

Submit observing reports to jim@distantgalaxy.com

Tom Barbish, observing from Coventry, RI

Fortunately, the heavy rain stopped abruptly on Sunday (12/13/2009) evening at 9:30 PM in Coventry, R.I. The skies slowly cleared allowing for some meteor observing between the broken cloud cover. A very approximate peak count of 80 per hour was obtained with 10 to 40 percent cloud cover from 11pm until 02:00am. The meteor streaks were relatively short compared to the Perseids, and no persistent trails were observed. Several random, and possible Orionids were observed.

Pete Peterson, observing from Wishing Star Observatory, Barrington, RI

Geminids report 01:10 – 01:40 hrs, 14 Dec 09

Sticking my head out of the door as I headed for bed I find that the rain has stopped, the heavy fog has lifted and the sky has cleared. The air temperature is warm. Orion's to the west of the meridian. Mars is high in the east. And Gemini is almost at zenith.

Climbing into my Aortic warmth coverall I'm out on the deck in a flash. It's not a heavy meteor shower but I'm warm and enjoying the clear night sky. The meteors are simply frosting on the cake.

After half an hour I find myself nodding off so I call it a night. Didn't record details, but during this period 7 meteors were observed. They ranged from 2nd magnitude to -2 magnitude, lasted from .5 to 1 second, and their sparkling paths were from 10 to 20 degrees long. Yes, they almost all sparkled! Very neat.

Roger Forsythe, observing from Warwick

I did get out for a half hour last night (morning of Dec. 14) around 12-12:30 and saw 11 meteors in that period. Long, 35-45 degrees in length average, and most were brighter than usual. At that time they were approx SSE and the radiant was high (nearly overhead). The skies cleared amazingly dark after so much precipitation. I would have stayed out longer but I am still recovering (hopefully) from pneumonia.

Tom Thibault, observing from Blackstone, MA

Morning of the 13th: I went out around 4:15AM on the 13th for some astrophotography and Geminid viewing. I stopped taking pictures and began looking to the west at 5:24 for meteors. I viewed for only 15 minutes till 5:39, temperatures were around 20 degree's and I had already been out for more than an hour. I viewed 10 Geminid's during the 15 minutes with one bright member with a long trail passing close by Mars. The shower was a good mixture of lengths and brightness originating from many angles all converging toward Pollux and Castor in the west.

Morning of the 14th: Began observing this morning at 4:18 with a obstructed view, I wasn't up to challenging the cold and wet this morning so I sat in front of a large set of sliding doors (10 feet) with a view of the west below Pollux and Castor with some addition obstruction to the N.W. I viewed until 5:24 and counted 17 meteors of varying brightness and tail lengths again radiating from the direction of Gemini. Assuming an equal distribution of meteors, a guess of between 34 – 40 meteors could have been seen per hour.

Mike Umbricht, walking through a parking lot in Providence, RI

I'm a bit fuzzy on the details, I was not observing, just walking through a parking lot in the city. I saw the meteor on Fri. probably sometime around 9:30 - 10:30 pm. I noticed it near the zenith and it was moving almost due west, but did not move very far from the zenith. It was about as bright as Venus and had a very intense blue color. There were flickering pinpoints of light surrounding it. Between the hazy sky conditions, my eyes were not dark adapted and the intense parking lot flood lights I could not see any stars near the zenith below about 2.5 mag.

Bob Horton, observing from Foster, RI

I got up at 2am on the morning of December 14th, and found the sky to be beautifully clear. I made myself a cup of hot tea, and then rolled the roof back on my observatory to do some viewing and photography of the Geminids.

Meteor activity from 2:15 until about 3am seemed a little slow, about one meteor every 2 or 3 minutes. During this time, most of these meteors were about 1st and 2nd magnitude, but a couple were as bright as 0 magnitude. After 3am, I noticed a definite increase in activity, and from about 3am to 3:45am I was seeing as many as three meteors every minute. Again, most of these were in the magnitude 1 to 2 range, but I did observe quite a few more bright meteors, some as bright as - 2.5 magnitude.

Most of the meteors I observed were fast moving, appearing as sharp streaks of light, lasting a second or less. Meteor activity seemed to be declining from four o'clock on, but I continued observing until 5:30am. At that point I was getting pretty cold, so I decided to close up my observatory and head back inside.

The most impressive meteor I saw that morning was a bright, slow moving meteor around 3:30am. I would estimate the magnitude to be about minus 2. What was so interesting about this meteor is that rather than appearing as a streak of light, it looked like a perfectly defined little bead of light, glowing bright blue-white in color. I saw it travel out of the constellation of Gemini and on into the constellation of Auriga, taking about 3 seconds before disappearing. As it traveled, it did leave an ionization trail behind it. However, this trail did not linger and disappeared about the same time the meteor disappeared from view.

I shot two rolls of film, and I am pretty sure I caught a few meteors that morning. Unfortunately, my camera was not pointing in the right direction when that really impressive meteor fell. But just like fishing, I can tell the story about the big one that got away.

Jim Hendrickson, observing from East Beach, Charlestown, RI

Early forecasts had called for unfavorable conditions on Sunday night, peak night for the Geminids, so I decided to take advantage of a clear Saturday night. Jack Szelka announced at the December meeting that he planned to observe from East Beach on Saturday night rather than make the trip on a work night, and invited all in attendance to join him. Jack, Joe Sarandrea, Dolores Rinaldi, and myself carpooled down to Charlestown on what was a spectacularly clear night. Mercedes Rivero-Hudec joined us shortly after we arrived. Given how cold and windy the previous night was, it was quite bearable with only a slight breeze from the west down at the beach.

We arrived at about 20:00 and the show had already started, with Gemini well above the horizon in the east. The winter Milky Way provided a spectacular backdrop with the sound of crashing waves nearby.

Not long after arriving, there was one spectacularly brilliant, pale blue Geminid that sliced through the Milky Way just east of Sirius. It was the longest-lasting meteor I saw, lasting approximately 4 seconds and leaving a brief train. It peaked about magnitude -2.

Jack and I set up our telescopes to take advantage of the dark skies in case the show didn't pan out. Mars had risen soon after we arrived, but we decided to wait about an hour before giving it a look through Jack's 12-inch. He got it set up and focused, then invited me to come over and take a look. As I was approaching the telescope, from about 1 meter away, I saw a green light emanating from the eyepiece of his finderscope. Thinking he had an illuminated eyepiece I continued to approach the main telescope eyepiece when everyone behind me shouted out, nearly in unison, "Wow, look at that green one!" I missed it, or did I? I soon realized that Jack did *not* have an illuminated eyepiece, I had seen the reflection of the meteor in the eye lens!

A short while later, after we had spent some time gazing at some of the season's best Messiers through Jack's 12-inch and my Pronto, we were all seated facing southeast, waiting for the next big one. After a lull lasting several minutes, a 1st magnitude yellow Geminid sliced right through the Pleiades.

In total, I saw approximately 30 Geminids during our 5 hour session, most were short streakers low in the south, average length was about 10 degrees and about 4th magnitude. I did count 4 that were magnitude 1 or brighter. I'm sure my count would have been higher if I hadn't spent much of the first 2 hours poking around the sky with my telescope, but nevertheless this was the best Geminids display that I have seen in recent times.

Jack Szelka, observing from East Beach, Charlestown, RI

On the evening before the peak, of the December Geminids Meteor shower, a small group of Skyscrapers members, went to East Beach, In Charlestown, RI, to observe the show. Although the weather was quite cold, the skies were very clear with average transparency and average seeing. The wind was very calm which made the cold bearable.

We brought along 2 scopes, a 12.5 inch Dobsonian and I believe a 70mm Tele Vue refractor. The early evening was not very active with meteors, but we got in some nice views of some deep sky objects. Later that evening the meteors started to appear. I can estimate we saw between 30 to 40 nice shooters.

2 large slow moving meteors were observed that were green in color and shed some sparks in the tail, one of which left a brief smoke trail.

We observed for about 4 hours. Unfortunately the wind started to pick up and everyone was just too cold to stay longer.

In all, it was well worth the trip to dark sky's as the weather on Sunday, the peak night, was not very good.

2009 Star Party Report

Bob Forgiel

For the 2009 International Year of Astronomy we actually had more rescheduling due to weather than actual events held. We had several events that were clouded out and apparently will be put off until 2010. Portsmouth Middle School and the Christian Home Educators are two examples of events that will be rescheduled in 2010.

When I think back I remembered 2008 to be a fairly busy year for us. I also recall making a reference to "star party marathon week", when we had events scheduled three days in a row. I was curious as to how badly the weather impacted our outreach for 2009 so I started looking back over what events were held, who rescheduled and what was just canceled. My records indicate for 2009 we held a total of 15 events and 1 Messier Marathon. When I looked back at 2008, we only held 14 events so we actually did better this year than last year even with all the rescheduling!

I was going to recap a lot of the events from the year but to keep it short, I decided to just mention the most memorable thing from the entire year. Out of all the events in 2009, the item that's most memorable to me was actually from the first event of the year. It was during the Woman's Wilderness Weekend when the temperature dropped into the low teens. I know you are thinking that my memorable item would probably be all the women but that's not it. This arctic event was our coldest event for the year but it was also the first event that two new members, Brian and Larry, volunteered to drive some distance and then setup while the temperature continued to drop. If I recall correctly, I think they were voted in as members at the following meeting so technically they weren't even officially members but they were out there braving the cold and helping out. There's not a real long list of members that volunteer on a regular basis and the list becomes even shorter when the temperature drops. Hats off to Brian and Larry to come in as new members and start helping out immediately in such adverse conditions.

I also want to thank everyone that has helped out and volunteered for either a public night or any other event. Member participation within any society is a direct indication of the societies strength or weakness. The amount of volunteers as well as time volunteered is taken into account when any society is looking for grants, tax-exempt status etc…. Even when you sign the book at the meetings, it's important. We can then show that we have people attending the meetings and how many.

Thanks again everyone.

Light Pollution Notes:
Iway Bridge Light Pillar Should Be Shut Down

Jim Hendrickson

I am writing this in regards to the economic and environmental costs associated with the lighting system being used on the new Iway Providence River Bridge. While there is no question that adequate lighting is necessary on the bridge, the lighting system actually in use is not designed simply for roadway visibility and safety, but to create a dramatic Las Vegas-style light pillar that is excessive and unnecessary. The lights used on the bridge appear to be used merely for ornamentation rather than providing the illumination necessary for roadway safety. This ostentatious lighting scheme is not only out of place in a small city far removed from Las Vegas, but it is also out of place in our energy-conscious and budget-sensitive times.

There is no doubt that we live in challenging economic conditions. Hardly a day goes by without some news about the state's budget woes and the measures and cutbacks being considered to close the budget gap. Given this reality, it is deeply troubling that we find it acceptable to spend our limited resources keeping the Iway Bridge light pillar shining into the sky every night.

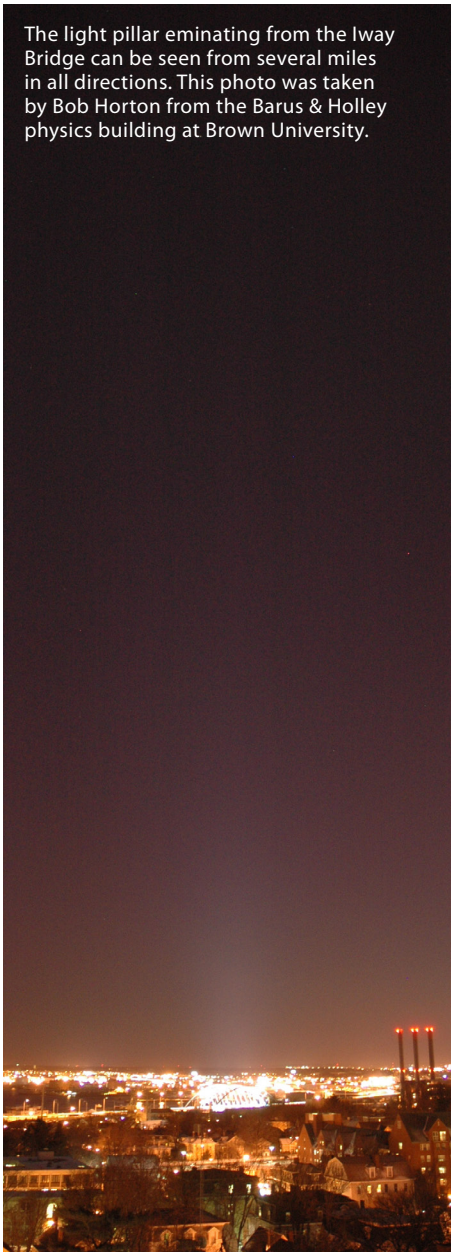
In recent times, energy efficiency and environmental awareness have become important issues in the sphere of public consciousness. We are being encourages to change the light bulbs in our homes to more energy efficient ones and to turn them off when we leave the room. National Grid is challenging us to use 3% less energy over the next year. The federal government has spent billions of dollars on incentives to get consumers to drive more fuel-efficient vehicles and to make energy-efficient home improvements. Consuming less energy not only saves money, but also reduces adverse effects on the environment.

When it comes to outdoor lighting, another impact on the environment--one very seldom given attention—is that excessive or improperly designed or directed lighting creates light pollution. Light pollution is term given to the problems caused by poorly shielded or misdirected lighting that shines not down on the ground where it is needed, but outwards and upwards, causing glare and skyglow. It is much more prevalent in cities than in rural areas due to a higher concentration of lights. Properly shielded lights prevent skyglow by directing all of the light to the ground, where it is needed for visibility and safety. Skyglow has an adverse effect on the environment by creating a persistent, artificial twilight that has been known to alter the behavior of insects, birds, and marine life. With the deliberate uplight of the Iway bridge lights, the skyglow over Providence has increased dramatically in the past year. In fact, on overcast nights I can see a profusely bright white patch in the clouds towards the direction of the Iway bridge from my driveway nearly 5 miles away. Given how obvious the lighting is from this distance, it is most certainly visible over a much larger radius, resulting in over 100 square miles of Rhode Island, Massachusetts, and Narragansett Bay that are affected by the skyglow from the Iway bridge light pillar. This spotlight into the sky has drastically increased the amount of ambient light at night over this area. It fact, the Iway bridge light pillar is now the brightest single source of light pollution in all of Rhode Island.

Not only is the natural world affected by light pollution, but there have also been recent studies that have suggested that excessive light at night has negative effects on human health due to interruption of

the circadian rhythm. Our body's internal clock requires the regular cycle of light and dark to regulate our health. After an article in the November 2008 issue of *National Geographic Magazine* titled "The End of Night: Why We Need Darkness" brought widespread public attention to the light pollution problem, the American Medical Association earlier this year adopted Resolution 516 calling for efforts to reduce light pollution for the sake of public safety and energy reduction.

With regards to these concerns, it has always been my understanding that environmental impact studies are conducted before projects on the scale of the Iway are undertaken. These studies are done, presumably, to prevent any public works or private development project from adversely affecting its immediate surroundings, neighbors, or the environment itself. Unfortunately, given how wide a swath of territory it directly affects, it seems that the environmental impact of the Iway bridge lighting has been grossly overlooked. While conducting research on what, if any regulations regarding light pollution exist in Rhode Island, I came across the 2002 Outdoor Lighting Control Act (http://www.rilin.state.ri.us/publiclaws/law02/law02420.htm). This act was written on the premise that "[t]he general assembly finds that fully shielded lighting units considerably reduce light pollution. The general assembly further finds that the replacement of unshielded lighting units with fully shielded lighting units can result in substantial lowering in the wattage of the lamp needed to maintain an equivalent level of lighting on the ground, thereby realizing a considerable energy savings to the state. Therefore, it is in the public interest to require the use of fully shielded lighting units to the maximum extent possible." I won't quote the entire text of the act here, but the relevant excerpts state that "[t[he installation of any new or replacement permanent outdoor lighting unit by or for a state agency shall meet the following conditions: (1) The new or replacement luminaire permits no more than two percent (2%) of the total lumen in the zone of ninety (90) to one hundred eighty (180) degrees vertical angle if the rated output of the [luminaire] is greater than thirty-two hundred (3,200) lumens. […] (4) Adequate consideration shall be given to conserving energy and minimizing glare and light pollution." It seems pretty clear that the 2002 Outdoor Lighting Control Act was enacted specifically to prevent the kind of light pollution and energy waste that the Iway bridge is blasting into the night sky over Rhode Island.



The light pillar eminating from the Iway Bridge can be seen from several miles in all directions. This photo was taken by Bob Horton from the Barus & Holley physics building at Brown University.

Lastly, 2009 has been declared by the United Nations as the International Year of Astronomy. Astronomy clubs, planetariums, and observatories worldwide have increased their efforts to educate the public on matters pertaining to astronomy. Throughout human history, the night sky has created a sense of awe and mystery that has inspired countless generations to admire its beauty and explore its enigmas. It was 400 years ago that Italian astronomer Galileo Galilei first begin to explore the night sky with a telescope and thus began a scientific revolution. The night sky was available to anyone willing to explore it.

Unfortunately, during the past few decades, light pollution has been slowly blotting out more and more of the night sky. What once was considered a problem only in large urban areas has sprawled out to smaller cities, suburbs, and even into rural areas. With the Iway bridge light pillar deliberately pouring many kilowatts of light directly into space, the light pollution in and around Providence has increased significantly. As noted earlier, this effect can be noticed from many miles away, so even the night sky view from areas far from Providence are adversely affected.

I frequently attend the free public observing programs at the Ladd Observatory on Tuesday nights. Ladd happens to be located 1.6 miles north of the Iway bridge, and the effect of the bridge's lights on the view of the sky from the observatory is vexing. The light pillar can be seen stretching over two-thirds of the way into the sky and nearly obscures everything due south, which is the most important part of the sky for viewing. Because objects in the night sky reach their highest point due south (just as the sun does at midday), they are therefore best positioned for viewing when they pass over due south. However, with the Iway bridge light pillar obscuring the view, the constellations and many telescopic objects that could once be viewed in the south are either severely diminished or no longer visible.

It makes me wonder, with a recent survey finding that Rhode Island students scored embarrassingly low in science aptitude tests, if we weren't spending so much energy to veil the view of the Universe, would more of Rhode Island's kids be more curious and inspired to study science and to explore the world and Universe we live in?

Since the Iway bridge light pillar is harmful to our state budget, our environment, obscures our view of the Universe, and does not conform to the 2002 Outdoor Lighting Control Act, I would think it best that the light pillar be replaced by a lighting system more in keeping with our energy and budget-conscious times. Certainly a new lighting system may include lighting for ornamentation as well as for roadway visibility and safety, but any lighting used for decorative purposes does not need to be so excessive and wasteful. I would also urge that the lighting for any and all future projects be designed and implemented with environmental responsibility in mind.

Glenn Chaple's
Sky Object of the Month

omicron Ceti
(Mira, the "Wonderful")

Last month, we looked at the prototypical eclipsing binary beta Persei (Algol). This month, we turn to another prototype, the classic long-period variable (LPV) omicron Ceti. This star boasts a rich history, having been discovered by David Fabricius on August 13, 1596. Johann Bayer added it to his *Uranometria* star catalog as a 4th magnitude star. When it became apparent that this star would miraculously appear and disappear (a stellar behavior unheard of in those days), astronomers gave omicron Ceti the nick-name Mira "the Wonderful." Mira's periodicity was first described by Johann Holwarda, who determined a period of 11 months - a figure is close to today's standard.

Mira is the prototype of a class of pulsating variable stars called "long-period variables (LPVs)." The typical "Mira-type" star is a red giant with a range of 5 or 6 magnitudes and a period of several months to one or two years. The brightest of LPVs, Mira typically varies from magnitude 3 to 9 in a 331 day cycle. At times Mira will rise to 2nd magnitude, and in 1779 was observed by William Herschel to rival the first magnitude star Aldebaran.

With modest means, you can follow Mira through a complete cycle. Naked eye observations will cover magnitude 5 and brighter, binoculars will work for magnitudes 5 through 8, while a small rich-field telescope can handle Mira at minimum. A small scope magnifying 50X will also uncover Mira's 9th magnitude optical companion, situated 120 arc-seconds away.

In November, Mira reached a peak brightness of about magnitude 3.5. The star has begun to fade, but should still be visible to the naked eye throughout December and the early part of January. The accompanying chart should help you make rough estimates of Mira's brightness. If you want to follow it into the domain of binoculars and small telescopes, log on to www.aavso.org. First, click on "Make a Chart." In the box labeled "NAME," type on "omi Cet." Next to the "Plot a Chart of this Scale" prompt, scroll to "B" (the scale used for relatively bright variable stars). Click on "Plot Chart" and – voila! – you have a "B" chart for Mira.

Last month, I noted that observing and recording an eclipse of Algol should be on every backyard astronomer's "to-do" list. Add Mira the Wonderful to that list.

Your comments on this column are welcome. E-mail me at gchaple@hotmail.com.

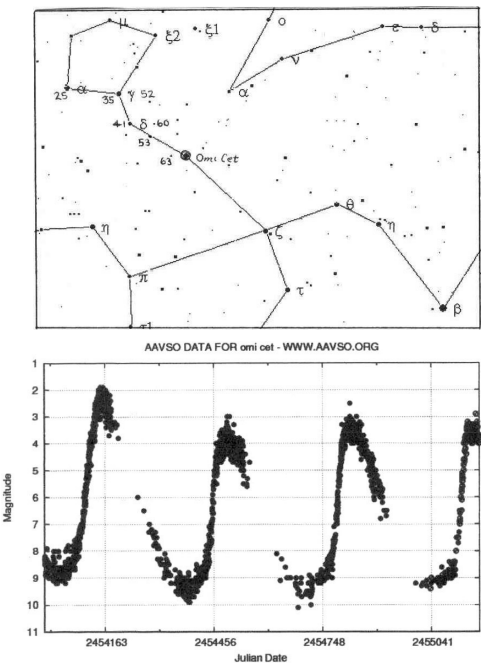


Chart for omicron Ceti from Cartes du Ciel. Magnitudes to nearest tenth with decimals omitted. Courtesy AAVSO. Light curve for omicron Ceti, September 2006-December 2009. Courtesy AAVSO.

NASA's Space Place

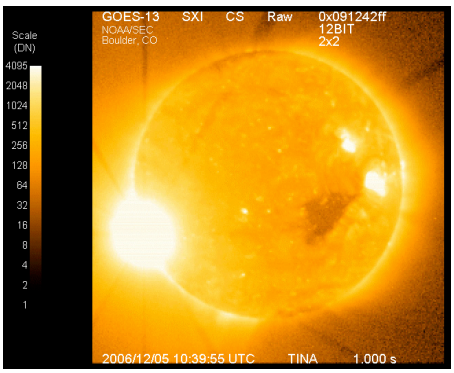
Sunglasses for a Solar Observatory
By Patrick Barry

In December 2006, an enormous solar flare erupted on the Sun's surface. The blast hurled a billion-ton cloud of gas (a coronal mass ejection, or CME) toward Earth and sparked days of intense geomagnetic activity with Northern Lights appearing across much of the United States.

While sky watchers enjoyed the show from Earth's surface, something ironic was happening in Earth orbit.

At the onset of the storm, the solar flare unleashed an intense pulse of X-rays. The flash blinded the Solar X-Ray Imager (SXI) on NOAA's GOES-13 satellite, damaging several rows of pixels. SXI was designed to monitor solar flares, but it must also be able to protect itself in extreme cases.

That's why NASA engineers gave the newest Geostationary Operational Environmental Satellite a new set of sophisticated "sunglasses." The new GOES-14 launched June 27 and reached geosynchronous orbit July 8.



X-9 class solar flare December 6, 2006, as seen by GOES-13's Solar X-ray Imager. It was one of the strongest flares in the past 30 years.

Its "sunglasses" are a new flight-software package that will enable the SXI sensor to observe even intense solar flares safely. Radiation from these largest flares can endanger military and civilian communications satellites, threaten astronauts in orbit, and even knock out cities' power grids. SXI serves as an early warning system for these flares and helps scientists better understand what causes them.

"We wanted to protect the sensor from overexposure, but we didn't want to shield it so much that it couldn't gather data when a flare is occurring," says Cynthia Tanner, SXI instrument systems manager for the GOES-NOP series at NASA's Goddard Space Flight Center in Greenbelt, Maryland. (GOES-14 was called GOES-O before achieving orbit).

Shielding the sensor from X-rays also reduces the amount of data it can gather about the flare. It's like stargazing with

dark sunglasses on. So NASA engineers must strike a balance between protecting the sensor and gathering useful data.

When a dangerous flare occurs, the new SXI sensor can protect itself with five levels of gradually "darker" sunglasses. Each level is a combination of filters and exposure times carefully calibrated to control the sensor's exposure to harmful high-energy X-rays.

As the blast of X-rays from a major solar flare swells, GOES-14 can step up the protection for SXI through these five levels. The damaged sensor on GOES-13 had only two levels of protection—low and high. Rather than gradually increasing the amount of protection, the older sensor would remain at the low level of protection, switching to the high level only when the X-ray dose was very high.

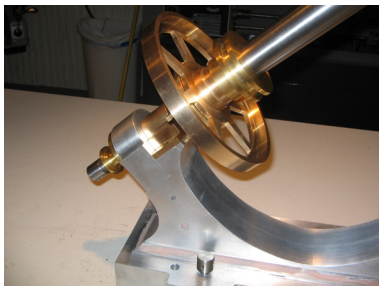
"You can collect more science while you're going up through the levels of protection," Tanner says. "We've really fine-tuned it."

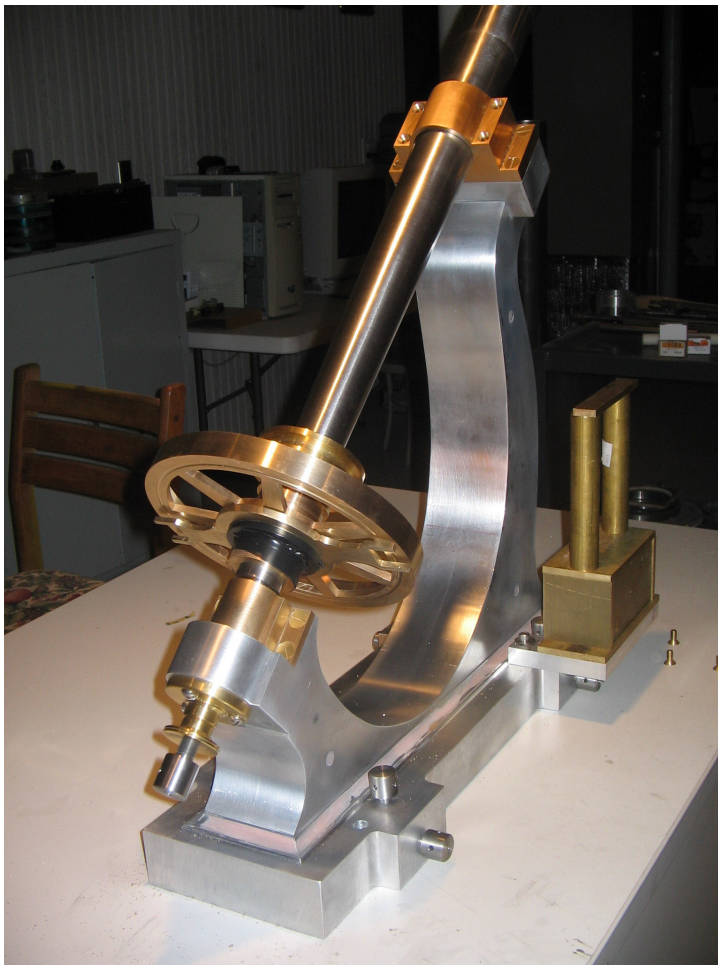
Forecasters anticipate a new solar maximum in 2012-2013, with plenty of sunspots and even more solar flares. "GOES-14 is ready," says Tanner.

For a great kid-level explanation of solar "indigestion" and space weather, check out spaceplace.nasa.gov/en/kids/goes/space-weather.

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

Image Gallery

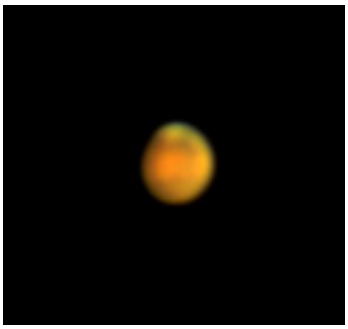


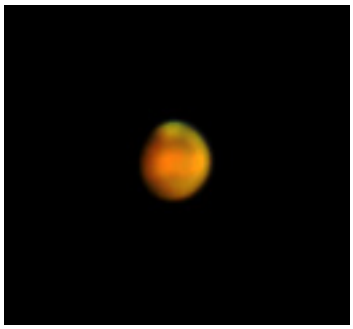


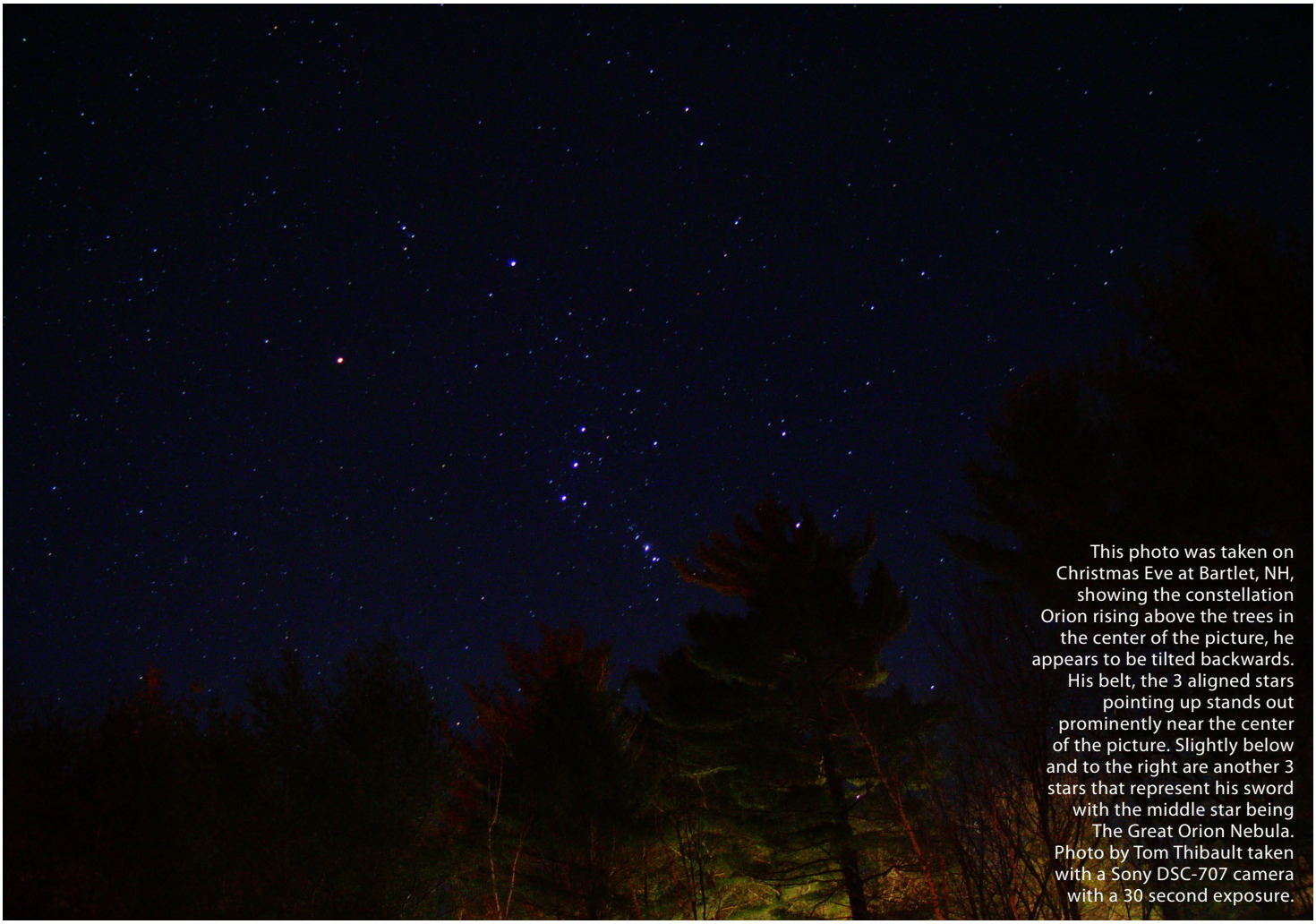
Al Hall reports on the progress of the mounting for his ¾ scale Alvan Clark telescope: Coming along nicely! RA circle engraved next! After Silver inlay and cutting scale lines.

Moon & Mercury on December 18. Photo by Steve Hubbard.

Mars images by Tom Thibault.







This photo was taken on Christmas Eve at Bartlet, NH, showing the constellation Orion rising above the trees in the center of the picture, he appears to be tilted backwards. His belt, the 3 aligned stars pointing up stands out prominently near the center of the picture. Slightly below and to the right are another 3 stars that represent his sword with the middle star being The Great Orion Nebula. Photo by Tom Thibault taken with a Sony DSC-707 camera with a 30 second exposure.

December Reports

Jim Crawford, *Secretary*
Lloyd Merrill, *Treasurer*

Executive Committee Meeting
Wednesday, December 2, 2009
Tom Thibault

Attendee's: Bob Horton, Bob Napier, Steve Hubbard, Lloyd Merrill, Tom Thibault, Jim Brenek, Tom Barbish, Dave Huestis, and Jim Hendrickson.

Items discussed:

Newsletter Mailing

Reducing size – 12 pages and greater becomes an issue • Limit to 6 pages when possible • By limiting content to pertinent and timely information • By reducing picture sizes • By focusing on society related activities and information • Funding should be discussed with membership to cover expense

Seagrave Exterior Sign: Review and discussion of draft proposal • Revised safety statement provided by Jim Crawford • Map of grounds to be added, Dave Huestis to provide • Pamphlet holder and or interchangeable display sleeve to be added • Tom Thibault to revise and send out to Executive Committee for review

New Member Handbook: Remove references to Field Trips • Add membership guidelines • Dave Huestis and Jim Hendrickson to revise and provide final draft • Discuss with membership funding for printing

Cash Flow	11/21/2009-12/21/2009
INFLOWS	
Donation	37.00
Dues - Regular	80.00
Interest Inc	13.39
TOTAL INFLOWS	**130.39**
OUTFLOWS	
Insurance	2,424.00
Electric	8.22
TOTAL OUTFLOWS	**2,432.22**
OVERALL TOTAL	**-2,301.83**
Banking Accounts	
Citizens Bank Checking	2,521.08
Capital One Money Market	13,301.85
Total Cash	**15,822.93**

Key Holder List: Due to unknown status of some current key holders listed, new locks will be installed and keys re-issued to active trained members • Discussion around use of Lock Box to limit amount of keys needed occurred • 6 separate keys will be needed

Review of Membership List: Bob Horton has been and will continue contacting listed members that are not up to date on dues by either E-mail or regular mail • 8 members have been contacted to date

Nomination Committee: Bob Horton has asked Kathy Siok to chair the Nomination Committee • Nominations to be held at the March Monthly Meeting

Misc. Items: Volunteers requested for Dec. 5th Meeting set-up, contact Bob Horton • Jan. 6th next scheduled Executive Board Meeting • Jan. 8th next scheduled Monthly Meeting

December Meeting & Holiday Party
Saturday, December 5, 2009
Monthly Meeting 7:30 pm

Bob Horton welcomed all members.

December Speaker: Marcia Bartusiak from MIT discussed her most recently published book, *The Day We Found the Universe*.

Secretary's Report: November report accepted by membership.

Financial Report: November report submitted with no corrections.

1st VP Bob Napier: January 9, 2010, the speakers will be Gerry Dyck and Scott Tracy. The presentation will be about Variable Star Observing.

2nd VP Steve Hubbard: No Report

Historian Dave Huestis: No Report.

Librarian Bruce Merrill: No Report.

Star Party Coordinator Bob Forgiel: The Christian Home Educators group is scheduled for Dec 11th. Volunteers needed to help out.

Trustee Jim Brenek: No Report.

New Business: None.

Old Business: New members **Bettina Briggs** and **John Leonelli** were voted into Skyscrapers. Welcome to the organization and we hope to see you at future meetings.

Good of the Organization: Bob Horton scheduled CCD Imaging Workshops throughout the summer but due to weather conditions only a few sessions allowed for the capture of some interesting images. Bob also said that the next Spectroscopy Workshop is scheduled for Jan 9th, rain date is Jan 23rd and will be geared more towards a hands on session. Al Hall gave a short presentation about using a log book to document your observing sessions. He showed logs and sketches of his many night time observing sessions. Most interesting was his many sketches of Mars and how each sketch matched a corresponding photograph. Bob Napier reported that if you get the chance pick up the Nov 2009 issue of *Country Living* magazine. Bob Horton is featured with a full page article about the Leonid Meteor shower.

Business Meeting Adjourned at 9:30pm

Directions to Seagrave Memorial Observatory

From the Providence area:
Take Rt. 6 West to Interstate 295 in Johnston and proceed west on Rt. 6 to Scituate. In Scituate bear right off Rt. 6 onto Rt. 101. Turn right onto Rt. 116 North. Peeptoad Road is the first left off Rt. 116.

From Coventry/West Warwick area:
Take Rt. 116 North. Peeptoad Road is the first left after crossing Rt. 101.

From Southern Rhode Island:
Take Interstate 95 North. Exit onto Interstate 295 North in Warwick (left exit.) Exit to Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.

From Northern Rhode Island:
Take Rt. 116 South. Follow Rt. 116 thru Greenville. Turn left at Knight's Farm intersection (Rt. 116 turns left) and follow Rt. 116. Watch for Peeptoad Road on the right.

From Connecticut:
• Take Rt. 44 East to Greenville and turn right on Rt. 116 South. Turn left at Knight's Farm intersection (Rt. 116 turn left) and follow Rt. 116. Watch for Peeptoad Road on the right.

• Take Rt. 6 East toward Rhode Island; bear left on Rt. 101 East and continue to intersection with Rt. 116. Turn left; Peeptoad Road is the first left off Rt. 116.

From Massachusetts:
Take Interstate 295 South (off Interstate 95 in Attleboro). Exit onto Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.

47 Peeptoad Road
North Scituate, Rhode Island 02857