



November 2019

Editor - Guy Earle

The St. Petersburg Astronomy Club has been the center of family astronomy in the Tampa Bay Area for decades. Our 275 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

KYLE BRINKMAN



A college football coach once tried to recruit a farm boy whose dad didn't want to let him off the family farm. The coach convinced the farmer that the egg heads at the university could double the milk production from his dairy cows if only the boy could go to college. The prospect of higher yields convinced the farmer to let his son play. The college professors studied the problem, ran their numbers and analyzed the problem to maximize milk production. They came back to the farmer with great news. They could actually triple the milk if he would only consider using spherical cows.

Sometimes that is the way it goes with science. I read an article the other day that said a Star Trek style warp drive would be possible. All you have to do is harness enough energy. It would only need enough energy held in the mass of something the



size of Jupiter. Theoretically brilliant. Practically useless.

It was that way for a long time in determining the size and scale of our solar system. With some error we can calculate the mass of the Earth using the density of iron and our measured curvature. We know our orbital period and can calculate the mass of the Sun if only we knew the distance. A transit of an inferior planet across the surface of the Sun gives us the opportunity to check the distance to the Sun using parallax and trigonometry.

Parallax is the phenomenon best explained by extending your arm with a finger up and finding a distant object. If you close one eye the object will be on the right of the finger. Close the other eye and it moves to the left side. This is the way our mind judges distance and why someone with only one eye cant judge distance.

This same phenomenon is used by citizen scientists this last November 11th to watch the Mercury transit. Observers have known GPS locations on Earth and synchronized clocks. Observers in widely

separated locations such as Europe and Florida will see the transit at different times. That difference is then used to calculate the distance of the Sun. Then the mass of the Sun can be used with the orbital periods of planets to calculate their mass. So one discovery leads to many more. The better we know one parameter, the better all subsequent calculations are.

New Members

We would like to welcome Valentino Hernandez and Maise Felton to our family of members.

General Meeting

This month’s general meeting will take place on Friday, November 22nd at 8:00 PM, at St. Petersburg College, Gibbs Campus, 6405 5th Avenue North.

Main Program

The November meeting will feature a lecture by Dr. Albert Hine and will be on the “Extraterrestrial Influences on the Geologic History of Florida.”

Topics he will cover time allowing will be Milankovitch cycle, plate tectonics, and Carbonite Factory.

December Astronomical Events

STEVE ROBBINS

★ Wednesday, December 4, the Moon is at apogee, 404400 km from Earth.

Wednesday, December 11, Saturn and Venus will be 1.8° apart in the sky.

Friday, December 13, the Moon will be at highest northern declination, +23.2°.

Saturday, December 14, only two days after the full moon, is the Geminid Meteor Shower with a ZHR of about 120. That’s two meteors per minute! Worth watching even in the moonlight.

Sunday, December 15, the Moon will be 1° north of the Beehive Cluster.

Wednesday, December 18, the Moon is at perigee, 370,300 km from Earth.

Sunday, December 22, should I mention the Ursid Meteor Shower with a ZHR of 10? No, I won’t.

Thursday, December 26, an annular solar eclipse will be visible from the exact opposite side of Earth. Murphy’s law has teeth. And the Moon is at its lowest southern declination, 23.2° south.

Saturday, December 28, Venus will be 1.1° north of the Moon.

December’s full moon is unimaginably called the Full Cold Moon.

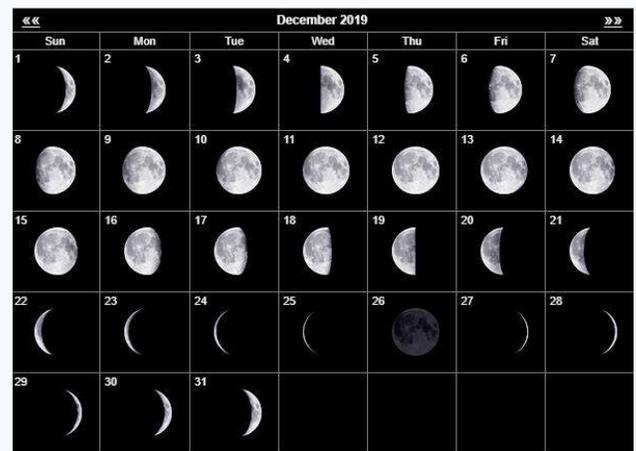
The Moon

First Quarter – December 4

Full Moon – December 12

Third Quarter – December 18

New Moon – December 26



Space Exploration News

STEVE ROBBINS



For the first time NASA has released a cost per launch of the SLS rocket that will launch astronauts from the US to the ISS. Are you sitting down? Two billion dollars per launch. No, I err. MORE than two billion dollars per launch. In fact, the total cost of an SLS/Orion package will be on the order of \$5 billion. Please keep in mind that you can launch 2/3 the capacity of the SLS with a Falcon Heavy for \$150 million. I predict SLS will fly.....once.

The transit of Mercury across the face of the Sun happened exactly as predicted Monday. At least that’s what I’ve heard. Early in the day, clear skies showed the event in all its splendor, but at 12:45 pm, the neutral density cloud filter reached 100% and third and fourth contact couldn’t be seen from DeLand.

NASA has been using a technique they call “pinning” to hold to top of the Insight “Mole” as it attempts to dig its way several meters deep to sense seismic waves and temperature below Mars’ surface. From the photos, it appears they were putting a side load on the mole to give it traction. The result? The mole was spit out of Mars by about 12”. After a photographic pass that you can watch, the next try will be pressing down on the top of the probe.

The latest featured photo released from the Juno Jupiter probe is fascinating. It’s the vortex of a storm 1,200 miles wide and it looks like a mirror image of M-51. Processed by “citizen scientist” Kevin M Gill from the JunoCam imager on November 3, this photo shows the great result of a

partnership between NASA and amateur astronomers.

SPAC Christmas Party

GUY EARLE



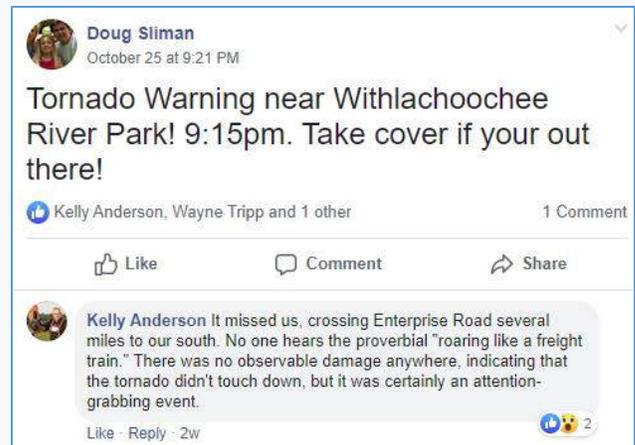
The December 13th SPAC meeting will be our annual Christmas party at 7 PM. There is a map to the location near the end of the newsletter. Hope to see you there!

October New Moon Weekend

KELLY ANDERSON



Nothing much to say...clouds came, we cursed, then went home.



Astronomy Outreach

JIM HUNTER AND TOM SPANO



On Wednesday November 6th Dave Pearson, Wally Vazquez, Brad Perryman, Steve Gaber, and I set up telescopes at Forest Lakes Elementary for a group of students, parents, and teachers to observe the Moon, Jupiter, and Saturn. The night started cloudy but slowly cleared up to reveal the Moon and soon after Jupiter.

About twenty minutes later we were also able to view Saturn.

The kids are currently learning about space, and are planning to visit the Kennedy Space Center later this year.

11/7 – I did a Great American teach-in at Stewart Middle school. This year I was competing with NASA and skyping astronauts. Guess who came out last.

I did three presentations to about 40–50 students each. Mediocre response

11/8 – Dave, Steve, Tom and I went to Tarpon Springs Elementary school, our first visit.

They were having a festival with bounce house, games and a fire truck. I went over and introduced myself to the enemy – they had four bright work lights that illuminated the entire area. It did not matter as I only got a couple seconds of the rim of the moon through clouds. Weather was terrible except it was cool – remember cool, it is when you are not sweating and swatting mosquitos. – Hopefully, it is back for the season

East Lake Library has been changed to 2/1/20 from 12/6/19.

Jupiter's Great Red Spot is Dying?

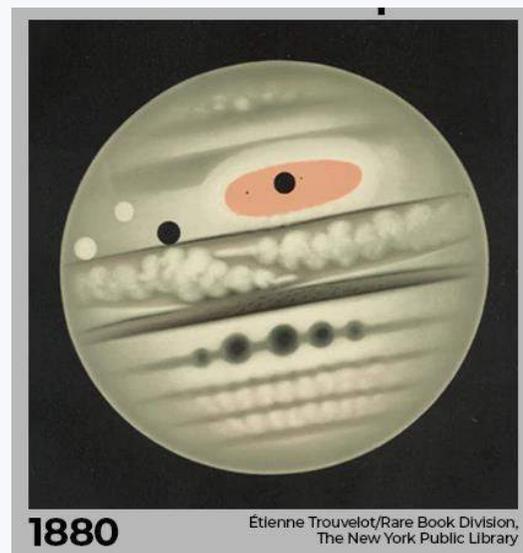
GUY EARLE

★ Jupiter has, at least for me here at home, disappeared behind the trees by the time it gets dark. I began imaging the gas giant at the very end of June, and spent quite a bit of time not only learning how to use the camera and software but also, and probably for the first time in all my years of observing, actually paid very close attention to its features. I wasn't simply sticking my

eyeball up to the eyepiece as usual, seeing if the Great Red Spot was visible and noting a few darker bands before moving on to another target. I have since realized when you make the effort to photograph an object on a regular basis, you start to pay very close attention to the details. Those details beget questions and before you know it you suddenly have an avalanche of reading, spurred on by a general curiosity.

I remember back in the mid-90's that the Great Red Spot (GRS) was fairly large but yet not that distinct. Flash forward to this summer, and I focused throughout the months of July and August on learning *how* to image, not concentrating on *what* I was imaging. Only when I conceded in October that my imaging for this season was done for Jupiter, and I had begun to put a collage together of all my GRS images, did I begin to see the subtle differences over time.

Jupiter's Great Red Spot has been observed ever since the 1600's with the invention of the first telescopes. Early descriptions had it more cigar-shaped, and

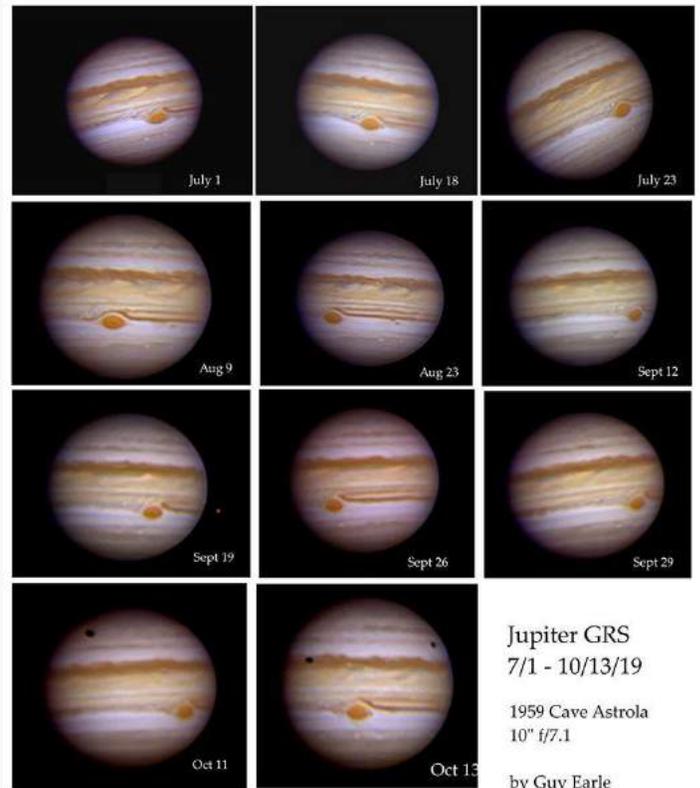


much larger than it is today. The slow shrinking has been occurring since the late 1800's, but the storm seemed to show more rapid diminution in 2012. Continuing to shrink, it is now about one-Earth in diameter, not three, and has grown darker and redder in the process. Despite the change in size, the GRS's position in the Southern Equatorial Belt (SEB) hasn't changed; it still moves at speeds of roughly 400 miles an hour surrounded by swirling vortices.

As a result of these changes, both professional and amateur astronomers have been watching Jupiter even more intently, especially since May 2019 when the GRS showed signs of "flaking," where outer layers were peeling off ("hooking") and then tearing away and dissolving into nearby bands and zones. This was altogether new for Jupiter. Some scientists believe that the GRS isn't really dying and manages to regenerate itself, but the general opinion is that the storm continues to get smaller. The flaking is something new since May, and scientists really do not know how this destruction process will affect the GRS in the coming years.

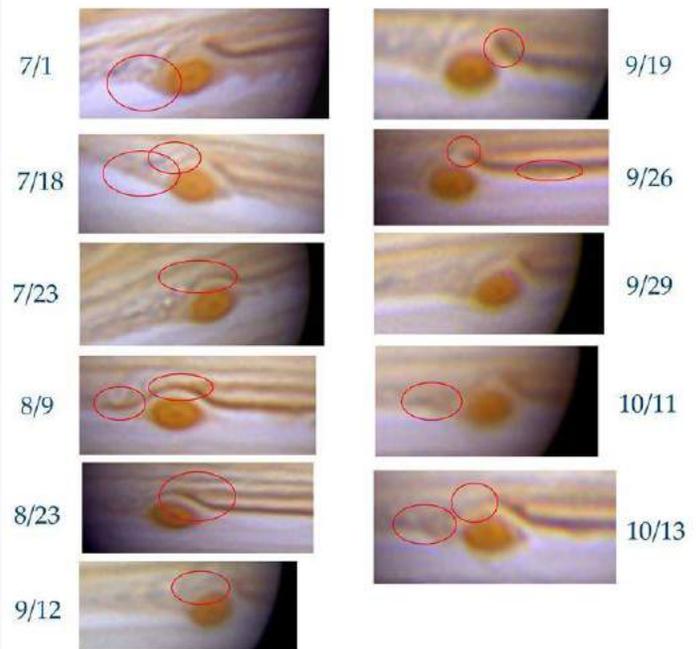
So when I began to assemble my Jupiter GRS collage, I was able to spot a full cycle of this flaking, pausing, and then another cycle about to start. I will be very curious to see Jupiter when it comes around again, and what changes have been wrought in this iconic storm.

Jupiter will reach opposition (it's closest approach to Earth, and therefore appear the largest) on July 14th, 2020.



Jupiter GRS
7/1 - 10/13/19
1959 Cave Astrola
10" f/7.1
by Guy Earle
Riverview, Florida

Great Red Spot



7/1, a hook and flake
7/18, the flake grows stronger and begins to move into the SEB ring
7/23, the flake goes back and begins to solidify the SEB ring, creating a GRS hollow
8/9, the SEB ring becomes solid, defining the hollow below
8/23, the SEB ring begins to fade, but grows in thickness
9/12, the hollow has dissipated
9/19, no flakes on the GRS and the SEB ring has thickened and pulled back
9/26, the SEB ring continues to pull back and thicken
9/29, no activity
10/11, a new flake begins to form again as on 7/1
10/13, the flake extends out again and begins to form the hollow, extreme flake on side of GRS

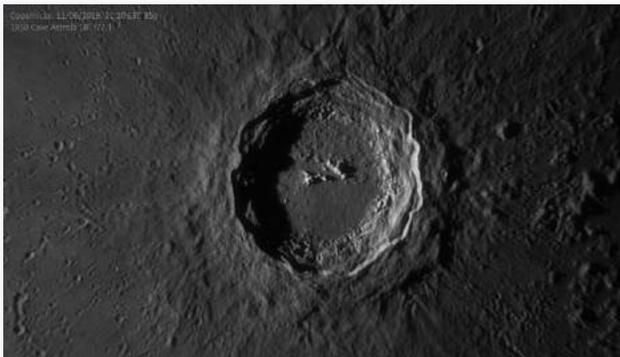
SPAC Astrophotography

GUY EARLE

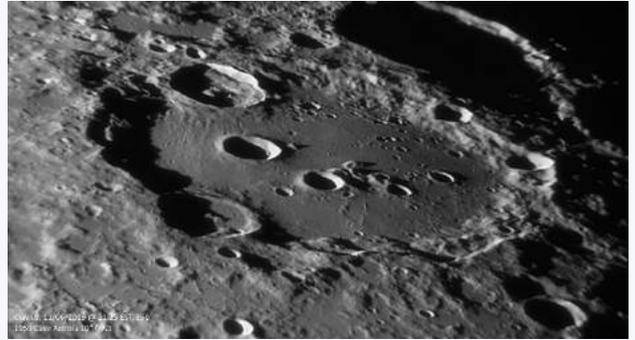
Here are some outstanding SPAC photographs. I encourage members to [email the editor](#) to submit for future newsletters or share them on our [SPAC Facebook page](#).



Target: NGC 869 Double Cluster
Location Chiefland, FL
Date: 2019-10-25
Exposures: 120 sec x 30
Camera: ASI 1600 MC
OTA: Celestron Rasa 11
Mount: Celestron CGX
by Jaime Kenas



Crater Copernicus on 11/06 by editor
1959 Cave Astrola 10" f/7.1 and Neximage 5 camera



Crater Clavius on 11/06 by editor
1959 Cave Astrola 10" f/7.1 and Neximage 5 camera



Waxing Gibbous Moon on 11/06 by editor
Through eyepiece with Samsung Galaxy S9+ and 1959
Cave Astrola 10" f/7.1



Target: M45, The
Pleiades
Dates: 10/24, 10/25
2019
Exposures: 60s x 114
Camera: ZWO ASI-
1600MC
OTA: Celestron RASA 11
Location: Chiefland, FL
by Jaime Kenas

Targets: B33 the
Horsehead and NGC
2024 the Flame
Date: 201910-25
Location: Chiefland, FL
Exposures: 120sec x 53
Camera: ZWO ASI
1600MC
OTA: Rasa 11
Mount: Celestron CGX
by Jaime Kenas





Target: Andromeda Galaxy, M31 and M110

Date: 2019-11-02

OTA: Celestron RASA 11

Exposures: 60s X 70

Camera: ZWO ASI-1600MC

Filters: None

Location: Big Cypress National Preserve
by Jaime Kenas

Mercury's Transit

GUY EARLE

★ Mercury recently had a transit, meaning it passed directly in front of the sun and was visible through telescopes with solar filters as a small, black dot crossing the sun's face. The transit occurred on Monday, November 11th from 7:36 AM EST until 1:04 PM EST. The next time this will be visible for us will be 2032 (and in case you're wondering about Venus, best to figure out suspended animation, as it won't happen until December 10-11 2117).

Here are some photos by our SPAC members:



Transit of Mercury, Nov. 11 2019, 14h 56m UT
photo by Greg Shanos



Transit of Mercury by Ron Wayman



Transit of Mercury by Greg Simpson
8-inch Schmidt-Cassegrain and Thousand Oaks Optical
white-light full-aperture solar filter.

SPAC Mirror Lab Report

BRAD PERRYMAN

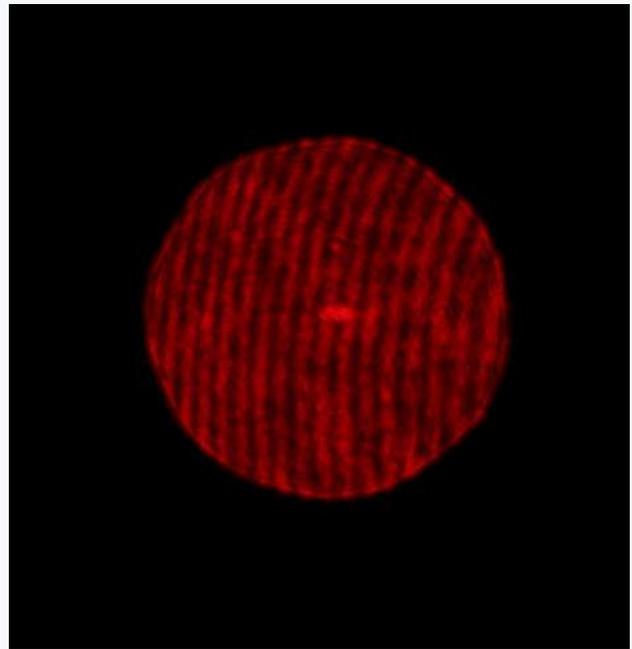


Ralph has made great strides in getting his interferometer up and running. A new test stand, the laser interferometer

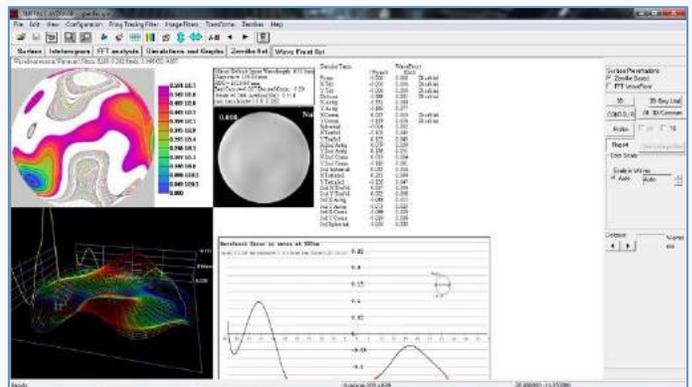


built, and camera all set up with a mirror ready to measure, only one thing left to do...make sure Moose isn't in the room when the laser is turned on.

The first run didn't go as planned. The fringes were not showing up in the camera but after making a few adjustments the interferometer displayed definable fringes.



Ron Jones was able to take the pictures to create model of the surface using an open fringe program to show the surface features.



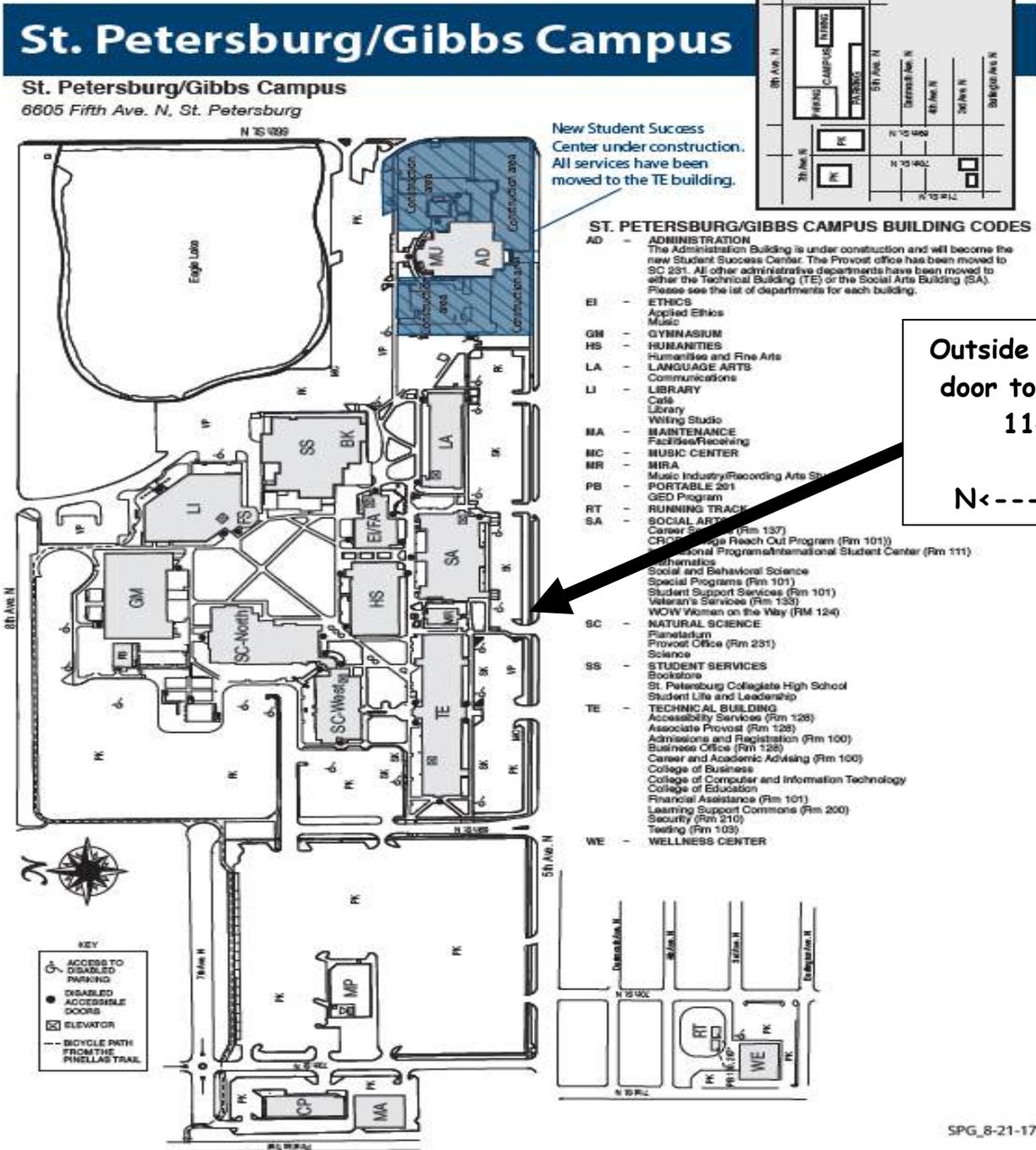
While in its current state, Ralph and Ron were able to produce usable data, but the fringes aren't perfect yet. Ghost fringes need to be eliminated and procuring a camera with the proper focal length to prevent edge distortion needs to be addressed before it becomes our preferred method for evaluating mirrors. It's a learning process and we are making progress.

SPAC December Christmas Party 7:00PM Friday, 12/13/19

Location: Philip Benjamin Social Arts Building - Room 114

Please bring a dish to share.

Park on the south side of the building. 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.



SPAC Business Meeting 

Our next business meeting is Wednesday, December 4th, 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	Kyle Brinkman	727 455-6931
Vice Pres.	John O'Neill	727 637-5945
Secretary	Shirley Vuille	727 864-2624
Treasurer	Jim Hunter	813 507-8415
Dir.-at-Large	Paul Krahrmer	727 535-5827
Dir.-at-Large	David Pearson	727 215-1526
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
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

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
John Stepanov	Benefactor
Gus Waffen	Benefactor
Ronald & Sterling Algieri	Patron
Peter & Jaclynn Dimmit	Patron
Joseph & Pamela Faubion	Patron
Steve & Cindy Fredlund	Patron
Richard & Mary Garner	Patron
Charlie & Linda Hoffman	Patron
Scott & Beth Irwin	Patron
Matt Labadie	Patron
Laura Lanier	Patron
Robert Myers	Patron
Brad & Lisa Perryman	Patron
Alan Polansky	Patron
David & Rusty Richmond	Patron
Anthony Staiano	Patron
Wally & Ramona Vazquez	Patron

Examiner Staff

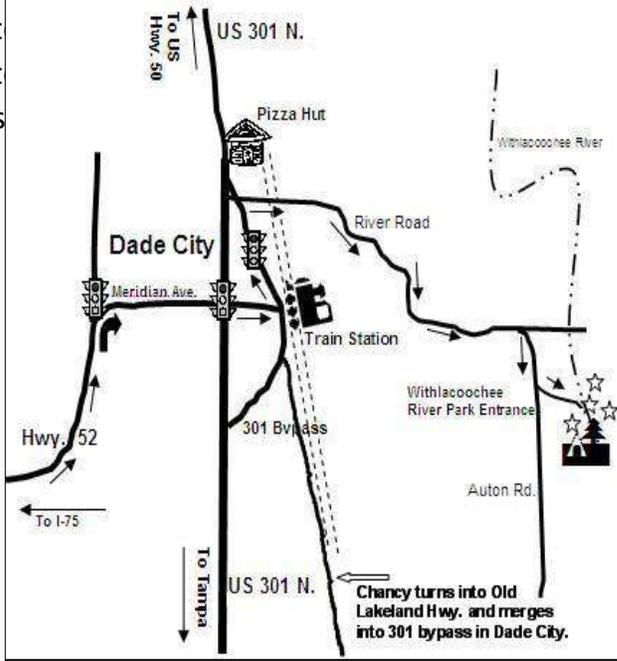
Editor	Guy Earle	813 785-1972
Reporter	Kelly Anderson	813 672-2751
In the News	Steve Robbins	386 736-9123
Mirror Lab	Ralph Craig	727 384-2086

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



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



SPAC, INC. MEMBERSHIP INFORMATION

Membership in St. Petersburg Astronomy Club, Inc. is open to anyone, regardless of age, who is interested in astronomy. Dues are considered donations and are non-refundable. Membership options are available as listed below:

To join or renew your membership:

Complete the following form and return it with your payment to: Jim Hunter - Treasurer, 17316 Oak Ledge Dr., Lutz, FL 33549-7626 - Telephone number (813) 909-7013 (checks should be made payable to SPAC, Inc.)

Name: _____ Telephone Number: _____

Spouse: _____ Children (*Under 18*): _____

Address: _____ City: _____ St. ____ Zip: _____

E-Mail address: _____

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.

Student: [] Free. Expected date of graduation: _____

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.