SPACE

St. Petersburg Astronomy Club Examiner

December 2022 Editor – Guy Earle

The St. Petersburg Astronomy Club has been the center of family astronomy in the Tampa Bay Area since 1927. Our 409 adult members are dedicated to promoting and sharing the wonders and science of astronomy. We host a dark-sky star party each New Moon at Withlacoochee River Park, along with local star parties, telescope-making workshops, science lectures, astronomy lectures, educational outreach sessions and much more.

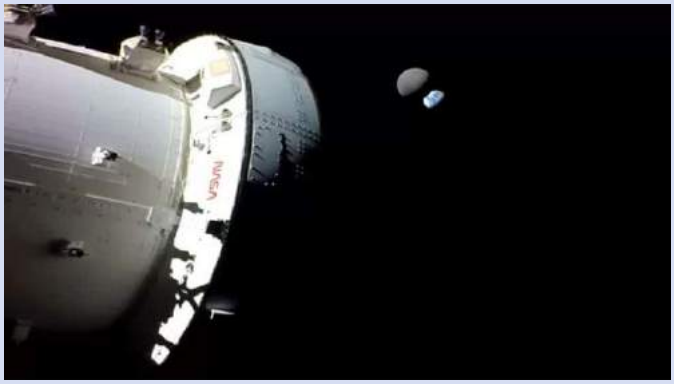
Inside this Issue:

Astronomy Image of the Month

The core of the Rosette Nebula (NGC 2238) by **Jamie Kenas**

Artemis breaks a record

NASA's Artemis 1 Orion spacecraft broke a distance record on November 28th, reaching a distance of 270,000 miles from Earth. For nearly 50 years the Apollo 13 mission held the record from the far side of the Moon at 248,655 miles.



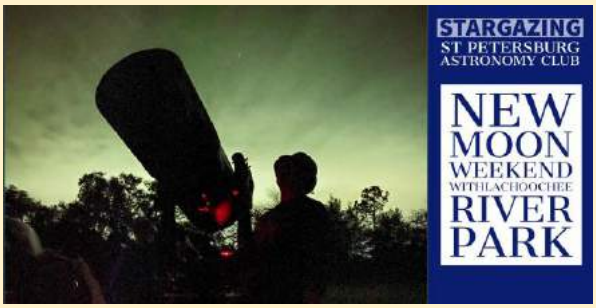
December General Meeting

This month's End of Year / Holiday Dinner / Pot Luck will take place on Friday, December 16th at **7:00 PM**. The meeting will be ***in person*** at St. Petersburg College, Gibbs Campus, 6405 5th Avenue North, Philip Benjamin Social Arts Building - Room 114

This will be our end of the year holiday party, so come on out to enjoy the festivities! If you can, bring a dish to share with others.

Please see a map to the event location near the end of the newsletter.

The club's **New Moon observing weekend** will be held December 16th – 18th at Withlacoochee River Park east of Dade City.



New SPAC Members

We would like to welcome Scott Cooke, Adrian Martinez & Alys Stuersel, Valerie Hyman, and Greg Connelly to our family of members.

Examiner Staff

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

SPAC New Moon Weekend
Withlacoochee River Park
November 18-20, 2022

By Intrepid Field Reporter

KELLY ANDERSON

Your not-so-intrepid Field Reporter was unable to attend this month's New Moon Weekend (I have excuses) but our secret observer (Joe) offered the following report:

Attending this month were Joe Canzoneri, Mark & Sharon Bruns, Tim Harris, Rich Tobin, Fred & Diane Friedman, Bob Stelmock, and Guy Earle.

Thursday had good seeing all night, but was a bit chilly. At least we believe it was good all night since everyone slept through much of the night. (Note to Winter observers: space heaters and warm boots are recommended). Winter's cooler temps keep humidity lower which improves transparency so it was pretty awesome.

Friday started out clear, but by 10:30 or so the cloud gods revoked our clear sky and it was time to pack it in. Saturday was pretty much a washout, unless you like to observe the bottoms of clouds.

As a sad side note, Hurricane Ian had its way with Mark and Sharon's fifth wheeler; it rolled the poor thing over and totaled it. Soooo sorry guys, but they were able to procure another fifth wheeler and they're back on the road. We are nothing if not resilient!

Even though the weekend wasn't the greatest for observing/imaging/staring at stars, the bright side was that a bunch of hardy astronomers took to the field and provided a convivial group of campers with a common interest. Always a good time at Withlacoochee River Park!

The next convivial concourse of celestial confabulators has been rescheduled for the week before Christmas, December 16 – 18. The actual New Moon occurs on December 23, so that weekend would probably not be the best time for everyone.

However, for those interested, there is a small group of eager star gazers planning on attending sometime during the following week. Wanna join us for a celestial New Year's Eve?

The Little Scope That Could

by Wayne Frey

If you have been in to astronomy for any length of time, you have probably had the same trials and tribulations that I am about to talk about. You start by looking up at the night sky and marvel at what you see. Wanting to see more you purchase a pair of binoculars or a small telescope. This only wets you appetite to see more so you purchase a larger telescope. This is known as aperture fever and I had a bad case of it.

Now that you have that big refractor or Newtonian you start to realize it came with time consuming chores that have to be repeated every time you want to look through the scope. They include setting up the tripod, mounting the scope to it and aligning on the polar axis. If you have a big Newtonian you also have to assemble it and collimate it. What you did not know is the fact that our eyes prevent us from seeing more detail no matter how big the telescope is. Darker skies will help so you drive an hour or two to get to them only to find that it is not really that much darker than your backyard. The fact is there are not many truly dark sites in the world anymore unless you are in a very remote part of it. Try taking that big scope to the mountains in Chile or even the western mountains of the USA.

The professional astronomers realized over a hundred years ago that attaching a camera to the scope gave them more detail. Of course, this also added to the number of time consuming chores needed to observe. You think, “I can save a lot of time if I had an observatory to permanently set it up” but that to adds to the chores and your observatory may be stuck in light polluted areas.

In the 21st century a French company called Unistellar put together all the latest technology we have in a 112mm telescope with a focal length of 450mm. It is a Newtonian on an alt/az mount that sits on a sturdy tripod. Inside the scope is packed with a small computer,

a WiFi emitter, a Lithium ion battery with a charging port and a CMOS sensor instead of a secondary mirror. Total weight of the unit and tripod is 19 lbs.

Setup take two minutes to remove the tripod & scope from the backpack and slide the scope into the tripod locking it down to the base with two thumbscrews. Carry the unit outside and remove the dust cap which holds the Bahtinov mask for focusing the scope. Wait 15 minutes for the scope to acclimate then press the power button for 2 seconds. The telescope is controlled with a free app from Unistellar that can be downloaded to a smartphone or tablet. I will not go into the operational procedure but it only takes minutes to connect to the scope and it plate solves the sky to know where it is located. The onboard computer has 5000 objects in the database or you can enter coordinates for an object not in the database. Press go to and the scope slews to the object.

The WiFi has a range of 55 ft (164.5 m) which allows you to go inside if you wish. It can also handle eight other smart devices with the app on them. What the scope sees appears on the screen of each smart device connected to the scope's WiFi. This allows all to save an image to their device if they desire to do so. Live mode with this little scope is not impressive but the secret is in the enhanced mode where the computer captures 4 second images and stacks them adding more & more details. The image below is 11 minutes, star clusters only take a minute or two.

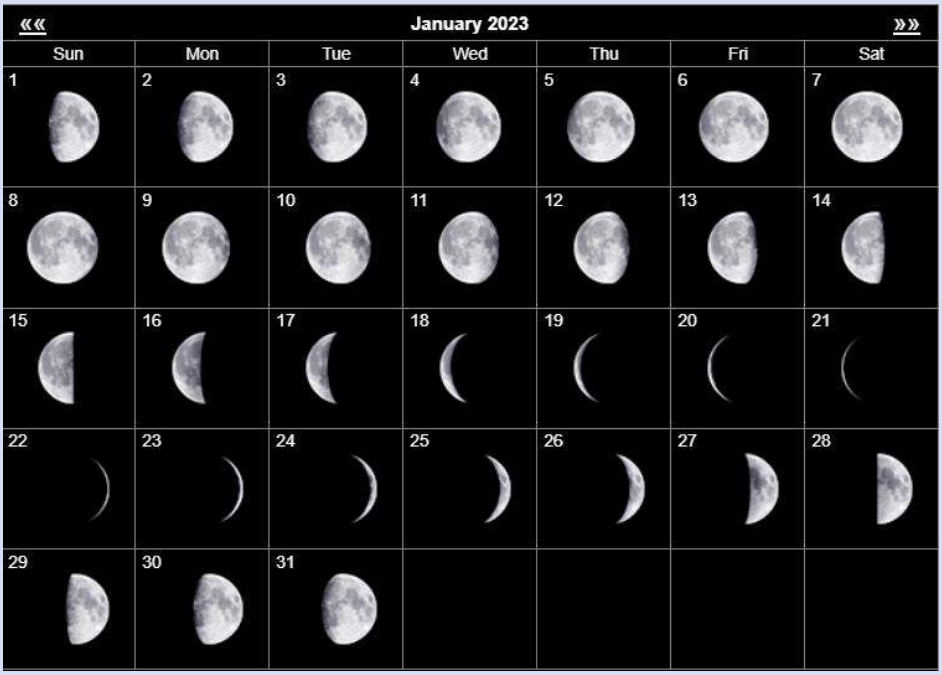
Unable to see galaxies or nebulae from my backyard, I was forced to trek out to a dark sky site. This was taken from a Bortle 7 sky with high thin clouds. Not sure why it is horizontal, tried everything to rotate it but nothing works.

This is the little scope that could do what big aperture scopes can not do by using what is called Electronically Assisted Astronomy. This is NOT astrophotography.

Order Your 30th Anniversary OBS T-shirt by December 12th

Click **HERE** by **Dec. 12th** to order your special OBS t-shirt, commemorating our **30th anniversary** at the lower, initial price. Click the link above and support the club! The t-shirt design was created by SPAC member Doug Sliman, these navy Hanes Beefy tees are available in both regular and tall sizes, as well in long-sleeve and sweatshirt.

January Lunar Calendar



Planetary season is beginning to draw to a close despite Mars being at its best right now. Saturn is just 40 degrees up at sunset, and for me that means it's about to go behind the trees and is generally so low on the horizon that imaging isn't worth the attempt.

Jupiter is due south right at sunset, so is prime for imaging despite being months past opposition. Last night I tried at 9:30, thinking to catch the GRS transit at 11:30, and it was already heading for the trees. The image was fuzzy and was already showing degraded quality from the lower position. Neptune is just a Telrad hop from Jupiter, so is heading out the door too.

Uranus is near Mars, so that's still good for now, being overhead at midnight. Mars makes a close approach to the Earth every two years, so try and get a look before it's gone. The planet goes through a dramatic size change over months; at the moment it's around 17 arc seconds but by February it's shrunk by nearly 50%.

Lastly, later this month Mercury makes its brief appearance in the western sky right at sunset, naturally never straying far in the sky from the Sun. We get a quick view twice a year of Mercury, only about a week at a time. Sometimes that view is barely above the horizon, and this month is only about 10 degrees up. Venus also shows herself and will continue gaining altitude in the western sky as we move into 2023.

SPAC Mirror Lab

Michael Davis

Hi All,

Season's Greetings!

This month I want to talk about a project I have been working on. As some of you probably know, I have a Youtube channel (Well, two channels now). Some of the videos on my main channel are about astronomy, telescope making, mirror making and molding and slumping glass in my kilns to make telescope mirror blanks. Someone saw some of my videos and contacted me hoping to get some help with a mirror he has that has some serious issues.

Alin Tolea contacted me and asked if I could re-anneal his telescope mirror. He had a 17.5 inch Coulter mirror that had a bad anneal and a lot of internal stress. This got my attention since I have the exact same mirror in my 17.5 inch DOB. He said he had tried to get Newport Glass to re-anneal it for him, but they just gave him the run-around. He was hoping I could do the job for him. I agreed to give it a try. I did warn him that there was a possibility that the glass could break in the kiln. Also, that I might not be able to do any better annealing it than Coulter could. I also warned him that If I succeed in relieving the stress in the mirror it would need to be re-figured at the very least, and maybe even go all the way back to fine grinding. Alin said the mirror was useless to him as it is and he had nothing to lose. So, we agreed to give it a try.

The mirror arrived just after Hurricane Nicole flooded my lab, and while I was still sick with complications from Covid. So, the project sat in limbo for a while until things dried out and I got to feeling better.

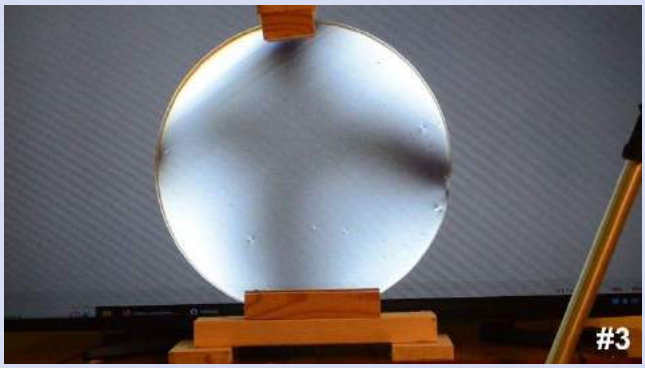
After a couple of weeks, I was feeling better and the water had receded, so I got started. I decided to make a video of the entire process. The video can be seen here:

https://youtu.be/vCmt46UfxRw

I unpacked Alin's mirror and got my first good look at it. I noticed a couple of issues right off. It had a large chip out of the edge (see Photo 1), but I could tell it was an old chip and not caused in transit. I also noticed that the back of the mirror was very rough. It had a sort of pebbly surface texture and a sharp ridge running across the back. I'd never seen such a rough back on a finished mirror before.

The real issue though was the internal stress in the mirror. Fortunately, the aluminum coating had already been removed so I could get a look at the stress level inside the glass. I needed to get some baseline or "before" photos of the stress as received, so I could compare them with images taken after my re-anneal. I built a "Redneck Polarimeter" to photograph the internal stress in the mirror. I built a stand to hold the mirror vertically in front of my big-screen TV in the living room. The TV is an LCD type, so the light coming from the screen is polarized. I could put a blank white background on the screen, and then look at the blank through a second polarizer. Rotating the polarizer to different orientations would show the stress inside the glass. I could put the polarizer on my camera to get video and stills of the stress. Glass with no stress would be perfectly transparent and show no light or dark areas and no color fringes. That's not what I saw in this blank. (See photos 2, 3, 4)


#2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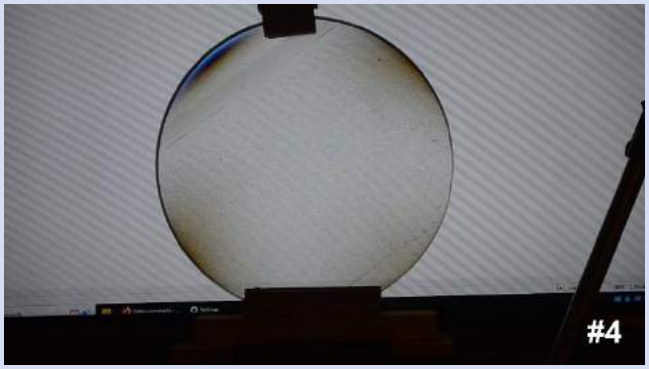

#4

This mirror had some serious stress issues. This mirror has the classic Maltese Cross stress pattern, but on steroids. Plus, the pattern is distorted and offset to the upper left, where that big ridge on the back of the mirror is. The stress in that area was so bad that there were rainbow color fringes near the edge there. That is bad, to say the least. It's hard to believe that Coulter ever even made this into a finished mirror and sold it. I'm glad my own Coulter mirror turned out much better than this one.

I put the mirror in my largest kiln (Photo 5) and worked out a firing schedule for re-annealing it. I tried something called a "Shotgun Anneal," which hits several different temperature points, hoping that one hits the sweet spot and produces a good anneal. The mirror was in the kiln for about a week (annealing is a very slow process).


#5

After the anneal was done and the mirror was out of the kiln, I noticed some strange spots on the surface of the glass. I have never seen anything like them before. There some red spots on both

the front and the back. There were also a couple of white spots on the front. My suspicion is that the red spots may have been caused by residue from chemicals used to strip the old aluminum coating. I also suspect that the white spots may be areas where the aluminum wasn't fully removed and got oxidized in the kiln. The spots look to just be on the surface of the glass, and should hopefully be removed during re-figuring.

I retested the mirror on my "Redneck Polarimeter" to see if it had improved any. It had improved! The stress was greatly reduced, but not gone. The Maltese Cross pattern was still there, but not as strong, and was now pretty much perfectly centered in the mirror. The stress had been reduced and distributed more evenly through the bulk of the mirror. The color fringes were gone. Plus, the stress only showed up in one polarizer orientation, where before some stress could be seen at any orientation. (See Photos 6 &7)

I had improved the mirror, but wanted to try to do even better. I still had a couple of weeks before Alin was due to pick up the mirror, so I decided to try another re-anneal. This time I targeted the most likely annealing temperature for borosilicate glass, and gave the mirror several long soaks there.

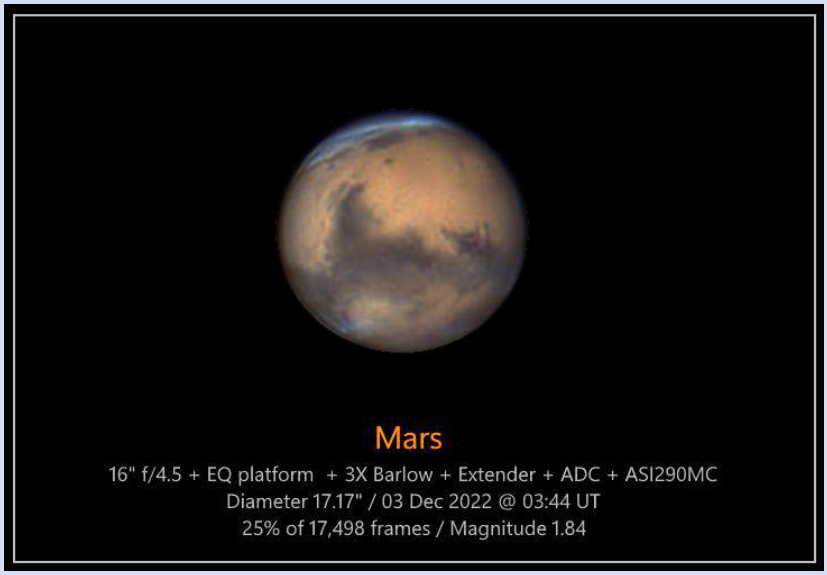
Unfortunately, there was no further improvement after the second anneal attempt. The stress level in the glass looked exactly as it did after the first anneal. I guess I got it as good as I could the first time. Oh well, I tried my best. The blank is a lot better than when I got it. It should make a better mirror now. Whether it will be satisfactory to Alin once it is re-figured is yet to be determined. I recommended to Alin that he have the back ground flat before refiguring. I also made some other suggestions that might help with this mirror.

This was an interesting project. I hope the mirror will be usable after re-figuring and will perform well in Alin's telescope.

That's all for this month. Please feel free to submit your own article ideas. 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 in my email torrent. You can follow everything happening at The Mirror Lab at http://telescopelab.com/. You can follow what I am doing on my blog at http://www.mdpub.com.

SPAC Image Gallery

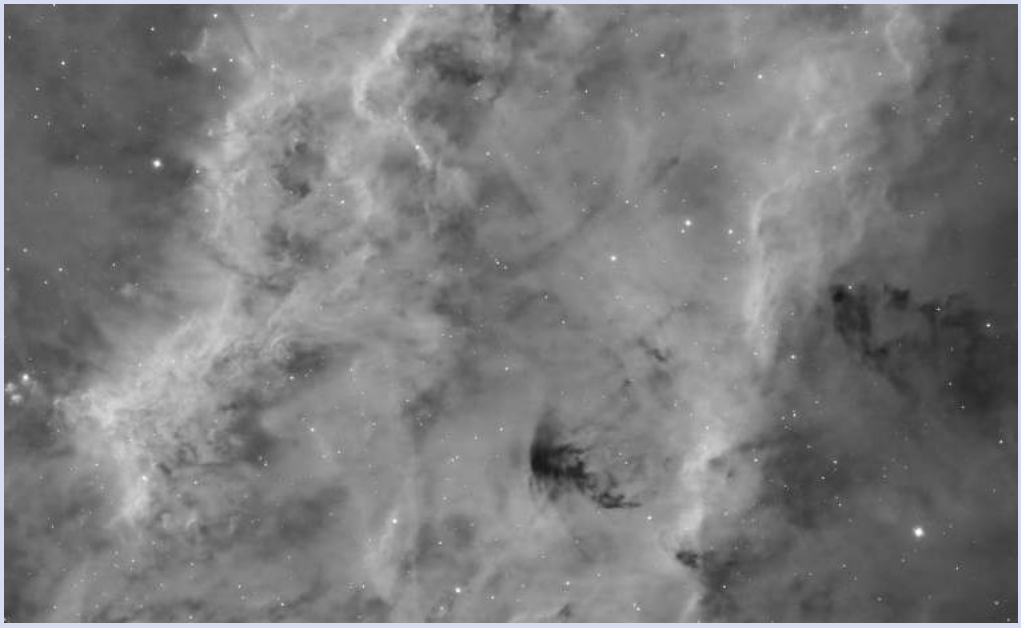
Here are some excellent astrophotography highlights from our fellow SPAC members. Anyone who would like to share his or her work, I encourage you to email the editor to submit for future newsletters or share them on our SPAC Facebook page.



Left: **Mars** with its polar cap and clouds by **Guy Earle**
Below: **The Western Veil Nebula** from home with live stacking by **Joe Canzoneri**

Left: **The Full Moon and Mars** on Dec. 7 at conjunction with 1965 Criterion 6" f/8 and ASI290MC by **Guy Earle**

Below: **The Crescent nebula** from home full moon out 60mm refractor 183mc pro camera 2min x 41 live stacking in sharp cap by **Joe Canzoneri**



Left: **NGC 1499 The California Nebula (HA)**
Date: 2022-12-06
Location: Chiefland Astro Ranch
OTA: Rasa 11
Camera: ZWO ASI2600MM Mount: CEM70
Exposures: 300s x43
Filter: Baader Ultra-highspeed by **Jamie Kenas**

SPAC Business Meeting

Our next business meeting is **Wed., Jan. 11th, 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 Krahmer	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	Jack Fritz	727 692-9831
SPACE Editor	Guy Earle	813 785-1972
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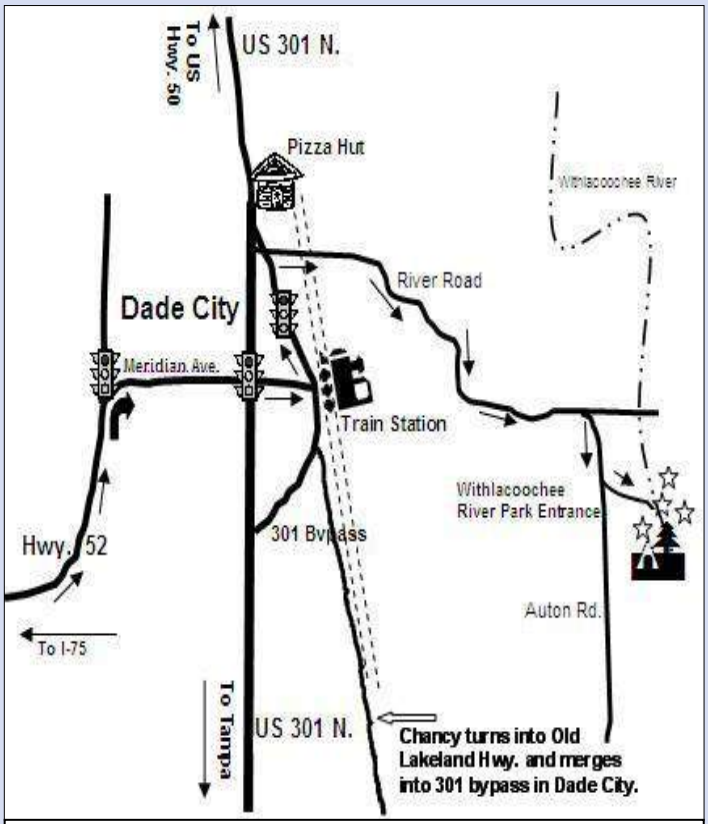
Membership Chair	Shirley Vuille	727 864-2624
Mirror Lab Chair	Paul McNabb	727-345-5713
Outreach Chair	Jim Hunter	813 507-8415
Star Party Chair	Mike Partain	850 339-0828
Librarian	Ralph Craig	727 384-2086
Club Webmaster	Jack Fritz	813 508-5680
Dark Sky Chair	Leeann Muszynski	813-601-0986

Click on the name to send email



Withlacoochee River Park – Dade City, FL
Detailed directions can be found at:
www.StPeteAstronomyClub.org

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.

St. Petersburg Astronomy Club

Recognition of Patrons & Benefactors

Clifford B. Benham	Benefactor
Lakeisha & Stephen Black	Benefactor
David Brewer	Benefactor
Walter Brinkman	Benefactor
Mark & Sharon Bruns	Benefactor
Dave & Deborah Catalano	Benefactor
Kimberly Dean & Caroline Sherman	Benefactor
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Christopher Halls	Benefactor
Michael Haworth & Melanie Otte	Benefactor
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Bob & Michele Winslow	Benefactor
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Tom & Michelle Sweet	Patron
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Ed Wilson	Patron
Elizabeth Wood	Patron

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.

SPAC END-OF-THE-YEAR / POT LUCK / HOLIDAY DINNER

Location: Philip Benjamin Social Arts Building, Room 114

Park on the south side of the building next to 5th Ave. S. It is ok to park in several Staff Parking spaces during this time. The only unlocked door to the building will be the Room 114 outside access door facing the south parking lot. The rest of the building's outside doors will be locked.