



the Skyscraper

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April
2011

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

Seagrave Memorial Observatory is open to the public

weather permitting

Saturdays: 8-10pm

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.

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Membership Renewal

April Meeting with Steve Hubbard

FRIDAY, APRIL 1, 7:30PM

AT NORTH SCITUATE COMMUNITY CENTER

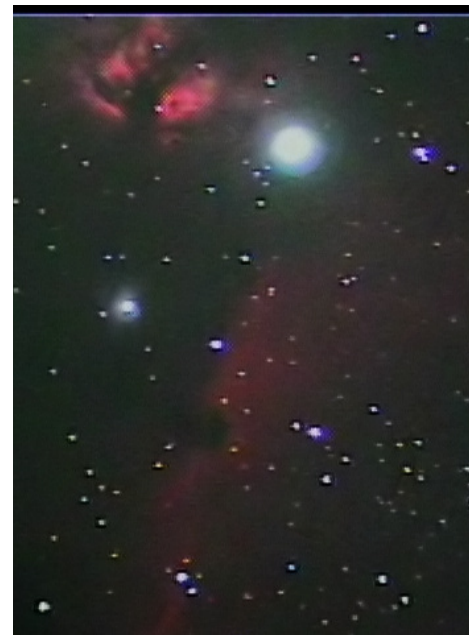
The Mallincam Miracle:

Real-Time Enhanced Observing of Deep Sky Objects and Planets

When I started observing over 35 years ago, visual observing was fun. Modest sized telescopes could show most deep sky objects visually from locations even near big cities.

Since then, light pollution has wiped out much of the night sky view for us. From my backyard near Worcester, ever growing light pollution has erased my ability to see all but the brightest deep sky objects even with a 16 inch telescope. Since obtaining a Mallincam imaging system a year ago, my interest in observing has been revitalized by amazing color images in real time literally cutting thru the light pollution and giving views similar to those through telescopes 3 times the size that the Mallincam is attached to. The Mallincam is a small miracle with incredible sensitivity and versatility that is revolutionizing observing.

Steve Hubbard has been an amateur astronomer since 1972 and is an award-winning telescope maker, winning awards for telescope construction and optical excel-



lence. He has been a member of Skyscrapers since 1973 and has served as president, first vice president and second vice president.

Friday, April 29
Members' Night:
Constellations
at Seagrave Observatory

Saturday, April 30
Imaging
Workshop
at Seagrave Observatory

Phases
of the
Moon



3



11



17



24

OTHER NOTABLE EVENTS: Saturn is at opposition on the 3rd. Jupiter is in conjunction with the Sun on the 6th. The Moon is between the Hyades and the Pleiades on the 7th. Mercury is at inferior conjunction on the 9th. The Moon is 2° S of M35 on the 9th. Mercury is 0.8° N of Mars on the 19th. Lyrid meteor shower peaks on the 22nd.

President's Message

Tom Thibault



Dear Skyscrapers Members,
It appears Mother Nature has heard our pleas and has relinquished her grip with Old Man Winter; the sun's rays have been shining higher, stronger, and longer. This winter is coming to an end, the Spring Solstice has arrived and the winter's snows are melting. With winter now behind us its time to go out and do what we all enjoy so much, getting out below the night skies and to take in the wonders of the universe.

Our March meeting featured our own Prof. Savvas Koushiappas who treated us all to a wonderful presentation on his ongoing research of cosmic gamma rays. Let me extend a thank you to Prof. Savvas from all of us for sharing some of his knowledge of this interesting subject.

Our business meeting followed, which highlighted that Skyscrapers has a busy month ahead of us. Our 2011-12 operating budget was presented and will be discussed and voted on during our April meeting; please take the time to review our proposal in this month's newsletter. Ed Haskell, who headed up our Nomination Committee, presented this years slate of candidates for our society as well as soliciting nominations from the floor. This was followed by Linda Bergemann, head of our Election Committee. Linda outlined our election procedures in preparation for the April elections. I urge all members to participate in our elections and to support whom they

feel will best represent Skyscrapers in the upcoming year.

We also displayed a Google Earth satellite photo of Seagrave and abutting properties. The photograph was provided by Gene Allen, our neighbor who has generously offered to clear trees from areas of his property abutting Seagrave. As I write this message, Jim Brenek has informed us that the clearing has begun and our access to the night skies is increasing. This is exciting news and we can not thank Gene Allen enough for his generosity. Thank you Gene.

Lastly, since December we have been gathering Member Surveys in regards to members' interests in an effort to determine and create Member Only Programs and Activities. We have compiled the returns and I am pleased to announce our first program. The returns have shown a great interest in naked-eye viewing and constellations as well as the mythology related to them. It is our intention to schedule quarterly members' nights for the purpose of viewing our seasonal skies and identifying the prominent constellations of that season and discuss their related mythology. Please take the time to see the related information in this month newsletter regarding this program. Additional programs in the future will be developed based on the survey returns, so visit our web site periodically for updates.

Clear Skies
Tom Thibault

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.

President

Tom Thibault DeepSpaceViewer@aol.com

1st Vice President

John Briggs john.w.briggs@gmail.com

2nd Vice President

Steve Hubbard cstahs@yahoo.com

Secretary

Ed Haskell haskell.ed@gmail.com

Treasurer

Jim Crawford jcrawford@cox.net

Members at Large

Steve Siok ssiok@cox.net

Gene Kusmierz gkusmierz@cox.net

Trustees

Jim Brenek jbrenek@cox.net

Tom Barbish labtjb@verizon.net

Pat Landers pl64@comcast.net

Star Party Coordinator

Bob Forgiel bforgiel@cox.net

Librarian

Amber Lesperance ambie630@yahoo.com

Historian

Dave Huestis dhuestis@aol.com

Editor

Jim Hendrickson jim@distantgalaxy.com

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 **April 22** 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.



Members' Night Programs

For several months I have been distributing and collecting member surveys regarding the topics our members would like to see in the way of special astronomy programs.

Well, the results have been compiled and we're ready to begin with our first program. A number of returns indicated an interest in Naked Eye Viewing and Constellation Mythology. **Beginning on April 29 and continuing every quarter to cover each season, we will explain the motion of the sky and why different constellations are visible throughout the year.** We will also provide instruction on the use of a planisphere (star wheel) for constellation identification, as well as exploring the rich mythology of these star patterns.

A portion of each session will take place indoors at our meeting hall using Starry Night Pro to simulate the night sky for you to practice on with your planisphere. Afterwards you will venture outdoors (weather permitting) to put your new found skills to the test under the dark skies of Seagrave Observatory.

We encourage all members to attend and participate, especially those of you who have had little experience with constellation identification.

So we may plan accordingly, you must pre-register by email or phone by Tuesday, April 26. My information follows below.

The start time for this program will be provided at a later date, but will most likely be no earlier than 6:00 pm on the 29th.

Come learn about the sky pictures which sweep across our night sky and share your knowledge with your fellow Skyscrapers.

Tom Thibault • 401.489.1957
Deepspaceviewer@aol.com

Easter and the Astronomical Connection

The date for the celebration of Easter is tied to astronomical events. In 352 A.D. the Council of Nicaea declared that Easter would fall on the first Sunday after the Full Moon on or next after the vernal equinox (Spring - March 20 or 21). However, if the Full Moon occurs on a Sunday, Easter is celebrated on the following Sunday. This reckoning allows for Easter to occur as early as March 22 or as late as April 25.

Using the above criteria, we can determine the date for the observance of Ester in 2011 as follows:

- The vernal equinox was on Sunday, March 20.
- The Full Moon on or after that date occurs on Sunday, April 17.
- And since that Full Moon occurs on a Sunday, Easter is celebrated the following Sunday, which is April 24.
- That means in 2011 Easter is celebrated just one day shy of the latest possible date.

Have a happy Easter, and remember to keep your eyes to the skies!

NGC 2903

Spiral Galaxy in Leo

Glenn Chaple's
Sky Object of the Month

To the deep-sky aficionado, spring means one thing – galaxies. Dozens of these island universes are within the grasp of small-aperture telescopes, while a 10-inch Dob can corral thousands. The constellation Leo is home to some of the brighter spring galaxies, including five listed in the Messier Catalog. One, however, escaped the eye of the French comet-hunter, even though it's visible in binoculars from dark-sky locations.

What Messier missed, William Herschel found. In 1784, during one of his all-sky surveys, he came upon a smudge of light $1\frac{1}{2}^\circ$ south of lambda (λ) Leonis in the "Sickle" of Leo. To him, the object seemed double, so he catalogued the pair as H I 56 and H I 57 - number 56 and 57 in category I (Bright Nebulae). Their modern-day designations are NGC 2903 and 2905.

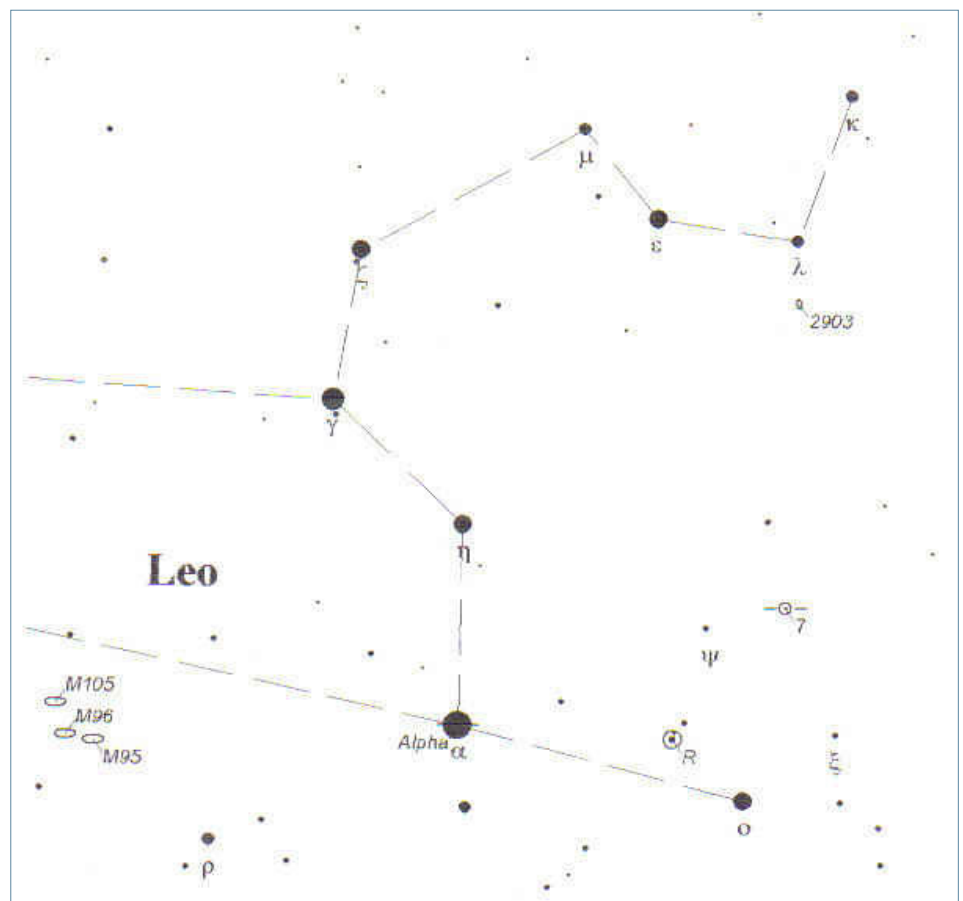
Like our Milky Way, NGC 2903 is a spiral galaxy intersected by a central bar. NGC 2905 is a stellar knot in one of the galaxy's spiral arms. NGC 2903 appears to be slightly more than half the size of the

Milky Way and lies between 20 and 25 million light-years away.

I first viewed NGC 2903 in April, 1977 after reading about it in Walter Scott Houston's "Deep Sky Wonders" column. Houston described it as a 9th magnitude galaxy with 11' by 4.6' dimensions, adding that NGC 2903 should be visible in a 2-inch finder. Here was a deep-sky target I could observe with the only telescope I owned at the time - a 3-inch f/10 reflector. Sure enough, that little scope and a 30X eyepiece brought NGC 2903 to light. With little effort, I was able to make out a definite nebulous patch, slightly oval in shape. I saw no evidence of NGC 2905.

NGC 2903 appears on the lists of both the Saguaro Astronomy Club's 110 best NGC and the RASC's finest NGC Objects. Check it out for yourself and see if it belongs on your list of favorites.

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



Get Ready to Observe Saturn

Dave Huestis

Back in my February column I wrote about one of my favorite constellations, Orion. For April I thought I'd provide an observing guide to my second favorite planet, Saturn. Did it surprise you that this beautiful ringed-world placed second in my planetary favorites list? Well, for me Jupiter is my favorite because it is much closer and provides a larger image in a telescope, which allows much more detail to be observed. Besides, one can easily watch the bright Galilean satellites parade around massive Jupiter like a miniature solar system. And Jupiter's cloud belts and zones are so much more prominent than Saturn's.

April is a good time to feature Saturn because on the 3rd at around 7:44 pm EDT the planet is at opposition (opposite the Sun in our sky) and at its closet point to the Earth, approximately 800,714,857 miles! For you native Rhode Islanders that is farther than Newport!

While this guide is basically for owners of a telescope, it can also be referenced for those of you who may wish to visit one of the local observatories in the near future. More on that a little later.

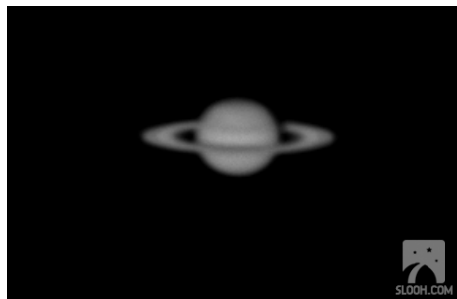
Before we can observe Saturn we first must locate this planet among all the stars in the night sky. A couple of years ago Saturn was within the easily recognizable constellation of Leo. Now the sixth planet from the Sun has moved into Virgo, whose pattern of stars is not that remarkable. However, on April 1st Saturn rises around 7:00 pm DST (Daylight Saving Time) in the east. One and a half to two hours later he will be about 20 degrees above the east-south east horizon. It will be the brightest star-like object in the area, and it will have a yellowish hue to it.

If you cannot find Saturn at that time, wait until the night of April 16-17 when the almost Full Moon will pass beneath and to the right of Saturn by less than ten degrees (a fist held at arm's length covers this distance).

Providing you own even a small telescope, you must try to focus in on this wonderful planet. The very first feature that will catch your eye is the rings, the beautiful attribute for which Saturn is most noted for. In astronomer Garrett P. Serviss' 1901 book, *Other Worlds*, he wrote, "Many telescopic views in the heavens disappoint the beginner, but that of Saturn does not. Even

though the planet may not look as large as he expects to see it from what he has been told of the magnifying power employed, the untrained observer is sure to be greatly impressed by the wonderful rings, suspended around it ... No previous inspection of pictures of these rings can rob them of their effect upon the eye and the mind. They are overwhelming in their inimitable singularity, and leave every spectator truly amazed."

During the span of Saturn's almost 29½ year orbit of the Sun, our Earthly perspective affords us a view of this magnificently ringed world from different angles above or below the ring plane. Since September 2009 we have been observing the north face of the rings, which are now tilted less than 10 degrees to the horizontal. Despite this small angle, they remain quite visible through just about any telescope. This tilt will increase each year until 2017 when the rings will be at their widest angle of 27 degrees. Last year we observed the rings tilted only two to three degrees.



It is amazing Saturn's rings are visible at all, considering the planet's distance from the Earth and the fact that the ring plane is only about 328 feet thick (just larger than the length of a football field). The rings are comprised of irregularly shaped dirty snowballs, ranging in size from grains of dust to many particles the size of pebbles. There are also some "boulders" as large as a car or small house-sized bodies. They all orbit Saturn along the planet's equatorial plane.

While Saturn's rings are slowly de-orbiting and will eventually all "rain" down onto his cloud tops (in 50 to 100 million years or so) and cease to exist, there's no excuse, except for bad weather, not to catch a glimpse of Saturn with your own telescope or to visit one of the local observatories.

Once you tire of ring watching you can turn your attention to the disk of Saturn

himself. The light-colored bands and zones in Saturn's cloud tops are much less prominent than those of Jupiter. (Very little cloud detail can be seen in small telescopes.) However, bright "spots" do develop from time to time. As I write this column at the end of February, a very large bright feature, which had first developed during December 2009, was continuing to expand in Saturn's North Temperate Zone. Do a Google search on the web to see if this so-called "Serpent Storm" persists. I have yet to view it with some larger telescopes.

In addition, both before and after opposition, one can observe the shadow of Saturn projected behind the planet and onto his rings. Also, as the observing angle of Sun/Earth/Saturn increases a keen-eyed observer should have no difficulty in detecting the shadow of the rings upon Saturn's cloud tops. These particular viewing circumstances provide a stunning 3D effect of the Saturnian system.

In conclusion, locally you can also see about 1/8th of Saturn's 61 moons, depending upon which size telescope is used. In order of size and brightness they are Titan, Rhea, Iapetus, Dione, Tethys, Enceladus, Mimas and Hyperion. The first five or six of the above can be observed in a dark moon-less sky using the 12-inch Brashear refractor at Ladd Observatory.

Hopefully by the beginning of April the snow will be gone and the temperature will be more comfortable for star and planet gazing. Drag those telescopes out of your basement, closet, or garage and put them to good use collecting the light of beautiful celestial objects.

But if you don't have a telescope or the one you do own does not provide a great view of Saturn, I encourage you to visit one of the local observatories. I suggest waiting until mid-April to give Saturn ample time to rise higher into the sky and clear the local tree-lines and buildings. Check out the websites for Seagrave Memorial Observatory in North Scituate (<http://www.theskyscrapers.org>) or Ladd Observatory (<http://www.brown.edu/Departments/Physics/Ladd/>) in Providence for the public night schedule. The large telescopes at these two facilities will certainly reward you for your efforts.

As always, keep your eyes to the skies.

The Constellations of Spring

Francine Jackson's Sky Notes

As the warm weather starts letting us know that seasonal change is really happening, we can look to the skies to remind us that springtime is once again coming to us. The Big Dipper isn't actually in the north right now; it's virtually overhead, making us almost feel as if the best way to observe it is to face south, then push our necks up to the limit. When we do so, we can see that the Dipper is a true guide to the constellation marking springtime, Leo, the Lion. As the Big Dipper is overhead, Leo is found due south.

People often ask why the lion has no tail. He actually does, but it's not considered part of his body. The tuft at tail's end is the constellation Berenice's hair. Queen Berenice was dismayed that her husband had to leave her and go to battle. She was so distraught at the possibility of losing him that she promised the gods she would donate her hair to them upon his safe return. He did; she did. The king then became so distraught that her waist-length hair had been shorn, until Berenice brought him outside and showed him the little place in the sky where her hair had been positioned.

The Big Dipper is also useful to find two more constellations welcoming the new season. Using the Dipper's handle, follow the curve it makes downward to a very bright star, Arcturus, the brightest in Boötes, the

Herdsmen. Boötes was placed where he is to make sure the Big and Little Bears always stay in their proper positions in the north. Apparently he's doing a great job. However, with bear herders not a prolific occupation these days, for us modern people an easier shape can be found. Boötes looks just like an ice cream cone, much more relevant especially for this time of year. Arcturus is the bottom of the cone. Then, follow two lines back toward the Dipper for the two sides of the cone, connecting them at their ends. One star above this line tells us this is only a single scoop. Below Arcturus and to the right is a tiny stream of stars marking the drip out of the cone's bottom. Also, you'll never forget the name Arcturus if you recall how you found it: You simply followed the curve, the arc, of the handle, to Arcturus.

Just off Boötes' left, or east side, is what some feel is the ice cream scoop that fell off. It is the tiara formerly worn by Bacchus, Corona Borealis, the Northern Crown. Bacchus placed his crown in the sky as a sign of love, a story that should be told around mid-February. The slightly brighter star in the curved shape is easily remembered, as one of its names is Gemma, the Gem, or Jewel, of the Northern Crown.

Back to Arcturus, if you continue the line you started from the Big Dipper you should

find another star, not as bright as Arcturus but the only really bright one in this part of the sky. You've found Spica, the sheaf of wheat in the hands of Virgo. Virgo, according to legend, represents the daughter of Ceres, the goddess of the harvest, charged with making sure we here on Earth were properly cared for. Unfortunately, Ceres' daughter was kidnapped by Pluto, causing Ceres to become derelict in her duties until Jupiter stepped in to effect a compromise. Pluto was to release Ceres' daughter for half the year. We see that in the sky, when Virgo rises out of the southeastern sky in early spring, a sign that Ceres is reunited with her. Ceres is then content, and returns to her terrestrial caregiving, until around September, when we note that Virgo begins to set early in the evening – Pluto has regained her. Ceres again begins her sadness, forgetting all about us, causing the ground to stop growth, and the cold to take over for the formerly comfortable planetary conditions. Then, just when we begin to wonder if the awful conditions will ever stop, Virgo once more shows itself in the southeast, and life begins again. To find this harbinger of spring, go back to the Big Dipper's handle, follow the arc to Arcturus, then speed on down to Spica. You have now found the rather large boxlike, not princesslike, shape of Virgo.

Seeking Markarian 421: The Brightest Blazar

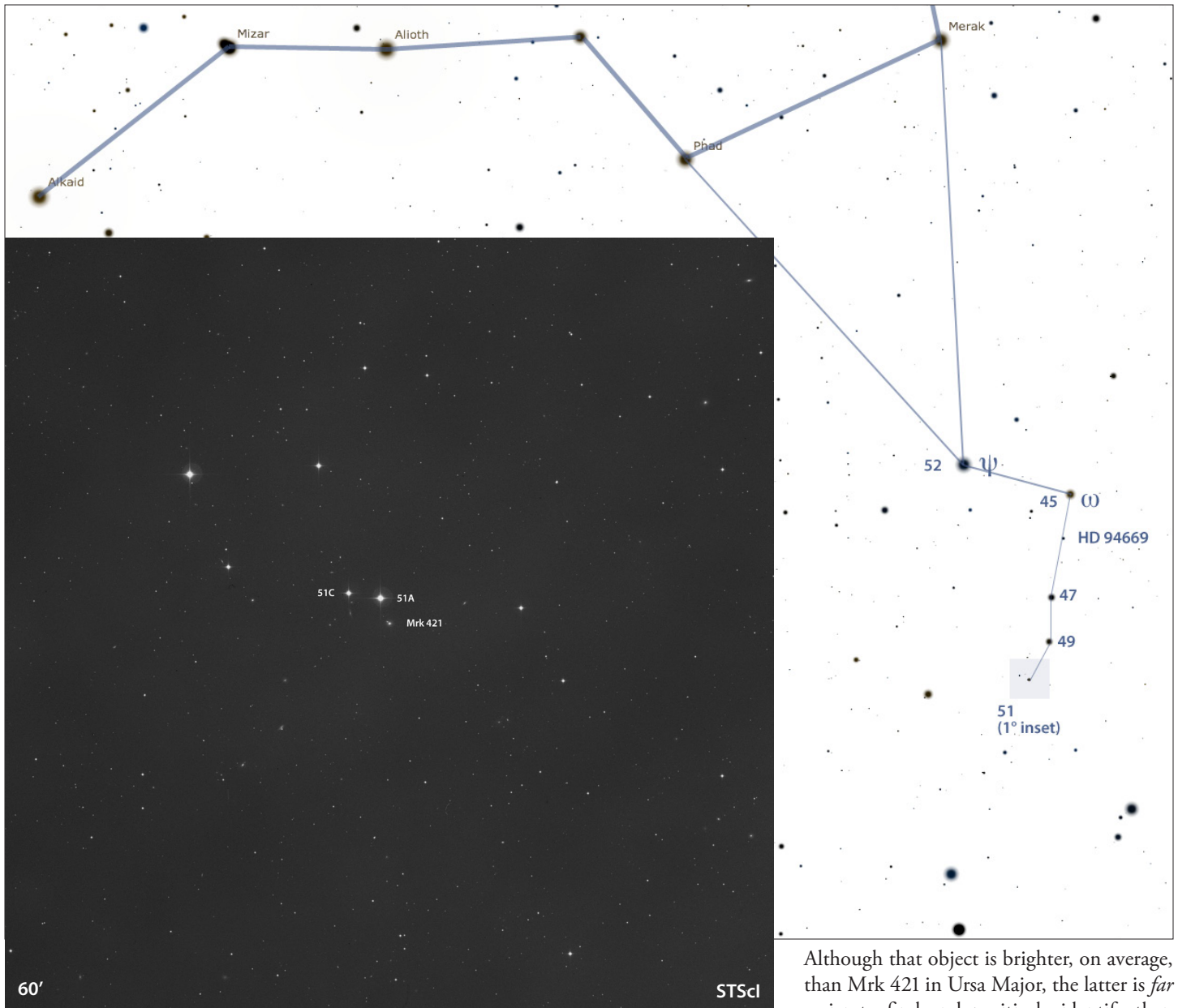
Craig Cortis

The largest telescope I own is 6" in aperture, but a number of objects I like to observe are considerably fainter than what a 6" scope is capable of showing. My usual answer to this shortcoming is to visit my good friend Tim Dube of East Douglas, Mass. Tim has owned a startling variety of telescopes since becoming involved in amateur astronomy back in the late 1990s, many of them larger than 6" and some 16" in aperture and *larger*. In early February, he sold a 16" Dobsonian he'd used for nearly two years to a friend and then acquired a pair of good refractors, one of 111mm aperture and a smaller scope of 72mm aperture. It didn't take long for Tim to start missing the

light-gathering power of the big scope and I was getting interested in trying to locate and finally observe a key object in Ursa Major, the magnitude 13.4 BL Lacertae-class quasar known as Markarian 421. Suffice it to say that *another* 16" Dobsonian was added to Tim's arsenal in due course, one having a finer quality mirror than that of his prior 16". The replacement Dob was picked up on a trip to Albany, NY on March 6 and we started testing it on the evening of the next day.

I think it must have been about a year ago that I became aware of a particular quasar in Ursa Major that intrigued me because it was classed as being a bright, possibly observable

example of a "blazar", a quasar oriented with respect to our position in a manner that permits observation nearly directly "down the barrel", or straight into the axis of one of its relativistic jets. When I read that the variable magnitude averaged about 13.4, I resolved to check detailed star charts to plan a star-hop, knowing that I would be able to see it in a scope of sufficient size on a good night from Tim's yard, provided the Moon would not be an interfering factor. Certain things didn't develop during the winter-spring portion of last year and we didn't end up seeing Markarian 421, for reasons I can't recall. We succeeded, though, on March 7 of this year. This object lies close to the mag-



Although that object is brighter, on average, than Mrk 421 in Ursa Major, the latter is *far* easier to find and positively identify than 3C 273, owing to a lucky and coincidental placement on the sky close to a semi-bright star that is *not* so bright that it renders the quasar invisible!

A simple star-hop begins by noting the 2 stars which form the *lower* corners of the Big Dipper. Beta UMA (Merak) marks the western end of this wide pair; Gamma UMA (Phecda, or Phad) lies at the eastern end. Visualize the mid-point between these stars and go *just* over 10° to the SSW to the 7th brightest star in the constellation, magnitude 3.0 52 (Psi) UMA. This star marks the S tip of a long, somewhat “spearhead”-shaped triangle having its shortest side marked by the line joining Beta and Gamma, which you might regard as being the *base* of the spearhead/spearpoint form. Next, go less than 3.2° WSW of 52 UMA to the magnitude 4.7 star 45 (Omega) UMA. This star is the *first* in a row of 4 semi-bright stars

UMa Star	RA	Dec.	Magnitude	Spectral Type
52 Psi	11h 09m 40s	+44° 29.9'	3.0	K1
45 Omega	10h 53m 59s	+43° 11.4'	4.7	A1
HD 94669	10h 56m 15s	+42° 00.5'	6.0	K2
47	10h 59m 28s	+40° 25.8'	5.1	G0
49	11h 00m 50s	+39° 12.7'	5.1	A
51A	11h 04m 31s	+38° 14.5'	6.0	A3
51C	11h 04m 44s	+38° 14.8'	7.6	F2
Mrk 421	11h 04m 28s	+38° 12.5'	13.4 var.	Blazar

nitude 6.0 star 51A UMA, which in turn is positioned at the western tip of a distinctive, small 5-star asterism. Almost immediately upon locating this diamond-shaped star pattern in the 16” and verifying 51 UMA at one end, I could easily make out what *had* to be Mrk 421!

The accompanying table lists, progressively from north-to-south, 7 stars in Ursa

Major which I used for my star-hop to a point *very* close to the quasar. You can access AAVSO star charts enabling an easy location of Mrk 421 by going online to a website called Washed-out Astronomy and clicking on a section entitled Quasars are Easy. (This is the same site I recommended in my article in the May 2010 issue of this newsletter on finding the quasar 3C 273 in Virgo.

that form an almost straight line roughly 4.2° long that runs SSE from 45 UMa down to 49 UMa. These 4 stars will look approximately evenly-spaced apart from one another. The most important guide star nearest to Mrk 421, 51A UMa, lies about 1.2° SE of 49 UMa, an angular distance very close to that of the separation between 49 and 47 UMa. (47 is the 3rd star down the line of 4 from 45 UMa.)

51 UMa is a multiple star having 3 components, the faintest of which will not be confused with Mrk 421 because it is magnitude 12.6 and is only 8.5" away from the far brighter primary. I didn't even notice it in the 16" scope, actually. 51C UMa is easily

seen due E of 51A by a wide separation of 150" and is the closest star to 51A of the 5 stars comprising the diamond-shaped little asterism I mentioned earlier. Mrk 421 lies SSW of 51A a bit less than the distance from A to 51C, perhaps roughly 120" SSW. These 3 objects form a coathanger-shaped, small triangle, with 51A UMa marking the center "hook" point and the quasar marking the SSW tip, seen in a big enough scope as a bluish-gray, star-like point of light. The distance to Markarian 421 is estimated to be from 395 to 435 million light-years, meaning that to see this ancient light is to look back in time to the Devonian or Silurian Periods of the Paleozoic Era. This blazar is one of

7 or more types of Active Galactic Nuclei currently recognized. An AGN is the superluminous, immensely energetic core of a certain general class of galaxy and may *only* be about the size of our Solar System, yet is able to produce light visible at staggering distances of hundreds of millions—or more typically, a few *billion*—light-years!

Mrk 421 has been observed at a maximum brightness of 11.6 magnitude down to 16 over the history of research on this object, but its average of 13.4 makes it a worthwhile target for those of you who own telescopes of sufficient size and are willing to try something different. Remember: It's easy to find, easy to *see*!

Dateline: North Scituate

Glacier Retreats from Seagrave Observatory

Skyscrapers Members and Guests Observe for First Time this Year

Dave Huestis

Saturday, March 19, 2011

7:00 PM, EDT

The grounds surrounding the facilities at Seagrave Memorial Observatory were finally snow-free and not muddy last Saturday night which allowed the observatory to open for the first public observing night of 2011.

Members of the public began arriving early (around sunset) because of all the hype regarding that evening's full Moon, called a Supermoon. The Moon was closest to the Earth around 3:00 pm EDT, approximately 221,565 miles distant, making it appear 14 percent larger and 30 percent brighter. This approach was its closest to the Earth in the Moon's elliptical orbit in about 18 years.

But before the Moon rose above the tree-line to the east, another treat was presenting itself above the tree-line to the west. It was the elusive planet Mercury. A good horizon was required to see the closest planet to the Sun during this favorable elongation. Skyscrapers' historian Dave Huestis passed binoculars around so everyone could get a good look, but Mercury was easily visible to the naked-eye.

Once Mercury dipped out of sight below the tree-line, the early visitors were invited to the Observatory's ante-room where a small museum holds historic images and artifacts from the past. After being treated to a few stories about the Observatory's past history, the guests were led upstairs to the main observatory by Skyscrapers' youngest member Alex Bergemann (age 11). Alex is being trained on all aspects of the

Observatory's operation. Once the twenty or so people ascended the stairs to the main dome, they were greeted by the 8 1/4-inch antique refractor that was built in 1878 by Alvan Clark and Sons of Cambridgeport, Massachusetts.

This instrument, recently refurbished with its polished brass components shining in the lit room, stood like a sentinel in the center of the dome. After a brief overall history of the Clark telescope, its former owner Frank Evans Seagrave, and of Skyscrapers, Inc., the dome and telescope were readied for observing. The white lights were replaced with dimmer red ones in order to become adapted to the dark to begin viewing. Guests were allowed to remove the hurricane hooks, which secure the dome, and one guest rotated the turret style dome using an old ship's wheel.

The first target that evening was the Orion Nebula, a beautiful and intricate cloud-like swirl of dust and gas in the area of Orion's belt about 1500 light years away. Not only was the nebula easily visible, but also were the four stars called the Trapezium. It was explained that these were young stars, having been born out of the nebula a mere million years ago.

While the tree-line to the east of the main telescope dome prevented an early view of the Moon and Saturn this evening, those objects were made available for view by Skyscrapers member Robert Horton who had brought his own telescope (a homemade 4 1/4-inch f/6 reflector), which was set up

beside the main observatory. Many folks got wonderful views through his telescope. At about 9:00 pm or so the Moon did clear the tree-line and was visible from the Clark telescope. The finder scope provided an image of the entire lunar surface, temporarily "blinding" each observer who viewed it.

Two other roll-off roof observatories sit behind the main dome. The one housing a 12-inch Meade computerized telescope was also in operation under the control of Skyscrapers' president Tom Thibault. Viewed there was also the Orion Nebula, the red star Albebaran, and M35, an open star cluster in Gemini.

Perhaps thirty people made the journey to Seagrave Memorial Observatory this past weekend to experience the heavens and a Supermoon first hand. Let the members of Skyscrapers show you the wonders of the universe every clear Saturday night. Check out their web site at <http://www.theskyscrapers.org/> for viewing time schedules and closure notifications. You can now also get updates via Twitter.

After the public left around the 10:00 pm closing time, Saturn cleared the trees about 10:10 pm. Apprentice Alex was provided the opportunity to locate this beautiful ringed planet by himself using the 8 1/4-inch Alvan Clark refractor. Alex does own his own telescope and is well versed in its operation. Within thirty seconds Alex had Saturn in focus. Way to go Alex!

Submitted by David A. Huestis, Historian, Skyscrapers, Inc.

GOES-R, Zombie Fighter

By Dr. Tony Phillips

On April 5, 2010, something eerie happened to the Galaxy 15 telecommunications satellite: It turned into a zombie.

The day began as usual, with industry-owned Galaxy 15 relaying TV signals to millions of viewers in North America, when suddenly the geosynchronous satellite stopped taking commands from Earth. It was brain dead! Like any good zombie, however, its body continued to function. Within days, Galaxy 15 began to meander among other satellites in geosynchronous orbit, transmitting its own signal on top of the others'. Satellite operators scrambled to deal with the interference, all the while wondering what happened?

In horror movies, zombies are usually produced by viruses.

"In this case, the culprit was probably the sun," says Bill Denig of the National Geophysical Data Center in Boulder, Colorado. He and colleague Janet Green of NOAA's Space Weather Prediction Center recently led a study of the Galaxy 15 anomaly, and here are their conclusions:

On April 3rd, a relatively minor solar flare launched a cloud of plasma toward Earth. Galaxy 15 had experienced many such events before, but this time there was a difference.

"Galaxy 15 was just emerging from the shadow of Earth when the cloud arrived and triggered a geomagnetic storm," explains Denig. Suddenly exposed to sunlight and the ongoing storm, "the spacecraft began to heat up and charge [up]."

Electrons swirling around Galaxy 15 stuck to and penetrated the spacecraft's surface. As more and more charged particles accumulated, voltages began to rise, and—zap!—an electrostatic discharge occurred. A zombie was born.

"At least, this is what we suspect happened based on data collected by GOES satellites in the vicinity," he says. "We'll be able to diagnose events like this much better,



The Galaxy 15 communication satellite was "brainless" for several months in 2010 after being exposed to a geomagnetic storm. The new GOES-R satellite will warn of such dangers.

however, after GOES-R is launched by NASA in 2015."

GOES-R is NOAA's next-generation Geostationary Operational Environmental Satellite. One of the instruments it will carry, a low-energy electron counter, is crucial to "zombie fighting." Low energy-electrons are the ones most likely to stick to a spacecraft's surface and cause brain-frying discharges. By monitoring these particles in Earth orbit, GOES-R will provide better post-mortems for future zombie outbreaks. This could help satellite designers figure out how to build spacecraft less susceptible to discharges. Also, GOES-R will be able to issue alerts when dangerous electrons appear. Satellite operators could then take protective action—for example, putting their birds in

"safe mode"—to keep the zombie population at bay.

Meanwhile, Galaxy 15 is a zombie no more. In late December 2010, after 9 months of terrorizing nearby spacecraft, the comsat was re-booted, and began responding to commands from Earth again.

All's well that ends well? True zombie fighters know better than to relax. Says Denig, "we're looking forward to GOES-R."

You and the kids in your life can learn about space weather at <http://scijinks.gov/space-weather-and-us>.

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

February & March Reports

Ed Haskell, *Secretary*
Jim Crawford, *Treasurer*



Skyscrapers Minutes February 4, 2011

North Scituate Community Center

Members Dave Huestis and Craig Cortis gave presentations, Dave on Project Slooh and Craig on a recent trip he took with Jim Hendrickson to the Florida Everglades to observe the southern sky.

SECRETARY'S REPORT adopted with no changes from floor.

TREASURER'S REPORT was heard.

TRUSTEES – Observatory is accessible but use caution due to ice.

LIBRARIAN – 12 DVDs of Skyscrapers meetings now in Library.

HISTORIAN No report.

Bob Forgiel presented additional recognition certificates to members who have helped at observing sessions and reported receipt of recognition of Skyscrapers by the Night Sky Network for the outstanding 2010 star parties.

OLD BUSINESS: New member was admitted: John Simmons. Accepted without dissent.

NEW BUSINESS

FOR THE GOOD OF THE ORGANIZATION

Steve Siok brought several New York Times articles on astronomy to our attention. Two were by Dennis Overbye (formerly at Sky & Telescope) and appeared this week: Kepler Planet Hunter Finds 1,200 Possibilities and Gazing Afar for Other Earths, and Other Beings, both of which may be found at topics.nytimes.com/topics/reference/timestopics/people/o/dennis_overbye/index.html. Today there is an Op Ed Even More Things in Heaven and Earth about the precipitous and possibly erroneous rush to judgment which denied Pluto its status as a planet.

Elections are coming up in April. Two committees handle this annual process, Nominations and Elections. Ed Haskell will head the Nominations Committee and Linda Bergman will handle the Election Committee. Persons interested in nominat-

ing themselves or others should contact the Nominating Committee now as the committee will be reporting out nominations at the March meeting.

The processes followed by these committees have been published in the newsletter and are available at meetings leading up to the elections.

Gerry Dyck reminded us that this is the 100th anniversary of the AAVSO and that there will be a big celebration in Cambridge in October (details when available).

Adjourned at 9:48 pm.

Respectfully submitted
Ed Haskell, Secretary

Executive Committee Meeting Minutes March 2, 2011

The meeting was dominated by a line by line review and discussion of budget items for the next fiscal year. This budget will be presented to the membership Friday for adoption.

The Nominating Committee slate was reviewed.

Ed Haskell and Kathy Siok have been asked to continue and broaden their examination of the various foundation documents (Constitution, By-Laws, Standing Rules, etc.) and to report their recommendations for corrections, additions and deletions within six months.

Meeting adjourned at 9pm.

Respectfully submitted
Ed Haskell, Secretary

The Skyscrapers Inc Meeting of March 4, 2011



The speaker for this evening's meeting is Professor Koushiappas who studies the interface of particle astrophysics and cosmology. He is interested in the structure and distribution of dark matter in the Universe, as well as astrophysical processes that can help identify its particle nature. He joined Brown University in the summer of 2008. Before

Cash Flow

1/1/2011- 1/31/2011

INFLOWS

Donation	\$16.00
Dues:Regular	\$200.00
Dues:Senior	\$30.00
Insurance Brokerage	\$4.10
Interest Inc	\$12.74
Astronomymaginc	\$34.00

TOTAL INFLOWS \$296.84

OUTFLOWS

Astronomymagexp	\$34.00
Presidents Fund	\$50.00
Refreshment Expense	\$25.51
Trusteexp	\$106.29
Electric	\$22.65

TOTAL OUTFLOWS \$238.45

OVERALL TOTAL \$58.39

Cash Accounts

Citizens Checking	\$2,345.64
Capital One	\$16,481.76
Total	\$18,827.40

2/1/2011- 2/28/2011

INFLOWS

Donation	\$40.00
Dues: Regular	\$200.00
Dues: Senior	\$10.00
Interest Inc	\$11.52
Astronomymaginc	\$68.00
Skytelmagincome	\$32.95

TOTAL INFLOWS \$362.47

OUTFLOWS

Astronomymagexp	\$68.00
Skytelexp	\$32.95

TOTAL OUTFLOWS \$100.95

OVERALL TOTAL \$261.52

Cash Accounts

Citizens Checking	\$2,442.05
Capital One	\$16,506.02
Total	\$18,948.07

that he was a postdoctoral researcher in the Theoretical Division at Los Alamos National Laboratory, and prior to that he was a postdoctoral researcher in the Department of Physics at ETH-Zurich (Swiss Federal Institute of Technology).

The launch of the Fermi Gamma-ray Space Telescope (FGST) in 2008 opened a new window to the high-energy Universe. The FGST is a gamma-ray telescope that surveys the whole sky every 3 hours, and has the highest angular resolution and sensitivity of any gamma-ray telescope. He presented a sample of exciting new results that emerged in the first 2.5 years of operation and briefly discussed FGST-related work at Brown University. It was a fascinating presentation by an obviously talented and promising young astronomer.

BUSINESS MEETING: Secretary and Treasurer reports did not appear in the March Skyscraper but will be in the April edition.

Trustees report only work at Observatory is snow related. Awaiting Spring.

1ST VP REPORT: Steve Hubbard is speaker for the April 1 Meeting.

STAR PARTY COORDINATOR: Rescheduling some postponed star parties (3 or 4 groups waiting better weather).

A large event is planned in July (Newport Folk Festival) which will involve daytime observing. Will need scopes appropriately equipped.

The President requested that persons addressing the meeting stand and state their name clearly and provide notes on their issue or report so that a complete record in the Minutes is possible.

HISTORIAN: A 25th Anniversary book was donated this past month bearing an inscription by Charles Smiley.

Last year it was determined that 200 copies were printed. As practical the Historian will continue to trace whereabouts of remaining copies.

NEW BUSINESS: 2010-2011 Budget.: President reviewed key items showing expenditures to increase to \$8,000 next year, an increase of around six percent. Kathy

Siok moved and Dave Huestis seconded to adopt. Motion passed.

NOMINATING COMMITTEE REPORTED THE SLATE FOR THE 2010-2011 ELECTION: President Tom Thibault • 1st VP John Briggs • 2nd VP Kathy Siok • Secretary Ed Haskell • Treasurer Jim Crawford • Member at Large Gene Kusmierz • Member at Large Jim Hendrickson • Trustee-Steve Siok

NEW MEMBERS INTRODUCED: Steve Frary from Jamestown and first reading for Rob and Madison Bazinet from Connecticut.

Kathy Siok came across a novel, *Percival's Planet*, by Clyde Tombaugh (discoverer of Pluto).

Dave Huestis reminds people that additional training sessions on the scopes can be arranged for those interested.

President reviewed status of tree cutting near Observatory and it was suggested we send a thankyou note to neighbor Gene Allen for the arboreal abatement.

Meeting adjourned at 9:37pm
Respectfully submitted,
Ed Haskell, Secretary

Budget Worksheet 2011-2012

Expense Category	2010-11 Approved Budget	2010-11 Expense Actuals	Variance	2011-12 Proposed Budget	Comments
Domain Name	\$115.00	-\$75.00	\$40.00	\$20.00	Reduction based on multiyear spread.
Incorp. Fee	\$22.00	-\$22.00	\$0.00	\$22.00	No change.
Postage	\$290.00	-\$72.29	\$217.71	\$220.00	Ballot mailing funds required.
Printing	\$140.00	-\$18.59	\$121.41	\$140.00	Ballot printing funds required.
Presidential Fund	\$150.00	-\$128.91	\$21.09	\$150.00	No change.
Electric	\$150.00	-\$149.10	\$0.90	\$175.00	Anticipated increase.
Propane	\$425.00	-\$51.36	\$373.64	\$375.00	Tank may be getting low, reflects min. delv.
Refreshments	\$350.00	-\$260.60	\$89.40	\$350.00	No change.
AstroAssembly	\$2,400.00	-\$2,668.81	-\$268.81	\$2,750.00	Increase based on LY spend.
Cookout	\$445.00	-\$314.59	\$130.41	\$423.00	Reduction based on LY spend.
Trustee Expense	\$518.00	-\$1,404.96	-\$886.96	\$700.00	Increased based on LY spend.
Property Insurance	\$2,500.00	-\$2,547.00	-\$47.00	\$2,625.00	Anticipated increase.
Donations	\$50.00	\$0.00	\$50.00	\$50.00	Clear Sky Chart
TOTAL	\$7,555.00	-\$7,713.21	-\$158.21	\$8,000.00	\$445.00 over LY
Income Category	2010-11 Approved Budget	2010-11 Income Actuals	Variance	2011-12 Proposed Budget	Comments
Other Donations	-\$300.00	\$881.25	\$581.25	\$300.00	No change.
Interest Income	-\$150.00	\$125.78	-\$24.22	\$125.00	Reduction based on LY performance.
Cookout	-\$445.00	\$490.00	\$45.00	\$500.00	Increase based on LY performance.
Star Party Donations	-\$500.00	\$502.50	\$2.50	\$500.00	No change.
Dues	-\$2,793.00	\$3,176.00	\$383.00	\$3,075.00	Increase based on LY performance.
AstroAssembly	-\$3,367.00	\$3,504.00	\$137.00	\$3,500.00	Increase based on LY performance.
TOTAL	-\$7,555.00	\$8,679.53	\$1,124.53	\$8,000.00	\$445.00 over LY

* Operating Budget increase of 5.9% over LY. Operating Budget increase of 5.01% over LY spend.

Skyscrapers, Inc. Membership Renewal

NAME _____
 ADDRESS _____

 CITY _____ STATE _____ ZIP _____
 PHONE _____
 EMAIL _____

Membership Dues

	Annual Dues (choose one category)
JUNIOR (13-17) <input type="checkbox"/>	\$10
REGULAR <input type="checkbox"/>	\$40
FAMILY <input type="checkbox"/>	\$50
SENIOR (65+) <input type="checkbox"/>	\$10
CONTRIBUTING <input type="checkbox"/>	
<i>(any amount in excess of annual dues is gratefully accepted as a donation)</i>	
	\$ _____

Magazine Subscriptions*

Members may optionally subscribe to the following publications at a significant discount from their regular subscription rates.

*Magazine subscription rates subject to change at any time.

ASTRONOMY \$34.00*
 SKY & TELESCOPE \$32.95*
 (\$10 savings)

TOTAL \$ _____

Mail to:

Membership Secretary
 Skyscrapers, Inc.
 47 Peepload Road
 North Scituate, RI 02857



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