# the Skyscraper

vol. 43 no. 6
June 2016

AMATEUR ASTRONOMICAL SOCIETY OF RHODE ISLAND ⋆ 47 PEEPTOAD ROAD ⋆ NORTH SCITUATE, RHODE ISLAND 02857 ⋆ WWW.THESKYSCRAPERS.ORG


In This Issue:


**3** The Sun, Moon & Planets in June

**4** Dual Planetary Close Encounters

**5** Shipwrecks & Transits

**8** NOAA's Joint Polar Satellite System (JPSS) to revolutionize Earth-watching

**9** Globular Cluster in Serpens: M5


## Skyscrapers Board Meetings

**Third Monday of the Month**
**All Members Welcome**

## Phases of the Moon

**New Moon**
June 5 03:00

**First Quarter Moon**
June 12 08:10

**Full Strawberry Moon**
June 20 11:02

**Last Quarter Moon**
June 27 18:19

# Friday, June 3, 7:00pm
## at Seagrave Memorial Observatory

## How Did Earth Get Its Ocean
by Adam Sarafian

**7:00 pm Light Refreshments**

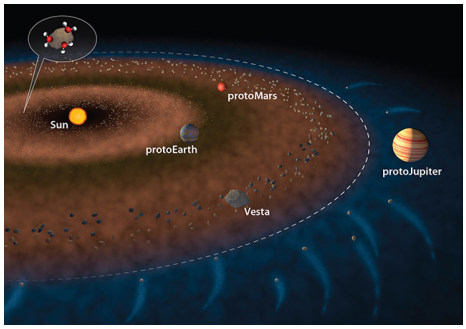
**7:30 pm Featured Speaker: Adam Sarafian**, PhD candidate at the MIT/ Woods Hole Oceanographic Institute Joint Program in Marine Geology and Geophysics. He is a NASA Jenkins Graduate Fellow. He received his BS and MS in geology from the University of Georgia.

**How Did the Earth Get its Ocean?**

This is a very old question. Two theories exist. Either our water came from inside the Earth, stored during its early formation or the water came from comets or other wet bodies hitting the Earth much later in its history.

Oddly enough, the answers lay in solid rocks and not our liquid water. The team at the Institute have obtained and extracted evidence from rare samples of ancient meteorites that have fallen to Earth. Adam and his colleagues have analyzed the isotopic ratios of hydrogen in these rocks, as this ratio varies in different parts of the solar system. We will find out how this difficult analysis was conducted and what answers it has uncovered.

**9:00 pm Observing the skies through the 138-year-old Alvan Clark Refractor** at Seagrave Observatory. In June, the planets Mars and Saturn will be well-placed for observing. (weather permitting)




# Seagrave Observatory Workshops, Saturdays @ 6pm

## June 4: Globular Clusters by Steve Siok

You may know what a globular cluster is, but are you aware of where they are and how important they are with respect to the structure of our galaxy? Steve Siok will lead you in search of them within the late spring and summer skies.

## June 11: Building a Backyard Observatory by Steve Hubbard

Skyscrapers member Steve Hubbard was tired of dragging his telescope in and out of his house to enjoy the sky, so he made his own backyard observatory. If you've ever thought about putting one in your own yard, Steve will speak of his experiences, and give you tips he learned that may prove helpful to you, also.

After each program, skies willing, stay and observe the sky with the organization's telescope, including the historic 8-inch Clark refractor. All programs are free for Skyscrapers members, and only $5.00 for nonmembers. For more information contact Steve Siok ssiok@cox.net or Francine Jackson francine_jackson@brown.edu. Hope to see you all there!

# Friday, June 10: Seven Wonders at the URI Planetarium

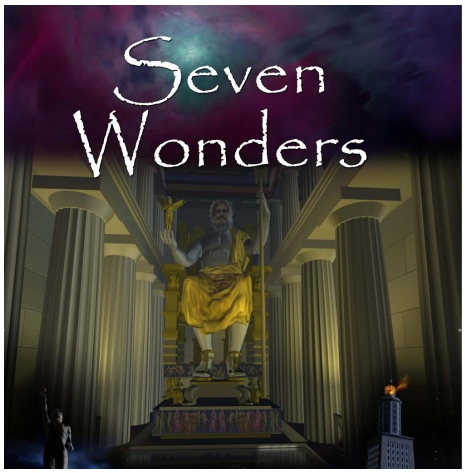
University of Rhode Island Planetarium
Upper College Road, Kingston, RI
Friday, June 10th, 2016 6:00 P.M.
Contact: Francine Jackson: 401-527-5558

Come enjoy a tour of the Seven Wonders of the Ancient World! These incredible features were built before modern-day equipment was even a thought, and yet, today, one of these is still a major feature. Why were these made? How? Come learn of the beauty and majesty of the Seven Wonders of the Ancient World. In addition, learn what are considered the Seven Wonders of the Universe, through the beauty of 21st century technology.

In addition to the featured presentation, Losing the Dark, a short introduction to light and its problems in our society will be given, as well as a tour of The Skies above the URI campus.

Admission to this presentation is $5.00, to benefit the URI Planetarium Fund. The URI Planetarium is on Upper College Road, at the end of Engineering Row and across the parking lot from East Hall.

The University of Rhode Island Planetarium is available for programs of many varied topics of astronomical interest. For more information, please call 401-527-5558.




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

**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 **June 15** 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.

# The Sun, Moon & Planets in June

This table contains the ephemeris of the objects in the Solar System for each Saturday night in June. Times are in Eastern. Time calculated for Seagrave Observatory (41.845N, 71.590W).

| Object | Date | RA | Dec | Const | Mag | Size | Elong | Phase(%) | Dist(S) | Dist(E) | Rise | Transit | Set |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sun** | **4** | 4 49.8 | 22 27.1 | Tau | -26.8 | 1891.8 | - | - | - | 1.01 | 05:12 | 12:44 | 20:17 |
| | **11** | 5 18.7 | 23 05.6 | Tau | -26.8 | 1890.2 | - | - | - | 1.02 | 05:10 | 12:46 | 20:21 |
| | **18** | 5 47.8 | 23 24.2 | Tau | -26.8 | 1889 | - | - | - | 1.02 | 05:10 | 12:47 | 20:24 |
| | **25** | 6 16.9 | 23 22.6 | Gem | -26.8 | 1888.2 | - | - | - | 1.02 | 05:12 | 12:49 | 20:25 |
| **Moon** | **4** | 3 45.3 | 14 22.2 | Tau | -8.5 | 1977.9 | 16° W | 2 | - | - | 05:04 | 12:21 | 19:43 |
| | **11** | 10 25.7 | 8 05.0 | Leo | -11.5 | 1846.8 | 75° E | 37 | - | - | 12:01 | 18:35 | 01:01 |
| | **18** | 15 54.2 | -16 00.6 | Lib | -12.5 | 1795.4 | 152° E | 94 | - | - | 18:39 | 23:45 | 04:48 |
| | **25** | 22 03.2 | -11 08.2 | Aqr | -12.4 | 1872.4 | 125° W | 79 | - | - | 23:16 | 04:51 | 10:32 |
| **Mercury** | **4** | 3 14.1 | 14 11.4 | Ari | 0.6 | 8.5 | 24° W | 35 | 0.43 | 0.8 | 04:12 | 11:08 | 18:05 |
| | **11** | 3 43.4 | 16 38.9 | Tau | 0.1 | 7.3 | 23° W | 49 | 0.4 | 0.93 | 04:05 | 11:11 | 18:18 |
| | **18** | 4 24.0 | 19 40.0 | Tau | -0.4 | 6.3 | 20° W | 65 | 0.36 | 1.07 | 04:05 | 11:25 | 18:46 |
| | **25** | 5 16.3 | 22 28.5 | Tau | -1.1 | 5.6 | 14° W | 83 | 0.33 | 1.2 | 04:18 | 11:51 | 19:24 |
| **Venus** | **4** | 4 46.4 | 22 14.1 | Tau | -3.8 | 9.8 | 1° W | 100 | 0.72 | 1.74 | 05:12 | 12:42 | 20:12 |
| | **11** | 5 23.5 | 23 19.5 | Tau | -3.8 | 9.8 | 1° E | 100 | 0.72 | 1.74 | 05:16 | 12:51 | 20:27 |
| | **18** | 6 01.0 | 23 51.7 | Gem | -3.8 | 9.8 | 3° E | 100 | 0.72 | 1.73 | 05:24 | 13:01 | 20:39 |
| | **25** | 6 38.6 | 23 49.5 | Gem | -3.8 | 9.8 | 5° E | 100 | 0.72 | 1.73 | 05:34 | 13:11 | 20:48 |
| **Mars** | **4** | 15 39.2 | -21 19.7 | Lib | -2.1 | 18.5 | 164° E | 99 | 1.51 | 0.5 | 18:47 | 23:28 | 04:08 |
| | **11** | 15 30.6 | -21 08.5 | Lib | -1.9 | 18.2 | 155° E | 98 | 1.5 | 0.51 | 18:10 | 22:52 | 03:33 |
| | **18** | 15 24.3 | -21 01.0 | Lib | -1.7 | 17.7 | 147° E | 96 | 1.49 | 0.53 | 17:36 | 22:18 | 03:00 |
| | **25** | 15 20.7 | -20 59.7 | Lib | -1.6 | 17 | 139° E | 95 | 1.48 | 0.55 | 17:06 | 21:48 | 02:30 |
| **1 Ceres** | **4** | 1 20.2 | -1 18.7 | Cet | 9.3 | 0.4 | 56° W | 98 | 2.95 | 3.39 | 03:15 | 09:13 | 15:11 |
| | **11** | 1 28.6 | 0 38.6 | Cet | 9.2 | 0.4 | 61° W | 98 | 2.95 | 3.31 | 02:54 | 08:54 | 14:54 |
| | **18** | 1 36.8 | 0 02.2 | Cet | 9.2 | 0.4 | 65° W | 97 | 2.94 | 3.22 | 02:32 | 08:34 | 14:37 |
| | **25** | 1 44.5 | 0 30.4 | Cet | 9.2 | 0.4 | 70° W | 97 | 2.94 | 3.13 | 02:11 | 08:15 | 14:19 |
| **Jupiter** | **4** | 11 03.8 | 7 23.5 | Leo | -1.9 | 36.9 | 90° E | 99 | 5.44 | 5.34 | 12:26 | 18:55 | 01:23 |
| | **11** | 11 05.9 | 7 08.8 | Leo | -1.8 | 36.1 | 84° E | 99 | 5.44 | 5.45 | 12:02 | 18:29 | 00:57 |
| | **18** | 11 08.5 | 6 51.4 | Leo | -1.8 | 35.4 | 78° E | 99 | 5.44 | 5.56 | 11:38 | 18:04 | 00:31 |
| | **25** | 11 11.5 | 6 31.5 | Leo | -1.8 | 34.7 | 72° E | 99 | 5.44 | 5.66 | 11:14 | 17:40 | 00:05 |
| **Saturn** | **4** | 16 47.5 | -20 34.4 | Oph | 0.0 | 18.4 | 178° E | 100 | 10.03 | 9.01 | 19:53 | 00:37 | 05:21 |
| | **11** | 16 45.3 | -20 31.1 | Oph | 0.0 | 18.4 | 172° E | 100 | 10.03 | 9.02 | 19:23 | 00:07 | 04:51 |
| | **18** | 16 43.2 | -20 27.9 | Oph | 0.1 | 18.3 | 165° E | 100 | 10.03 | 9.05 | 18:53 | 23:38 | 04:22 |
| | **25** | 16 41.2 | -20 25.0 | Oph | 0.1 | 18.2 | 158° E | 100 | 10.03 | 9.08 | 18:23 | 23:08 | 03:53 |
| **Uranus** | **4** | 1 27.1 | 8 29.7 | Psc | 5.9 | 3.4 | 51° W | 100 | 19.96 | 20.59 | 02:47 | 09:19 | 15:52 |
| | **11** | 1 28.2 | 8 35.6 | Psc | 5.9 | 3.4 | 57° W | 100 | 19.96 | 20.5 | 02:20 | 08:53 | 15:26 |
| | **18** | 1 29.1 | 8 40.8 | Psc | 5.9 | 3.5 | 63° W | 100 | 19.96 | 20.39 | 01:53 | 08:26 | 15:00 |
| | **25** | 1 29.9 | 8 45.2 | Psc | 5.8 | 3.5 | 70° W | 100 | 19.96 | 20.29 | 01:26 | 08:00 | 14:33 |
| **Neptune** | **4** | 22 54.9 | -7 49.5 | Aqr | 7.9 | 2.3 | 92° W | 100 | 29.96 | 29.91 | 01:14 | 06:48 | 12:21 |
| | **11** | 22 55.0 | -7 49.2 | Aqr | 7.9 | 2.3 | 98° W | 100 | 29.96 | 29.79 | 00:46 | 06:20 | 11:54 |
| | **18** | 22 55.0 | -7 49.5 | Aqr | 7.9 | 2.3 | 105° W | 100 | 29.96 | 29.67 | 00:19 | 05:53 | 11:26 |
| | **25** | 22 54.9 | -7 50.4 | Aqr | 7.9 | 2.3 | 112° W | 100 | 29.96 | 29.56 | 23:51 | 05:25 | 10:59 |
| **Pluto** | **4** | 19 12.9 | -20 56.7 | Sgr | 14.2 | 0.3 | 147° W | 100 | 33.11 | 32.26 | 22:24 | 03:06 | 07:49 |
| | **11** | 19 12.3 | -20 58.3 | Sgr | 14.2 | 0.3 | 154° W | 100 | 33.12 | 32.2 | 21:56 | 02:38 | 07:20 |
| | **18** | 19 11.6 | -21 00.1 | Sgr | 14.2 | 0.3 | 160° W | 100 | 33.12 | 32.16 | 21:28 | 02:10 | 06:52 |
| | **25** | 19 10.9 | -21 01.9 | Sgr | 14.1 | 0.3 | 167° W | 100 | 33.12 | 32.13 | 21:00 | 01:42 | 06:24 |

# Dual Planetary Close Encounters

**by Dave Huestis**

Amateur astronomers have been observing the planet Jupiter for several months now. It's much more convenient when you can catch a glimpse of this gas giant world during a reasonable evening hour. And we still have two more months where we can scrutinize Jupiter and his four Galilean moons before he sinks too low in the sky. But the heavens are going to oblige us with even more planetary pleasures to supplement our personal exploration of the solar system. Within four days of one another, Mars and Saturn will be at their closest distances to the Earth for 2016.

On May 30, Mars will be a mere 46,776,104 miles from us. Then on June 3, Saturn will be 837,996,600 miles from us. These dates are the absolute best times during 2016 to observe these two worlds, as they are closer and appear larger than usual through a telescope. To locate Mars and Saturn please look to the southeast sky around 10:00 p.m. on June 1 (see accompanying star map). If you have a good knowledge of constellation star patterns, you'll notice Scorpius rising up at an angle above the horizon. The heart of the scorpion is the red giant star Antares, which means "rival of Mars". Above Antares is the scorpion's head and claws. This portion of the constellation comes between Mars and Saturn.

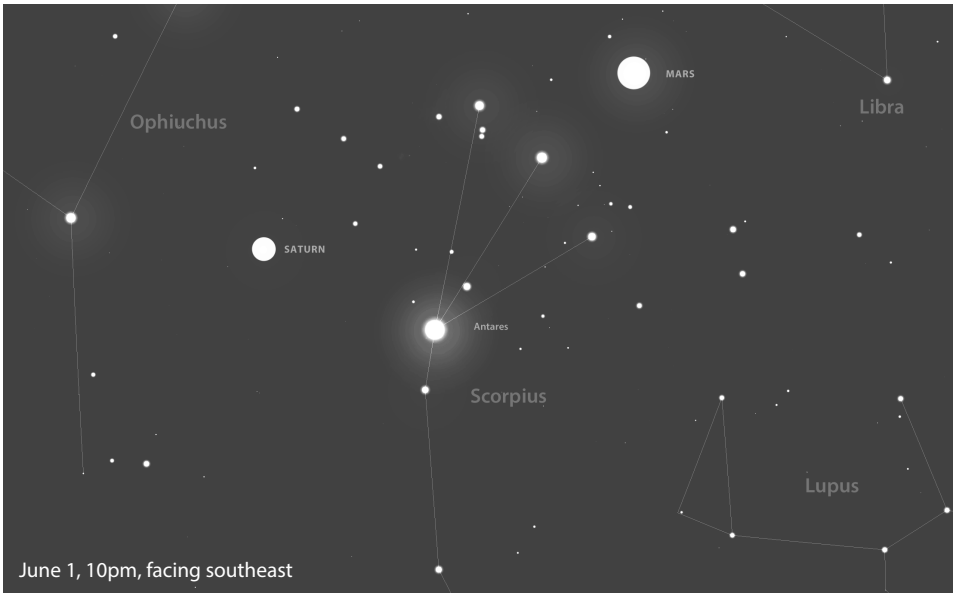
Pumpkin-orange colored Mars is to the upper right of Scorpius' claws in the constellation Libra, while yellowish Saturn can be found to the lower left in Ophiuchus. Antares, Mars and Saturn will be the brightest objects in this region of the sky and will form a nice triangle. If you have a telescope you can begin observing the planets even before it gets completely dark on June 1, but

Image of Mars by Steve Hubbard

you may want to wait until they rise higher above the horizon. You can visit Jupiter once again while waiting for that to happen. The local observatories may also have to wait until later in the evening or possibly an additional week or so due to obstructions of trees and houses.

To begin our examination of Mars please visit the following Skyscrapers website for a brief history of our second closest planetary neighbor: http://www.theskyscrapers.org/mars-history-highlights-1 . Suffice it to say that initial accounts of possible "canals" on Mars at the end of the 19th century captured our imagination and most assuredly hastened our exploration of this desolate world with spacecraft.

Now let's review what an observer should expect to see through even a small telescope.




Mars' close approach on May 30 will afford decent views through a telescope. While not the closest it can be, this close encounter is the closest one since 2005. So it is worth making every effort to observe one of our neighboring worlds to best advantage. For some Mars observers it might be a challenge to observe much detail considering how small the disk of the planet will appear. However, don't let Mars' small image size deter you from gazing at this planet. Medium-sized backyard telescopes should still coax some detail out of the small image. And of course the local observatories will be able to share even more Martian detail when steady seeing allows them to "crank up" the magnification.

Once you focus in on Mars with a telescope, the first detail you will notice will be the color. It's not quite red, but not quite orange. Perhaps Crayola has a hue that best describes what we can see. How would you describe it? The second detail that will catch your eye will be the North Polar Cap (NPC). It's definitely a bright white feature that can be seen because Mars' north pole is currently tilted 12 degrees towards the Earth. (Since the tilt is so shallow, you may also catch a glimpse of the South Polar Cap, as it will still be winter in Mars' southern hemisphere.) The cap will be small, but noticeable. Mars' summer solstice in the northern hemisphere was on January 3, so a lot of polar melting will have occurred by the end of May. The NPC will continue to shrink as the Martian summer progresses. Meanwhile, the Earth/Mars distance will be increasing and the image size will be decreasing after our close encounter as the Earth "laps" Mars and pulls ahead in our respective orbits. The autumnal equinox (Fall) begins in Mars' northern hemisphere on July 5. Dusky surface markings should be apparent under medium telescopic magnification. These features are the underlying rock exposed by the shifting sands during intense dust storms. Wait for steady seeing conditions to observe as much detail as possible.

A keen-eyed observer should be able to catch a few glimpses of a dark area like Syrtis Major or a bright one like Hellas Basin. You don't have to know the names of the features you glimpse. Just simply enjoy the view of any surface feature you can observe. And though Mars is noted for producing dust storms that can globally enshroud the planet, it is unlikely that will happen during this time of close approach. Mars will be

observable through the end of the year, and by December 31, it will be 152,488,340 miles from us. Our next close encounter will be on July 31, 2018, when Mars will almost be at its largest apparent size possible and only 35,785,537 miles away.

In conclusion, be patient when observing Mars. The planet's disk will be small. Wait for steady seeing conditions. Don't try observing Mars if the stars are twinkling. Take a knowledgeable look at this alien world that inspired generations of astronomers and science fiction writers alike to ponder the existence of Martian life-forms.

Drag out those telescopes and expose them to the light of the universe. One day your children or your grandchildren may set foot upon this exciting landscape.

### Saturn: Lord of the Rings

As mentioned at the beginning of this article, Saturn will be at its closest distance to the Earth on June 3. This beautiful ringed-world is a spectacular sight even in a small telescope. The system of rings is easily seen and they are a most impressive sight. With the ring system tilted 26 degrees toward the Earth, we are viewing the north face of the ring plane. With the rings so "wide open," this configuration allows much detail to be seen. Next year they will be at their maximum "openness" or tilt of about 27 degrees.

It is really amazing that 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 composed of irregularly shaped dirty snowballs, ranging in size from grains of dust to the size of pebbles. There are also some "boulders" as large as several feet across. They all orbit Saturn along the planet's equatorial plane. Look for gaps within the ring system.

Though Saturn is a gas giant a little smaller than Jupiter, it does not exhibit the prominent bands and zones in its cloud tops as its larger cousin does. Not much detail can be observed at all on Saturn's disk. In fact, if it weren't for Saturn's ring system, this planet would be quite a boring destination for most amateur astronomers and the public alike.

What one can look for is the shadow of the rings upon Saturn's cloud tops. The configuration of the rings provides a stunning 3-D effect of the Saturnian system, including eight of its brightest moons in a dark moonless sky with the telescopes available locally. We'll be focusing on Saturn until between the first and second week of October, depending upon local horizon views.

So during the next few months, plan on treating yourself and your family and friends to wonderful views of Saturn and Mars through either your own telescope or one of the larger instruments at any of the local observatories. You won't be disappointed.

Experienced sky interpreters will be on hand to provide incredible views of our local planetary family and distant stars, nebulae, galaxies and star clusters at each of the following facilities. Seagrave Memorial Observatory (http://www.theskyscrapers.org) in North Scituate is open every clear Saturday night. Ladd Observatory (http://www.brown.edu/Departments/Physics/Ladd/) in Providence is open every clear Tuesday night. The Margaret M. Jacoby Observatory at the CCRI Knight Campus in Warwick (http://www.ccri.edu/physics/observatory.htm) is open every clear Wednesday night. Frosty Drew Observatory (http://www.frostydrew.org/) in Charlestown is open every clear Friday night. Check the respective websites for open times.

Keep your eyes to the skies.

*Dave Huestis is Skyscrapers Historian and has been contributing monthly columns to local newspapers for nearly 40 years. See more at http://theskyscrapers.org/dave-huestis*

# Shipwrecks & Transits

**by Francine Jackson**

For those of you who don't believe that anything interesting happens in Rhode Island, there was an occurrence that brought international attention to our fair state. At a recent press conference, Dr. DK Abbass announced that there is now an 80% chance that Captain James Cook's ship the Endeavour has been located in Newport harbor. Present at the conference were so many members of Australia's and New Zealand's broadcasters that we in the hall couldn't observe the PowerPoint presentation; to the persons Down Under, the Endeavour is equivalent to our Mayflower, and they hold Captain Cook in very high regard.

But, why should we care, despite the fact that a very historic vessel was deliberately sunk in our waters during the Revolution. This ship, which did, in fact, introduce the southern lands to the British Empire, was the one that stopped at Tahiti in 1769, where Cook and his team set up an observatory in order to observe the transit of Venus.

Hopefully, many of you were able to see at least a part of the recent transit of Mercury. Although the day began fairly cloudy, the sky cleared early for us to enjoy close to seven hours of our tiniest planet appear to cross the surface of our Sun. With solar filters, H-alpha telescopes, and even a Sunspotter, Brown's Ladd Observatory had a steady stream of visitors able to view this phenomenon throughout the day. And, everyone was amazed that the ball of the planet could be seen as easily as it was, as Mercury is just 1½ the diameter of our Moon, and close to 60 million miles away.

A transit of Mercury, although fairly common, occurring about a dozen times each century, was first realized as an important, but really too small, way to aid in making sense of the size of our solar system. Edmund Halley, observing this while on the island of St. Helena, saw the geometric potential for using a planetary transit to determine the yardstick for our neighborhood, the astronomical unit, the average distance between the Earth and the Sun. Mercury was too small, in his opinion, to capture very good observations, but, Venus, over twice as large, and twice as close, would be an ideal planet to do so. The transit of Venus in 1769 had astronomers travel all over the world, and Captain Cook and his crew, on Tahiti, was responsible for some of the better results.

Notice, unfortunately, the surety is not 100%. Five British ships were sunk at approximately the same location, and four have been recognized as such; there is still one more ship waiting to be identified. But, we know the Endeavour is there, and even if it is the still elusive bark below our waters, we can be proud that such an important, historic ship is now here.

*Francine Jackson is Skyscrapers Public Relations Spokesperson, writes the weekly newsletter for Ladd Observatory and serves as planetarian at the University of Rhode Island. See more at http://theskyscrapers.org/francine-jackson*

# May Reports

## Meeting notes from the May 6 Skyscraper meeting

And So It Begins:

Newly elected President Steve Siok started the May 6 meeting at 7 hours, 36 minutes and 42 seconds pm.

Steve apologized in advance for anything that he might do incorrectly as he hadn't held the office of president for 10 years. It was at this point that Mrs. Siok called out from the back with a correction to what Steve talked about and indicated that she would continue to correct Steve as needed in the future.

Thus was established the first known joint rule Diarchy in Skyscrapers history. https://en.wikipedia.org/wiki/Diarchy

**New Members Introduced and Voted Into Membership By Steve Hubbard:**

Glen Huestis was introduced a second time to the membership and voted in.

Ron Zincone who was in attendance was introduced as a prospective new member along with Michael Lucini who couldn't be with us. Both will be voted upon at the next meeting

**Update on the 27 inch Telescope Project by Steve Siok:** The grant proposal for the scope was bundled with all Brown University grant requests and submitted to the Champlin Foundation. Steve challenged all of the members to start working with the 16 inch scope that we have as a learning project. The 16inch is able to be used remotely and this would help members to understand the basics of working with a telescope remotely. The Trustees will be preparing a series of learning sessions about this.

Photographic Interlude #1, Jim Hendrickson and Tracy Prell:

During Steve's update, Jim Hendrickson and Tracy Prell while sitting right next to each other commenced a series of numerous photographs of Steve. There was a spirited competition to see who could capture the best likeness of President Siok for his future Presidential Library.

**Trustees report, Kent Cameron:** Kent and Jim Crawford took the lawnmower out, puzzled over it for a while and then cleaned it and got it ready for this year's grass cutting.

**Upcoming Public Outreach, Francine Jackson:**

• Thursday, May 12. A star party at the Newport Art Museum. Probably the last one there until the Fall.

• Friday May 20, an away event at Portsmouth High School.

• Kent Cameron has been coordinating a possible star party at Riverbend Farm in Uxbridge MA. This is part of the Chafee National Corridor under the jurisdiction of the National Park Service. No date yet set. Stay tuned for details

**Upcoming Meetings, Steve Siok:** Steve provided a rundown of upcoming meetings as first VP Ian Dell'Antonio was not in attendance at that moment.

• The June meeting will have Adam Serafis speak to us about research he has been doing to try and determine how the Earth got it's water

• The July meeting will feature Dr. Wallace Arthur who will speak to us about cosmic rays. This was moved from February when we had to cancel a meeting. This will be accompanied by a picnic / cookout

• In August, Steve Hubbard will speak about his experiences traveling to and viewing the total Solar eclipse of March 2016 in Indonesia. There may be a possible cookout in August too

**For The Good Of The Organization:** Dave Huestis presented a first edition copy of the 75 year book of Skyscraper history previously owned by the late John Hopf, long time Skyscraper member living in Newport. The book was offered up for auction with the proceeds to go to the society. After spirited bidding, Tracy Prell won the copy with a final bid of $150

Photographic Interlude #2

Immediately upon Dave presenting the 75 year book, numerous camera clicking noises and flashes of light arose from the seats occupied by Tracy and Jim

**Good of the Organization Continued:** Dave Huestis spoke on behalf of librarian Alex Bergemann who was not in attendance. The library has been reorganized. This was the first time it had been open since before Astroassembly last October. In future, it will be open and items available for borrowing from 7 to 7:30pm on meeting nights when we are meeting at the observatory. See Dave or Alex to borrow anything. A list of available items is on line. See "Skyscrapers Library Borrowing Procedure" link on our website. http://www.theskyscrapers.org/library-procedures

Francine Jackson reminded the members of the upcoming series of Saturday afternoon / evening workshops. All to start at 6pm, cost will be $5 for non members, free for members. The first one will start on Saturday, May 7 and will be a presentation on the Sun by Ian Dell'Antonio. See the May Skyscraper or follow link at society web page for the full list and descriptions of upcoming workshops: http://www.theskyscrapers.org/astronomy-workshops-spring-2016

There will be a presentation at the URI planetarium on Black Holes on Saturday May. Contact Francine for more details.

Bob Horton announced that there will be public viewing of the Transit of Mercury on Monday, May 9 at Ladd Observatory in Providence from 8am until 2:30pm. A number of telescopes will be set up.

Al Hall reminded the membership of the upcoming opposition of Mars later in May. An earlier close approach of Mars is what first brought Al to the observatory as a mere youth of 14, many, many years ago.

Al also announced that after 8 years of work, he and Dick Parker would be bringing to Stellafane the ¾ reproduction Alvan Clark refractors that they have made. Both were based on exacting measurements of each part of the society's 8 inch Alvan Clark telescope when Al, Dick and many of our members refurbished the Alvan Clark some years ago. The very last 2 parts of the project are on the workbench!

Ian Dell'Antonio provided additional details about the grant proposal for the 27 inch telescope. A proposal for $382,000 has been bundled in with the Brown University President's request to the Champlin Foundation. The legal team at Brown has signed off on the proposal. If we get the money, it will all have to be spent within calendar year 2017. The announcement of whether the grant is approved will be later in 2016 towards December.

**Presidential Announcements, Steve Siok:** Dick Parker and Dick's son recently brought a large group of cub scouts to Seagrave Observatory for a Saturday night observing session. In appreciation, they have provided the society with a donation of $200. The scouts also created a really nice hand made poster that they sent us with pictures of constellations and other things that reminded them of their visit.

On May 28, there will be a photo presentation of the latest results from the outer Solar system to include Pluto and Ceres at The New England Planetary center at the Field building of Brown University.

Steve asked immediate past president Bob Horton up. Steve read a very nice pre-


Dr. Michael Person

sentation thanking Bob for his hard work and efforts during the prior 2 years of his term. This was accompanied by a present of some sort in a bag that Steve didn't make all too clear as to what it was.

Photographic Interlude #3:

During Steve's presentation to Bob Horton, incredibly numerous clicking noises and camera flashes yet again emanated from the vicinity of where Tracy and Jim were seated.

**Featured Speaker Dr. Michael Person:** Following Steve's presidential announcements and occurring at a time that the newly elected secretary neglected to note, Steve segued into an introduction for Dr. Person. This was accompanied by:

Photographic Interlude #4… The Longest One Yet:

Upon Dr. Person arriving at the front of the meeting hall, a seemingly endless series of camera clicks and flashes once again emanated from the seats being occupied by Tracy and Jim. It became apparent that there was an ongoing project underway to create a stereo version of Dr. Person to be converted into a hologram for possible future use.

Here endeth my report. We all enjoyed a really great talk by Dr. Person.

Respectfully submitted by Steve Hubbard, Secretary

## Skyscrapers Inc. E Board Meeting May 16 2016

Meeting opened at 7:02pm

In Attendance: Steve and Kathy Siok, Tom Thibault, Jim Crawford, Jim Hendrickson, Francine Jackson, Kent Cameron. Lloyd Merrill, Bob Napier, Steve Hubbard+

**Future Meeting Dates:** It was agreed upon that future E Board meetings will be held on the third Monday of each month at 7pm. Any members in dire need of stimulating conversation and finding nothing on TV are invited.

**Treasurer's Report:** There are still a couple of outstanding issues to iron out before the full transition to Lloyd is complete. There is an issue with our status with the Corporation Board that is being worked on to correct. Money from the Amazon Smiles program is hooked into our PCU account. We have seen no money from this yet. It was thought that distribution was quarterly so we might see something next month.

**Upcoming Speakers:** Steve reported that we have speakers in place until August. He gave Ian a list of others to pursue. We have 2 speakers set for Astroassembly, looking for others. The theme this year for Astroassembly is: "Where Has Amateur Astronomy Gone In The Previous 3 Decades?"

Process for Introducing New Members:

There is confusion. Steve tasked Steve Hubbard, Lloyd and Jim Crawford to each dedicate a brain cell or 2 to clarify and streamline the process.

**Trustees Report:** Trustees will undertake an inventory of all property and equipment. A spreadsheet with photos was suggested.

Lawn mower is fixed up and ready to go

The slit on the main building needs repairs. There is water damage under the back corner roof of the building housing the Patton telescope. Trustees will evaluate and set work sessions up.

A radio club in RI wants to use our property again for part of a weekend in June. It was felt to be ok, but they need to provide liability insurance. Jim Crawford is going to get in touch with them and have an analog discussion to resolve some questions.

Bob Napier and Jim Crawford have been researching Security cameras for our property. They will be talking with the person in charge of security cameras at Ocean State Job Lot for input and advice. It has not been determined if we will be able to have a system as sophisticated as that on the TV show "Person of Interest" with artificial intelligence that will take over the observatory and displace all of the humans. This is being looked into.

**Star Parties/Special Events:** There have been about a dozen in attendance at each of the workshops done so far.

There was spirited discussion about the possibility of having a section of our website devoted to notices of upcoming events. Privacy concerns and possible issues with a members only section were discussed. Francine, Jim and Tracy will be discussing this and seeing if they can come up with a solution.

**Meeting Night Refreshments:** We need someone skilled at coffee making and capable of plugging in the coffee pots early enough before the meeting to take this on. Perhaps we could get an unpaid intern from Starbucks interested in a coffee making career.

We would like people to consider bringing a treat to share to the meetings. Given the ever expanding girth of the membership, volume does not seem to be a consideration with such a system.

We will have a cookout for the July meeting and a potluck for the August meeting. Both will be on the second Saturday of each month.

**Status of the Meade 16 inch:** Bob Napier changed the hand control cable. Stress on the cable caused some fraying of the wires. It seems to work now. Bob found that the focuser cable had been plugged in. This was a mystery as the controller for the cable has been missing for a long time. Someone may have gone into the building and put the focuser cable in to mock us.

**Light Pollution:** The world headquarters of Citizens Bank will be moving to a new campus in Johnston RI. There was discussion of how we could reach out to find out the lighting plan and voice our concerns and who we could talk with. Steve had reached out to Kelly Beatty of Sky and Telescope magazine for advice. Kelly is expert on the subject of light pollution and very willing to help us.

Meeting ended at 8:47pm

Steve Hubbard / Secretary

# NOAA's Joint Polar Satellite System (JPSS) to revolutionize Earth-watching

**by Ethan Siegel**

If you want to collect data with a variety of instruments over an entire planet as quickly as possible, there are two trade-offs you have to consider: how far away you are from the world in question, and what orientation and direction you choose to orbit it. For a single satellite, the best of all worlds comes from a low-Earth polar orbit, which does all of the following:

- orbits the Earth very quickly: once every 101 minutes,
- is close enough at 824 km high to take incredibly high-resolution imagery,
- has five separate instruments each probing various weather and climate phenomena,
- and is capable of obtaining full-planet coverage every 12 hours.

The type of data this new satellite – the Joint Polar Satellite System-1 (JPSS-1) -- will take will be essential to extreme weather prediction and in early warning systems, which could have severely mitigated the impact of natural disasters like Hurricane Katrina. Each of the five instruments on board are fundamentally different and complementary to one another. They are:

1. The Cross-track Infrared Sounder (CrIS), which will measure the 3D structure of the atmosphere, water vapor and temperature in over 1,000 infrared spectral channels. This instrument is vital for weather forecasting up to seven days in advance of major weather events.

2. The Advanced Technology Microwave Sounder (ATMS), which assists CrIS by adding 22 microwave channels to improve temperature and moisture readings down to 1 Kelvin accuracy for tropospheric layers.

3. The Visible Infrared Imaging Radiometer Suite (VIIRS) instrument, which takes visible and infrared pictures at a resolution of just 400 meters (1312 feet), enables us to track not just weather patterns but fires, sea temperatures, nighttime light pollution as well as ocean-color observations.

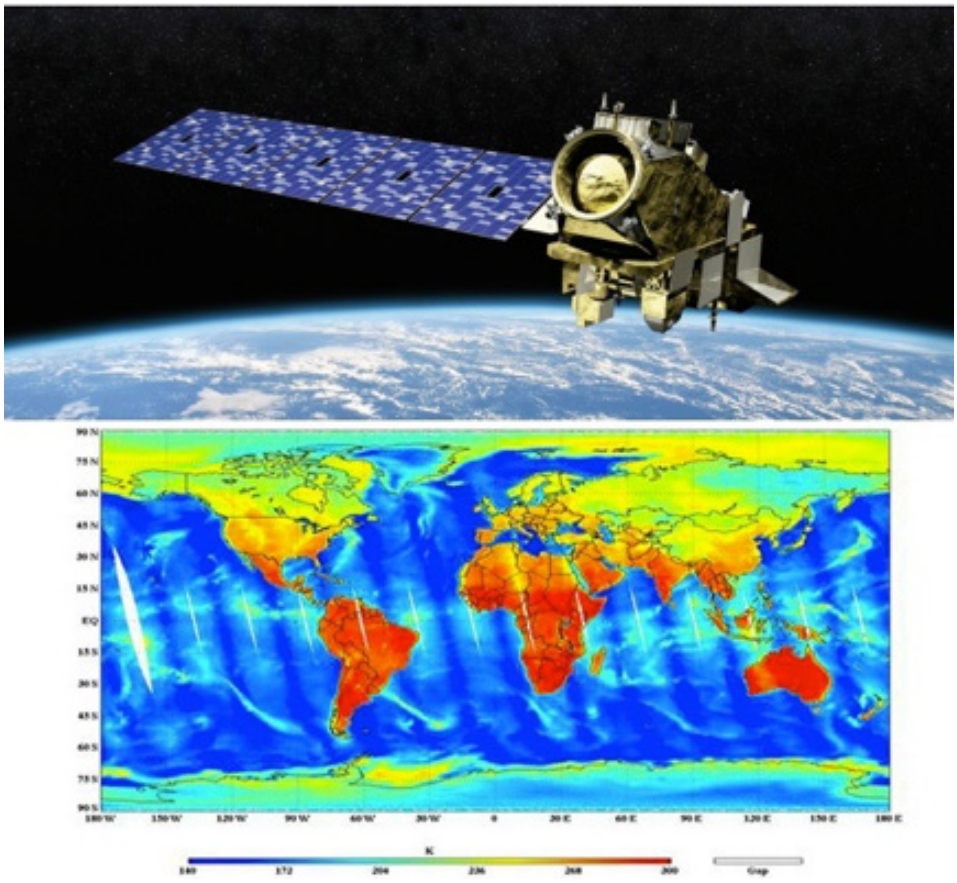
4. The Ozone Mapping and Profiler Suite (OMPS), which measures how the ozone concentration varies with altitude and in time over every location on Earth's surface. This instrument is a vital tool for understanding how effectively ultraviolet light penetrates the atmosphere.

5. Finally, the Clouds and the Earth's Radiant System (CERES) will help understand the effect of clouds on Earth's energy balance, presently one of the largest sources of uncertainty in climate modeling.

The JPSS-1 satellite is a sophisticated weather monitoring tool, and paves the way for its' sister satellites JPSS-2, 3 and 4. It promises to not only provide early and detailed warnings for disasters like hurricanes, volcanoes and storms, but for longer-term effects like droughts and climate changes. Emergency responders, airline pilots, cargo ships, farmers and coastal residents all rely on NOAA and the National Weather Service for informative short-and-long-term data. The JPSS constellation of satellites will extend and enhance our monitoring capabilities far into the future.

---

*This article is provided by NASA Space Place. With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!*



An artist's concept of the JPSS-2 Satellite for NOAA and NASA by Orbital ATK (top); complete temperature map of the world from NOAA's National Weather Service (bottom).

# Globular Cluster in Serpens

# M5

## Magnitude – 6.2, Dimension – 17′

**by Las Vegas Astronomical Society**

"Beautiful nebula discovered between Libra and Serpens, close to the sixth-magnitude star Flamsteed 5 Serpentis." Charles Messier (1764)

"This superb object is a noble mass, refreshing to the senses after searching for fainter objects" Admiral Smyth (1838)

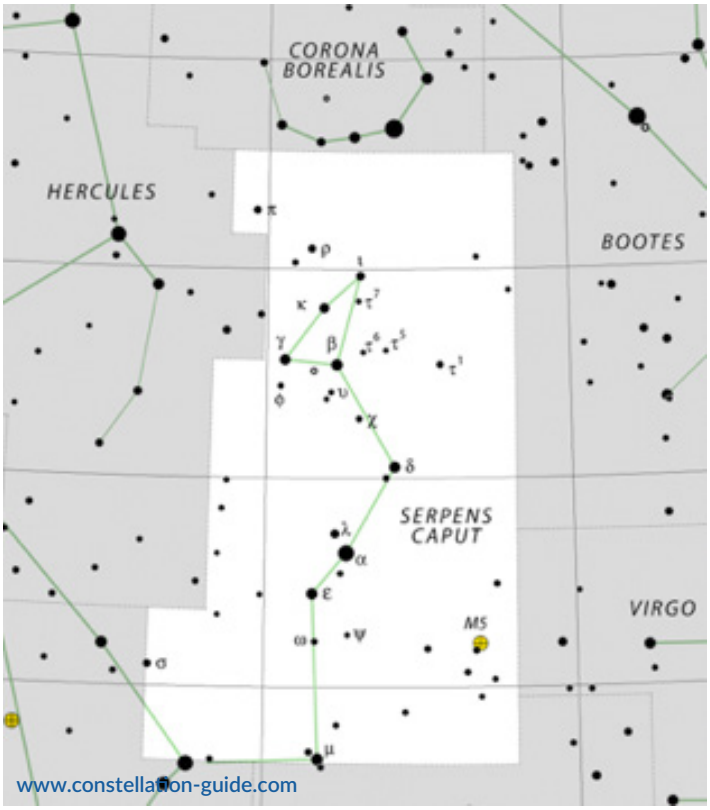
"A beautiful assemblage of minute stars, 11-15 mag. Greatly compressed in the centre." T.W. Webb (c. 1859)

"Myriads of glistening points shimmering over a soft background of starry mist." Mary Proctor (1924)

These comments about Messier 5 say it all. This is one of the finest globular clusters in the northern sky, rivaling Messier 3 in Canes Venatici and M13 in Hercules. Discovered by the German astronomer Gottfried Kirch in 1702, Messier 5 is about 25,000 light years away.

---

*The purpose of the LVAS Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone that is interested, and if you are able to contribute notes, drawings, or photographs, the LVAS will be happy to include them in our monthly summary. If you would like to contribute material, submit your observing notes, sketches, and/or images to either Roger Ivester (rogerivester@me.com) or Fred Rayworth (queex@embarqmail.com). To find out more about the LVAS Observer's Challenge or access past reports, log on to lvastronomy.com/observing-challenge.*



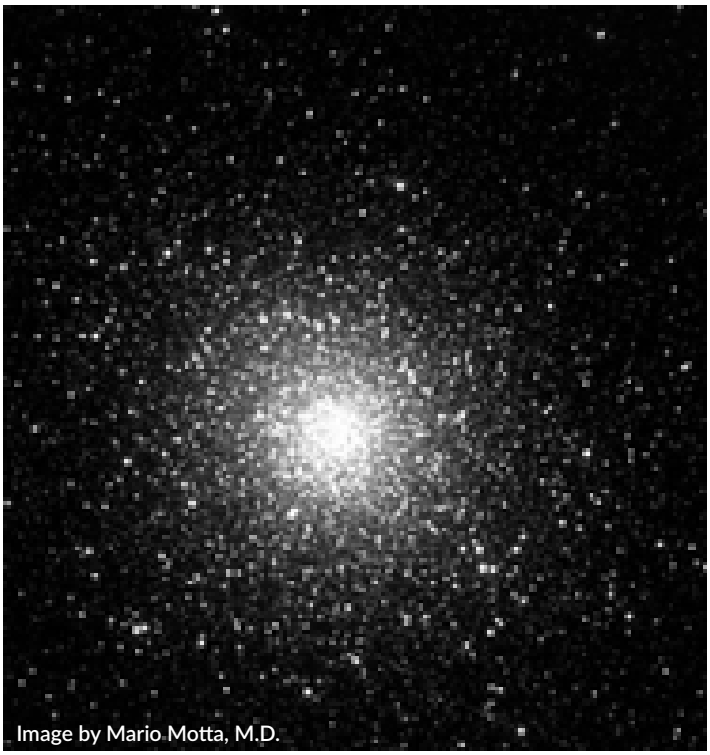



Image by Mario Motta, M.D.

# Directions to Seagrave Memorial Observatory

www.theSkyscrapers.org

**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.
• or • 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.

---

SKYSCRAPERS INC.

47 Peeptoad Road
North Scituate, Rhode Island 02857