



# the Skyscraper

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December  
2010

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 7pm - 9:00pm**

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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## December Holiday Party & Meeting with Dennis di Cicco

**SATURDAY, DECEMBER 4, 7:00PM AT NORTH SCITUATE COMMUNITY CENTER**

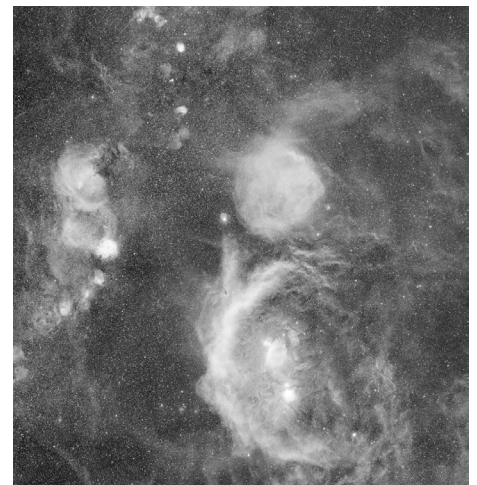
We are continuing our Skyscrapers tradition and will be holding our December Meeting on the Saturday (Dec. 4th) at 7:00 rather than our normal Friday. Our meeting will be at the Scituate Community Center, as it will be from December through April. We are planning to have a Pot Luck Dinner, and past years have proven that many of our members are not only astronomically capable but gastronomically proficient as well.

We have planned on providing the coffee, hot chocolate, apple cider, and some pastries. The Saturday date was decided upon years ago to allow those planning a homemade dish sufficient time to prepare them, and to provide our members adequate time to arrive. Let me know what food item you plan to bring so that our efforts can be coordinated and we don't end up with too much of any one item. You can contact me via e-mail at [DeepSpaceViewer@aol.com](mailto:DeepSpaceViewer@aol.com) or call me at 401-489-1957.

### Fun with 6 Billion Pixels: Building a Huge Hydrogen-Alpha Mosaic of the Winter Milky Way

Last winter the speaker and his colleague Sean Walker tackled their most ambitious joint project yet -- creating an 85-degree-square mosaic of the Milky Way stretching

from Canis Major to Perseus made with deep exposures in hydrogen-alpha light. Between October and January the speaker made approximately 130 hours of exposure from his backyard observatory in Sudbury, Massachusetts. In the weeks that followed, Sean spent an equal amount of time assembling the 25-frame mosaic, which, if printed at its native resolution, would make a print nearly 12 feet square. The image shows many large-scale nebulous structures that are all but unknown to observers. This popular-level talk will explain how the mosaic was made and why it's not the kind of project that sane people should attempt.



Phases of the Moon



5



13



21



27

**OTHER NOTABLE EVENTS:** Mercury is at greatest eastern elongation on the 1st, and is 1.5deg S of M8, the Lagoon Nebula. Venus is at maximum illumination on the 4th. The Moon is 0.5deg S of Mars on the 6th. Geminid meteor shower peaks in the 14th. The Moon is 2deg S of the Pleiades on the 18th. Mercury is at inferior conjunction on the 19th. Total lunar eclipse on the 21st. Winter Solstice is on the 21st. Ursid meteor shower peaks on the 22nd. Double shadow transit on Jupiter on the 25th, 26th & 29th.

# President's Message

Tom Thibault



Dear Skyscrapers Members,

Well, there no more denying it, winter is getting set to officially arrive. Less and less leaves remain hanging from the trees and the grass has stopped growing. We even had our first snowfall. Though it was very minor and some may have not seen it, it still happened. We have now turned our clocks back an hour and are now in standard time.

Many people would find this not the best news to be hearing, but for some of us who enjoy the evening skies it provides an opportunity for increased viewing and a chance to see some of the night sky's best. What a pleasure it can be to begin viewing by 6:00 pm rather than having to wait until past 9:00. It can get a bit chilly, but everything comes at a cost. So bundle up and get out there.

We are continuing our Skyscrapers tradition and will be holding our December Meeting on the **Saturday (Dec. 4<sup>th</sup>) at 7:00** rather than our normal Friday. Our meeting will be at the Scituate Community Center, as it will be from December through April. We are planning to have a Pot Luck Dinner, and past years have proven that many of our members are not only astronomically capable but gastronomically proficient as well.

Now, if you're like me, a person that should not be allowed near a stove, feel free to bring your favorite prepared items from professionals like Sarah Lee or Frito Lay. We have planned on providing the coffee, hot chocolate, apple cider, and some pastries. The Saturday date was decided upon years ago to allow those planning a homemade

dish sufficient time to prepare them, and to provide our members adequate time to arrive. Let me know what food item you plan to bring so that our efforts can be coordinated and we don't end up with too much of any one item. You can contact me via e-mail at [DeepSpaceViewer@aol.com](mailto:DeepSpaceViewer@aol.com) or call me at 401-489-1957.

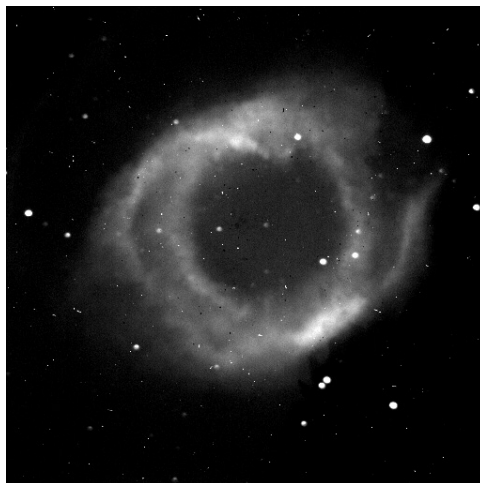
We would like to organize Members Night activities at Seagrave in the upcoming year. This month's newsletter includes a Members Survey. Please take the time to print a copy and answer the survey questions. We will provide a return drop box at our next few meetings or feel free to mail to: Skyscrapers Inc., 47 Peeptoad Rd., N. Scituate, RI., 02857, Attn. Members Survey. We intend on utilizing the returned survey information to develop programs based on our members' interests. Feel free to provide any suggestions you may have in regards to Members Night activities. We are requesting the return of completed survey's by the end of February.

Lastly, our society recently showed our commitment to educating the public. Historian Dave Huestis organized a Star Party for the Callahan Elementary School in Burrillville on November 12<sup>th</sup>. It was beautiful night in which 12 member volunteers participated. A chorus of Wow's and Awesome's were heard that evening from more than a hundred students and their families. Great job to Dave and all those who participated, I'm sure we've recruited a few future Skyscrapers that evening.

Clear Skies

Tom Thibault

Here's a shot of the Helix Nebula that I just took using the 16" Meade on the Mathis mount. It is a 6 minute, unguided exposure using the H-a filter. The tracking is not "perfect" at 6 minutes, but it is pretty darn nice. The Helix was also in the part of the sky illuminated by the I-way bridge. Next time, using the autoguider, the telescope should track perfectly for even longer exposures. Photo by Bob Horton using the Meade 16-inch SCT at Barus and Holley.



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 **December 24** to Jim Hendrickson, 1 Sunflower Circle, North Providence, RI 02911 or e-mail to [jim@distantgalaxy.com](mailto: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](mailto:jim@distantgalaxy.com). Note that you will no longer receive the newsletter by postal mail.

# A Great Month for Astronomy Enthusiasts

Dave Huestis

Attention all stargazers! If you haven't ventured outdoors to do any sky gazing recently, then the astronomical events for the month of December should entice you to do so. Yes, more than likely it is going to be quite cold out in the backyard or an open field, but a well prepared observer would not let that deter him or her from enjoying a couple of great celestial displays. All you'll have to do is keep yourself warm and the phenomena will reward you for your perseverance.

Have I got your attention? It's time to get excited about the annual Geminid meteor shower and a total lunar eclipse.

First up is the annual display of meteors known as the Geminids. They are the most consistent of the major meteor shower displays, each year producing 60+ meteors per hour at peak under the best dark sky conditions we have here in southern New England. This year the peak occurs on the night of the 13<sup>th</sup> to the early morning of the 14<sup>th</sup>. The just past First Quarter Moon will set around midnight, leaving the hours between then and dawn's early light free of its light and making this the optimum time to observe the most shooting stars.

If you cannot wait until after midnight, the Geminids can be observed early in the evening, unlike some of the other major meteor showers. Why? Gemini, the constellation from where the shooting stars appear to radiate, is about 30 degrees above the eastern horizon by 9:00 pm. (The actual radiant point is very near Gemini's bright stars Castor and Pollux.) But the moonlight will obscure all but the brightest members of this display early on.

You also do not want to stare directly at Gemini. While you can trace the origin of a Geminids' trail back to the radiant point, seldom do they begin right at that point in the sky. An observer needs to scan as much of the sky as possible, constantly shifting one's gaze high and low, right and left.

Standing still out on the cold ground to observe the Geminids gets tiring really fast. While your neighbors might think you have lost your mind, I still suggest you use a lounge chair with a sleeping bag to observe this shower. Dress warmly and simply get comfortable. If there is any wind be sure to block it. I don't want to hear of any frostbite injuries!

Geminids are fairly bright and moderate

in speed, hitting our atmosphere at 21.75 miles per second. They are characterized by their multicolored display (65% being white, 26% yellow, and the remaining 9% blue, red and green). These meteors also have a reputation for producing exploding meteors called fireballs.

Let's hope the sky gods will smile down upon us for the Geminid meteor shower display on the night of December 13-14. And Mother Nature – no snow please.

The second great astronomical event of December occurs one week later on the morning of December 21. Our geographic location here in New England provides us with an opportunity to observe a total lunar eclipse from start to finish. That's the good news. The bad news for some is that the eclipse begins here on the east coast at 12:28 am EST and ends at 6:06 am EST, with totality occurring between 2:40 and 3:54 am. It's a Tuesday morning event, so I suspect there may be a few MIAs at work later in the day.

The only solution would be to book a flight out to the west coast where it will occur three hours earlier. (In Hawaii it occurs before midnight on the 20<sup>th</sup>. Anyone planning a trip?) But, if you are going to be stuck at home locally, here's a brief overview of the event and what you can expect to observe.

A total lunar eclipse occurs when the Sun, Earth and Moon are in alignment. With the Earth placed in the middle of this celestial configuration, its shadow is projected onto the lunar surface. The duration of such an eclipse, particularly of totality, is determined by how precisely the three bodies are aligned.

While the Moon does not pass centrally through the Earth's shadow during this eclipse (if it did that scenario would produce a long eclipse and longer duration of totality), it does last five hours and 38 seconds from start to finish, with totality lasting one hour and 14 minutes. Though it will take some prime dream time away you, I don't think many of you can pass up this great viewing opportunity.

Besides, if you carefully review the start and end times of the primary phases of this eclipse, you can easily venture outdoors and catch a few minutes of each phase and then catch a few winks before the next one. However, I'm hoping you will commit a few

hours of your time to enjoy this wonderful and beautiful celestial event.

The eclipse technically begins at 12:28 am when the Moon slides into the Earth's light penumbral shadow. Though this initial phase is undetectable, as the Moon slides deeper into the penumbral shadow a keen-eyed observer will see a subtle shading of the lunar surface. The Moon will be moving eastward as it encounters the shadow, so the left portion of the lunar surface will slowly begin to darken. It is just prior to the Moon entering the Earth's dark umbral shadow that one notices that the moonlight looks somewhat subdued.

When the Moon first encounters the dark umbral shadow at 1:32 am, the partial phase of the eclipse begins. For one hour and eight minutes the Moon will move deeper and deeper into the dark shadow, generally from left to right. Then at 2:40 am the Moon will be completely immersed in the Earth's dark umbral shadow and totality begins. Totality will last until 3:54 am for a total duration of one hour and 14 minutes. Will the Moon appear to completely disappear from the sky during totality? It all depends upon how much dust is in the Earth's atmosphere at eclipse time. (With the Iceland volcanic eruption this past Spring and the more recent eruption of Merapi in Indonesia, I suspect totality to be either deep red in color or very dark.) We'll know by mid-totality at around 3:17 am.

During totality please take careful note of the various hues of color on the lunar surface. Enhance your view with binoculars or a small telescope if you have them. The lunar landscape often looks ashen during totality, with subtle copper, orange or red tones scattered about. And the colors often change as totality progresses. So watch carefully. It is truly a beautiful sight to observe.

Totality ends at 3:54 am when the Moon begins to leave the dark shadow and sunlight returns to its surface. For one hour and eight minutes the partial phase will continue until the entire Moon completely emerges from the dark umbral shadow at 5:02 am. For a while the Moon's light will still look somewhat subdued as it remains within the light penumbral shadow until 6:06 am when the eclipse ends. (In a dark sky you may be able to detect this shadow soon after the partial phase completes. Thereafter the remaining phase will hardly be noticeable

at all as the Moon begins to return to full brightness.)

Please note the sky in the vicinity of the Moon before the eclipse begins. The Moon undergoes its eclipse near the boarder of Gemini, Taurus and Orion. Only a few bright stars will be seen. As the eclipse progresses and the sky becomes darker, watch as the fainter stars emerge into visibility. It will be like someone using a celestial dimmer switch, gradually increasing the brightness of the stars (or if you prefer, decreasing the brightness of the Moon).

I hope the weather will cooperate on the morning of December 21 so that stargazers of every interest level can take advantage of the magnificent circumstances which produce the beauty of a total lunar eclipse. If you miss this one for any reason we won't experience another total lunar eclipse here in southern New England until April 15, 2014. That's a long wait, so make every effort to catch a few glimpses of this one to satisfy

your love for the beauty nature provides.

Below is a quick-glance chart of the important phases of the December 21, 2010 total lunar eclipse. All times are Eastern Standard Time and are approximate.

Moon enters penumbra (eclipse begins - not detectable):	12:28 am
Moon enters umbra (partial begins):	1:32 am
Moon completely within umbra (totality begins):	2:40 am
Moon nearest to the center of the Earth's umbral shadow (mid-totality):	3:17 am
Moon begins to leaves umbra (totality ends, partial begins):	3:54 am
Moon completely leaves umbra (partial ends, penumbral begins)	5:02 am
Moon leaves penumbra (eclipse ends - not detectable):	6:06 am

Later that same day the Sun will have reached its most southerly position in our northern hemisphere sky. It's an event

called the Winter Solstice, occurring at 6:38 pm EST. Thank goodness the days will be getting longer once again.

Good luck and keep your eyes to the skies.

And remember, Seagrave Observatory remains open during the winter months unless snow or ice makes the parking lot inaccessible or the grounds impassable. Please visit our web site at <http://www.theskyscrapers.org> for information. Also, the observatory will be closed on Saturday, December 4.

Should Seagrave be closed, you might visit Ladd Observatory (<http://www.brown.edu/Departments/Physics/Ladd/>) in Providence. Ladd is open every clear Tuesday night during the winter months from 7-9 pm, weather permitting. Since parking is available on-street, only a parking ban or icy conditions would close the facility. Check out the Ladd website for any cancellations.

Happy holidays and keep your eyes to the skies!

Francine Jackson

## Sky Notes

I was asked a question the other day concerning the monthly names of our Moon. As time has gone by, and most people don't even see the giant object in the sky, we should stop and remember how important the Moon was as a seasonal reminder, especially this time of year.

Although we normally consider the Full Moon of September the Harvest Moon, it actually is the first Full Moon after the autumnal equinox, the beginning of fall. At that time, the Moon is located at a relatively flat position of the ecliptic, causing it to rise earlier than usual. The Moon, in its path around the Earth, normally moves about 14 degrees eastward each day, appearing in the sky about an hour later. At the equinox time, the Moon rises just about a half hour from one night

to the next during the days from before to after the Full Moon, giving more light and allowing time to harvest the crops for a longer time, giving rise to the name Harvest Moon.

The next Full Moon takes place after all the fields have been harvested. At that time, because there are no plants left, there is no place for many of the animals to hide, and it is an easy time for the hunters to ready themselves for the long winter to come – the Hunter Moon.

November, because the weather is starting to turn cold, it was time to look for clothing and blankets that would keep the residents warm. One of the more plentiful animals was beaver. Therefore, it was time to set traps before the waters froze. Also, the beavers, in kind, would be building their hous-

ing for the winter. Both activities gave this Full Moon the term Beaver.

And, then for December, the Full Moon is located on the ecliptic at the position of the Sun during summer. For us it means the Moon travels at its highest path across the sky, staying in the sky for the longest of the year. And, because our nighttimes are longest, this is the Long Night Moon. It is also referred to as the Full Cold Moon, because of the approach of the coldest season of the year, even though as we know the really cold nights don't normally happen until late January and February.

Finally, this December Moon will be especially important for us because of the total lunar eclipse, the first visible from here in several years. Enjoy the view.

Craig Cortis

## A "Star" That Wasn't Supposed to *Be* There

I got a surprise birthday present on the night of October 9, the day before my birthday. A combination of technology and an effect of sunlight observed at *night* offered me this unexpected "gift" out in the Berkshires in western Massachusetts at Arunah Hill, the great nature and astronomy club in

a remote, wonderfully dark rural area that is in southwest Cummington, Mass. The club's property comprises about 70 acres with the highest elevation point at over 2,000 feet. Arunah Hill lies 2.5 miles south of route 9, roughly two-thirds of the way from Northampton WNW to Pittsfield at a loca-

tion chosen primarily for its excellent night sky observing combined with a relatively high elevation. (History of the club's founding and development is a story for another time.) Neighboring towns are Worthington to the south, Peru to the west, and Windsor to the northwest. Skyscrapers' John Kocur

is a member at Arunah, as am I. The site is widely regarded by serious observers to be among the very best spots available for amateur astronomy throughout southern to central New England, on a par with Stellafane in Springfield, Vermont.

Scratch any astronomy gathering and you're bound to find friendly, cordial people with whom to associate. On the night mentioned I was fortunate to be among good company in the personages of John Kocur and his friends Barry and Frank. Barry, a director at Arunah, had two telescopes set up, the larger of which was a 16" Dobsonian reflector that is a duplicate of one owned by my good friend and observing partner Tim Dube of East Douglas, Mass. Barry's other scope was a nifty 5" f/5 Newtonian on a handy, smooth working alt-az mount with good manual slow motion controls and a quality optical finder scope. Such scopes are perfect for the kind of observing I most enjoy and I was pleased to have temporary use of the rich-field reflector, which was well collimated and yielded fine images over a range of magnifications with various eyepieces. Although I generally spend most of my time at Arunah Hill by stargazing naked-eye or with a binocular, I appreciated the convenience of using a telescope and mount that I didn't even have to set up!

The four of us enjoyed good weather and clear skies that night; experienced Arunah observers would probably have rated the sky at 7.5 to 8.0 on a scale of 1 to 10. A mild, intermittent breeze coupled with ideally dry conditions at the summit clearing resulted in almost *no* dew over many hours. Temperature was cool but not uncomfortable and the Moon was only two days old. It was roughly around 10:00 pm when I decided to walk downhill a bit to a point perhaps 100 yards from the summit parking lot where the scopes were positioned. I glanced up at central Cetus to check the brightness of Mira (Omicron Ceti), the famous prototypical long-period variable star first noted (officially) and recorded by the German astronomer David Fabricius back in 1596. Mira is the brightest LPV, ranging in magnitude from a record of 2.0 up to 10.1 over a period of just under 332 days. The position is RA 02h 19m 21s, Dec. -02° 59'. At 10° to the southwest of Mira lies the magnitude 3.7 star Zeta Ceti (Baten Kaitos), the easternmost star of a large quadrilateral asterism that somewhat resembles an immensely scaled-up version of the well-known Trapezium multiple star at the heart of M42, the Orion Nebula. Magnitude 3.5 Eta Ceti forms the western tip of

the 4-star pattern; the nearby magnitude 3.5 star Tau Ceti marks the southern point. By "nearby", I'm referring to Tau Ceti's distance from our Sun of only 11.9 light years. Zeta Ceti is easily identified owing to its naked-eye pairing with Chi Ceti, a magnitude 4.7 star that lies 35' to the southwest of Zeta. (Chi is itself a wide binocular double with a magnitude 6.9 companion at 184" away.)

Almost immediately upon looking towards Mira and Zeta Ceti, I noted what *seemed* to be an extra naked-eye star just west of the midpoint between the two stars mentioned. Look for the magnitude 11.1 spiral galaxy NGC 779 on a star atlas to see the approximate location of my "star" that appeared out of place; the galaxy's position is RA 01h 59m 40s, Dec. -05° 58'. I was stunned and stood "rooted to the spot" to see this aberration, particularly because it didn't seem to be moving and was brightening gradually as I watched, looking comparable to Zeta Ceti. Mira, by the way, was supposedly rising to a projected peak magnitude of 3.3 or so by around October 15. My first inclination was to imagine this star-like object to be a nova of some kind, but I must admit I resisted the notion almost as quickly as it occurred to me—how could I be *that* lucky? In any case, after gaping for a few more seconds at something I'd not witnessed before, I turned and ran back up the slope, calling out to my companions to get their scopes ready for this new object in Cetus.

John Kocur and Barry asked me to indicate the star's position as I rejoined them; I did so, using my green laser. The new "star" was fading somewhat by this time but was still a naked-eye object. We put it in view in three telescopes and were fascinated to watch it move gradually against background stars, but *remain fixed in position* in the center of an eyepiece field! (Barry's two scopes were both manually-moved, non-tracking types.) Even at high power in the 16", the object stayed centered in the field continuously over many minutes. Bear in mind that this was seen in a *non-tracking* telescope.

Naturally, a telescope that is not tracking stars but is used by an observer in a fixed position on its mount will show stars as constantly moving objects that "drift" across the eyepiece field, first appearing—then disappearing—over a short period of time. The time involved is dependent on the eyepiece's angular width of field and whatever magnification power is yielded in any given telescope's focal length. (Divide the scope's focal length in millimeters by that of the eyepiece being used to determine magnification; a

900mm focal length scope will give you 45x magnification in a 20mm eyepiece.) Short focus scopes will yield much wider, richer fields than others having longer focal lengths, another factor involved in this time consideration of object drift. If we consider a *fixed* telescope as technically being a part of Earth's surface and realize that the planet is continually rotating on its axis with respect to the stars, this "drift" of stars across an image field is easily understood. The telescope is being *carried* along with our spinning Earth, but the stars seemingly remain fixed at their positions on the celestial sphere.

The new object in Cetus had faded in brightness considerably after roughly 20 minutes from the time I first noticed it; we observed its magnitude to begin approximating the average brightnesses of most stars seen in the image fields swept by our fixed scopes. Nonetheless, its initial naked-eye appearance had been impressive and mysterious, comparable perhaps to magnitude 3.7 Zeta Ceti or even a bit brighter. The new object in Cetus had faded in brightness considerably after roughly 20 minutes from the time I first noticed it; we observed its magnitude to begin approximating the average brightnesses of most stars seen in the image fields swept by our fixed scopes. Nonetheless, its initial naked-eye appearance had been impressive and mysterious, comparable perhaps to magnitude 3.7 Zeta Ceti or even a bit brighter. Both Barry and John came up with the best, most plausible explanation for what we saw before it occurred to me; I was completely flummoxed. They conjectured that a point of light that looked like a star but stayed fixed in the center of an eyepiece field, amid background stars that did continually drift across the field, had to be a geosynchronous satellite orbiting Earth from a seemingly fixed position on the sky with respect to points on the ground. Such satellites occupy orbits typically in excess of 22,000 miles in altitude; their orbital speed rate closely matches that of Earth's rotation and they therefore appear to "hang" in the sky as opposed to most other satellites we customarily observe to move across the sky in their considerably closer Earth orbits. Geosynchronous satellites orbit close to Earth's equatorial plane.

The flaring in brightness followed by a gradual dimming would've been explained by the satellite's changing position with respect to sunlight reflected from its body—its attitude in orbit simply reflected more sunlight at certain times than at other times, and it may have been "tumbling" somewhat. At 22,000-plus miles out, the geosynchronous

satellite was evidently able to be illuminated by the Sun even though local time was 10:00 to 10:30 pm EDT, approximately. (The time is a rough guess and may have been a bit earlier; I neglected to take note that evening.) I told this story to Jim Hendrickson during a conversation at Ladd Observatory on October 12. Jim asked if the satellite was close to Dec.  $-06^\circ$ . He'd heard that was the zone of declination on the sky in which such satel-

lites would be restricted, a fact of which I was unaware. A subsequent check of a star atlas confirmed my sighting to have appeared at just about Dec.  $-06^\circ$ , just as Jim had figured! This seemed to bear out the geosynchronous satellite explanation nicely.

As if all this observing activity wasn't enough, I saw a second such object just shortly after we'd finished viewing the first. I estimate its position to have been about RA

01h 40m, Dec.  $-06^\circ 30'$ , marking the northern tip of a triangle involving the aforementioned Zeta Ceti to the southeast and magnitude 3.6 Theta Ceti to the west, which is the northern star of that 4-star asterism in Cetus I described earlier. All in all, a great observing treat unlike anything I'd ever seen, and a nice birthday gift from the night sky to my own eyes.



## Blue Rings around Red Galaxies

By Trudy E. Bell and Dr. Tony Phillips

Beautiful flat rings around the planet Saturn are one thing—but flat rings around entire galaxies?

That is the astonishing discovery that two astronomers, Samir Salim of Indiana University at Bloomington and R. Michael Rich of UCLA described in the May 10, 2010, issue of *The Astrophysical Journal Letters*.

“For most of the twentieth century, astronomers observing at visible wavelengths saw that galaxies looked either ‘red and dead’ or ‘blue and new,’” explained Salim. Reddish galaxies were featureless, shaped mostly like balls or lentils; bluish ones were magnificent spirals or irregular galaxies.

Elliptical galaxies looked red, astronomers reasoned, because they had mostly

old red giant stars near the end of their life cycles, and little gas from which new stars could form. Spiral and irregular galaxies looked blue, however, because they were rich in gas and dust that were active nurseries birthing hot, massive, bluish stars.

At least, that's how galaxies appear in visible light.

As early as the 1970s, though, the first space-borne telescopes sensitive to ultraviolet radiation (UV) revealed something mysterious: a few red elliptical galaxies emitted “a surprising ultraviolet excess,” said Rich. The observations suggested that some old red galaxies might not be as “dead” as previously supposed.

To investigate, Salim and Rich used NASA's Galaxy Evolution Explorer satellite

to identify 30 red elliptical galaxies that also emitted the strongest UV. Then they captured a long, detailed picture of each galaxy using the Hubble Space Telescope.

“Hubble revealed the answer,” says Salim. The UV radiation was emitted by enormous, flat bluish rings that completely surrounded each reddish galaxy, reminiscent of the rings of Saturn. In some cases, the bluish rings even showed a faint spiral structure!

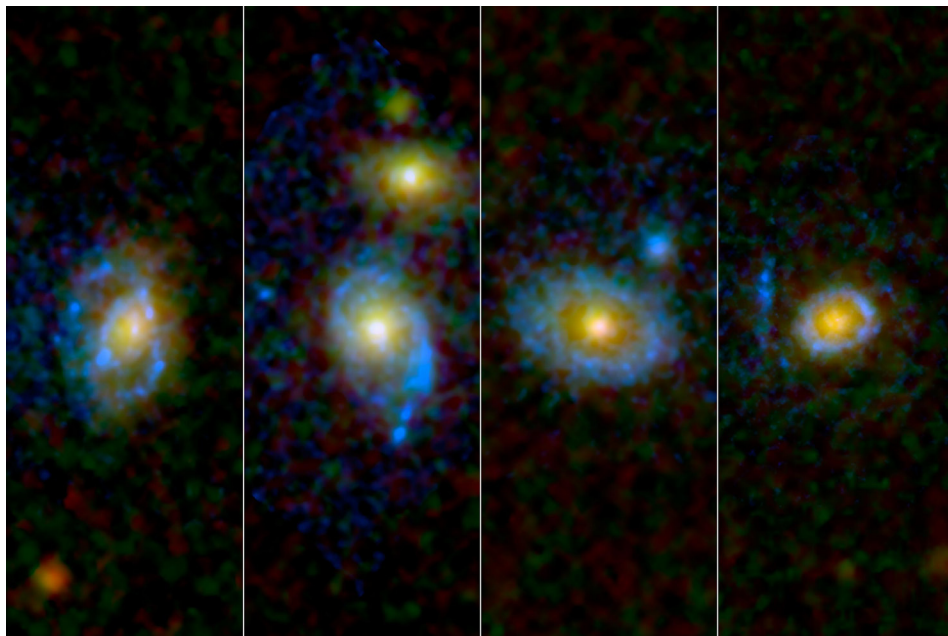
Because the bluish UV rings looked like star-forming spiral arms and lay mostly beyond the red stars at the centers of the elliptical galaxies “we concluded that the bluish rings must be made of hot young stars,” Salim continued. “But if new stars are still being formed, that means the red-and-dead galaxies must have acquired some new gas to make them.”

How does a galaxy “acquire some gas?” Salim speculates that it was an act of theft. Sometimes galaxies have close encounters. If a gas-rich irregular galaxy passed close to a gas-poor elliptical galaxy, the gravity of the elliptical galaxy could steal some gas.

Further studies by Galaxy Evolution Explorer, Hubble and other telescopes are expected to reveal more about the process. One thing is certain, says Rich: “The evolution of galaxies is even more surprising and beautiful than we imagined.”

The press release is available at <http://www.galex.caltech.edu/newsroom/glx2010-03f.html>. The full published article is “Star Formation Signatures in Optically Quiescent Early-Type Galaxies” by Samir Salim and R. Michael Rich, *The Astrophysical Journal Letters* 714: L290–L294, 2010 May 10.

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

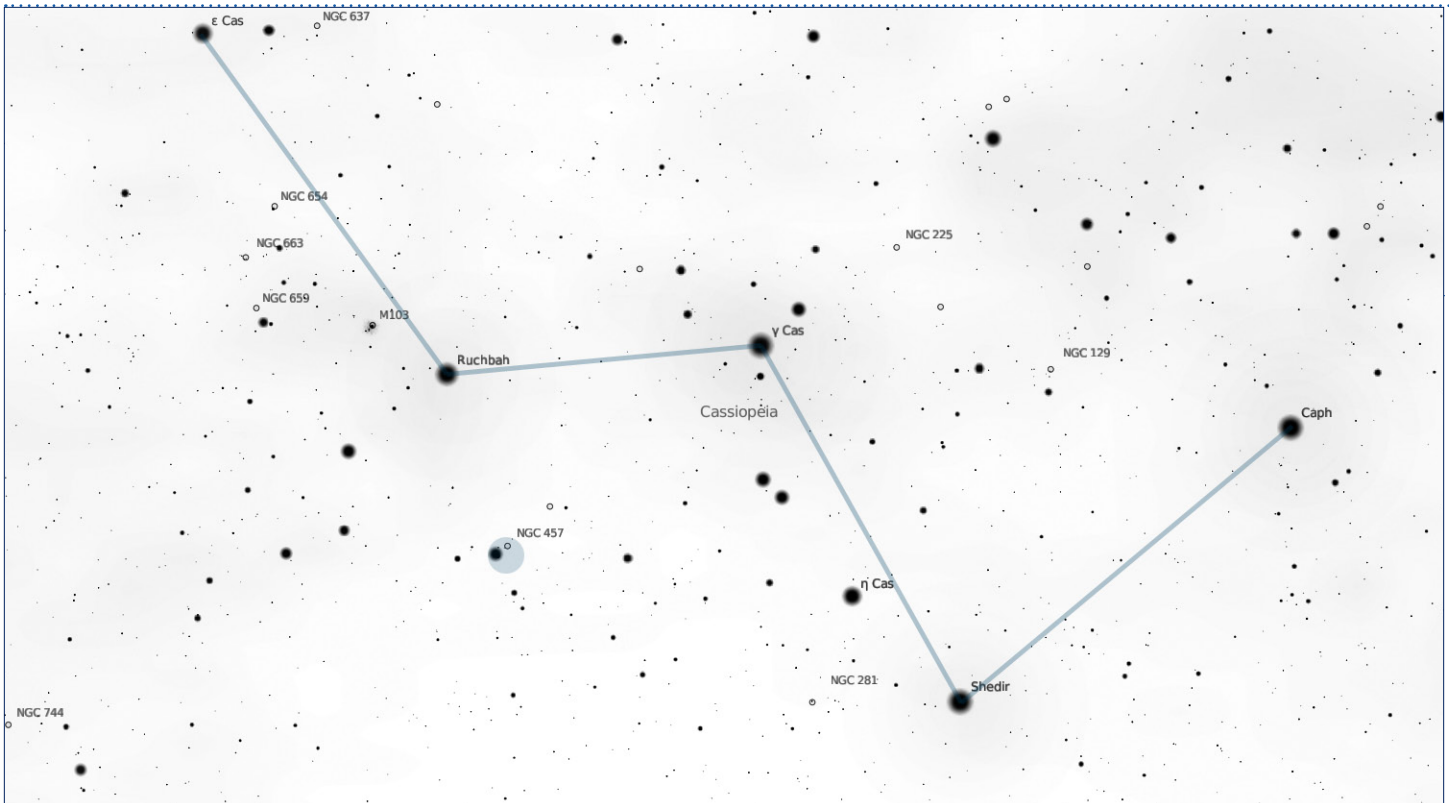


The Galaxy Evolution Explorer UV space telescope helped to identify red elliptical galaxies that also emitted the strongest UV. These are detailed, long-exposure Hubble Space Telescope images of four of these galaxies that capture the UV-emitting rings and arcs indicative of new star formation.

# NGC 457

(the “ET Cluster”)

Glenn Chaple’s  
Sky Object of the Month



Have you seen “ET” lately? Not that cute little alien in Steven Spielberg’s 1982 movie. I’m referring to the ET-mimicking open star cluster NGC 457 in Cassiopeia. Discovered by William Herschel in 1787, NGC 457 is often overlooked because of its proximity to the Messier cluster M103. That’s an unfortunate situation. Not only is NGC 457 superior to M103 in visual appearance, it may well be the most spectacular of Cassiopeia’s clusters. As such, it’s a must-see

for late-autumn star parties.

And it does bear a striking resemblance to Spielberg’s ET. Two bright stars,  $\phi^1$  and  $\phi^2$  ( $\phi^1$  and  $\phi^2$ ) Cassiopeiae, are ET’s eyes. A group of some 40 stars northwest of the “eyes” form ET’s body. Passing through the body is a row of stars that extends outward to the sides, creating the alien’s arms. Add a handful of stars to the base of the body, and ET has feet. Because  $\phi^1$  is brighter than  $\phi^2$ , ET seems to be winking at us.

ET will greet the owner of even the most modest telescope. A standard 2.4-inch refractor can capture a few dozen cluster members, while an 8-inch reflector will snare one hundred. A magnification of just 50-75X comfortably encompasses the cluster’s 20 arc-minute width.

To find the NGC 457, trace a line from epsilon ( $\epsilon$ ) to delta ( $\delta$ ) Cassiopeiae, then extend it about two degrees beyond. Although the cluster’s published magnitude is 6.4, the presence within the cluster of 5<sup>th</sup> magnitude  $\psi^1$  betrays the presence of NGC 457 to the unaided eye.

Is  $\phi^1$  Cas a true member of NGC 457? Various distance measurements would indicate otherwise. While  $\phi^1$  appears to be around 2000 light years away, studies place the main cluster at a distance of nearly 10,000 light years. However the distance estimates of NGC 457 are sketchy at best and one set of measures puts  $\phi^1$  squarely within the bounds of the cluster. But let’s not quibble about statistics. Instead, train your telescope on NGC 457 and say hello to ET.

Your comments on this column are welcome. E-mail me at [gchaple@hotmail.com](mailto:gchaple@hotmail.com).



NGC 457 (the ET Cluster) [celestronimages.com](http://celestronimages.com)

Ed Haskel, *Secretary*  
 Jim Crawford, *Treasurer*

# November Reports

**EXECUTIVE COMMITTEE MEETING**  
**WEDNESDAY, NOVEMBER 3 7:30 P.M.**  
**SEAGRAVE OBSERVATORY**

Attendees: Jim Hendrickson, Ed Haskell, Dave Huestis, Steve Hubbard, Bob Forgiel, Jim Brenek, Tom Thibault, Tom Barbish, Bob Napier, Jim Crawford, Steve Siok, Bob Horton

**ITEMS DISCUSSED: ASTROASSEMBLY RESULTS.** 85 attendees netted \$840. • Cost of the Observatory grounds sign was \$89. • The Clark Telescope work is completed except for mousing the hook, and some minor work on a bushing and the RA slow motion.

**POLICIES:** Nominations and voting procedures were discussed and Kathy Siok will submit proposal at the next E-board meeting.

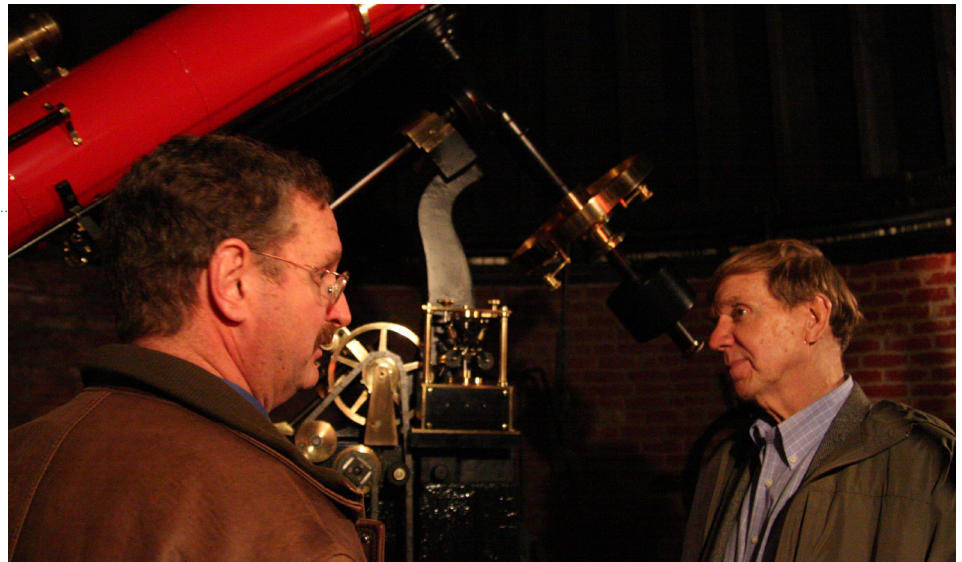
Adjourned at 9:05pm

**NOVEMBER MEETING MINUTES**  
**SATURDAY, NOVEMBER 5, 2010**  
**SEAGRAVE OBSERVATORY**

Tom Thibault was ill so the meeting was chaired by VP .

The Minutes of the October meeting were approved. No changes were noted in the Treasurer's report.

The Trustees reported that they still desire to train members to be telescope operators and that classes may be organized as needed. The neighbor to the east of the observatory is planning to do some tree removal and



grading which should result in improved parking for the observatory.

AstroAssembly was attended by around 85 people including walk-ins. After expenses are paid we will net approximately \$840. The members expressed their gratitude for all Steve's efforts with a hearty round of applause.

There were no items of Old Business and no New Business was raised.

Good of the organization: The Clark drive slowdown seems to be resolved.

Next meeting is December 4, the Holiday Party a pot luck supper.

Meeting adjourned at 8:00 pm.

Respectfully submitted by Ed Haskell

**Cash Flow**  
 10/13/2010- 11/24/2010

**INFLOWS**

Donation	10.00
Dues	
Senior	10.00
Interest Inc	14.53
Magincome	
Skytelmagincome	32.95
Starparty	125.00
<b>TOTAL INFLOWS</b>	<b>192.48</b>

**OUTFLOWS**

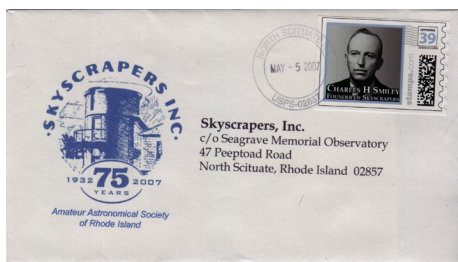
Uncategorized	32.95
Astroexp	
Astrorestroom	175.00
Clarkproject	340.00
Insurance	2,547.00
Postage and Delivery	26.40
Presidents Fund	40.40
Refreshment Expense	12.00
Trusteexp	85.00
Electric	21.51
<b>TOTAL OUTFLOWS</b>	<b>3,280.26</b>

**OVERALL TOTAL**

**3,087.78**

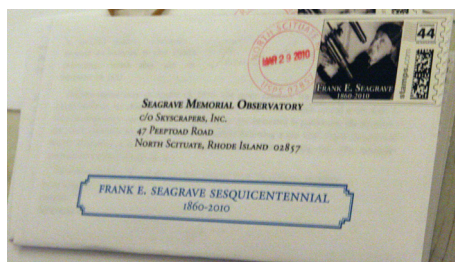
**Banking Accounts**

Citizens Checking	1,518.54
Capital One	16,455.78
<b>Total</b>	<b>17,974.32</b>



**Skyscrapers 75th Anniversary Cachet** celebrating the 75th anniversary (1932 - 2007) of Skyscrapers, Inc., The Amateur Astronomical Society of Rhode Island. Special stamp is of Skyscrapers founder Charles H. Smiley from Brown University. Cache is postmarked on the 75th anniversary date: May 5, 2007. Within the envelope is a brief history of the Skyscrapers organization by Historian David A. Huestis.

**Frank E. Seagrave Sesquicentennial Celebration Cachet** celebrating the 150th birthday (1860-2010) of Frank Evans Seagrave. Seagrave's



observatory has been in the capable hands of Skyscrapers, Inc. since 1936. Special stamp is an image of Frank E. Seagrave recently found in the Charles H. Smiley slide collection at Ladd Observatory in Providence. Cache is postmarked on Seagrave's 150th birthday: March 29, 2010. Within the envelope is a brief history of Frank E. Seagrave by Skyscrapers' Historian David A. Huestis.

Each cache is \$3.00. Contact David A. Huestis at dhuestis@aol.com. Caches will be mailed first class in a small manila envelope. Postage to be determined by how many requested.



# Membership Survey Tom Thibault

Dear Fellow Skyscrapers,

In a continuing effort to provide our membership enhanced value and access to our wonderful equipment and facilities at Seagrave Observatory, we would like to organize Members' Night Activities throughout the year.

Realizing we have a diverse group with varied skill levels and interests, we value your input to better understand our membership's needs. We can then develop activities and tailor our sessions accordingly.

Please take a few minute or two of your time to help us determine what astronomical topics you would like to see incorporated as part of these members' enrichment programs, so appropriate teaching, training and observing sessions can be developed.

## Number of years with an interest in astronomy?

- 0-5 years
- 6-10 years
- 11-15 years
- 16 and more

## Number of years as a Skyscrapers member?

- 0-5 years
- 6-10 years
- 11-15 years
- 16 and more

## Astronomical interests (multiple selections accepted)

- Mythology
- History
- Naked eye viewing
- Meteor showers
- Comets and asteroids
- Moon and planetary
- Solar
- Double Stars
- Variable Stars
- Deep space objects
- Photography
- Telescope making
- Other

## Would you be interested in participating in Member Night Activities?

- Yes
- No
- Maybe

## Best Evening for you to participate in activities (Multiple selections accepted)

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

## What would you be interested in increasing your knowledge of (multiple selections accepted).

- Mythology
- History
- Naked eye viewing
- Meteor showers
- Comets and asteroids
- Moon and planetary
- Solar
- Double Stars
- Variable Stars
- Deep space objects
- AstroPhotography
- Telescope making
- Other

## Are there subjects not listed above that you feel may be of interest to you and others?

Please provide any thoughts below that you may have in regards to activities you feel may be of membership interest that should be considered for Members' Night Activity.

# 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