



SPACE

St. Petersburg Astronomy Club **E**xaminer

August 2020

Editor – Guy Earle

The St. Petersburg Astronomy Club has been the center of family astronomy in the Tampa Bay Area since 1927. Our 274 adult members are dedicated to promoting and sharing the wonders and science of astronomy. We host dark-sky and local star parties, telescope-making workshops, science lectures, astronomy lectures, educational outreach sessions and much more.

President's Message

One inevitability about the summer weather in Florida is that it compels you to appreciate the limited time you have observing the night sky. The windows of opportunity are fleeting between the clouds, high humidity and the need for a good nights sleep. Nevertheless, it is well worth it when you witness the majestic tail of comet c/2020 F3 (NEOWISE) which will not be seen again from earth for another 6766 years, or have tracked the streaks of lights shooting across the early morning sky from the Perseus meteor shower.

One of my favorite telescope views will take place tomorrow. If you are up early enough Saturday morning, weather permitting of course, between 2:30am and 4:15am you can see a rare double shadow transit on Jupiter. The moons Ganymede and Io will eclipse the sun for that short time over the surface of Jupiter.

Stay safe and Clear Skies.

Astronomy Image of the Month:



*Comet NEOWISE by SPAC member
Bill Lomaka on July 22nd*

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Brad Perryman, SPAC President

New SPAC Members

We would like to welcome Joe May & Cate Dowman to our family of members.

August General Meeting

This month's general meeting will take place on Friday, August 28th at **8:00 PM**. The main program will be by Chris Vuille on "**Einstein, Kaluza-Klein, Cosmic Relics, and Other Stories.**" This meeting will be held virtually with GoToMeeting.com.

Please join from your computer, tablet or smartphone by clicking [here](#).

You can also dial in using your phone.
United States: +1 (786) 535-3211
Access Code: 192-720-429

The club's next **New Moon observing weekend** will be held September 17th-19th at [Withlacoochee River Park](#).



September Astronomical Events

STEVE ROBBINS

★ Sunday, September 6, the Moon will be at apogee, 405,600 km from Earth and in conjunction with Mars, zero degrees apart for some Earth locations.

Friday, September 11, Neptune is at opposition.

Saturday, September 12, the Moon will be at greatest northern declination, +24.4°.

Saturday and Sunday, September 12 & 13, both Venus and the Moon wander within 2.6° of the Beehive Cluster.

Friday, September 18, the moon will be at perigee, 359,100 km from Earth.

Tuesday, September 22, a rare conjunction with Mercury .8° south of Spica.

Tuesday, September 22 is also the northern hemisphere autumnal equinox.

Thursday, September 24, the Moon will be at greatest southern declination -24.5°.

Friday, September 25, Jupiter will be 1.7° north of the Moon.

September's full moon is called the **Corn Moon**. Time to harvest that corn and make room for autumn telescopes.

The Moon

- Full Moon – September 2
- Third Quarter – September 10
- New Moon – September 17
- First Quarter – September 23



Space Exploration News

STEVE ROBBINS

★ The United States Air Force has decided to stay with its current providers of space launch capacity, SpaceX and United Launch Alliance, for the next five years. This means *cancellation of the Launch Service Agreements* with Blue Origin (\$500 million) and Northrup-Grumman (\$792 million). This promises to be a very messy divorce as especially Northrup-Grumman has significant political backing.

Scientists have discovered what they believe to be the *largest impact structure* in the solar system on Jupiter’s moon, Ganymede. A moon larger than Mercury, this impact structure extends for a radius of 4,800 miles, indicating collision with another body between 30 and 90 miles in diameter, with ramifications covering the entire surface of Ganymede.

Keeping to their independent nature, making rockets for themselves, then seeing if NASA is interested in using them, SpaceX

successfully flew the *Starship SN5 prototype* 150 meters in the air, then landed exactly on target with a single, off-center Raptor methane fueled motor. Asked what future plans were for SN5, Elon Musk said, “Not sure yet, but hopefully. Will need leg & other repairs. Probably SN6 flies before SN5. We need to make flights simple & easy — many per day.” If successful, Starship will eclipse all rockets being used or planned today, rendering all obsolete, even before they are built.

Focusing in on Ceres’ Occator crater with its enigmatic white spots, scientists have discovered the mineral hydrohalite, found only in sea water. They theorize that *Ceres has reservoirs of salt water under the surface* that occasionally are vented to the surface making these spots. These observations are from the space probe Dawn’s last infrared images from only 22 miles above the surface.

New SPAC Membership Cards

A SPAC membership card can be created and printed on the SPAC Website. You need to [visit the site](#), create a password and sign in as a member. Your personal membership card is available at that location. The card is needed to be eligible for reduced camping fees at Withlacoochee River Park.

July New Moon Weekend

GUY EARLE

★ In the absence of our Intrepid Field Reporter, Kelly Anderson, I'll share my July Field Report from Withlacoochee River Park. Given the usual heat and extreme mosquito issues of the typical Florida summer, I usually don't even entertain the idea of going to the park, but instead do all my observing from home. Thinking best to pack light, I opted not to drag the 16" dobsonian to the observing field and instead decided to bring an 8" reflector on a German equatorial mount. On Saturday afternoon, after checking the weather reports multiple times, I left to join a few fellow SPAC members, some of whom had arrived as early as Friday. As I drove up onto the observing field late that afternoon I was surprised that there, alone in their RV like an island in the middle of the Pacific, were Doug and Teri Sliman. The weather, which had been bad the previous couple of days, had chased almost everyone away. I looked around the expanse of the observing field and saw only two other possible astronomy setups. As I

drove up I was greeted by Doug waving his arms like Tom Hanks trying to signal a passing ship after an unfortunate FedEx flight. Before I even managed to unpack my gear, I was promptly asked and provided with a delicious extra steak that Doug had just cooked. Jack Brockhurst showed up to join the small observing group shortly after my surprise meal, with a prearranged plan that I'd show him how I image the planets.

As it became dusk, and the clouds settled in nicely, I set up for a night's hopeful observing session. To our surprise there were hardly any mosquitoes! Good company and refreshments always help at WRP when the clouds are thick, and true to the weather prediction, things started to partially clear up around 11:30. The skies were passable for doing planetary, and Jack and I imaged Jupiter and Saturn while Doug unfortunately was beset with alignment problems on his telescope. At around 1 AM, Doug called it quits and covered his scope, while I swung the 8" reflector over to Mars for another quick planetary imaging session with Jack.

With increased rapidity the clouds appeared to be getting thicker, so it was time to head home. Doug decided it was not preferable to be on the field by himself, lest a lone red balloon suddenly appear. It wasn't the greatest astronomy session, but being with friends always makes it worthwhile. There's always August, and as Kelly Anderson says, "clear skies are assured."



Faster than a speeding galaxy

STEVE ROBBINS

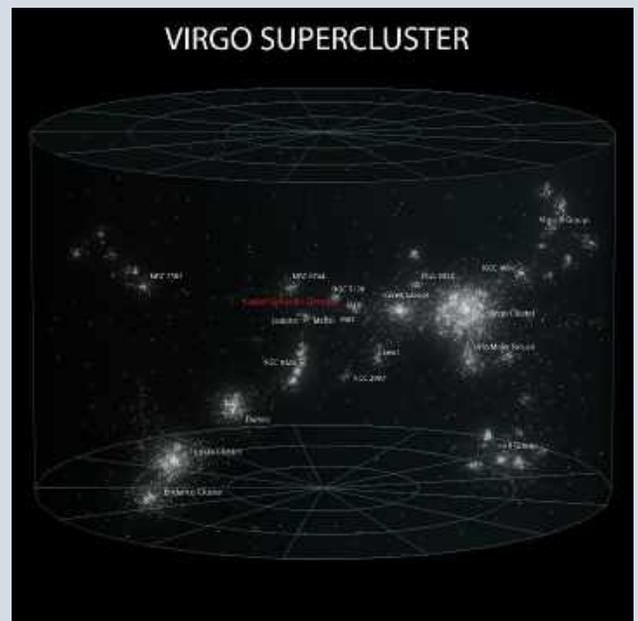


We think that galaxies move incredibly fast. We hear scientists say that the Milky Way is moving at 2.1 million kilometers per hour toward the Virgo Supercluster. We are astounded at all the zeros, the impossible comparison with velocities in our everyday experience and we brown out. Our brain cells saturate and cease any thought at all. Perhaps we issue a reactive "Holy CRAP!!!" We stop thinking in our astonishment.

Well, that is precisely when we need to BEGIN thinking. But how can we possibly do that? I propose that we do it by using the concept of scale velocities. It is pretty easy to conceptualize a real automobile, which may cruise at 70 mph. Suppose we build a 1/12 scale model of that automobile. And we want it to look to the observer as if it were traveling at 70 mph. How do we do this? We do it by scaling the velocity with the object, making it travel 70/12 mph or 13.833 mph. Now why does this look right to our eye?

It is because our perception of how fast something is moving is our comparison of how large it is and how many times its own length it travels in a second. We see a gnat zipping around so quickly we can hardly follow it and say "that gnat is moving fast" because he moves 30 or 40 times his body length in a second, even though if you measure the speed, it might be 2 miles per hour. We look at a car moving 5 miles per hour, and it might take three or four seconds to travel its own length and we say it's moving slowly. But measured in miles per hour the slow car is moving quicker than the fast gnat. Clearly, as far as intuitive speed our numbers aren't doing us any favors.

The numbers seem to lie to us because it is entirely inappropriate to measure the velocity of a mosquito using units appropriate to measuring the speed of an automobile! Similarly, I contend that it is entirely inappropriate to measure the motion of an immense galaxy by those same units so useful in describing an automobile's motion.



So our scientists tell us that the Milky Way is hurtling through the universe at 1.5 million miles per hour toward the Virgo Supercluster. Does this measurement do anything at all to help you visualize what is happening here? Our mental picture is of movement so unimaginably fast that our breath is just taken from us and we feel faint. These galaxies are just whizzing around so fast we can't imagine what keeps them from flying apart! But are our scientists really communicating here? Is our picture of galactic motion the same as theirs or different? How well are they communicating with the public here?

My position is that they have given us all the correct numbers, but their use of inappropriate units of measurement is misleading. They have not helped us understand that state of the universe and I can help you. Who brought the tin foil hat? I'm ready. Are you ready to join me?

Let us begin our trip to the twilight zone by mentally reducing the Milky Way Galaxy to the size of a car. And to make the most extreme case, let's assume it is moving at a speed hundreds of times faster than its actual motion through space, the speed of light. That IS the speed limit, isn't it? At that magnitudes too high velocity, this car will travel its own length in 100,000 years (the Milky Way Galaxy is about 100,000 light years in diameter, that is, for light to travel from one rim to the opposite rim, it would take 100,000 years). In order for the Milky Way Galaxy to move its own diameter through space, it would take 100,000 years! Would that be fast? Or damned slow?



It gets much worse. Because the galaxy isn't moving at the speed of light. It's moving 1.5 million miles per hour. The speed of light in a vacuum is 186,282 miles per second, times 60 seconds in a minute, times 60 minutes in an hour equals 670 million, 615 thousand, 200 miles per hour. 670,615,200 miles per hour is the speed of light. We're moving only 1.5 million miles per hour. So if you divide 670,615,200 by 1,500,000, you see that we are moving 447.08 times slower than the speed of light. That means you have to multiply that 100,000 years to move one diameter through space by 447.08 to get the number of years our galaxy actually takes to move its own diameter. That is 44.708 million years!

Now let's scale that down to human terms. The galaxy is represented by an automobile, and we're standing together leaning on the fender of the automobile talking about whether it's moving or not. Some of you know what's coming already. That automobile is moving, but it will take 44.708 million years to move one car length. Can any instrument on earth detect that it is moving at all? Won't we stand there leaning on it for a half hour or so, agree it's parked and go about our other business? Yes, I think so. The big numbers blinded us to the truth.

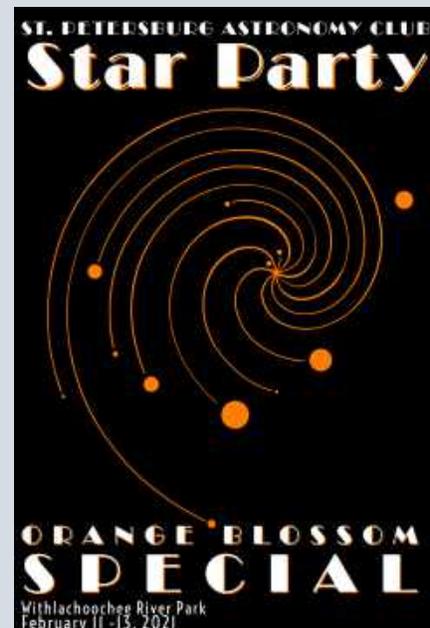
VOTE for the 2021 OBS t-shirt design

The SPAC board has chosen the top three submissions from our membership for the **Orange Blossom Special** star party commemorative t-shirt. **All registered SPAC members** have until **August 1st** to vote online by following the link at [OBS T-SHIRT VOTING](#). The results will be tallied and announced at both the October business and general meetings.

OPTION "A"



OPTION "B"



OPTION "C"



SPAC Astrophotography

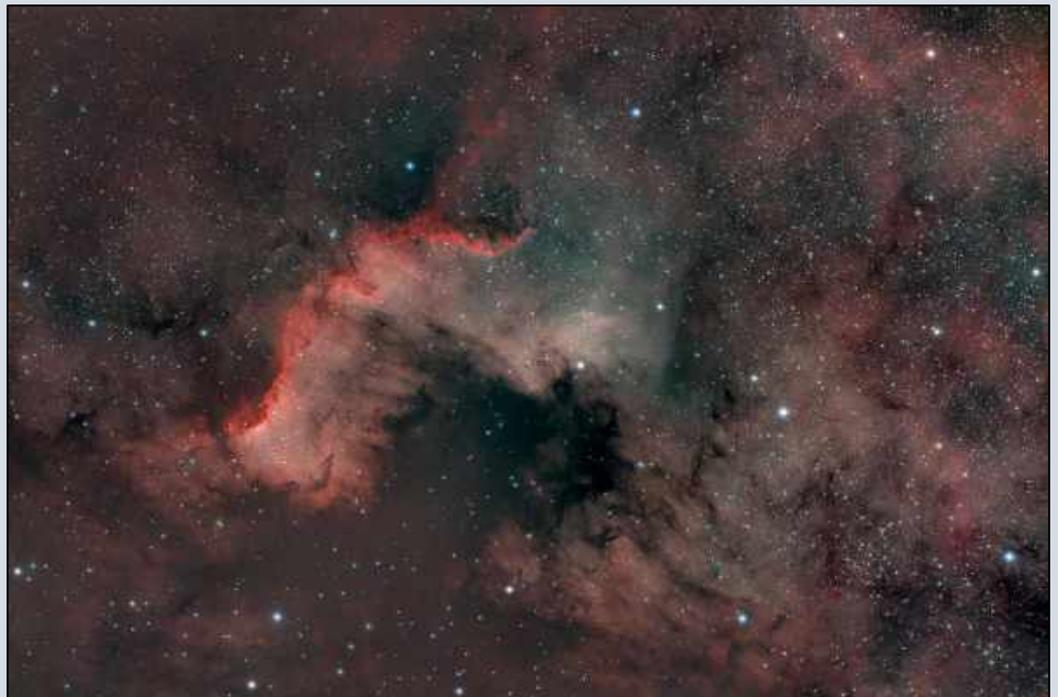
GUY EARLE

★ Here are some fantastic astrophotography highlights from our fellow SPAC members. Anyone who would like to share his or her work, I encourage you to [email the editor](#) to submit for future newsletters or share them on our [SPAC Facebook page](#).



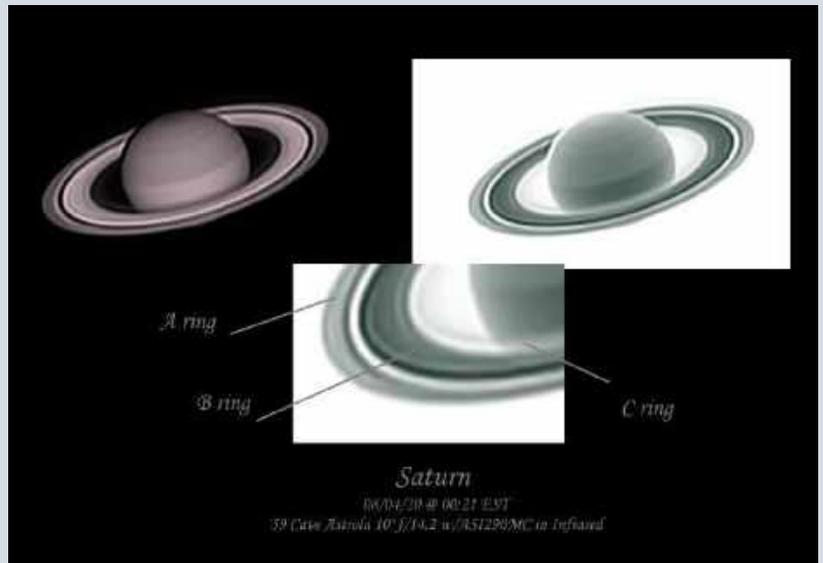
Left: Center of the Pelican Nebula (IC 5070) with H-alpha, Sii, and Oiii filters. 60 images at 1235mm, total exposure time 4.5 hours. Meade 8" SCT with reducer, ASI1600mm Pro camera. — by Omar Rahman

Right: NGC 7000 The North American Nebula
Dates: 2020-08-05
Location: My house, St Pete.
OTA: Celestron RASA 11
Mount: Celestron CGX
Camera: ZWO ASI 2600MC
Exposures: 180s x120
Filters: Optolong I-enhance by Jamie Kenas





Above: **Full solar disc** showing active regions 2767 (lower right) and 2768 (upper left).
Taken with a Coronado 60mm DS w/BF10 / CGEM II / Asi178MM + SharpCap/Autostacker t
3/Registax/Photoshop , best 20% of 3600 frames over 1 minute by **Naresh Singh**



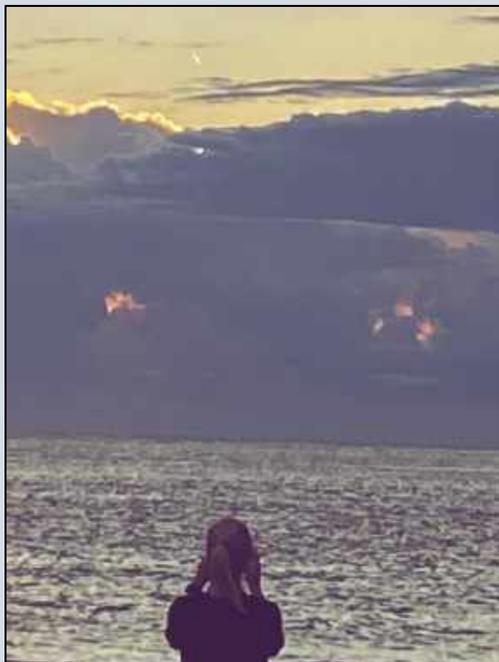
Above: **Saturn** in infrared and inverse coloring to bring out the rings **by the editor**



Above: **Comet NEOWISE** was taken with a Nikon D300 12.1MP 105mm fl f6.3 on an equatorial tracking tripod. Composite of ten photos with dark frames in Deep Sky Stacker then Photoshop enhanced **by Greg Shanos**



Above: **The Omega Nebula M17** at Withlacoochee River Park, Celestron RASA 11 on CGX mount, ZWO ASI 2600 MC; 120s x75 exposures with Optolong I-enhance **by Jamie Kenas**



Left: **Pseudo NEOWISE** by Doug Sliman
Above: **M20** by Joe Canzoneri

Annual Elections

JACK FRITZ & STEVE GABER

This year’s elections will be conducted online via our website on October 24th. You will need to go to

<https://www.stpeteastronomyclub.org/>

and sign in. Once you have signed in, you will see a green button, “Annual Elections.”

The election for Club offices and board members is to be held this October.

Here are the current officers and Directors at Large:

President, Brad Perryman

Vice President, Paul Kraemer

Secretary, Shirley Vuille

Treasurer, Jim Hunter

2020 Director, Steven Gaber

2019 Director, Kyle Brinkman

All the above officers have agreed to continue to serve in their respective positions.

The 2021 Director position is vacant and open for nominations.

The Club thanks David Riichmond for faithfully serving as a Director since 2018.

The Board of Directors invites members to submit new nominations for these positions.

Any Club member who wishes to submit a nomination is encouraged to do so by the September general meeting. If you nominate a person for a position, be sure to ask that person if he or she is willing to serve in that position.

The election will be held on the day of the general meeting, **October 23, 2020**.

SPAC Mirror Lab Report

MICHAEL DAVIS



Hello, All. There’s actually been a lot going on with the Mirror Lab in the last month. First, Brad and Ralph have been helping Mike Partain rebuild the base of his telescope. They went full Norm Abram on it, right down to the biscuit joints. Looks like some good progress is being made. With those guys on the job, the scope is sure to be a work of art.



Speaking of works of art, Ralph brought over the finished base for the OBS raffle scope that he and Brad re-built. We did a test fit to see how well the optical tube assembly I have been reworking fit in the new base. It was a perfect fit. The swing clearance was good. Here Ralph is showing off the (nearly) finished scope. Ralph is the wrong person to use for scale. He makes any scope he stands next to look puny. I also got a couple of close-up shots of the great woodworking details the guys built into the base.



After Ralph left the new base with me, I began installing the electronic drive system on it that allows it to track. That all seems to be going together nicely. Somebody is going to be winning a really nice scope at the next OBS. I may have to buy some raffle tickets myself. I might just miss having this scope in my workshop. Better check with the wife first though, because I already have a lot of telescopes. In fact I just added a new one to my extensive collection.

Here is a brand new telescope I just built from an old mirror and an old tube, and an old mount, and an old mirror cell. The primary mirror is the first mirror I ever ground myself back when I first joined the SPAC Mirror Lab way back in 2012. It is a 10 inch f/4.6 mirror with a really nice figure. I made the thick glass blank myself in my kiln. After making this first mirror, I was hooked on mirror making. I immediately went on to bigger and better things, finishing several larger mirrors, becoming an instructor at the lab, and just an all-around lab rat for years. All the while this poor mirror languished in a box on the shelves in the garages of several places I've lived since

then. Finally, it has a home! When we shut down the lab site at the old Pinellas Science Center I bought a bunch of the stuff that got auctioned off cheap. I got a nice used 10 inch mirror cell. I also got an entire 10 inch Dobsonian telescope that was in really rough shape. Plus I already had the base from a defunct old telescope that I had been holding on to. Looking at all those parts cluttering up my workshop, and noticing the mirror box out of the corner of my eye, the idea to build a new telescope from all those old parts came to me.



I gutted and took everything out of the old DOB scope from the auction (an f/6). I shortened and repainted the tube. I installed the mirror cell from the auction, my primary mirror, and a secondary mirror and holder I also happened to have on hand in my big box of misc. telescope parts. Even the snazzy finder scope is something I picked up cheap at last year's OBS swap meet. I did buy a nice Crayford-style focuser for it, but I have very little actual money invested in this scope. Next I had to build a box to clamp around the scope and mate with the old base. I knocked one out from scrap plywood in my workshop, and put some PVC pipe fittings on the sides to act as

altitude trunnions. The result is a classic Dobsonian scope with a hand-made mirror, and built from mostly found and inexpensive materials that even the master himself would likely approve of (I met Dobson a few times, so I'm pretty sure he would).

The scope works very well. I haven't had it out under a decent dark sky yet, and have only tested it out under the horrid light pollution of southern Pinellas County. However, that is about to change. My wife and I just recently bought a big ranch in the middle of nowhere in Wyoming. It even has an observatory with a permanently mounted SCT telescope in it. I am going to be driving out to our ranch in about a month to do some maintenance work. I'm going to take this telescope with me. Its new forever home is going to be the observatory on the ranch under the super dark Wyoming sky. It will complement the scope that is already there. I can't wait to use it out there.

That's all for this month. You can follow what I am doing on my blog at <http://www.mdpub.com>. If you know of a mirror making or telescope making story that you think should be showcased here, email me at astronomermike@gmail.com. Put "Mirror Lab Submission" in the title so it will stand out.

You can also find the **SPAC Mirror Lab**, with lots of information on making and testing mirrors, telescopes that have been made by members, and many other various aspects at their website: www.telescopelab.com

National Weather Service

SHIRLEY VUILLE



The 2020 Atlantic hurricane season is June 1 – November 30. Now is the time put together a hurricane survival kit. Pinellas County has produced a guide to help you make these preparations and can be found at this link:



http://www.pinellascounty.org/emergency/PDF/All_Hazard_Guide.pdf

From the Editor

In this month's issue you will notice a few changes to the Examiner's format and coloring, in my ever-evolving wish to make the newsletter an even more enjoyable read for everyone. I took over editing the Examiner back in March 2019 from the indomitable Jack Fritz, whose name might still be showing up when the Examiner is emailed to you. We believe that has been fixed, but in case it has not, please edit your email address book for spacexaminer@gmail.com to display as "SPACE Editor."
Thank you.

International Dark Sky Association

LEEANN MUSZYNSKI



Due to light pollution, the night sky over many of our cities is hundreds of times brighter than a natural, starlit sky. Skyglow hides the stars from our sight and prevents us from experiencing a natural night, even in areas hundreds of miles away from urban development.

Part of solving the problem of light pollution is to have a thorough understanding of its magnitude. Measuring the brightness of the night sky is relatively easy and you can help by becoming a citizen scientist.

Participate in the Globe at Night Campaign. August 10-19, 2020 featuring the constellations Cygnus & Hercules. No special tools are required and observations can be reported by smartphone, tablet, or computer.

www.globeatnight.org

The Dark Sky Meter app makes use of your iPhone camera to record the brightness of the night sky, while Loss of the Night app walks the user through the sky as measurements are made with the human eye.

A sky quality meter is an instrument used to measure the luminance of the night sky. It is used to quantify the skyglow aspect of light pollution and uses units of "magnitudes per square arcsecond" on a scale of 16.00-22.00, with the lowest number being the brightest and highest representing the least light pollution. Measurements can be submitted to a database on the manufacturer's website and to the Globe at Night database.

SPAC Business Meeting

Our next business meeting is Wednesday, September 9th, at 8:00 PM via conference call; details upon request.

All interested members are invited to attend. All club business decisions are made at the business meeting so as not to encumber the general meeting.

Officers & Directors

President	Brad Perryman	727 420-1957
Vice Pres.	Paul Krahrmer	727 535-5827
Secretary	Shirley Vuille	727 864-2624
Treasurer	Jim Hunter	813 507-8415
Dir.-at-Large	Kyle Brinkman	727 455-6931
Dir.-at-Large	Steven Gaber	727 215-0464
Dir.-at-Large	David Richmond	727 692-9831
SPACE Editor	Guy Earle	813 785-1972
Public Relations	John O'Neill	727 637-5945
Membership Chair	Shirley Vuille	727 864-2624
Mirror Lab Chair	Paul McNabb	727-345-5713
Outreach Chair	Jim Hunter	813 507-8415
Star Party Chair	Mike Partain	859 339-0828
Librarian	Ralph Craig	727 384-2086
Club Webmaster	Jack Fritz	813 508-5680
Dark Sky Chair	Leeann Muszynski	813-601-0986

Click on the name to send email

Recognition of Patrons & Benefactors:

Clifford B. Benham	Benefactor
Walter Brinkman	Benefactor
Andy Demartini	Benefactor
Jack & Roni Fritz	Benefactor
David Knowlton	Benefactor
David & Tara Pearson	Benefactor
Doug & Teri Sliman	Benefactor
Bruce Berger	Patron
Tim Cannedy	Patron
Michael Coate	Patron
Ralph & Christine Craig	Patron
Peter & Jaclynn Dimmit	Patron
Joseph & Pamela Faubion	Patron
Steve & Cindy Fredlund	Patron
Richard & Mary Garner	Patron
Valentino Hernandez	Patron
Charlie & Linda Hoffman	Patron
Scott & Beth Irwin	Patron
Matt Labadie	Patron
Laura Lanier	Patron
Corey Lynch	Patron
Robert Myers	Patron

Antonio Paris	Patron
Brad & Lisa Perryman	Patron
Alan Polansky	Patron
David & Rusty Richmond	Patron
Anthony Staiano	Patron
Wally & Ramona Vazquez	Patron

Examiner Staff

Editor	Guy Earle	813 785-1972
Reporter	Kelly Anderson	813 672-2751
In the News	Steve Robbins	386 736-9123
Mirror Lab	Ralph Craig	727 384-2086

Withlacoochee New Moon Weekends

There's no need for reservations. However, the park closes at sundown, so you will need to arrive before then. The park rangers will give you the gate-code once you're inside the park. Please do not call for the gate code as they are not allowed to give it out over the phone.

Reservations are not necessary. Please print and display our [Friends-Of-The-Park Pass](#) on your dashboard.

Please join us! All astronomy enthusiasts are welcome. You do not need to be a club member to attend. Please refer to our [Club Calendar](#) for details and scheduled dates.



Withlacoochee River Park - Dade City, FL
Detailed directions can be found at:



St. Petersburg Astronomy Club Membership Form

Membership in St. Petersburg Astronomy Club, Inc. (SPAC) is open to anyone, regardless of age, who is interested in astronomy. Benefits of membership include a monthly subscription to the SPAC Examiner newsletter, reduced camping rates and use of the club’s bunkhouse at our dark sky site at Withlacoochee River Park, the ability to serve on the SPAC board and voting privileges. Dues are considered donations and are non-refundable. Membership options are available as listed below.

You are now able to choose how you wish to join or renew your membership:

- **Preferred On-line Website Option: New instructions as our website has been updated.**

Go to https://www.stpeteastronomyclub.org/Sign_In.php on the SPAC website where you can join, view and update your membership profile, provide payment, and **print your membership card.**

- **US Mail Option: Takes more time to process manually because we are all volunteers.**

Complete the attached membership form and send it along with your payment to:

Jim Hunter
17316 Oak Ledge Drive
Lutz, FL 33549.
(Checks should be made payable to SPAC, Inc.)

Adult 1: _____ Adult 2: _____

Street: _____

City, State, Zip: _____

Home Phone: _____ Cell Phone: _____

Email Address: _____

Number of Children under 18: _____

Memberships:

Single: \$ 30.00/YR. Includes one adult, minor children, the “SPACE” newsletter, and all the rights and privileges of membership.

Family: \$ 35.00/YR. Includes two adults, minor children and the above rights and privileges.

Patron: \$ 50.00/YR. A Patron member is entitled to the above rights and privileges.

Benefactor: \$100.00/YR. A Benefactor member is entitled to the above rights and privileges.

Student: FREE. SPAC offers free membership to full time high school and college students.

Expected date of graduation: _____

Total Submitted: \$ _____

Your SPAC Membership Card is required for reduced fees at the campground.