

Southwest Florida Astronomical Society, Inc. SWFAS



The Eyepiece December 2020

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A MESSAGE FROM THE PRESIDENT

Covid is still a major issue on our events.

I am checking if we will have a CRP Star Party on the 12th. This is Geminid Meteor Shower night! If we do have it, bring pads or a lounge chair (and probably blankets!) Things usually get going around 10pm.

On the 21st we have the Jupiter/Saturn Conjunction low in the southwest at sunset.

The December meeting is Officer Election meeting. If you are interested in any of the officer positions, please contact me before the meeting. At this point, all the current officers are interested in continuing in their current positions unless someone else really wants to take over. We are looking for someone to handle programs for the meetings. If you are interested in maintaining our website (Wordpress based) please let me know.

Matthew Knight has a Celestron Nexstar 5 5SE with carrying case, 12v power cord, accessories tray, a 40mm Sirius eyepiece, a GSO 2x Barlow and a few other accessories, looking to sell it all for \$450 telescope operates fine. You can reach Matthew via text or call him at 239-810-7444

Please join our Zoom meeting Thursday. We have only had about a dozen members each time and would really like to see more members.

Brian

Star Party Schedule 2020

Sea Hawk Park - No more Seahawk Park Star Parties for the time being.

Caloosahatchee Regional Park - 12/12 -- This is tentative.

Big Cypress Preserve – Tentative

December 12th, 2020, January 9th 2021, February 13th, 2021, March 13th, 2021

Ideas for Using Outreach Funds

SWFAS would like to hear from members for any suggestions for applying outreach funds.

Members' Recommended Reading & News Links

Members are encouraged to submit to the editor links to recommended articles and books that might be of interest to Club members.

Uncle Rod's Astro Blog

<https://uncle-rods.blogspot.com>

Books

Each Weekly Newsletter of S&T has a 60-second news section. The general link for S&T Astronomy News is <https://www.skyandtelescope.com/astronomy-news/>.

Sky and Telescope has a new free introductory E-book "Stargazing: Getting Started" if you sign up with your email. <https://skyandtelescope.com>

For NASA-JPL News see <https://www.jpl.nasa.gov/> .

For Astronomy Magazine & News, see <https://www.astronomy.com/news>

Astronomy magazine has a free PDF download of "The Hitchhiker's Guide to the Planets", published September 19, 2019.

In the Sky for December

Rise & set times of planets are in local time for Ft. Myers, FL, (26.6°N, 81.9°W).

NOTE: Standard Time starts on November 1st.

(<http://www.heavens-above.com>).

Sunrise: 1st 6:58 am (114°ESE). Sunset: 5:34 pm (246°WSW)

Sunrise: 31st 7:15 am (116°ESE). Sunset: 5:45 pm (245°WSW)

September starts with 11 hours, 7 minutes of daylight and ends with 10 hours, 36 minutes.

(<https://www.timeanddate.com>)

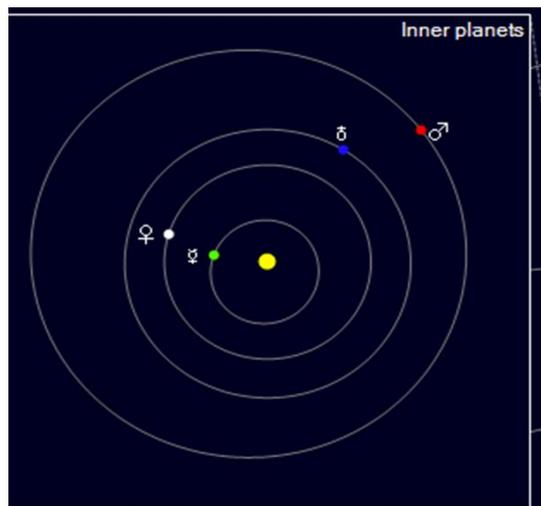
Information is from above as well as *Sky & Telescope* and *Astronomy Magazine* and *SkyMania.com*.

Night sky simulations, such as on <https://www.timeanddate.com> (select Night Sky) are helpful for planning planetary observations relative to constellations and other night sky events (Beta).

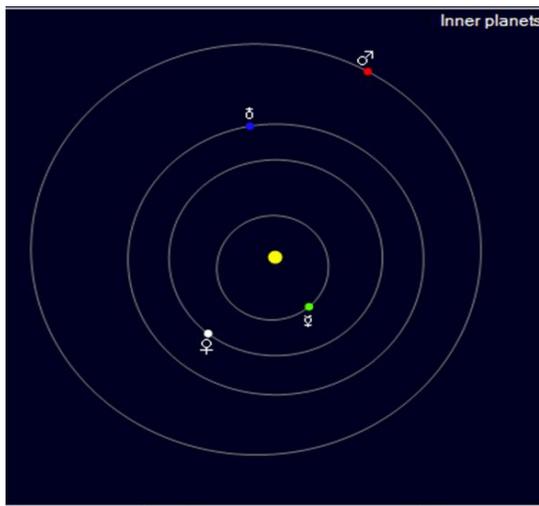
Moon: Last Quarter – 8th; Perigee – 12th; New – 14th; First Quarter – 21st; Apogee – 24th; Full–30th. On the 1st, it sets at 8:01 a.m. (296°W), and rises at 6:42 p.m. (112°E). On the 31st, set time is 8:35 a.m. (297°WSW), and rise time is 7:19 p.m. (64°ENE).

Mercury (starts in Libra and moves to Sagittarius this month). On the 1st, at -0.7 magnitude and 4.91" wide, it rises at 6:14 a.m. ½ hour before sunrise (Az, 112°ESE), then sets at 4:52 p.m. (248°WSW). By the end of December, at a brightness of -0.9 and 4.83" wide, it rises before the Sun at 7:52 a.m. (117.6°E). About 15-20 minutes before sunset, it sets at 6:08 p.m. (242.5°W).

From Heavens Above.com



Inner Planets, December 1st



Inner Planets, December 31st

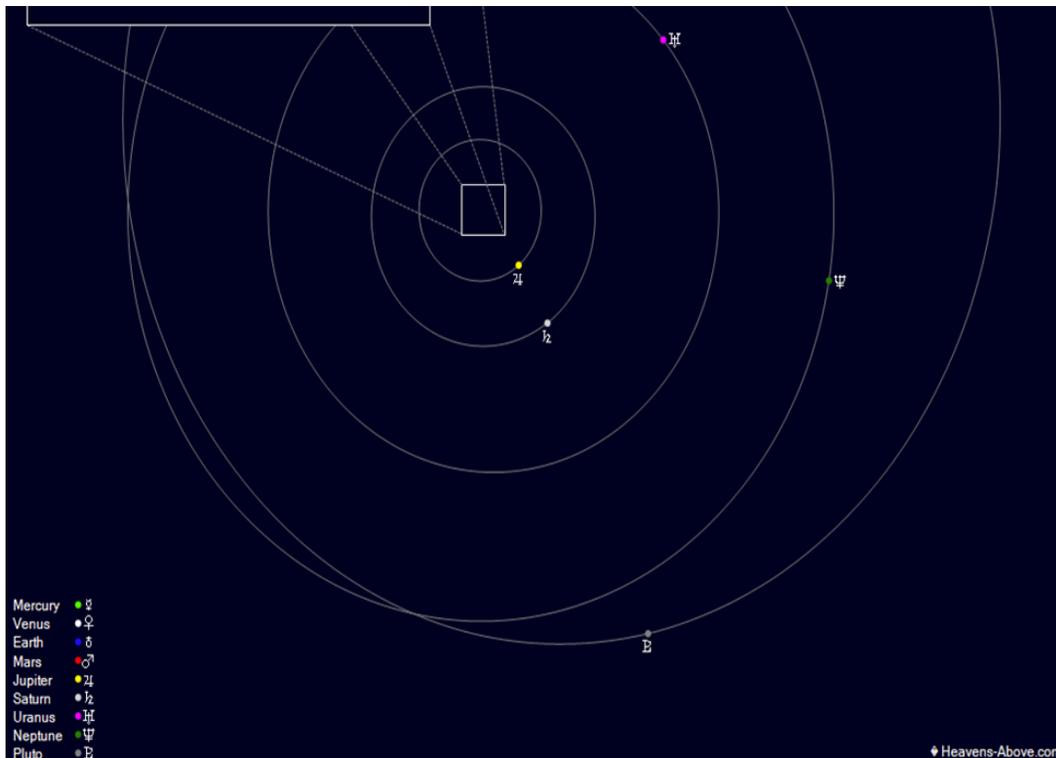
Mercury	● ☿
Venus	● ♀
Earth	● ♂
Mars	● ♂♂
Jupiter	● ♃
Saturn	● ♄
Uranus	● ♅
Neptune	● ♆
Pluto	● ♇

Venus (dawn, starts in Libra, then moves to Ophiuchus this month) On the 1st, it rises at 4:53 a.m. at 105.5°E, (RA, Decl=14^h40^m3.4^s, -13°51'15") and sets at 3:56 p.m. (254°W) (RA, Decl=14^h42^m17.5^s, -14°2'10"). Its brightness is at -3.9 to -3.8 for the month, and changes from about 11.6" to 10.7" wide. On the 31st, it rises at 5:48 am (115°E) and sets at 4:13 pm (245°W).

Mars (all night, in Pisces all month) The Earth – Mars orbital relationship shows the Earth quickly moving ahead in its inside track. Mars dims in December from magnitude of about -1.1 and 14.6" wide to -0.3 and 10.5" wide. On the 1st, it rises at 2:33 p.m. and sets the

next morning at 3:00 a.m. (Az~278°W) (RA, Decl=1^h2^m49.9^s, 6°42'6"). On the 31st, it rises at 1:01 p.m., and sets at 1:48 a.m. January 1, 2021 (Az~283°W) (RA, Decl=1^h39^m39.3^s, 11°17'20"). S&T's Mars Profiler tool, <https://is.gd/marsprofiler>, shows the viewable Martian face by date and time.

Outer Planets for December. Their configuration does not change much for one month.



Jupiter (dusk until early/mid-evening, Southwest, starting in Sagittarius and moving to Capricornus on the 15th). It starts the month with a diameter of 34.4" and ends at almost 33". Jupiter and Saturn start the month setting ~3½ hours after sunset and end it setting ~1¾ hours after sunset. On the 1st, it rises at 10:21 a.m. and sets that night at 8:49 p.m. at Az=246° (RA, Decl=19^h52^m40.1^s, -21°23'18"). On the 31st, it rises just after 8:47 a.m. and sets that night at 7:21 p.m. (247°, Az) (RA, Decl=20^h19^m34.9^s, -20°4'34"). Its brightness starts the month at -1.9 and increases slightly to -1.8 by month's end. Jupiter and Saturn will be <1° apart during December, having their first conjunction in 20 years, and the closest conjunction since 1623. They are only 0.1° apart (6' arc) on December 21st, and are at their closest viewable separation in 800 years, a rare treat.

Saturn (dusk until early/mid-evening, Southwest, starting in Sagittarius and moving to Capricornus on the 18th). Saturn's brightness for the month is fairly constant at 0.6. Its disk size decreases slightly from 15.65" to 15¼" this month. On the 1st it rises at 10:29 a.m. and sets at 8:59 p.m. (246.5°, Az) (RA, Decl=20^h1^m36.4^s, -20°52'11") that night just minutes and ½ ° Az after Jupiter. On the 31st, it rises at 8:43 a.m. and sets around 7:16 p.m. (247°, Az) (RA, Decl=20^h14^m40.0^s, 13°15'42"). Saturn's rings span 35", a little more than Jupiter's width of 33", almost doubling Saturn's apparent size. On the 16th – 18th within an hour after sunset, Saturn, Jupiter are between the crescent Moon positions looking SSW, just below Capricornus.

Saturn and Jupiter appear again within an hour after sunset on the 21st, minus the Moon just below Capricornus.

Uranus: (all night, in Aries) At the beginning of December, it rises, at 3:35 p.m. and sets at 4:32 a.m. (Az=285.5°WNW) (RA, Decl=2^h19^m57.3^s, 13°28'9") on the 2nd. It appears only 3.65" wide and a 5.7 brightness this month. On the 31st, it rises at 1:35 p.m. and sets at 2:31 a.m. (Az=285.5°WNW) (RA, Decl=2^h17^m19.1^s, 13°15'39") on January 1, 2021. A finder chart is in the October issue of Sky & Telescope.

Neptune: (evening to midnight, in Aquarius) On the 1st, it rises at 1:12 p.m., and sets about 12:51 a.m. (Az=264°WSW) (RA, Decl=2^h19^m57.3^s, 13°28'9") on the 2nd. On the 31st, it rises at 11:15 a.m. and sets that night at 10:50 p.m., 264°Az, (RA, Decl=23^h18^m15.4^s, -5°39'52"). A finder chart is in the September issue of Sky & Telescope.

International Space Station: The ISS is visible on December 7-12 (early evening) & 17-22 (predawn). See this link for specific times and routes for the ISS: <http://www.heavens-above.com>

Hubble Space Telescope: will be visible on December 1-14 (early evening), and from the 23rd - 31st (predawn). Brightness magnitudes range from +0.7 - +3.8. See this link for specific times and routes for the HST: <http://www.heavens-above.com>

Comets and Asteroids: See this link for specific times and routes for brightest observable comets and asteroids: <http://www.heavens-above.com>. Links to finder charts are also available. Comet C/2019 M3 ATLAS is about 8 ½ brightness, at >19° altitude in the Southwest (223°Az) in Piscis Austrinus. Comet 88P Howell, in Capricornus, has a brightness of 10.1, dimmer than last month, and Alt, Az of 7.5°, 240° WSW. The dim bulb of the group this month is C/2019 U6 at 15.5, in Hercules on the horizon at 296° WNW.

Zoom Meeting Info: (Thursday December 3rd, 7:30pm)

(Please don't login or test the link before 7:15 pm on Thursday)

If you have not been emailed the link, contact Brian or Tom.

Members who are familiar with Zoom may disregard instructions below.

For PC Users:

You'll want to install the "Zoom" app. on your computer, if you don't already have it. This way when you click on the link at the time of the meeting, it will take you directly to our meeting.

Download for (free) Zoom Client for Meetings:

<https://zoom.us/client/latest/ZoomInstaller.exe>

For Apple Users:

If you don't already have the "Zoom" app, you need to download it. After downloading, ignore all further instructions, and click to leave the app. (This app will automatically be used when you

double click the link to the meeting on Thursday)

Here's the link to (free) Zoom in the App Store:

<https://apps.apple.com/us/app/zoom-cloud-meetings/id546505307>

General Instructions to join the meeting:

1. Click on the link above to join the meeting
2. Click on window that appears, "Join Zoom Meeting".
3. Then "Join Computer Audio"
4. On entering the meeting, audio is going to be "off" by default. Press down and hold your space bar to talk. Both Brian and the presenter will be unmuted by default. This is being done to cut down on background noise, as it seems to accumulate as our numbers increase.

For more information on audio and video go to:

<https://support.zoom.us/hc/en-us/articles/204484835-My-Audio-is-N>

Tom's Email: kleinto@netscape.net

Minutes for the Zoom Meeting on Nov 5th,2020

Meeting started at 7:40 with 15 members present. Minutes approval motion by Tom Segur, seconded by John MacLean, motion passed. Treasurer's Report approval motion by Tom Klein, seconded by Mike McCauley, motion passed.

Reported by Brian Risley

Southwest Florida Astronomical Society, Inc. Event Schedule for 2020/2021

This is tentative based on Covid-19 conditions

Date	Event	Location	Time/Note
Dec 3 rd , 2020	Monthly Meeting	Zoom Meeting	7:30pm
Dec 12 th , 2020	Monthly Star Party	Caloosahatchee Regional Park	Dusk
Dec 26 th , 2020	Solar Observing	Ponce De Leon Park Punta Gorda	9:00 am - Noon
Jan 7 th , 2021	Monthly Meeting	Calusa Nature Ctr Planetarium?	7:30pm
Jan 23 rd , 2021	Solar Observing	Bayshore Live Oak Park Port Charlotte	9:00 am - Noon
Feb 27 th , 2021	Solar Observing	Gilchrist Park Punta Gorda	9:00 am - Noon
Mar 27 th , 2021	Solar Observing	Ponce De Leon Park Punta Gorda	9:00 am - Noon
April 24 th , 2021	Solar Observing	Bayshore Live Oak Park Port Charlotte	9:00 am - Noon
May 22 nd , 2021	Solar Observing	Gilchrist Park Punta Gorda	9:00 am - Noon

All observing events are Weather Permitting.

If it is cloudy or a chance of rain, we may not setup at all.

There may be no way to provide advance notice of cancellation.

Events may be cancelled several hours before scheduled time based on observed conditions and forecasts at that time and weather may change.

Monthly Star Parties: These are held at either Seahawk Park in Cape Coral or at Caloosahatchee Regional Park (CRP) off SR78 7 miles east of SR31. Other than park fees noted, these are free and open to the public. Those wanting to learn how to use equipment can bring it to the monthly star parties or the monthly meetings. We are always glad to help people learn how to use their telescopes. It is also a great way to learn about different telescopes and try some out before making a purchase.

Seahawk Park is in North Cape Coral off Wilmington Blvd. (Nelson Rd or Chiquita Blvd are the nearest cross streets.) There is a brown sign in the center median at the entrance to the park. (GPS may not get you to the park, as some of the local roads have been closed.) You will make a big J hook before getting to the parking area. Seahawk Park is managed by the *Cape Coral R/Seahawks* Club for Radio Controlled Planes and they have priority. They are usually done by sunset but may be there before sunrise. Park in the lot and transport your equipment to the concrete staging area before the runway. This park is handicap capable as there is level concrete leading from parking to the staging area.

CRP has a gate that closes at dusk, you can check the county's website for current gate closing times and the status of the park's Northside entrance as that is where we observe from. (They may close the area if there are issues with the trails.) There is a parking fee of \$1/hr or \$5/day at CRP. Park in the main Northside parking lot. We sometimes setup down the dirt road that goes to the east. That area is grassy and may not be level, so one should walk on the dirt road as much as possible and watch their step.

Big Cypress: The Big Cypress Welcome Center is located off US41 3 miles east of SR29 about 25 miles east of Naples. Big Cypress has earned a Dark Sky Park designation. They hold observing events down the road that extends south of the Welcome Center during the winter months. This is a real dark sky site. Their observing events are free. The site is open all the time and is a fee free area. They ask that you keep the road clear.

Solar Events: We have daytime solar events where one can safely look at the Sun. Things such as sunspots and prominences may be visible. These are free unless tied to another event that may have an entrance fee. There are seasonal monthly events held at different parks around Charlotte County as well as at other major public events in SW FLA.

Rotary Park Star Party: This is a free public star party held at Rotary Park at the south end of Pelican Blvd in South Cape Coral. Park to the west of the main building and walk to where we are setup to the east of the main building.

Moore Observatory, FSW Punta Gorda Campus: The campus is located off Airport Rd just east of I-75. Go to the right around the lake and park. The observatory is located down the path along the lake. Besides the telescope in the observatory, additional scopes may be setup around the observatory. This is a free event.

Star Party Etiquette: Bright white flashlights are not welcome. We use red flashlights to preserve our night vision. At the parks, please use just your parking lights if possible. As there may be cords and tripod legs that are hard to see in the dark, we ask that all children be well behaved and cautious around the telescopes. If you need help in moving around in the dark, just ask. Someone will be happy to guide you with a red light. If you have a telescope and need help with it, just ask. Someone will be glad to show you how to use it.

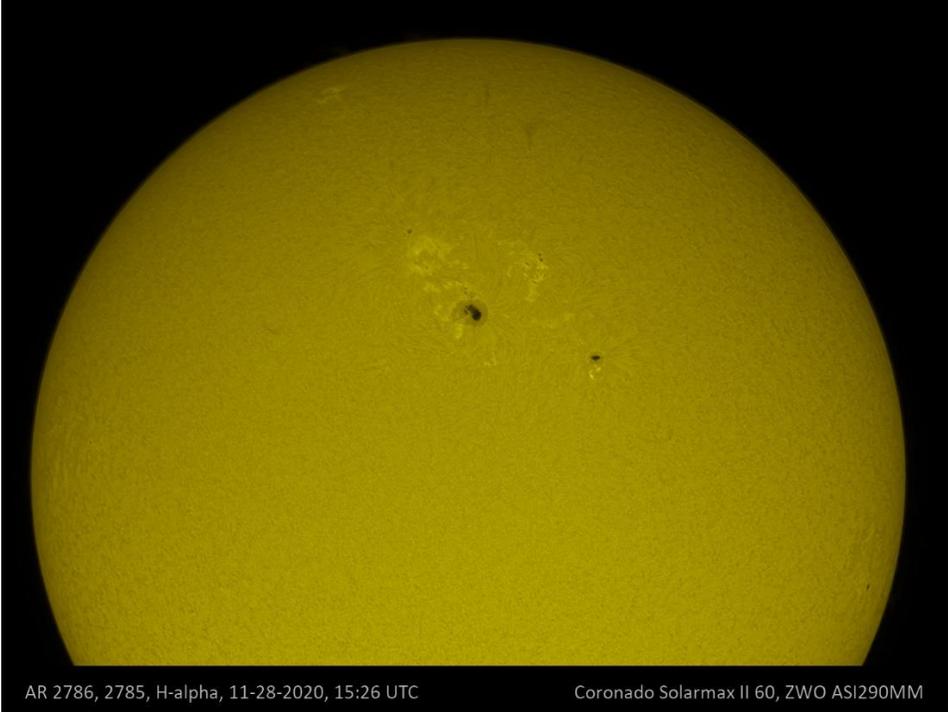
Golden Rules to Telescope Observing: Move your eye to the telescope, don't try to move the telescope to your eye! Ladders/chairs are there for your support, the telescopes do not provide support and should not be touched.

Website: www.theeyepiece.org Check us out on Facebook, too.

Members' Photos

By John Maclean

H-alpha false color shots of the Sun on 11/28/2020 showing the new sunspot groups with associated plage area



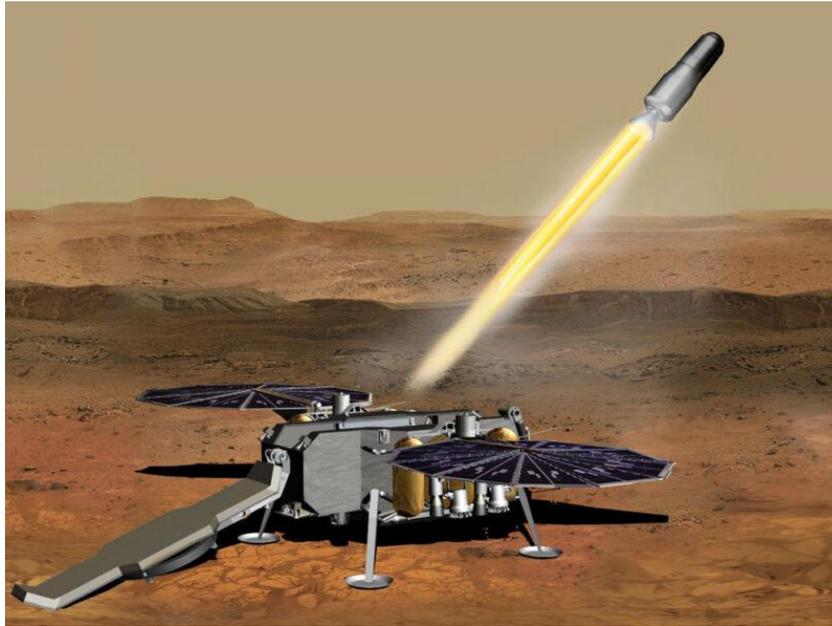
By Ray Bratton



Mars Sample Return Program Forges Ahead

By: Emily Lakdawalla, Sky & Telescope Weekly November 11, 2020

It's full steam ahead for the joint NASA-ESA Mars Sample Return program.



***This illustration shows a concept of how the NASA Mars Ascent Vehicle, carrying tubes containing rock and soil samples, could be launched from the surface of Mars in one step of the Mars sample return mission.
NASA / JPL-Caltech***

Perseverance is [just 100 days away from its landing](#) ¹ on Mars. Its mission: to gather samples from Jezero Crater for eventual return to Earth. Those eventual plans received a major boost today: an independent review board with members from NASA, the European Space Agency (ESA), the planetary science community, and aerospace industry affirmed that NASA's and ESA's plans to retrieve and return those samples are achievable.

To recap: For more than three years, NASA and ESA have been working together to plan a Mars Sample Return program, which will have three major components. The first is the Perseverance mission, well on its way. Second, a NASA-built Sample Retrieval Lander will send a small ESA-built rover to retrieve Perseverance's samples, place them into a NASA-built Mars Ascent Vehicle (that is, a rocket), and launch them into Mars orbit. Third, an ESA-built Earth Return Orbiter will rendezvous with the samples and place them into a NASA-built Earth return vehicle, which will bring them back to Earth.

The review board report recommended budget and schedule changes, increasing spending by at least \$500 million and delaying the plans for the first launch from 2026 to 2027. The board also suggested a new mantra for the Perseverance mission: "It's all about the samples."

Tanja Bosak (MIT), who is a [Perseverance Returned Sample Science Participating Scientist](#),² explains the difference between operating a science mission like Curiosity and a sample-gathering mission like Perseverance: “Curiosity has a lot of time to move over the terrain and stop at any interesting spot, look around, go back to spots of interest, and conduct lengthy and complex analyses.

“Perseverance has much less time during the prime (or extended) mission to explore and has to keep on moving, while at the same time characterizing the geology, developing the context for sample selection, and acquiring the samples.”

Another key recommendation by the independent review board: very close collaboration, with wide-open, transparent communication, between NASA and ESA at all levels of management on the Mars Sample Return program. In fact, it recommended that NASA and ESA establish field offices at each other’s leading centers involved in the program.

The last time there was such a close collaboration between NASA and ESA was on the Cassini-Huygens mission; NASA built Cassini at the Jet Propulsion Laboratory, and ESA built Huygens at its ESTEC facility in the Netherlands. This close collaboration has obvious management benefits, but there’s an additional political benefit: it is much harder to cancel a mission where the cooperation is so close.

[Cassini-Huygens survived a U.S. government push for its cancellation](#),³ thanks in large part to pressure from ESA.. More recently, the U.S. unilaterally pulled out of its participation in ESA’s ExoMars program, leaving ESA stuck without an experienced partner to help them land their ambitious rover on Mars.

Casey Dreier, senior space policy adviser for The Planetary Society, says: “ESA and NASA learned their lesson from the ExoMars debacle: don't make a joint mission easily severable. Both space agencies need each other to succeed in this mission, which makes any one of them walking away from this commitment highly consequential. This helps establish a stronger base of political buy-in for the program, which it will need in order to survive the inevitable cost and technical challenges it will face.”

All eyes are now on Perseverance. If it lands safely on February 18th, it will be full speed ahead for Mars Sample Return.

[Read the full report here](#)⁴(PDF).

¹ <https://www.jpl.nasa.gov/news/news.php?feature=7780>

² <https://mars.nasa.gov/news/8611/nasa-adds-return-sample-scientists-to-mars-2020-leadership-team/> , NASA Adds Return Sample Scientists to Mars 2020 Leadership Team, NASA News, February, 2020.

³ <https://www.latimes.com/science/la-sci-cassini-oral-history-20170912-htmstory.html> , “ ‘OK. Let’s do it!’ An oral history of how NASA’s Cassini mission to Saturn came to be”, by Deborah Netburn, Staff Writer, Sep. 12, 2017

⁴ “Summary of NASA Responses to Mars Sample Return Independent Review Board Recommendations”, NASA, Science Mission Directorate, November 10, 2020.

This article is distributed by NASA Night Sky Network



The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

Visitors to Both Jupiter and Saturn

David Prosper

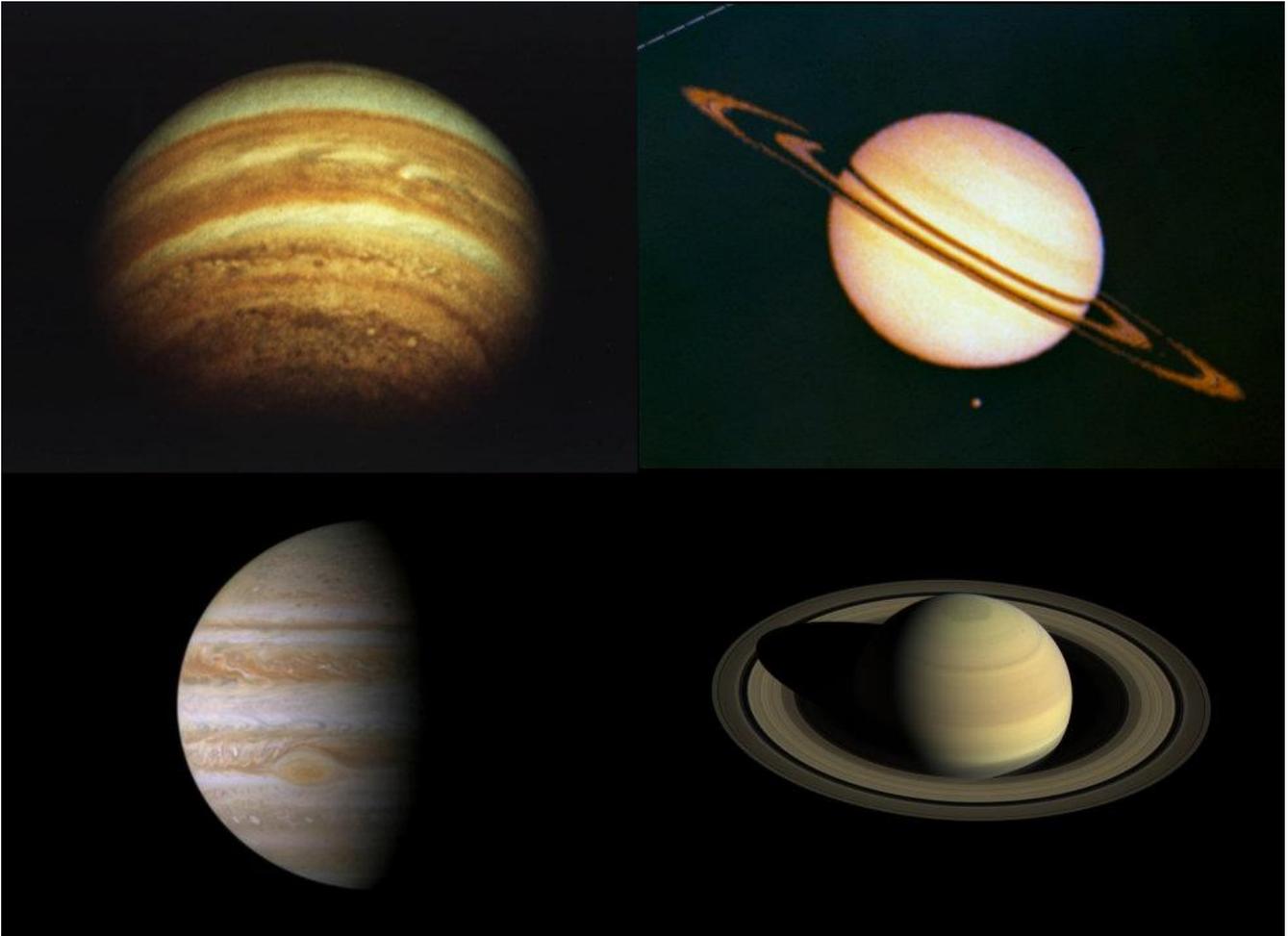
Have you observed Jupiter and Saturn moving closer to each other over the past few months? On December 21, the two worlds will be at their closest, around 1/5 of a full Moon apart! While the two gas giants may appear close, in reality they are hundreds of millions of miles apart. Despite this vast distance, a select few missions have visited both worlds by using a gravity assist from giant Jupiter to slingshot them towards Saturn, saving time and fuel.

Pioneer 11 was the first mission to visit both worlds! Launched in 1973, the probe flew past Jupiter in late 1974, passing just 26,400 miles above its stormy clouds. In 1979, it became the first spacecraft to encounter Saturn. Pioneer 11 took the first up-close photos of Saturn and its satellites, and made many exciting discoveries, including the detections of its magnetic field and a faint "F" ring, before departing Saturn and eventually, the solar system.

The Voyager missions quickly followed up, taking a "Grand Tour" of the four largest and most distant planets in our solar system. Both probes were launched within two weeks of each other in 1977. Voyager 1 flew past Jupiter in March 1979, discovering Jupiter's faint ring and two new moons, along with active volcanoes on Io's surface! The probe then flew past Saturn in November 1980, discovering five new moons, a new "G" ring, mysterious ring "spokes," and "shepherd moons" shaping the rings. After a brief encounter with Titan revealed evidence of complex organic chemistry and liquid on the moon's frigid surface, Voyager 1 was flung out of the plane of the solar system. Following close behind, Voyager 2 took detailed photos of Jupiter's moons and cloud tops in July 1979. Flying past Saturn in August 1981, Voyager 2 measured the thickness of Saturn's rings and took detailed photos of many of its moons. This second explorer then captured images of Uranus and Neptune before leaving our solar system.

Cassini-Huygens was the last mission to visit both worlds. Launched in 1997, the mission flew past Jupiter in late 2000 and took incredibly detailed photos of its stormy atmosphere and faint rings. Cassini entered into Saturn's orbit on July 1, 2004. The Huygens probe separated from Cassini, landing on Titan to become the first probe in the outer solar system. Cassini discovered geysers on Enceladus, fine details in Saturn's rings, many more moons and "moonlets," the changing oceans of Titan, and seasonal changes on Saturn itself. After revolutionizing our understanding of the Saturnian system, Cassini's mission ended with a fiery plunge into its atmosphere on September 15, 2017.

What's next for the exploration of the outer worlds of our solar system? While Juno is currently in orbit around Jupiter, there are more missions in development to study the moons of Jupiter and Saturn. Discover more about future NASA missions to the outer worlds of our solar system at nasa.gov.



The difference in technology between generations of space probes can be stunning! The top two photos of Jupiter and Saturn were taken by Pioneer 11 in 1974 (Jupiter) and 1979 (Saturn); the bottom two were taken by Cassini in 2000 (Jupiter) and 2016 (Saturn). What kinds of photos await us from future generations of deep space explorers?

Club Officers & Positions:

President/Equipment Coordinator:

Brian Risley

swfaspres@gmail.com

(239-464-0366)

Treasurer:

John MacLean

john.maclean@comcast.net

(239-707-3365)

Viewing Coordinator/Fakahatchee:

Chuck Pavlick

cpav4565@gmail.com

(239-560-1516)

FSW Punta Gorda Moore

Observatory Director:

Thomas Segur

tsegur479@comcast.net

(941-249-8726)

Astronomical League

Coordinator: (ALCOR):

John MacLean

john.maclean@comcast.net

(239-707-3365)

Vice President/
Program/Event Coordinator:

Mike McCauley

mmccauley13@comcast.net

(860-982-5022)

Charlotte Event Coordinators:

Tony Heiner

verahei@aol.com

(941-457-9700)

Thomas Segur

tsegur479@comcast.net

(941-249-8726)

Calusa Nature Center

Planetarium Director:

Heather Preston

heather@calusanature.org

(239-275-3435)

Secretary:

Don Palmer

swfas.sec@gmail.com

(239-334-3471)

Librarian:

Maria Berni

(239-940-2935)

Website Coordinator:

Matthew Knight

swfas.webmaster@gmail.com

Club Historian:

Danny Secary

asecary@gmail.com

(239-470-4764)

Newsletter Editor:

Michael Moses

mikem3593@icloud.com

(941-276-6069)

www.theeyepiece.org

Southwest Florida Astronomical Society, Inc.
P.O. Box 100127
Cape Coral, FL 33910