



the Skyscraper

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



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Saturday, July 13 at Seagrave Memorial Observatory

7:00pm **Refreshments**

7:30pm **Astronomy Above the Antarctic**
by Prof. Gregory Tucker

Flying telescopes on high altitude balloons from the Antarctic provides relatively low-cost access to a space-like environment. This talk will describe two experiments which have been developed to answer questions about what happened during the first fraction of a second after the Big Bang to how stars form.

Prof. Tucker joined the Brown faculty in 1997. A graduate of M.I.T., he received a Ph.D. from Princeton University. Prior to joining the Brown faculty, he did postdoctoral work at the University of British Columbia and was a physicist at the Harvard-Smithsonian Center for Astrophysics. He grew up in Lexington, MA.

9:00pm **Observing at Seagrave Observatory**



President's Message

Ed Haskell

Regular readers of my monthly letters will recall that several times I have alluded to the Observatory Automation Project led by Steve Siok and Tom Thibault. This month it is particularly timely that I update you on the progress being made by this project.

In the interest of space and for the sake of my carpal tunnel syndrome I will not recap every detail that has been handled but will stick to some of the major tasks completed. You may recall that this project is subdivided into many tasks which various members or groups of members are handling.

One of these is security of the observatory buildings. Through the efforts of Tom Thibault the window into the Clark building has been secured by the donation of a professional security shutter at no cost to the Society.

Another requirement is the provision of a remotely controllable motorized drive to open and close the slide-off roof of the 16 inch Meade. This expensive facility has also been obtained at no cost to the Society and is nearing completion as I write this.

When the 16 inch scope was purchased it was configured to permit eventual remote access. That facility has been updated and additional equipment added such that it is now possible to control the telescope and display what it is seeing at a remote location, in this case the Meeting Hall. While the initial design was for a video transmission from the telescope the passage of nearly 13 years has made it technically feasible to handle control and imaging signals over Ethernet, the foundation for the INTERNET. Thus the connection between the 16 inch and the Meeting Hall will be by local area network (LAN) and in a future upgrade this will be extended to wide area networking (WAN) otherwise know as the INTERNET, for viewing in member homes.

I said above that this report is timely. This is because at the July meeting members of the Observatory Automation Project will give a live demonstration as part of the program. So if you were teetering on the edge of attending on the 13th I hope this will push you over the edge.

Thanks for all you do for Skyscrapers.



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 **July 19** 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



Naming July's Full Moon "Apollo Moon" in Honor of the First Moon Landing



Francine Jackson

It's really hard to believe, but next July, 2014, marks the 45th anniversary of the first men on the Moon. For those of us able to remember watching this riveting sight, it was to be the first of not only visits by NASA astronauts, but the first of private enterprise, as we waited for the next step, "colonization," and the ability for all to be able to set foot on our nearest neighbor, allowing us to observe the Earth as only a small number of people had.

But, as we all know, that wasn't the aim of the Apollo mission - it was more a test of which country had the better technology. And we, the U.S., won. Now, over forty years since the last set of explorers walked on the Moon's surface, many of the younger generation are unaware of the incredible feat performed in the 1960s, to the point

that they can't imagine ever leaving Earth. How sad.

Every month, the Farmer's Almanac gives us many names for the Full Moon, from Strawberry in June to mark the abundance of the fruit, to the traditional Harvest and Hunter as the fall season commences. The Moon names are traditional, coming mainly from our survival roots. But, why shouldn't we name a monthly Full Moon to commemorate what to the "baby boomers" was the adventure to end all adventures? Especially now, as we have lost Neil Armstrong, the first man to place his boots on the Moon, we should try our best to recall the Fantastic Voyage of the last century. Skyscrapers, Inc., should lead the field in the push to name the July Full Moon the Apollo Moon.



Phases of the Moon

New Moon

July 8 07:14

First Quarter Moon

July 16 03:18

Full Apollo Moon

July 22 18:16

Last Quarter Moon

July 29 17:43

Telescopes & Lending Library Available to Members

We own a number of **telescopes** of different sizes, sophistication, and quality which are **available for loan to members**. If you do not own a telescope but wish you had access to own sometimes, or if you do own a scope but would like to try out other types and sizes, then you should converse with one of the Trustees about the procedure for borrowing an instrument.

The Society has a fairly large **library** of astronomy related books and other media which is **available to the membership**. In addition to the obvious value as a reference resource these volumes can be helpful in letting you study a title carefully before spending limited astronomy funds on your own copy. **Alex Bergemann** is the librarian and will be happy to assist you.



8-inch Newtonian Loaner scope



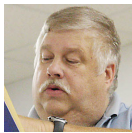
10-inch SCT Loaner scope



Skyscrapers Library



EXIT PUPIL CREATIVE WORKSHOP
BY: SCOTT MACNEILL



Some Treasures of the Summer Milky Way From Perseus to Sagittarius

Dave Huestis

Last month I lamented the fact that during the summer months amateur astronomers have to wait so long before darkness falls before we can begin our observing sessions. However, as the saying goes, “Good things come to those who wait.” For once twilight fades we can focus our attention, binoculars and telescopes on the majesty of the summer sky and all the astronomical treasures it contains.

At 10:30 pm during the beginning of July, from a sky not severely limited by light pollution, an observer will notice a milky

patch of light well above the eastern horizon and spanning the sky from north to south. Though an inexperienced observer may mistake this glow as thin cirrus clouds, it is really the light from some of the 400 billion stars of our Milky Way galaxy. We view it from a vantage point about two-thirds of the way out from the galaxy center in one of its four spiral arms. This perspective, gained from a great distance, allows us to observe it as a flattened disk with a central bulge.

While the mythology of the constella-

tions up and down the Milky Way is truly fascinating, I only wish to highlight some of the beautiful sights that can be observed. There is something here for everybody. You can simply use your unaided eye, or grab that pair of binoculars from the closet or drawer (7x35s or 7x50s work very well for this task), and scan the entire length of that hazy cloud of starlight.

We’ll start our brief Milky Way tour in the northern sky. (Download a free planisphere/star wheel at <http://www.lawrence-hallofscience.org/starclock/starwheel.pdf>.)



Locate the constellation of Cassiopeia which is shaped like the letter W. Farther towards the north is Perseus. Between the two patterns we can easily see the Double Cluster with the naked eye. While binoculars will enhance the view, a telescope under low magnification will reveal the magnificent beauty of this open cluster of stars.

Our next stop “down” (south) the Milky Way is the constellation Cygnus the Swan (also known as the Northern Cross). This celestial avian is immersed in the myriad of stars that comprise the Milky Way. More than likely you’ll recognize the pattern of a cross before you see a swan in these stars. It is here in the Cygnus region where the Milky Way divides into two bands, separated by obscuring dust called the Great Rift. Take a look with binoculars to start

with and scan this area. It is a very beautiful region of space. If you have a telescope of any size, don’t hesitate to sweep this area. Agnes Clerke, a late 19th- and early 20th-century astronomy writer described Cygnus as “perhaps the most lovely effect of colour in the heavens.” Indeed, there are more red and orange colored stars in this region of space than anywhere else in the sky. The red stars are most striking. You will be well rewarded for your search efforts.

Deneb, the northernmost and brightest star of the constellation, forms the top of the cross (or the tail of the swan). Use binoculars to locate a large open cluster of stars north of Deneb. It’s called M39. Objects with the “M” prefix were catalogued by French astronomer Charles Messier (1730-1817) while he was hunting for comets.

M39 contains about 20 bright stars. A low-power eyepiece on a small telescope will allow the object to fill the entire field of view.

Just south from Sadr, the center star of the cross, one can find another open cluster called M29. This cluster is more compact than M39 and only contains about eight bright stars. The four brightest stars of this group form a square. The cluster can be found using binoculars, but a low-power telescope will enhance the view.

Head farther down the Milky Way from Sadr and you’ll come to Albireo at the base of the cross. Albireo means “beak,” and represents the beak of our swan. This gem is one of the finest double stars in the sky. It seems double star observers have always tried to outdo one another when describing the often contrasting colors of the star sys-

tem pairs they were observing. For instance, the components of Albireo were described as topaz yellow and sapphire blue. Well, I call them the Cub Scout stars, blue and gold. The scouts who visit us at Seagrave Observatory certainly like that description.

Continuing our journey south we come to the constellation of Scutum and a star cloud of the same name. In a dark sky, your eye will see a much greater expanse of milky haze. This eastern band is one of the brightest in the Milky Way because there is no intervening dust and gas to block our view of the stars. Astronomer E.E. Barnard (1857-1923) wrote, "the stars pile up in great cumulus masses like summer clouds." A prominent open cluster, M11, also known as the Wild Duck Nebula, can be found here.

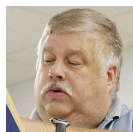
As we continue our journey down the Milky Way we encounter star rich regions of our galaxy. We can observe many open clusters of stars, like M21, M23 and M25 in Sagittarius. While in one mythological tale this star pattern represents an archer, today Sagittarius is more recognizable as a teapot. In fact, with the handle to the east and the spout to the west, the Milky Way appears to be steam pouring forth from it. Along the way we encounter the Eagle Nebula (M16) in Serpens Cauda, and intriguing nebulae with names like Trifid (M20) and Lagoon (M8) in Sagittarius.

These highlights are just the tip of the proverbial iceberg for celestial sights to observe within our home galaxy. I hope you will take an opportunity to tear yourself away from your television, computer screen

and mobile device to spend some quality time gazing at the beauty of the Milky Way.

Dark skies do still prevail at some of the local observatories where you can explore the Milky Way with other sky enthusiasts. 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 will reopen on Tuesday, July 16, providing the sky is clear. Frosty Drew Observatory (<http://www.frostydrew.org/>) in Charlestown's Ninigret Park is open every clear Friday night year-round. Be sure to check all the websites for the schedules and opening times before visiting these facilities.

Keep your eyes to the skies.



ISON Update & Call for Comet Photos

Dave Huestis

Skyscrapers is in the process of organizing member and public outreach programs for Comet ISON.

The outreach will include lectures on

comets in general, Comet ISON in particular, and also an introduction to Skyscrapers.

As part of our presentation on comets we would like to include comet images tak-

en by Skyscrapers members.

Many of our members have captured great images of comets throughout the decades. Please consider sharing your gems with your fellow Skyscrapers and the public alike.

The deadline for submissions is Tuesday, September 3.

I have already begun working on a column about comets, and some of those details will be included in a Powerpoint presentation. If you can do so, please submit your images well before the deadline. Your early efforts will allow me to get an early jump on creating the program.

If your images are already digital files, then just send them along.

If they are older slides or black and white negatives, please scan them at a high resolution.

Either way, note the details of the image captured and send to my email address listed below.

If ISON survives its very close perihelion on November 28, we are also hoping to offer observing opportunities at multiple locations after sunset. Unfortunately, due to the high tree-line to the west and northwest of our telescopes at Seagrave, Skyscrapers will not be able to offer evening views of the comet until January.

Thank you for your consideration.

Keep your eyes to the skies.



When this Hubble Space Telescope picture was taken on April 10, Comet ISON was slightly closer than Jupiter's orbit at a distance of 386 million miles from the Sun. NASA, ESA



Our Friend Sol

Mark Sweberg

A very hearty welcome to everyone, especially newcomers to astronomy who feel intimidated by the expertise of the Rhode Island astronomy community. Herein is offered a monthly look at the Universe geared to beginners, as seen through the perspective and enthusiastic eyes of a beginner—me. Together, we'll explore the awesomeness of the sky and try to understand many of the imponderables of the Universe. We'll marvel together as we gaze into the same spaces our distant ancestors did, ask the same questions they did, and forge our place in the link between the past and future.

We'll start our explorations not with the nighttime sky, often thought the realm of astronomy, but rather, daylight time. To be sure, distant stars and planets populate the daytime sky as they do nighttime, but for our own star, the Sun, go unviewable. We'll come to appreciate the Sun, this beautiful orb of energy. And, we'll acknowledge that mankind's romance with her will be but a brief fling, for she will die in a mere five billion years; a drop in the bucket in cosmic time.

First a geography lesson. Rhode Islanders constantly hear our state referred to as a unit of measurement. Rhode Island natives learned in the hallways of elementary school from classmates speaking in hushed tones that 257 Rhode Islands' fit into Texas

or that 634 fit into Alaska.

I tell you this because, today, we are implored to think globally and act locally. Okay. Acting locally implies visiting Seagrave Observatory or any other local Observatory open for public viewing.

Thinking globally infers that one million Earths can fit into the Sun. The diameter of the Earth is almost 8,000 miles (12,750 kilometers). That of the Sun is 865,000 miles (1.39 million kilometers). That's huge! Yet, the Sun is a baby compared to many of its other cousins. There are an estimated 1021 stars in our Universe. If you write that number out, it looks like this: 1,000,000,000,000,000,000. The largest of these approach a size about 800 times that of our Sun. These truly are the cosmic Alaska's.

Don't like summer heat waves? Consider this: the temperature at the core of our Sun is about 29 million °F (16 million °C.) Temperatures at the surface are a balmy 9,900° F (5,500°C.) Really? Earth bound fire fighters routinely enter burning infernos of 1,100°F (593°C) to save life and property. Disgruntled restaurant customers burn their palettes on hot beverages a lot cooler than that, and routinely sue the restaurant!

And, then there are sunspots to consider. Sunspots are funny things. Sunspots on the photosphere (surface) of the Sun are large.

An average sized sunspot is about the same size as the Earth. There we go again, thinking globally. They are cooler than the adjacent surface of the Sun. They travel slowly across the Sun in groups. They are on an 11 year cycle of heightened activity. Also, they are magnetized. And, just for good measure, they change their polarity every 11 years. What was north becomes south and vice versa. When you think about it, sunspots are really awesome.

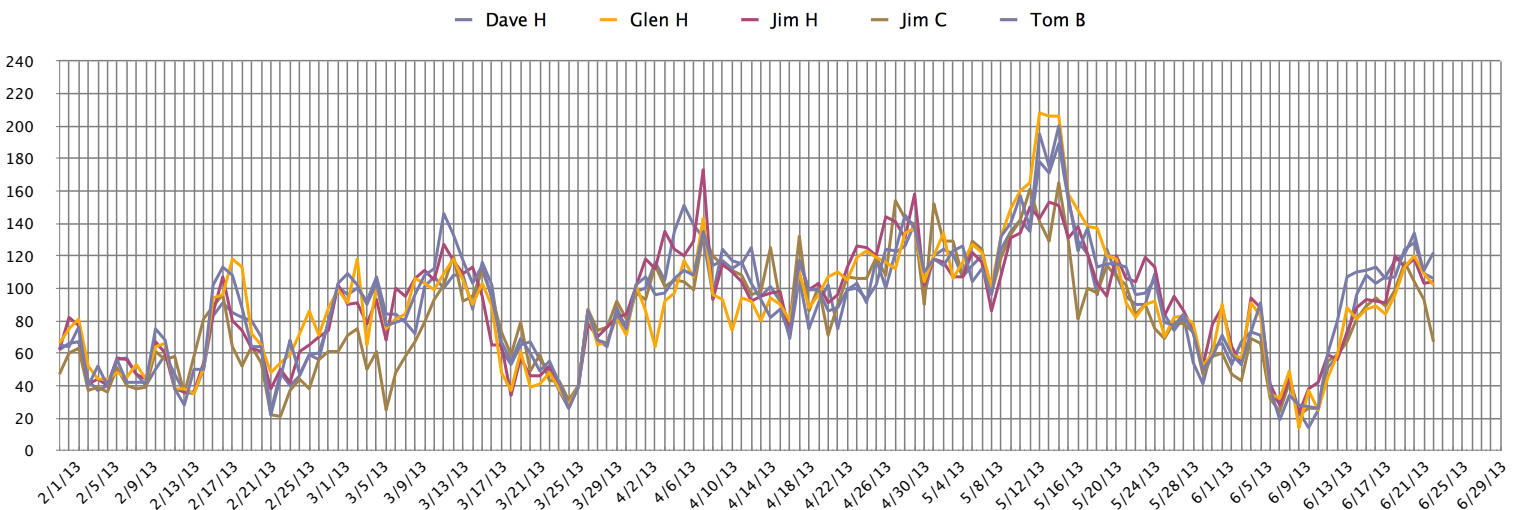
Still, I have a gripe with sunspots. They disrupt communications on earth and do other dastardly deeds. For instance, 1970's CB radios were a great thing while traveling on the highway. Huge convoys of cars and trucks would form, their drivers all talking to each other. You could acquire a funny handle. Everybody and his brother rushed out to get a CB radio. Sadly though, their popularity diminished over time. Why? Among other reasons, sunspot activity interfered with the transmission of their radio waves over long distances. As with the dinosaurs, who got dumped on by an asteroid (a subject for a future column), the Universe had its say. Many a grown man cried, but hey, we still have the song: Convoy, <http://www.youtube.com/watch?v=FcaeYmT4wsg>.

In closing, I hope you have a keener appreciation of the nurturer of all life, our Sun. Next month, we'll continue our explorations. See you then!

Mark Sweberg

Your comments on this column are welcome. E-mail me at mark.sweberg@gmail.com

Skyscrapers Daily Relative Sunspot Number Comparisons





Binary Star: Ras Algethi (Alpha Herculis)

Scott MacNeill

Summer break is here and what a great time to be looking to the sky. July brings warm, late nights with the beautiful wisps of the Milky Way galaxy hanging high overhead. The BBQ is ripping, the beach is hopping, what better way to end a great summer day than a night under the stars. This month we will take a celestial trip 350 light years away into the edge of the constellation Hercules as we zoom in on the stunning binary star, Ras Algethi.

Among some of the brighter stars in the sky, Ras Algethi, has a visible magnitude of 2.8 and is found 350.6 light years away from Earth. This fantastic binary system is made up of two stars with a narrow 4 arcseconds of separation. The companion star, Alpha Hercules B, has a spectral classification of G5+F2 blazing bright blue-green and is also a binary system comprised of two stars. Though we will not be observing this smaller binary system. The primary

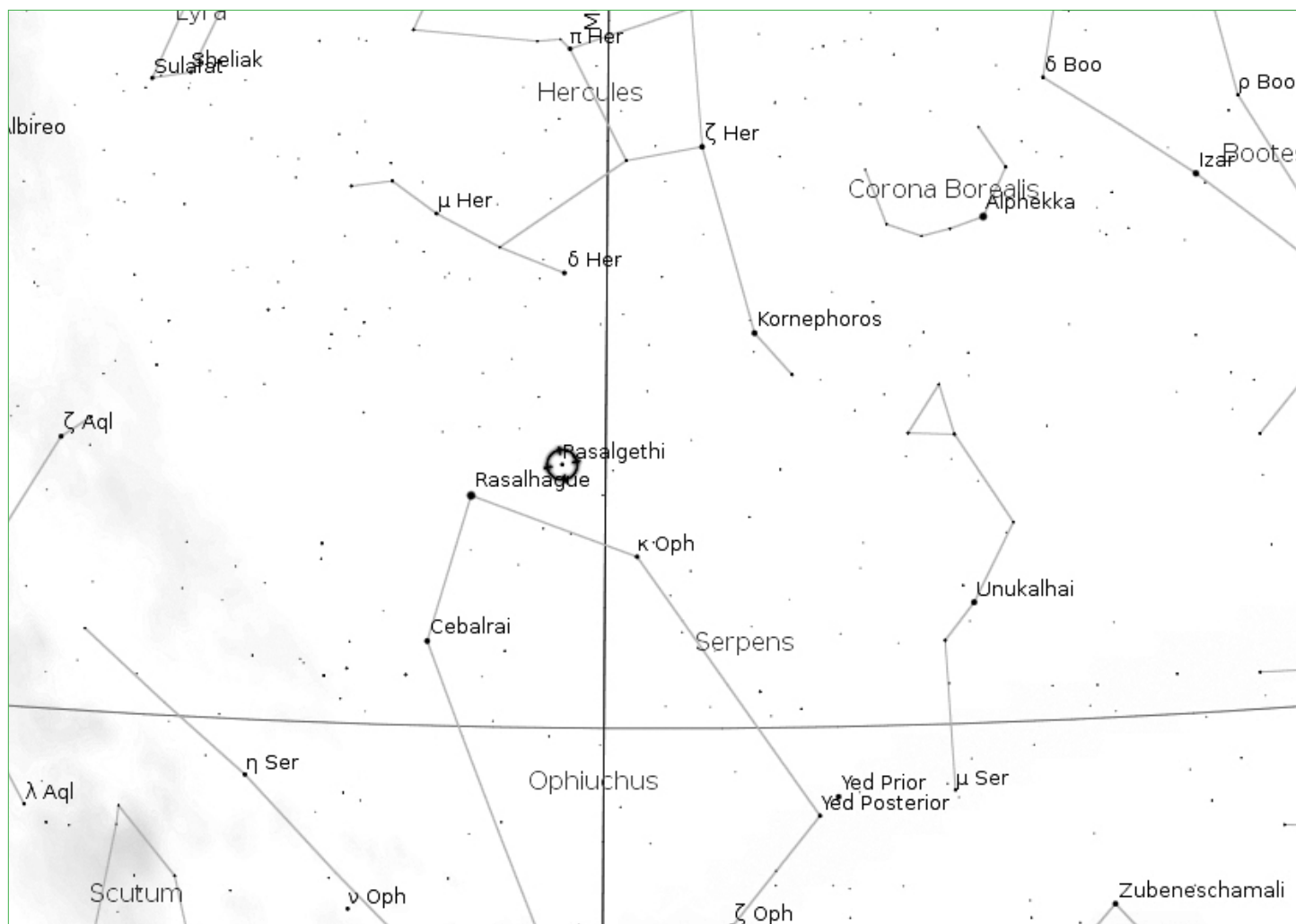
star, Alpha Hercules A, is a huge red super giant that has a diameter the size of Earth's orbit, a spectral classification of M5, and shows off a clear stark orange.

Finding Ras Algethi in the night sky is a snap. With a bright 2.8 magnitude, this star will stand out even when viewed under moderate to intense light pollution. At mid-July just after 10:00 p.m. EDT, while facing South, Ras Algethi will be about 62° degrees above the horizon when viewed from Southern New England. Look for the brightest star in this area, which is the super bright 2.0 magnitude star Rasalhague, the head of Ophiuchus. Once Rasalhague is identified, hop 3° west and slightly north to the next brightest star. This is Ras Algethi.

Observing Ras Algethi will be easily suited for a good quality backyard telescope. At 4 arcseconds of separation, both stars will appear quite close to each other.

If observing with less than 100x magnification, the light from both stars will coalesce making the star look elongated or oblong. Distinct separation of the binary couple will become clearer at 80x-90x magnification with clearly visible separation becoming apparent at 100x magnification or more. Expect a sharply bright orange color from the primary star with a pearlescent blue shifting to hints of green emanating from the companion star.

Take a good long look at Ras Algethi. Relax your eye into the beautiful colors that this binary star shows off. Once you have had your fill of Ras Algethi, take an addition moment to slightly blur your focus and the color differences will become overly apparent. Then take a moment to place a "A" for AWESOME next to this star on your list of summer binary goodness.



Globular Cluster in Scorpius

M80

Glenn Chaple

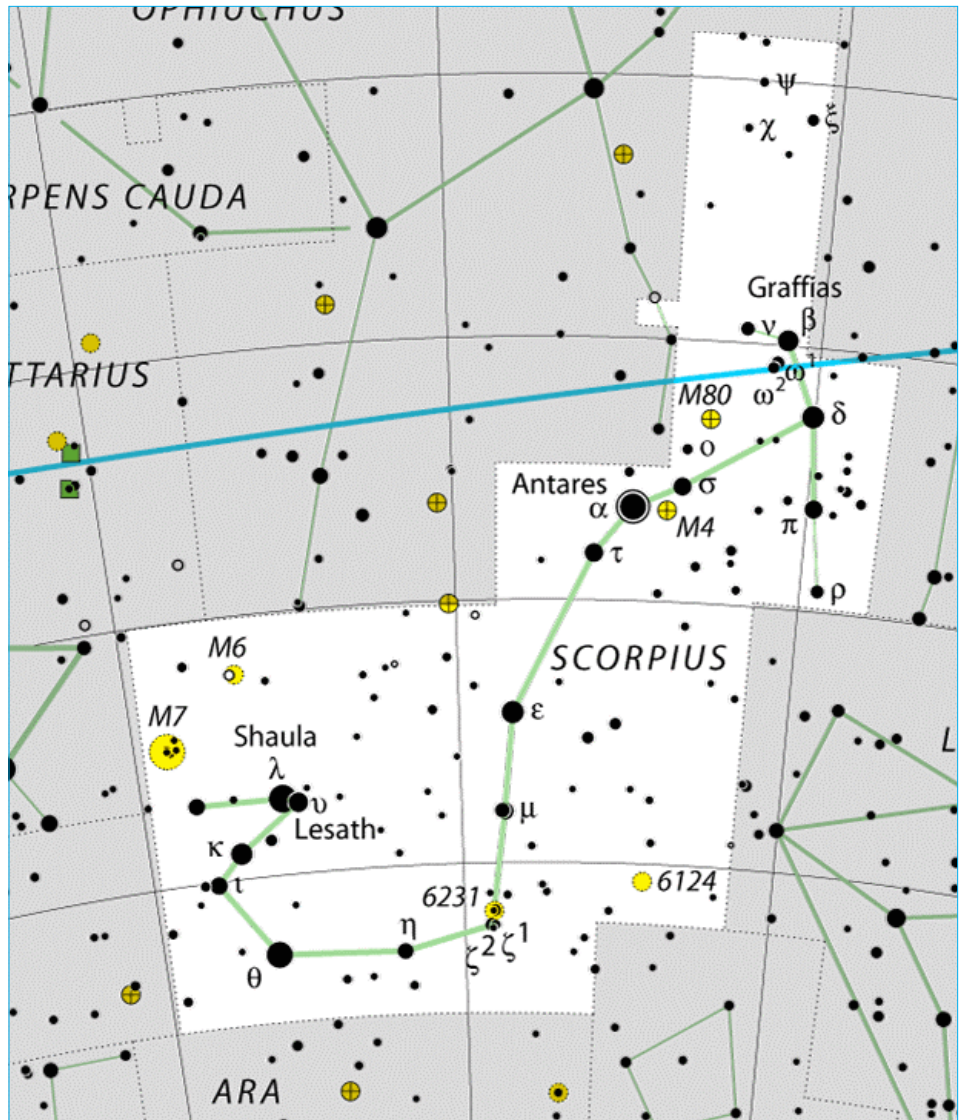


From last month's featured object, the challenging double-double nu (ν) Scorpii, we dip 4 arcminutes south and slightly east to a point roughly midway between Antares (α Scorpii) and Graffias (β Scorpii). The small 7th magnitude fuzzball we encounter when viewing this area with binoculars or low-power rich-field scope is the globular cluster M80.

M80 was discovered on January 4, 1781, by Charles Messier, who wrote, "The nebula is round, the center brilliant, and it resembles the nucleus of a little comet, surrounded with nebulosity." William Herschel observed M80 four years later and called it "one of the richest and most compressed clusters of small stars I remember to have seen."

This compression is obvious, even when M80 is viewed with small telescopes. In the spring of 1971, despite being an inexperienced backyard astronomer and using a modest 3-inch reflecting telescope and magnification of just 30X, I easily noted its "small and condensed" appearance. More recently, I returned to M80 with a 4.5-inch f/8 reflector and a boost in magnification to 150X. Despite this jump in aperture and magnifying power, I was still unable to resolve any cluster members. No surprise, because M80 – at least its core – is all but impossible to resolve. The outer region appears grainy when viewed with medium to large aperture scopes.

Most sources cite a distance to M80 of between 28,000 and 36,000 LY. Cramped within its 95 LY diameter are several hundred thousand stars. Herschel was right. M80 is truly one of the densest globular clusters in the Galaxy.



Star chart from www.constellation-guide.com.
Photo by Mario Motta M.D.

JUNE REPORTS



Secretary
Tom Thibault

Skyscrapers Annual Meeting Minutes – June 8, 2013

2nd Vice President Bob Horton called the Skyscrapers June Members Meeting to Order at 7:20PM after our Pot Luck dinner.

2nd Vice President Bob Horton: A number of speakers have been confirmed for the October 4-5 AstroAssembly with additional speakers awaiting confirmation, more details to come. • AstroAssembly volunteers will be needed to assist in our organizations premier event, please consider in lending a hand.

Trustee Steve Siok Informed the membership the restroom facilities have been upgraded with a light to assist with night time deposits.

Trustee Conrad Cardano: The Inn at Castle Hill is looking for those with telescopes to share the night skies with guests of their facilities, feel free to contact them if you have an interest.

Secretary Tom Thibault on behalf of **Treasurer, Linda Bergemann:** Introduced for future membership consideration were George Petitto and Richard Savignano.

Dave Huestis, Historian: Good of the Organization: Donated a signed copy of Kim Arcand book, "Your Ticket to the Universe". • Noted the recent Smithfield Magazine which featured Solar Observing and a photo of Bob Forgiel's telescope equipment that was used. • Requested any member photographs from past and recent comets for use in preparing a program for use with the upcoming ISON comet.

Speaker, David Gow provided the membership with an overview of his work in restoring the Saegmuller Telescope Clock Drive at Ladd Observatory. He also noted other significant projects he has worked over many years in his career.

Bob Horton closed the meeting at 8:40PM and invited the membership to stay and enjoy the views through the organizations telescopes which are open for rest of the evening.

Submitted by Tom Thibault - Secretary



Treasurer
Linda Bergemann

Cash Flow YTD July 1, 2013
(4/1/2013 through 3/31/2014)

INFLOWS

Donation	
Misc Donation	\$132.00
Refreshment Donation	\$30.20
Starparty Donations	\$54.00
TOTAL Donation	\$216.20
Dues	
Contributing	\$134.05
Family	\$240.00
Regular	\$790.00
Senior	\$225.00
TOTAL Dues	\$1,389.05
Subscription Income	
Astronomy	\$290.00
Sky & Telescope	\$197.70
TOTAL Subscription Income	\$487.70
TOTAL INFLOWS	\$2,092.95

OUTFLOWS

Facilities Expense	
Electric	\$57.57
Propane	\$80.25
Property Maintenance Fund	\$198.00
Trustee Exp	\$264.09
TOTAL Facilities Expense	\$599.91
Misc Expenses	
Corporation, State Fee	\$30.00
Postage and Delivery	\$9.20
Refreshment Expense	\$49.36
TOTAL Misc Expenses	\$88.56
Subscription Payments	
Astronomy	\$290.00
Sky & Telescope	\$197.70
TOTAL Subscription Payments	\$487.70
TOTAL OUTFLOWS	\$1,176.17
OVERALL TOTAL	\$916.78

Cash and Bank Accounts - As of 7/1/2013

Capital One Bank	\$12,310.71
Checking	\$11,694.83
PayPal Account	\$0.00
TOTAL Bank Accounts	\$24,005.54



David Gow

AstroAssembly
2013
Friday, October 4
& Saturday, October 5



High-Energy Spy

By Dr. Martin C. Weisskopf

The idea for the Chandra X-Ray Observatory was born only one year after Riccardo Giacconi discovered the first celestial X-ray source other than the Sun. In 1962, he used a sounding rocket to place the experiment above the atmosphere for a few minutes. The sounding rocket was necessary because the atmosphere blocks X-rays. If you want to look at X-ray emissions from objects like stars, galaxies, and clusters of galaxies, your instrument must get above the atmosphere.

Giacconi's idea was to launch a large diameter (about 1 meter) telescope to bring X-rays to a focus. He wanted to investigate the hazy glow of X-rays that could be seen from all directions throughout the sounding rocket flight. He wanted to find out whether this glow was, in fact, made up of many point-like objects. That is, was the glow actually from millions of X-ray sources in the Universe. Except for the brightest sources from nearby neighbors, the rocket instrument could not distinguish objects within the glow.

Giacconi's vision and the promise and importance of X-ray astronomy was borne out by many sounding rocket flights and, later satellite experiments, all of which provided years-, as opposed to minutes-, worth of data.

By 1980, we knew that X-ray sources exist within all classes of astronomical objects. In many cases, this discovery was completely unexpected. For example, that first source turned out to be a very small star in a binary system with a more normal star. The vast amount of energy needed to produce the X-rays was provided by gravity, which, because of the small star's mass (about equal to the Sun's) and compactness (about 10 km in diameter) would accelerate particles transferred from the normal star to X-ray emitting energies. In 1962, who knew such compact stars (in this case a neutron star) even existed, much less this energy transfer mechanism?

X-ray astronomy grew in importance to the fields of astronomy and astrophysics. The National Academy of Sciences, as part



Composite image of DEM L50, a so-called superbubble found in the Large Magellanic Cloud. X-ray data from Chandra is pink, while optical data is red, green, and blue. Superbubbles are created by winds from massive stars and the shock waves produced when the stars explode as supernovas.

of its "Decadal Survey" released in 1981, recommended as its number one priority for large missions an X-ray observatory along the lines that Giacconi outlined in 1963. This observatory was eventually realized as the Chandra X-Ray Observatory, which launched in 1999.

The Chandra Project is built around a high-resolution X-ray telescope capable of sharply focusing X-rays onto two different X-ray-sensitive cameras. The focusing ability is of the caliber such that one could resolve an X-ray emitting dime at a distance of about 5 kilometers!

The building of this major scientific observatory has many stories.

Learn more about Chandra at www.science.nasa.gov/missions/chandra. Take kids on a "Trip to the Land of the Magic Windows" and see the universe in X-rays and other invisible wavelengths of light at spaceplace.nasa.gov/magic-windows.

Dr. Weisskopf is project scientist for NASA's Chandra X-ray Observatory. This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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