

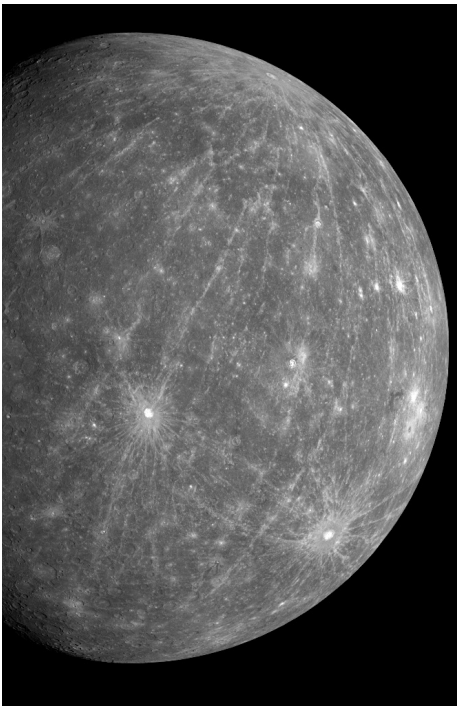


the Skyscraper

vol. 40 no. 5
May 2013

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

Friday, May 3, 7:00pm at Seagrave
Memorial Observatory



How did Mercury form? New constraints from the MESSENGER mission by William Vaughan

Mercury's high mean density implies that this planet has a disproportionately large metal core. What accounts for this unusual interior structure? Maybe Mercury's outermost rocks have been stripped or scorched away, or maybe Mercury is made of different stuff than the other planets. Such simple explanations have been complicated by geophysical observations from the Mariner 10 mission as well as geological and geochemical results from the ongoing

MESSENGER mission. The exciting new results from MESSENGER (and the exciting old results from Mariner 10) will be reviewed in the context of Mercury's genesis.

Will Vaughan is a graduate student in planetary science at Brown University. Will's interests include the Moon and Mercury.

Coffee & refreshments at 7:00pm, observing will follow the lecture, weather-permitting.

Astronomy Program & Book Signing at Greenville Public Library

Join us on May 18th for an afternoon of astronomy, from 11am – 1pm at the Greenville Public Library. NASA scientist and local author, **Kim Arcand**, will be discussing and signing copies of her new book "Your Ticket to the Universe: A Guide to Exploring the Cosmos". Copies will be available for purchase at a price of \$24.95. Kim's book is also for sale on Amazon.com, or at your local Barnes & Noble.

In addition, adjunct faculty from the Dept of Science and Technology at Bryant University,

Dave Huestis, and Sandi Brenner, will be doing a talk on solar activity.

Dave is also the historian for Skyscrapers, Inc., The Amateur Astronomical Society of Rhode Island. Weather permitting there will be solar observing provided by members of Skyscrapers.

Registration is required. Please visit the Greenville Public Library online at www.yourlibrary.ws, or call (401)-949-3630 Ext.1

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Upcoming Meetings

Saturday, June 8 at Seagrave Memorial Observatory

Our June meeting will begin with a members pot-luck followed by a presentation by **David Gow**, who did the restoration work on the Ladd Observatory clock drive system.

Saturday, July 13 at Seagrave Memorial Observatory

Our July speaker will be Prof. Greg Tucker from Brown University.



President's Message

Ed Haskell

Over the course of the past year there have been many references to the Automation Committee. I want to bring you up to date on what is happening with automation.

The project to automate one or more of our observatories is segmented into several phases. Phase One is nearing completion. The deliverable for Phase One encompasses interfacing the 16" Meade to a control system that operates the telescope remotely as well as opening and closing the slide off roof, running an Ethernet cable underground from that observatory to the Meeting Hall, interfacing that cable to a control system to which is attached the projector, and then projecting the images from the 16" onto the screen in the Meeting Hall.

At this writing all of the required tasks have been tested individually. Over the course of the next several weeks integration testing and adjustment will be accomplished and a demonstration will be performed at the May or June meeting.

At the conclusion of Phase One it will be possible for a room full of members and guests to simultaneously see what the 16" Meade sees. Imagine no longer standing in line!

This new facility may change the way we do Open nights in fundamental ways. For example, presently if the sky is overcast, or worse, we cancel the public viewing. With some advance thought it should be possible to stay open and give the public the major part of what they need to experience, in that visitors can be shown the instruments and then taken to the Meeting Hall where they see a recording of what they would have seen in better weather.

Now many of us are purists and feel that

nothing can replace the experience of viewing through the eyepiece. Perhaps this is so, but when the public shows up in a driving rainstorm (believing that our telescope must surely be powerful enough to pierce the clouds!) we will not have to turn anyone away disappointed.

Once this facility is operating there is a long list of benefits to the membership which will be possible which are only a dream at present. I will cover some of those benefits in a subsequent President's Letter.

The Automation Committee is jointly chaired by Steve Siok and Tom Thibault. They continue to look for additional members to get involved.

Thanks for all you do for Skyscrapers.

Phases of the Moon

Last Quarter Moon

May 2 11:14

New Moon

May 10 00:28

First Quarter Moon

May 18 04:35

Full Moon

May 25 04:25

Last Quarter Moon

May 31 18:58



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.

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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 **May 24** to Jim Hendrickson, 1 Sunflower Circle, North Providence, RI 02911 or e-mail to jim@distantgalaxy.com.

E-mail subscriptions

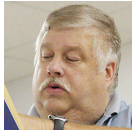
To receive The Skyscraper by e-mail, send e-mail with your name and address to jim@distantgalaxy.com. Note that you will no longer receive the newsletter by postal mail.



Seagrave Memorial
Observatory
Open Nights

Saturdays at 9:00 pm
weather permitting





Saturn Now Visible in May's Early Evening Sky

Dave Huestis

If you have any rudimentary knowledge about astronomy and are like most people, anytime someone mentions the planet Saturn the first image that pops into your head is a planet with an extensive system of rings surrounding it. This sixth planet from the Sun is a magnificent object to observe, even through a small department store refractor. Why? Saturn's exquisite ring system is a marvelous spectacle to behold.

Richard Proctor (1837-1888), a famous English astronomer, wrote in the many editions of his book *Other Worlds than Ours*, "One is not surprised that observers who have been studying the heavens for years return again and again to the contemplation of this ringed planet, for there is nothing like it elsewhere in the heavens. I can well remember the sensation with which I saw the ringed planet for the first time. I look on that view as my introduction to the noblest of all the sciences."

Proctor's quote could have easily been stated by me or one of my associates from Seagrave Memorial Observatory. Observ-

ing Saturn and his rings for the first time through a telescope can certainly inspire anyone to delve into amateur astronomy to see what other wonders the heavens have to offer.

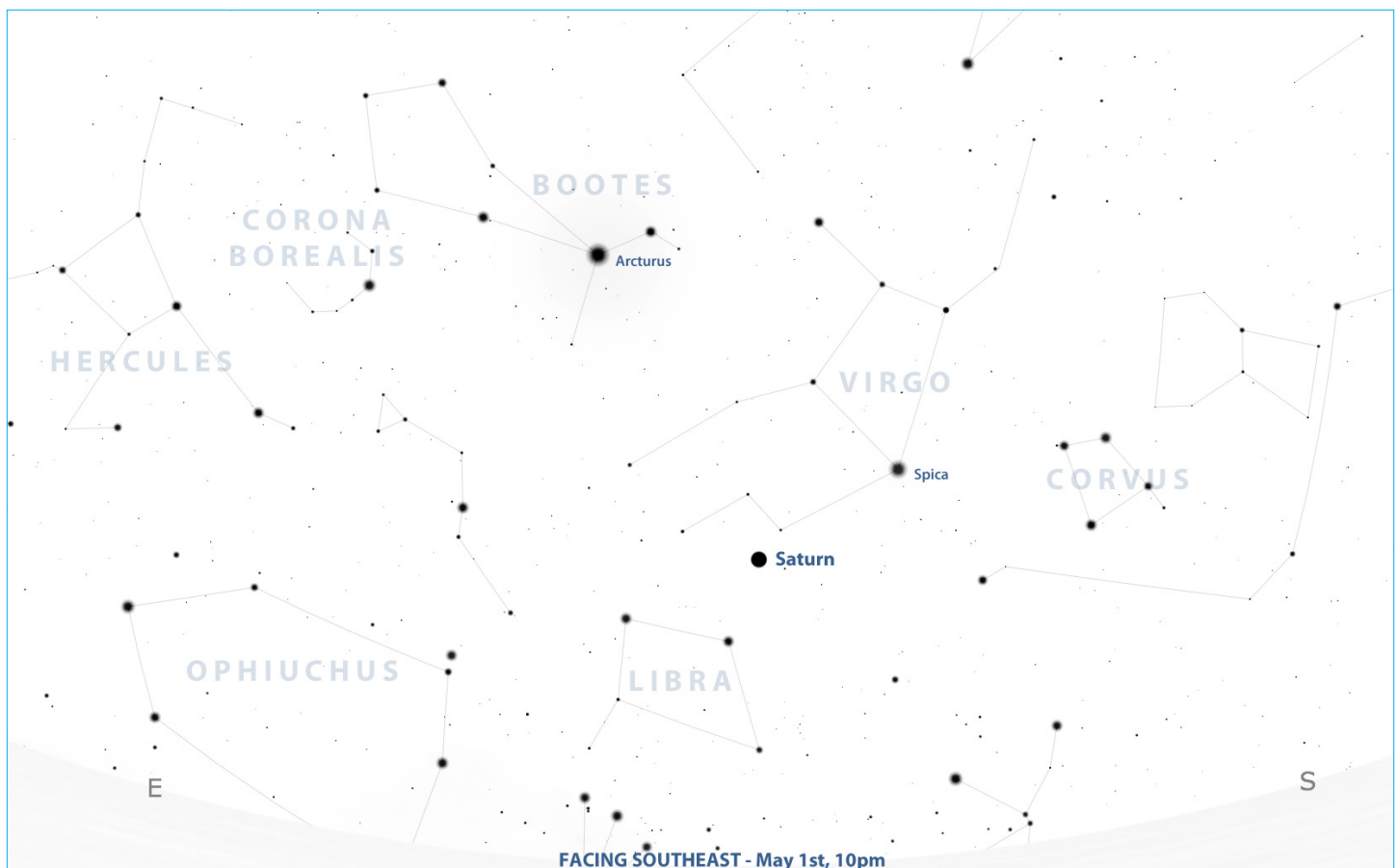
My first view of Saturn through a telescope was back in 1972 after I had purchased a six-inch reflector from the old Edmund Scientific Co. While I do not have a clear memory of that specific event, and I didn't make any notes about my observation, I'm sure the sight of Saturn and his rings was certainly an inspiration for me to continue my exploration of the heavens.

Furthermore, I wholeheartedly agree with comet discoverer and astronomy writer David H. Levy who wrote in his book, *The Sky: a User's Guide*, about his first telescopic view of Saturn, "I was stunned. Having seen the pictures, I knew what Saturn was supposed to look like...From the viewpoint of a child with a tiny telescope, the first look at Saturn's rings was unforgettable...I still wish that everyone could look at those beautiful rings."

While there are many wonderful, high-detailed images of Saturn available on the Web, there is nothing that can replace that eyes-on experience when the photons reflected from this magnificent ringed-world interact with your eye and brain to produce the unmistakable image that is Saturn. If you have your own telescope that opportunity awaits you as soon as you read this column. If you are not currently fortunate to possess one of these fine instruments, then visit one of the local observatories for a detailed view during an open night.

On April 28, Saturn is at opposition, which means it is opposite the Sun in our sky. As the Sun is setting Saturn is rising. Depending upon your observing location, you might not be able to view this ringed world at that time due to it being blocked by trees and houses. However, by 10:00 pm Saturn will be more easily accessible to view about 25 degrees above the southeast horizon. And around the midnight hour Saturn will transit your local north/south meridian, about 36 degrees off the southern horizon. At opposition Saturn is at its closest to the Earth for this year, approximately 820 million miles.

Each successive night Saturn will rise earlier. As we approach the Summer Solstice on June 21 at 1:04 am EDT, you will



have to wait a little later for bright twilight to fade. Also, if you don't know your constellations, Saturn may be a little challenging to find. It will be in Libra on the Virgo border. These two star patterns are not the most recognizable ones in the sky. (See the accompanying finder chart to help you in locating this beautiful ringed planet.)

However, once the sky has darkened sufficiently to reveal the stars, Virgo's bright star Spica will be about fifteen degrees to the upper right of Saturn. To use Spica as your guide to finding Saturn, all you have to do is remember a catchy phrase that uses the handle in the Big Dipper asterism of Ursa Major to "arc to Arcturus, speed on to Spica." Saturn's yellowish hue will make it appear a little paler than Spica's white appearance.

Saturn is indeed a pleasure to observe even through a small telescope, so make every effort to focus in on this wonderful planet. The very first feature that will catch your eye is the rings. During Saturn's almost 29½ year orbit of the Sun, we see the rings at varying inclinations. Currently they are tilted at an angle of 18 degrees, affording a view of the northern "surface" of the ring system.

It is 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). Although there are hundreds of ringlets, you shouldn't have any difficulty seeing the separation between the primary "A" (outer) and "B" (inner) rings, called the Cassini Division. This gap is only 2,175 miles wide. In comparison, the width of the "A" ring is 9,321 miles and the "B" ring is around 16,032 miles across. What ring features can be observed will depend upon what size

telescope is used.

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



Saturn image by Steve Hubbard

several feet across. They all orbit Saturn along the planet's equatorial plane.

While the rings will command most of your attention, don't neglect 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. In 2011 a so called "Serpent Storm" (due to its serpentine shape) stretched completely around Saturn's North Temperate Zone. It has since dissipated.

In addition, both before and after opposition, one can observe the shadow of Saturn projected 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 3-D effect of the Saturnian system.

Also, though Saturn has 62 known moons, at best we can observe the eight brightest with the largest of the telescopes available in Rhode Island. Those moons are:

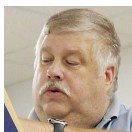
Titan, Rhea, Iapetus, Dione, Tethys, Enceladus, Mimas and Hyperion. The first five or six of the above can be observed in a dark moon-less sky using the 12-inch Brashear refractor at Ladd Observatory.

If you or your children have never observed Saturn firsthand though a telescope, then please take advantage of the opportunities provided at the local observatories. Anyone with an Internet connection can see splendid images of the Saturnian system. However, that detached and passive exploration can never substitute for the actual experience of seeing this distant world for oneself. Elicit the same sensation as reported by Proctor, Levy and yours truly as we glimpsed Saturn and his system of rings for the first time.

In conclusion, if you have your own telescope stored away in a closet, basement, or out in a shed or garage, please clean it up and focus your sights on Saturn. Telescopes should be collecting starlight, not dust! 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. Seagrave Memorial Observatory in North Scituate (<http://www.theskyscrapers.org>) is open every clear Saturday night for observing. Ladd Observatory (<http://www.brown.edu/Departments/Physics/Ladd/>) in Providence is open every Tuesday night regardless of the weather. Don't forget about Frosty Drew Observatory (<http://www.frostydrew.org/>) in Charlestown on every clear Friday night. Please visit the respective websites for details about opening times and closures.

Volunteers at these facilities are more than happy to share their knowledge of the sky with kindred spirits who can appreciate the beauty of the universe.

As always, keep your eyes to the skies.



May's "Meteor-ocre" Shower

Dave Huestis

The May Eta Aquarid meteor shower is one of the best displays of shooting stars during the year. Unfortunately not here in the northern hemisphere.

This meteor shower peaks on the morning of May 6 at around 3:00 am EDT, one to two hours before morning twilight begins. A waning crescent Moon will rise around 4:00 am EDT.

The meteors appear to radiate from the

constellation Aquarius, which at peak time will be about 12 degrees above the east-southeast horizon at the 4:00 am hour. While Aquarius is not very prominent, one can still recognize the Water Urn asterism (looks like a Y-shaped group of stars).

The Eta Aquarids are particles shed long ago from Halley's Comet and left to orbit about the Sun. We see them hitting our upper atmosphere head-on at 41 miles per

second at the same time annually. Perhaps with some luck you will be able to observe maybe 15 swift and yellow Eta Aquarids per hour at peak.

It's even possible you may see a few bright "earthgrazers," which are shooting stars that blaze long and slow along the horizon. And because the Eta Aquarids are very fast meteors, forty percent of them leave long persisting dust trains when they disintegrate.

So go out and catch a falling star or two on the morning of May 6.



Spiral Galaxy in Virgo

M104: Sombrero Galaxy

Glenn Chaple

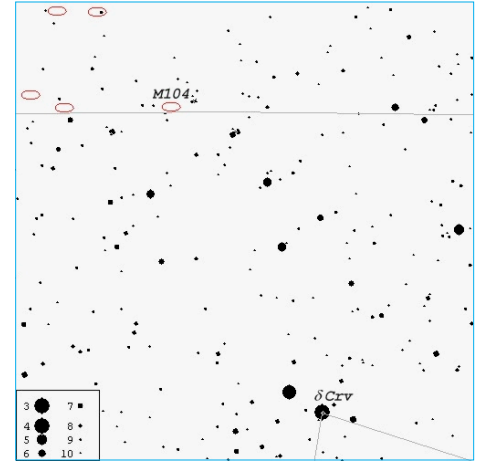
One of the more noteworthy examples of an edge-on spiral galaxy bisected by a dark dust lane is M104, the Sombrero Galaxy. The nick-name arises from the galaxy's resemblance to the traditional Mexican headwear, the bright nuclear bulge forming the hat and the spiral arms/dust lane the wide brim.

Although M104 is located in Virgo, the best launch point for a star-hop is from the 3rd magnitude star delta (δ) Corvi (refer to the accompanying chart). About $2\frac{1}{2}$ degrees north and slightly east of delta is a one degree long arrowhead outlined by a trio of 5th and 6th magnitude stars. The arrowhead points to M104, about 2 degrees further northeast.

At 8th magnitude and possessing a high surface brightness, M104 can be glimpsed in binoculars on a clear moonless (a dark-sky location helps). A small-aperture scope reveals its elongated 8' by 4' shape. The

visibility of the dust lane is dependent on telescope aperture and sky transparency. From regions of truly dark skies, it can be glimpsed with a 4.5-inch telescope. If you live in a suburban area with light-polluted skies, you'll need an 8-inch or larger scope. Even then, the dust lane may be an averted vision feature. The Sombrero Galaxy is one deep-sky object that fairly screams for ultra-dark skies and wide aperture!

If you view the Sombrero with a wide angle eyepiece that magnifies 75X or more and captures a $1\frac{1}{2}$ degree field, you'll see two interesting stellar groupings to the west. The first is a hockey stick shaped arrangement of four 8th magnitude stars that forms the teeth of the shark-shaped asterism Jaws. Further west and slightly south is an amazing triangle-within-triangle arrangement called the Stargate. Visible in small aperture scopes, it's a stunning sight in large instruments.



M104 was discovered by Pierre Mechain in 1781 and independently by William Herschel three years later. Estimates of its distance vary, with recent findings hinting at about 30 million light years. In diameter, it's roughly half the size of our Milky Way.

(L to R) M104, Jaws, Stargate. Photo by Pat Freeman www.astro-pat.com

APRIL REPORTS



Secretary

Tom Thibault

Skyscrapers Annual Meeting Minutes – April 5, 2013

Called to order by President Ed Haskell at 7PM at Seagrave Observatory

At the start of the meeting there was a call for all ballots to be returned to the election committee.

Membership: Introduced for the first time were: Matt White and Matt Olivette.

Officers Reports

First Vice President – Robert Horton: Since May, 2012, there have been 19 speakers at Skyscraper meetings (one or 2 per meeting). Speakers were from: Brown University (4), Skyscrapers (5), and the rest from a variety of places • Summer meetings were held on Saturday Nights (June, July, August) with pot lucks. This plan will continue for 2013, but there will be one pot luck only – to be held at the June meeting. The December meeting was also held on a Saturday with a pot luck, at the Community Center. • Several workshops were held on the topics of: Spectrophotometry, Solar Observing, Double Stars. More are being planned for the future including: Conrad Cardano: Observing for beginners, Pat Landers: Member Observing Nights, and the Transit of Venus. Thank you to all who have participated during 2012. We look forward to more exciting opportunities in 2013.

Second Vice President – Kathy Siok: AstroAssembly 2012 was on the topic of

Citizen Science and was very successful, both in attracting participants and financially. This event is our biggest fundraiser and enables Skyscrapers to run programs during the year. • AstroAssembly 2013 will be held on Friday and Saturday October 4+5th. Arrangements for the community Center and the Caterer have already been confirmed. This year's topic is likely to be: "Observatory Automation" in keeping with our recent interest in our project at Seagrave Observatory. If anyone would be interested in giving a talk, please contact Kathy Siok or Bob Horton.

Secretary – Tom Thibault was not present and there was no report

Treasurer – Lloyd Merrill: It has been a good year financially. The budget was very tight, but thanks to some cost-saving measures and for increased revenue, we ended the year with a \$2000 surplus. AstroAssembly and special Star Parties helped to keep us in the black and are very important to our continued success. • Lloyd will be stepping down as treasurer this year due to health issues. President Haskell commended Lloyd for his excellent management of our finances and budget.

Nominations Committee – Dave Huestis, Jim Hendrickson, Bob Forgiel: Dave Huestis reported that there was one person who responded to the call for nominations (jim Crawford) this year and that the committee was pleased with the slate for 2013.

Historian – Dave Huestis: Dave reported that 2014 is the 100th Anniversary of Seagrave Observatory. A Committee has been formed to work on events to cel-

ebrate this event (Dave, Kathy & Steve Siok.....others.) • A list of all speakers at Skyscrapers over the last 75 + years is available on our website which will be updated regularly. There were articles in 2 local papers about the Society – The Valley Breeze and RI Local. (There are copies of these in the meeting hall.)

Automation Committee – Steve Siok + Tom Thibault: Steve reported that progress has been made on this project and that connections between the 16" and the meeting hall have been established. Several needed accessories have been installed. The plan is to complete this project by October and AstroAssembly. Help is welcomed. Contact Steve Siok or Tom if you would like to be involved.

Trustees – Pat Landers, Steve Siok, Conrad Cardano: Steve reported that the buildings and ground are in fine shape and that a number of minor repairs have been completed this year. A riding mower has been purchased and volunteers are welcome to help with the grass-cutting this summer.

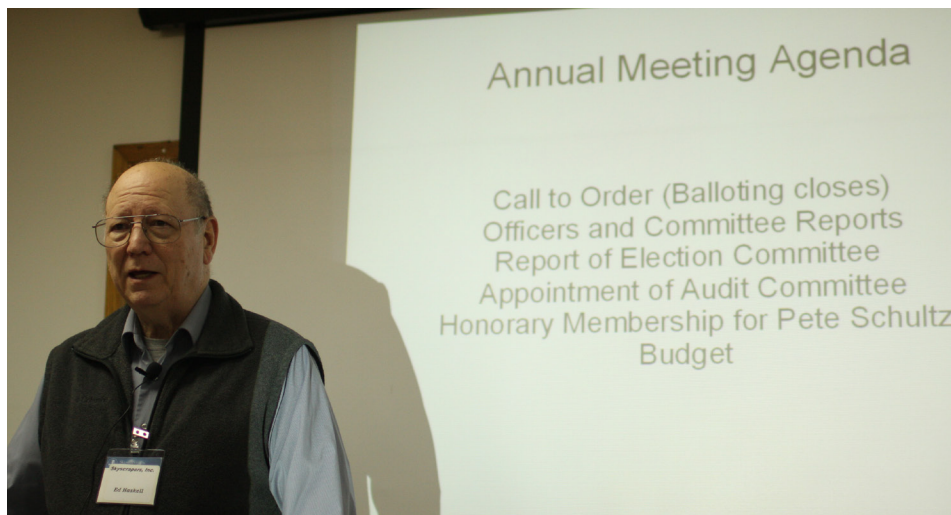
Observatory Committee – Steve Siok reporting: The volunteer schedule for clear Saturday nights has been working well. If anyone would like to join the committee to volunteer to run a telescope about 2 hrs on a Saturday, they should contact Steve.

There will be an audit of the books this year. Since there were no volunteers, President Haskell appointed. Jim Crawford and John Leonelli to work on this committee.

Dave Huestis moved that Dr. Peter Schultz be awarded Honorary Membership to Skyscrapers. Dr Schultz is the director of the Planetary Geology Center at Brown University and has made many contributions to astronomy and to Skyscrapers Inc. The motion was seconded by Tom Barbish. There was a unanimous approval of this motion.

Budget for 2013-14

The budget has been published in the newsletter. President Haskell reported that Skyscraper resources have been managed very carefully to keep us in the black. This continues to be in effect for the future and we need to find new sources of revenue. Star Parties have been a surprising source of funds. It was moved and seconded that the budget be accepted. Questions about the budget were answered. The vote was





unanimous to accept the budget for this year.

For the Good of the Organization

Dave Huestis mentioned that members of the group had helped our neighbor move in January. She was very pleased and recently gave us a \$100 gift card to Pastryland for meeting refreshment.

Dave showed the group a vintage AAVSO Star Atlas that had been returned this evening. It had been borrowed by one of the members about 40 years ago from Rick Lynch.

A new Atlas of the Moon has recently been acquired.

Kathy Siok reported that she had framed a certificate from “NASA The Space Place” thanking Skyscrapers for it’s contributions to public understanding of astronomy.

Gerry Dyck mentioned that three days before the meeting he had seen the ISS transit the sun while doing a sunspot count for the AAVSO. It was the second such surprise sighting. The first time was about two years before that. Both sightings were unplanned and gave special pizzazz to his routine solar observations.

14. Election Committee – Steve Siok

The results of the 2013 Election were reported to the membership: President: Ed Haskell, 1st Vice President: Kathy Siok, 2nd Vice President: Robert Horton,

Secretary: Tom Thibault, Treasurer: Linda Bergemann, Members at Large (2): Pat Landers, Ernie Ross, Trustee (3 yr term) Jim Crawford.

The meeting was adjourned at 7:40 PM and followed by a talk on Double Stars by **Glenn Chaple.**

Following the talk, members gathered on the Observatory grounds and at the telescopes to observe a variety of double stars. All Hall brought his 6” refractor and Dick Parker brought is 4/5” refractor to this event.

Respectfully, Kathy Siok (Secretary Pro Tem)

Skyscrapers Board Meeting Minutes – 3/18/13

Attendees: Ed Haskell, Bob Horton, Kathy Siok, Linda Bergemann, Tom Thibault, Lloyd Merrill, Steve Siok, Conrad Cardano, Jim Crawford, Pat Landers, Dave Huestis and Jim Hendrickson

Meeting called to order at 7:00PM at Seagrave.

Ed Haskell, President: Discussed and viewed draft of “Presidents Award” to be presented at a future meeting. • Continue the emphasis on membership value; suggestions regarding future programs were solicited. • Appointment will be made of a Membership Committee Chairman whom will work closely with our Outreach Coordinator to focus on membership matters and recruitment. • It was noted the society budget year end with a surplus attributed to generous donations and Star Party activity. We should continue to review income opportunities to compensate for possible future shortages in those categories. • Review of the Nomination and Election procedures should be reviewed.

Kathy Siok, 1st Vice President: Noted she would work closely with Bob Horton in light of their swap in positions on the Board.

Bob Horton, 2nd Vice President: Has indicated he has begun contacting potential speakers for AstroAssembly which will be of an Automation Theme. • Noted the success of the Double Star challenge held at the April 5th Members Meeting and welcomed suggestions for future programs.

Tom Thibault, Secretary: Suggested the process of planning AstroAssembly be documented as a guide for future 2nd Vice

Presidents Kathy and Bob agreed and will work together on this while preparing for this year’s event.

Dave Huestis, Historian: Informed the group that Seagrave Centennial Calendars will be produced for sale at AstroAssembly.

Trustees: Steve Siok noted a demonstration of the Automation is planned for possibly May or June. It will feature the abilities of remote control and image display from the meeting hall. • Jim Crawford suggested increase public awareness activities be considered to promote Skyscrapers and Seagrave Observatory. • Conrad Cardano noted concerns when large groups visit Seagrave. A handout outlining what we have to offer during their visit. It should also include conduct on the grounds that are expected.

Meeting adjointed at 9:02PM

Submitted by Tom Thibault - Secretary



Treasurer
Lloyd Merrill

Cash Flow YTD April 28, 2013

Category Description	4/1/2013-3/30/2014
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INFLOWS

Donation	
Starparty Donations	\$30.00
Other Donation	\$40.00
TOTAL Donation	\$70.00
Dues	
Family	\$180.00
Regular	\$240.00
Senior	\$100.00
TOTAL Dues	\$520.00
TOTAL INFLOWS	\$590.00

OUTFLOWS

Facilities Expense	
Electric	\$14.98
Trustee Exp	\$85.00
TOTAL Facilities Expense	\$99.98
TOTAL OUTFLOWS	\$99.98
OVERALL TOTAL	\$490.02

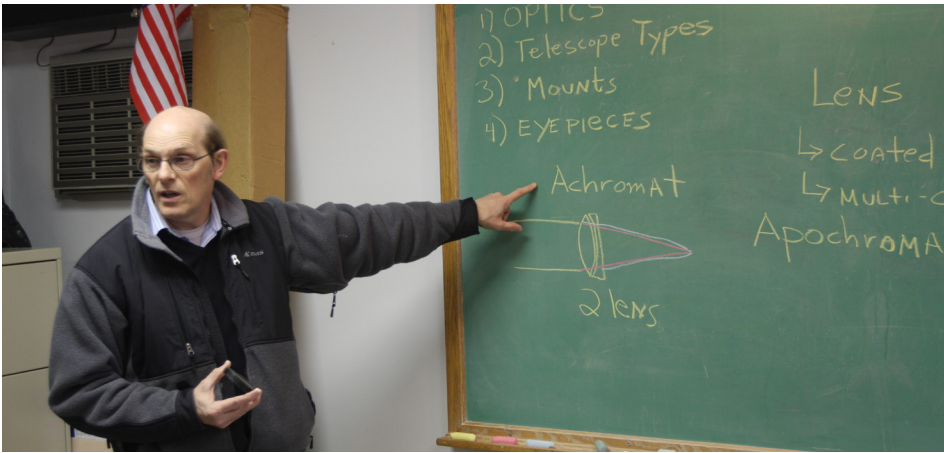
Cash and Bank Accounts	4/28/2013 Balance
Capital One Bank	12,301.50
Checking	11,251.41
PayPal Account	0
TOTAL ASSETS	23,552.91

WHAT'S HAPPENING AT SEAGRAVE OBSERVATORY



Following our April meeting with Glenn Chaple, we opened the observatory for a "Double Star Challenge" with a list of double stars provided by Glenn. Several members brought telescopes for a pleasant evening of observing, although a persistent breeze added to the challenge. Among the telescopes set up on the grounds were Dick Parker's 4-inch refractor and Al Hall's 6-inch, the lens of which is destined for his 3/4 scale replica of our 1878 Alvan Clark.





April 6: Open Night at Seagrave Observatory



April 13: Open Night at Seagrave Observatory



April 20: Astronomy Day, Star Party & Night at Seagrave Observatory



April 27: Open Night at Seagrave Observatory

Astronomy Day Telescope Workshop

On April 20, Astronomy Day, Conrad Cardano conducted an introduction to telescopes workshop at Seagrave Observatory. Our guests were George Petitto and Vin Pasquale.



Exploring the Water World

By Diane K. Fisher

In some ways, we know more about Mars, Venus and the Moon than we know about Earth. That's because 70% of our solar system's watery blue planet is hidden under its ocean. The ocean contains about 98% of all the water on Earth. In total volume, it makes up more than 99% of the space inhabited by living creatures on the planet.

As dominant a feature as it is, the ocean—at least below a few tens of meters deep—is an alien world most of us seldom contemplate. But perhaps we should.

The ocean stores heat like a “fly wheel” for climate. Its huge capacity as a heat and water reservoir moderates the climate of Earth. Within this Earth system, both the physical and biological processes of the ocean play a key role in the water cycle, the carbon cycle, and climate variability.

This great reservoir continuously exchanges heat, moisture, and carbon with the atmosphere, driving our weather patterns and influencing the slow, subtle changes in our climate.

The study of Earth and its ocean is a big part of NASA's mission. Before satellites, the information we had about the ocean was pretty much “hit or miss,” with the only data collectors being ships, buoys, and instruments set adrift on the waves.

Now ocean-observing satellites measure surface topography, currents, waves, and

winds. They monitor the health of phytoplankton, which live in the surface layer of the ocean and supply half the oxygen in the atmosphere. Satellites monitor the extent of Arctic sea ice so we can compare this important parameter with that of past years. Satellites also measure rainfall, the amount of sunlight reaching the sea, the temperature of the ocean's surface, and even its salinity!

Using remote sensing data and computer models, scientists can now investigate how the oceans affect the evolution of weather, hurricanes, and climate. In just a few months, one satellite can collect more information about the ocean than all the ships and buoys in the world have collected over the past 100 years!

NASA's Earth Science Division has launched many missions to planet Earth. These satellites and other studies all help us understand how the atmosphere, the ocean, the land and life—including humans—all interact together.

Find out more about NASA's ocean studies at <http://science.nasa.gov/earth-science/oceanography>. Kids will have fun exploring our planet at The Space Place, <http://spaceplace.nasa.gov/earth>.

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



Call for Photos

Skyscrapers members, in 2014 we will be celebrating the Centennial anniversary of our observatory in North Scituate. Frank Seagrave moved his 8-inch Clark refractor to the once dark skies on Peeptoad Road in 1914 from his old observatory on Benefit Street in Providence to escape the gas lamps and coal dust that were affecting his observations.

A committee has been formed, and we will be exploring ways to commemorate this special event.

Without going into the details (we want there to be some pleasant surprises), I am asking our long time members to search through their picture and slide archives looking for images that show Seagrave Memorial Observatory throughout the decades. I am particularly interested in images from the 50's through the 70's. Whatever format you have, please have them scanned at a high resolution (at least 2400dpi for slides and 300dpi for prints) and saved as uncompressed tiff or jpeg formats. We need raw images. Do not tweak them in any way.

When submitting your image(s) please provide as much detail as possible, including date, etc.

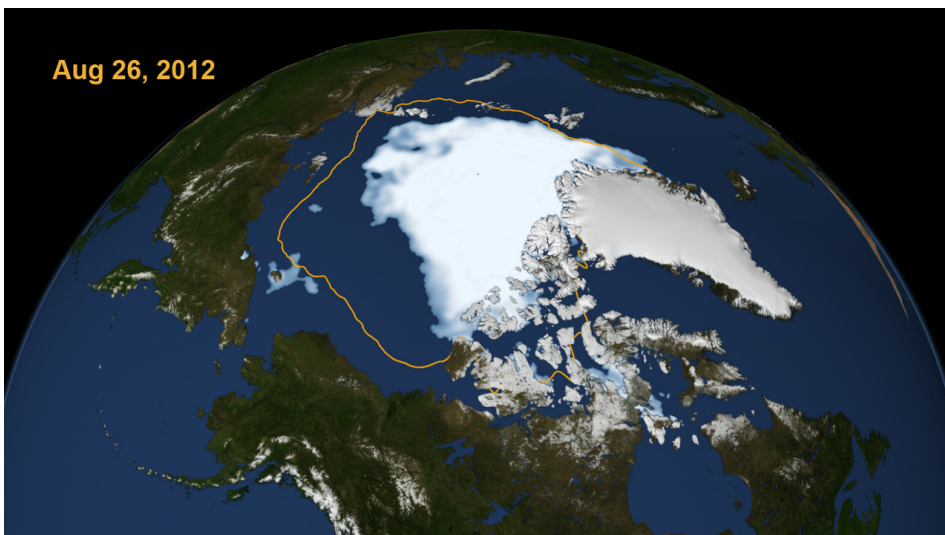
By submitting you are also giving Skyscrapers permission to reproduce your image(s), giving you full credit, in whatever media we choose to help illustrate the history of the observatory.

For a variety of reasons the deadline is May 1, 2013. Yes, this May!! However, please don't wait until that date to submit your image(s). Please submit when you find one or two. Don't hold them and submit all at once. Depending upon the resolution of your scan, we may have to ask to borrow your original to have it professionally scanned at a higher resolution.

You may submit your images by email to me at: dhuestis@aol.com

Help us as we prepare to celebrate the Centennial anniversary of Seagrave Memorial Observatory.

David A. Huestis, Historian



This image from September 2012, shows that the Arctic sea is the smallest recorded since record keeping began in 1979. This image is from NASA's Scientific Visualization Studio at Goddard Space Flight Center.

Skyscrapers members attended Brown University Physics Department's Arthur. O. Williams Public Lecture "From Mars to the Multiverse" by **Martin Rees**. Present were Ian Dell'Antonio, Gerry & Helga Dyck, Jim Hendrickson, Dave Huestis, Bob Horton, Francine Jackson, Savvas Koushiappas and Steve Siok.



Evening Planetary Conjunction in Late May





May 27

Mercury
Jupiter Venus

May 29

Mercury
Venus
Jupiter

May 31

Mercury
Venus
Jupiter

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.
- 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.



47 Peeptoad Road
North Scituate, Rhode Island 02857