

# OKLAHOMA SPACE ALLIANCE

## OUTREACH – March 2026

**102 W. Linn #1, Norman, OK 73069**

Oklahoma Space Alliance will meet at the  
at Cyber Hall and Gaming Lounge next to Norman Computer  
at 2:00 p.m. on March 14, details inside

v

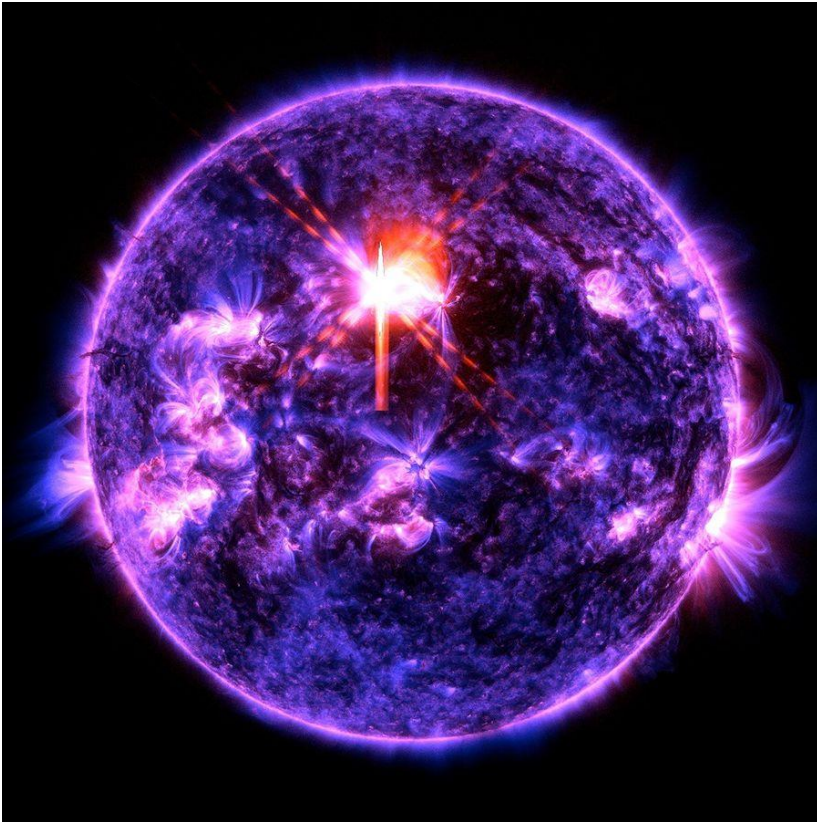


Figure 1 Image of the Sun taken in UV by the Solar Dynamics Observatory showing the February 4 Solar Flare (NASA Photo Archive)

## OKLAHOMA SPACE ALLIANCE OUTREACH March 2026

### March Meeting

Oklahoma Space Alliance will meet at 2:00 p.m. on Saturday, March 14, at the location next to Norman Computers on West Main in Norman. Prospective members are welcome.

The meeting room is in the Cyber Hall and Gaming Lounge next to Norman Computers. Please enter through the Cyber Hall door. The Cyber Hall is at 914 W Main St, opposite Norman High School. The phone number is (405) 292-9501. To get to the meeting space from points north, take Highway 77 exit off I-35, and continue south until you reach Main Street. Norman Computers is about a block and a half west of this on the south (left) side of a small mall.

### Saturday, March 14, 2:00 p.m.

1. Introductions and review of Space events this past month
2. What's Happening in Space, News, Pictures, and Videos approximately one hour. See <http://osa.nss.org> before the meeting for items to be discussed.
3. Break
4. Oklahoma Space Alliance Chapter Business Discussion
  - a. Review OSA treasurer's report.
  - b. Minutes of February Meeting
  - c. Yuri's Night
  - d. Plans for 2026
5. Video (to be announced)
6. Chat

### Minutes of February 14 Oklahoma Space Alliance Meeting

Oklahoma Space Alliance met February 14, 2026, at the Cyber Hall and Gaming Lounge at Norman Computers in Norman, Oklahoma. Attending were Clifford McMurray, Tim Scott, Dave Sheely and Syd Henderson, with Robin Scott joining us by phone. OSA President Clifford McMurray. presided over the meeting He did an *Update* discussing links to material covered in the meeting and this is online at <https://osa.nss.org/Update2602.pdf> so I'll cover the details that aren't covered there.

Crew 12 has launched to the International Space Station, eliminating a temporary shortage of astronauts on the ISS due to Crew 11 having to come back a few days. This was the first time a crew had to come back for medical reasons since 1985, when a cosmonaut may have had a STD. [Or perhaps a prostate infection. In any case, it got worse in space.—SFH]

Artemis II has 700000 gallons of H<sub>2</sub>. Artemis I had three delays over similar leaks in six months. Windows for March launch are March 9 or 11. [It has, of course, been moved to April.-SFH]

With the upcoming revamp. *New Glenn* will be able to lift seventy tons to Low-Earth Orbit, forty to GEO, and twenty to lunar injection which is better and cheaper than SLS. [How could it not be cheaper?] We watched a video on the story of *New Glenn*.

China has ten companies working on reusable rockets. *Long March 10* went to orbit but China failed to retrieve the booster. *Long March 10* took off from a new launchpad on Hainan Island off the southern coast of China, and this launchpad will be used for all lunar missions. *Long March 10* is the rocket that will take taikonauts to the Moon in 2030. [In the meantime, the *Chang'e* program continues through 2028.]

The Mars Rover *Perseverance* drove itself for two days using AI-generated waypoints. The problem with self-navigation is that your position information degrades.

Turkey has not signed the Artemis accords. Does Turkey believe that Somalia can become stable enough for Turkey to build a spaceport there?

The Kardashev Scale, is a method of ranking civilizations by their technological advancement based on the total amount of energy they can control. Type I is planetary energy, Type II is stellar energy, and Type III is galactic energy. Currently, humanity is a Type Zero. [Type II, I believe, would require a Dyson Sphere.]

The proposed off-earth data center is a “mere bonus element” of Elon Musk’s new moon-base strategy. Scare quotes are his.

*New Shepard* has flown 38 times, 17 of them with passengers. The total number of passengers is 92. New Shepard employees are being transferred to the Blue Moon project.

SpaceX has now achieved 595 booster landings.

Skyler Chan’s GRU has one full-time employee beside himself. [He needs a lot more Minions to become a supervillain.]

Building semiconductor chips in orbit enables large savings in energy. There is already enough investment to build ForgeStar-2.

Russia is talking about re-using its module of the International Space Station as the core of the Russian Orbital Station (ROS). Russian newspaper *New Izvestia* criticized Oleg Orlev (director of the Institute of Biomedical Problems of the Russian Academy of Sciences) who a few years ago was complaining about conditions on the Russian module. *New Izvestia* “Have bacteria and fungi suddenly become less dangerous over the past three years?” [Perhaps they see a future in mutated microbes.]

Russia says the Soyuz Launch Platform will be back in operation in March, which is quick turnaround after their accident in November. [And there are already launches scheduled this month.]

We looked over the article <https://arstechnica.com/space/2025/11/attack-defend-pursue-the-space-forces-new-naming-scheme-foretells-new-era/> which has a list detailing the new naming scheme. [This reminds me of a system used to name ships telling people whether they were sailing or steam ships, how many masts or smokestacks, and especially how many turbines.]

Annual reports are due March 1. Syd will e-mail activities report to Tim. [Done.] Tim and Kip will meet for the stuff the President of OSA has to do. Tim does the Treasurer’s Report.

We have \$717.41 in checking account and \$267 in cash after Syd cashes his check for the newsletter.

We watched a video of SpaceX factory building the world’s most powerful rockets for MARS, and one on what life would look like on a Starship to Mars. Fuel was moved to the front of the spacecraft to reduce the pendulum effect. Starship would have 500 cubic meters of living space as currently configured, about that of the ISS. Upgrades will raise this to 100 cubic meters.

We watched a video, “How SpaceX Reinvented the Rocket Engine.”

For balance, we watched the Blue Origin CEO explain how their new solutions to get back to the Moon are better than SpaceX’s.

Minutes by OSA Secretary Syd Henderson

## Minutes of January 10 Oklahoma Space Alliance Meeting

Oklahoma Space Alliance met January 10, 2026, at the Cyber Hall and Gaming Lounge at Norman Computers in Norman, Oklahoma. Attending were Clifford McMurray, Adam Hemphill, Dave Sheely, and Syd Henderson. OSA President Clifford McMurray. presided over the meeting He did an *Update* discussing links to material covered in the meeting and this is online at <https://osa.nss.org/Update2601.pdf> so I’ll cover the details that aren’t covered there.

Next month Blue Origin will tell us what they intend to do with *New Glenn*.

The *Escapade* Mars orbiters will leave their halo orbits around the Earth-Sun L<sub>2</sub> point for Mars on November 26 and arrive there in 2027. Adam thinks they are in a long elliptical orbit that approaches Earth at perigee [which would make sense because they could use Earth as a gravitational Slingshot.

Jared Isaacman (the new NASA Administrator) has ninety days to identify programs that are more than thirty percent overdue or thirty percent over budget.

Congress has agreed on a \$24 billion NASA budget compared to the \$18.8 billion proposed. This includes restoring much of the science budget but not the Mars Sample Return mission.

The Tiangong Space Station crew did an eight-hour spacewalk to inspect the damage to Shenzhou 20, which is still attached to Tiangong. [It returned on January 19.]

Elon Musk was reluctant to have SpaceX go public since it might interfere with his Mars plans. The public offering is the largest in history.

A University in Japan sent up moss samples up to the ISS and 80% percent survived but with a bit less chlorophyll. There is a potential of 5600 days survival to exposure to space.

Yuri's launchpad was mothballed because of lack of funds. [Which I guess is why it's not available for crewed Soyuz missions.]

A Chinese citizen of Canada was arrested for surveying Cape Canaveral by drone and a Chinese naturalized American citizen was arrested for taking photographs at Vandenberg.

Mars Odyssey will run out of fuel within the next two years. We are approaching a shortage of Mars relay satellites, but the current NASA budget has \$300 million allocated for communications satellites around Mars.

By 2030 the risk that an aircraft will collide with falling space debris is 1%. [Over what time frame? I assume this is for all aircraft together, not individually!]

The record for the number of uses for a SpaceX booster is 32.

The ISS astronauts who were abruptly returned in January [because a crew member had a medical problem] were to return in February anyway, so were through five-sixths of their mission.

We watched a video of the November New Glenn launch and booster landing.

We watched a video on the odyssey of Snoopy, the Apollo 10 LEM, which is still orbiting the Sun and occasionally comes to visit Earth. Snoopy started orbiting the Sun in 1969, passed Earth in 1984 and (probably) in 2018. It is in the orbital plane of the Earth and will return again in 2028.

We watched a 60 Minutes Australia interview with Barry Wilmore and Sunita Williams on their experiences on the Starliner Crew test mission and their stay on the ISS.

Minutes by OSA Secretary Syd Henderson

## Space News

Artemis II or 2—I see Artemis missions listed with both Arabic and Roman numerals—has already been postponed, first time due to a hydrogen leak, second time due to a helium leak. Artemis was returned to the Vehicle Assembly Building to fix the latter, but also meant Artemis will miss its March launch windows. Earliest possible launch window is now April 1, with other windows on April 3 – 6, then not until April 30.

With a new head of NASA, it's time to revamp the launch schedule for *Artemis* missions after *Artemis II*, and the proposed changes are major, and in my opinion, actually an improvement which might actually get us back to the surface of the Moon by 2028. President Trump would like it because it is before the end of his term in office. It also would mean that we would beat China by maybe two years. [It also throws the launch dates I've been putting in "Calendar of Events" in disarray, moving them all up, but the schedule is also less fixed.]

First of all, *Artemis III*, which was to be the first crewed lunar landing since 1972, is now a near-Earth mission to test out both lunar crew modules. In other words, it's *Apollo 9* mark 2.0 rather than *Apollo 11* mark 2.0. [*Artemis II* is more *Apollo 8* mark 2.0, or, since it will use a free return trajectory, *Apollo 13* mark 2.0 This Time on Purpose.] It hasn't been decided whether to use *Blue Moon* or *Starship* for the test lunar module; it will depend on which is ready. It may actually test both, which would mean a docking for each one.

This is a bit of a shift since *Starship* was to do *Artemis III* and *IV* and *Blue Moon Artemis V*. The mission has also been moved up to 2027, I've been questioning whether *Starship* would be ready by 2028, so now the schedule is even tighter.

Part of Isaacman's objections were that it was taking something like three years between mission and he wants to reduce this to ten months, which seems to me more practical if you want to have an actual moon base. In order to do this, he wants to fix the configuration of the Artemis missions rather than trying to create new spacecraft with each mission. In particular, this means the SLS Block 1B is out. NASA is considering converting the United Launch Alliance's Centaur V for use on all Artemis missions (after II, of course).

This puts the Mobile Launcher 2 in jeopardy because its purpose was to carry the SLS Block 1B to the launchpad. A new launcher was needed since Block 1B would have been much larger than SLS Block 1 and would fit on the older launcher. Now they can continue to use the previous launcher. However, Mobile Launcher 2 has used 98% of its funding and is near completion. I hope that it can also be used for SLS Block 1 since it would be good to have two choices, especially since Mobile Launcher 1 was damaged during the *Artemis I* mission.

Another possible (I would say likely) casualty of the revised schedule is *Lunar Gateway*, which was already in jeopardy. It would have been cut by the revised NASA budget last spring, so I was surprised it was still being worked on.

If all goes well for *Artemis III*, especially for the *Starship* and/or *Blue Moon*, *Artemis IV* would land near the Moon's South Pole in the first half of 2028, and it is able to land early in that time period, *Artemis V* could land late the same year. After that, missions would continue around every ten months. If they are wildly successful, I wouldn't be surprised if the interval is even shorter than that.

A bit of caution: we will have a new administration in 2029 which will have their own ideas. It is also likely that Isaacman will have a Democratic congress to deal with in 2027 (it's an off-year election after all). Support for space tends to be bipartisan, so Isaacman's plans may go forward.

The astronaut whose illness caused the early termination of ISS Crew-11 was 58-year-old veteran astronaut Mike Fincke. Apparently the triggering incident took place on January 7. Whatever the incident was is being withheld for reasons of privacy (HIPAA strikes again), but we do know that it required equipment not available on the ISS. The ISS has limited scanning capability—for instance no MRI and presumably no CAT scans due to shielding problems (you don't want to send lead into space when launch weight is a concern)—but it does have a portable ultrasound which was used to monitor Fincke.

Incidentally, when I say experienced, I mean experienced. *Astronomy* magazine correspondent informs us, 'Known for his technical expertise, he has performed nine spacewalks and is one of the few Americans certified to fly the Space Shuttle, the Russian Soyuz, the Boeing Starliner, and the SpaceX Crew Dragon.' I guess he'll need to get certified on Blue Origin spacecraft.

Despite the early termination of their mission, Crew-11 spent 167 days in orbit, completing something like 85% of their mission. Their replacement crew was already scheduled for launch in mid-February, and the ISS was shorthanded for exactly a month.

One silly speculation I saw was that the woman astronaut might be pregnant. Someday, though we are going to have an off-earth pregnancy and it's nice to know the ISS has an ultrasound on board. I'd be interested in learning what medical equipment we plan to have on Moon Base.

By the way, the commander of the Crew-11 flight was Zena Cardman, who was one of the two astronauts who lost their place on Crew-9 so the Starliner crew could come back. The other astronaut who lost her seat was Stephanie Wilson, who hasn't yet gone back into space but is one of the Artemis team, so will hopefully get an even better ride.

A team of astronomers has confirmed that the star Gliese 887 (aka GJ 887, Lacaille 9352, CD -36° 15693, and many other names) has four and maybe five planets, including two super-earths discovered in 2020, with signs of a third. This third one, GJ 887d, the one that has just been confirmed, is the one that has astronomers buzzing: it is the second closest exoplanet that lies within the habitable zone of a star.

Whether it is habitable remains to be seen, especially as the second closest exoplanet to Earth, Proxima Centauri b, almost certainly is not, Proxima being a flare star. Gliese 887 is significantly brighter than Proxima, but still not visible to the naked eye despite being only 10.7 light-years away. It is a red dwarf star with apparent magnitude 7.34 (Proxima is 10.43 and much closer) and is type M0, which means it is almost a K type star. Unlike Proxima, Gliese 887 doesn't seem to be a flare star, so there is some hope for GJ 887d having an atmosphere and liquid water. On the other hand, it has a mass greater than six times that of Earth, so it may have a really thick atmosphere. [Sources: <https://www.astronomy.com/science/astronomers-confirm-potentially-habitable-exoplanet-in-the-solar-neighborhood/> and the Wikipedia page on Gliese 887. Also see <https://www.space.com/gliese-887-super-earth-exoplanet-atmospheres.html>]

## Sky Viewing

We have our first major meteor shower since early January: the **Lyrid meteor shower** peaks in the early morning hours of April 22. Though the Lyrids can reach 90 meteors per hour, 20 per hour is more usual. The Moon will be a crescent setting around 1:00 p.m., so it won't be a factor. By the way, the Lyrid radiant is actually in an inconspicuous place at the border of the constellation Hercules, but Vega is nearby and is the fifth-brightest star in the night sky (and goes almost straight overhead in Norman). Although the peak will be just after midnight, you may be seeing Lyrids as early as 9 – 10 p.m.

The **Eta Aquariid Meteor Shower** peaks on May 5, although this is not a sharp peak: you can look for them three or four days in around that date. This shower has a peak rate of about 55 meteors/hour. Unfortunately, the gibbous moon will interfere with viewing.

The Eta Aquariids are one of two meteor showers associated with Halley's comet. The other are the Orionids, which peak around October 22, but this is the better one.

**Mercury** was in inferior conjunction with the Sun on March 7 and is currently not visible. However, since this was an inferior conjunction, Mercury is moving away from us hence when it reappears around March 20, it will be getting brighter and continue to do so well into April. However, this is an unfavorable elongation, and it won't get above five degrees a half-hour before sunrise.

Incidentally, Mercury had a conjunction with the new crescent Moon a few weeks ago and Mike Hopkins managed to see it. (It helps to see an object if it is near another one that is highly visible but not so bright as to drown out the light of the first object.) I've never seen Mercury, but I once managed to see Jupiter once as the sun was setting because it was right next to the Moon.

**Venus** is slowly becoming more visible in the evenings. It is still low in the west, but is setting seventy minutes after the Sun and, even if it's only ten degrees above the horizon a half hour after sunset, it is also magnitude -3.9, so should be easily visible. It will gradually get higher and brighter in April, but it will be at its best in August and September. Incidentally, on April 23, Venus is only 0.75 degrees south of **Uranus**, so it's a good time to look for the seventh planet if you have binoculars. They'll be close for three or four days, so you'll have several chances.

**Mars** was in conjunction with the Sun on January 9, and, since it takes two years to make a circuit of the Sun, and the Sun is rising later each Day, Mars is still hidden in twilight. It may be just visible in the east right before sunrise at the end of March (which would be appropriate since the month and planet are named for the Roman god Mars), slightly more visible in April, but really May and even June is better. After that, Mars will be visible into the summer of 2027.

Skipping ahead a planet. **Saturn** is about to disappear as it nears its March 25 conjunction with the Sun, after which it will be visible in the mornings in late April. It's worth noting that Mercury, Saturn and Mars are within two degrees of each other on April 20, but will unfortunately be only two degrees above the horizon a half hour after Sunrise. For the record, Mercury is the brightest, followed by Saturn and Mars. Saturn separates from the Sun more rapidly than Mars so it should become more easily visible in May and June.

**Jupiter** on the other hand, still dominates the evening sky, especially since the Moon is new on March 18. It is currently setting at about 3:30 a.m. Jupiter will be setting around 3:00 a.m. on April 1 and 1:00 a.m. on April 30. On the evening of April 1, check out Jupiter with binoculars: all four moons will be on the same side in order of distance: note that they are not really in a straight line: although it's possible for all four Galilean moons and Jupiter to be in a straight line, the three inner moons have to have one on one side of Jupiter and two on the other, because that's how their resonances happen to work out.

**Uranus** is in the constellation Taurus about five degrees (half a fist-width) south of the Pleiades. This means it is in the sky most of the night, and at magnitude 5.6, is theoretically visible to the naked eye in very dark sky, but if you have less than perfect vision, binoculars or a small telescope is probably necessary. Note that on April 23, Uranus will be a bit easier to find since it will be having a close conjunction with Venus. Uranus will not move much from one night to the next, so if you find it one night, you're set for weeks. To search for Uranus, try <https://lovethenightsky.com/see-uranus-through-a-telescope>

**Neptune** is currently lost in twilight and will soon join Mercury, Mars, and Saturn in morning invisibility.

### Viewing Opportunities for Satellites (March 13 – April 13, 2026)

You can get sighting information at [www.heavens-above.com](http://www.heavens-above.com), which gives you a constellation map showing the trajectory of the satellite.

With the addition of the solar panels, the International Space Station can be as bright as magnitude -4.0 making it brighter than all the stars other than the Sun and all the planets other than Venus. The Hubble Space Telescope can get up to magnitude 1.5, which is brighter than the stars in the Big Dipper, but magnitude 2.0 is more likely. *Tiangong* is the Chinese Space Station. It currently gets up to magnitude -2.2 after the addition of the Wentian module in July 2024.

The "mag." beside the date indicates the brightest magnitude the satellite gets during the pass. Most of the ISS passes get between -2.9 and -3.9, which is brighter than Jupiter ever gets, but not quite as bright as Venus.

Missions to and from the International Space Station and *Tiangong* can change their orbits. The next launch to the ISS is a Progress cargo module on March 22 There are no currently announced flights to *Tiangong* in March or April.

The information below is from Heavens Above.

HST 3/13 mag. 1.8			
	Time	Position	Elevation
8:37 p.m.	241°	10°	
8:40:14	180	29	
8:41:59	136	20	
Vanishes into Earth's shadow			

HST 3/14 mag. 1.7			
	Time	Position	Elevation
9:06 p.m.	241°	10°	
9:10	180	29	
9:13	119	10	

Tiangong 3/20 mag. -0.9			
	Time	Position	Elevation
6:34 a.m.	309°	14°	
6:36	15	38	
6:39	86	10	

Tiangong 3/22 mag. -1.7			
	Time	Position	Elevation
Appears from Earth's shadow			
6:12:18 a.m.	315°	32°	
6:13:31	20	57	
6:17	101	10	

Tiangong 3/23 mag. -1.6			
	Time	Position	Elevation
6:48 a.m.	281°	12°	
6:50	211	42	
6:53	138	10	

ISS3/28 mag. -3.8			
	Time	Position	Elevation
9:01 p.m.	316°	10°	
9:04:48	40	71	
9:05:45	112	43	
Vanishes into Earth's shadow			

ISS 3/29 mag. -3.0			
	Time	Position	Elevation
8:14 p.m.	327°	10°	
8:17	38	38	
8:20	108	10	

ISS 3/31 mag. -3.2			
	Time	Position	Elevation
8:15 p.m.	305°	10°	
8:19	225	60*	
8:22	14	10	

\*Passes midway between Sirius and Jupiter.

Tiangong 4/1 mag. -2.1			
	Time	Position	Elevation
8:44 p.m.	248°	10°	
8:47:23	335	81	
8:49:48	63	16	
Vanishes into Earth's shadow			

Tiangong 4/3 mag. -1.3			
	Time	Position	Elevation
8:20 p.m.	264°	10°	
8:23	341	49	
8:26	58	10	

Tiangong 4/10 mag. -2.3			
	Time	Position	Elevation
9:20 p.m.	295°	10°	
9:23:05	29	88	
9:23:34	116	61	
Vanishes into Earth's shadow			

Tiangong 4/12 mag. -1.6			
	Time	Position	Elevation
8:55 p.m.	286°	10°	
8:57:57	210	50	
8:59:22	140	20	
Vanishes into Earth's shadow			

Key: Position is measured in degrees clockwise from north. That is, 0° is due north, 90° is due east, 180° is due south, and 270° is due west. Your fist held at arm's length spans about ten degrees. "Elevation" is elevation above the horizon in degrees. So, to view the Tiangong space station at 8:57:57 p.m. on April 12, measure just over three fist-widths west of due south, then five fist-widths above the horizon.

### Programming Notice: NASA+ on the Web

NASA-TV has become NASA+ [s](#)

NASA+ live event schedules are available at <https://www.nasa.gov/live/> or <https://plus.nasa.gov/scheduled-events/>.

## Calendar of Events

Sometime in 2026: *New Glenn* launch carrying Firefly's *Elytra* orbital transfer vehicle and the *ELaNa-42* mission which will launch 42 cubesats.

Sometime in 2026: Launch of the *Venus Life Finder Probe and Photon* relay satellite to Venus by RocketLab's Electron Booster for MIT. For more information, visit [https://en.wikipedia.org/wiki/Venus\\_Life\\_Finder](https://en.wikipedia.org/wiki/Venus_Life_Finder).

Sometime in 2026: Launch of Japan's *Martian Moons Exploration* (MMX) which includes a Phobos lander and sample return. This also is carrying IDEFIX, a Mars Rover built by France and Germany. For information, see [en.wikipedia.org/wiki/Martian\\_Moons\\_eXploration\\_\(MMX\)](https://en.wikipedia.org/wiki/Martian_Moons_eXploration_(MMX)).

Sometime in 2026: Second (uncrewed) *Gaganyaan* flight test. This one will carry the Vyommitra humanoid robot. For more information on the Gaganyaan program, see <https://en.wikipedia.org/wiki/Gaganyaan>. Note: with *Gaganyaan 1* being delayed until the second half of 2026 *Gaganyaan 2* and/or *3* will likely be moved to 2027.

Sometime in 2026: Third (uncrewed) *Gaganyaan* flight test. This one will carry the Vyommitra humanoid robot.

Sometime in 2026: Maiden flight of *Terran R* mission to Mars from Impulse Space. This includes a Mars lander. For more information, [en.wikipedia.org/wiki/Terran\\_R](https://en.wikipedia.org/wiki/Terran_R).

Sometime in 2026: Maiden flight of *Volans*, the first orbital launch vehicle developed in Singapore, for Equatorial Space Systems.

Sometime in 2026 [date unfixed]: Launch of Blue Origin's *Blue Moon* Mark 1 lunar lander. This is one of a number of missions called Pathfinder. Mark 1 is uncrewed; Mark 2 is a few years off but will carry astronauts.

Sometime in 2026 [date unfixed from third quarter]: Launch of Boeing *Starliner-1*, first operational Starliner mission.

Sometime in 2026: Maiden flight of *Aurora* rocket. First orbital flight from Spaceport Nova Scotia.

Sometime in 2026: launch of Canadensys Lunar Rover.

First quarter of 2026: Maiden flight of Rocket Labs Neutron launcher, from Wallops Island, Virginia. For more information, [https://en.wikipedia.org/wiki/Rocket\\_Lab\\_Neutron](https://en.wikipedia.org/wiki/Rocket_Lab_Neutron)

March [moved from January]: *Starship 12*: This will be the first flight of configuration 3.

March: Launch of *BlueBird 7* via *New Glenn*. This National Security Space Launch is the third *New Glenn* mission.

March: First launch of *Irtysh*, aka *Soyuz 5* with a dummy payload.

March 14: Oklahoma Space Alliance meeting, 2:00 p.m., Norman Computers. Meeting information will be posted at <http://osa.nss.org>.

March 22: Neptune is in conjunction with the Sun.

March 22: Launch of Progress module MS-33 to ISS. This is the first launch from Baikonur to the ISS since the collapse of the maintenance cabin into the flame trench last November.

Second quarter of 2026 [moved from first quarter]: *Starship 13*. This will be the first orbital flight of Starship. Also, this will be the first attempt to capture the upper stage (*Ship*).

Second quarter of 2026 [moved from first quarter]: Launch by Falcon 9 Heavy of MRV which will carry DARPA's robot satellite servicer (RSGS), which will install extension pods to lengthen satellites' lifetimes.

Second quarter of 2026: second *Blue Ghost* mission, carrying *Lunar Pathfinder* to the far side of the Moon. This mission also carries the United Arab Emirates *Rashid 2* rover. *Rashid-1* was lost with the *Hakuto-R* mission in 2024.

April 1 [earliest possible date]: *Artemis II*, aka *Integrity*, the first crewed test flight of SLS and Orion. This will be a free-return mission: that is, it will loop around the Moon without landing. For more information, visit [https://en.wikipedia.org/wiki/Artemis\\_2](https://en.wikipedia.org/wiki/Artemis_2).

April 3: Mercury is at greatest elongation, 27.8° west of the Sun (hence can be seen before sunrise).

April 11: Oklahoma Space Alliance meeting, 2:00 p.m., Norman Computers. This will be our Yuri's Night celebration. Meeting information will be posted at <http://osa.nss.org>.

April 12: Yuri's Night. 65<sup>th</sup> anniversary of manned spaceflight.

April 22: Peak of Lyrid meteor shower.

May 5: Peak of Eta Aquariid meteor shower. This is one of two meteor showers associated with Halley's Comet.

May 8: Oklahoma Space Alliance meeting, 2:00 p.m., Norman Computers. Meeting information will be posted at <http://osa.nss.org>.

May 14: Mercury is in superior conjunction with the Sun.

May 22: Uranus is in conjunction with the Sun.

June: Swift Rescue Mission to raise the Neil Gehreis Swift Observatory to a higher orbit.

June 4 – 7: International Space Development Conference, Hilton McLean Tysons Corner, McLean, Virginia. For more information, visit <https://isdc.nss.org/>.

June 15: Mercury is at greatest elongation, 24.5° east of the Sun (hence can be seen after sunset).

June 13: Oklahoma Space Alliance meeting, 2:00 p.m., Norman Computers. Meeting information will be posted at <http://osa.nss.org>.

Second half of 2026 [moved from January]: First (uncrewed) *Gaganyaan* flight test. For more information, see [https://en.wikipedia.org/wiki/Gaganyaan\\_1](https://en.wikipedia.org/wiki/Gaganyaan_1).

Second half of 2026: A SpaceX *Nova-C* mission to the Moon takes Intuitive Machines' IM-3 lander, NASA's Lunar Vertex rover, and several NASA Cadre rovers. For information, [en.wikipedia.org/wiki/IM-3](https://en.wikipedia.org/wiki/IM-3)

Third quarter of 2026 [moved from first quarter]: Maiden flight of Spain's Miura 5 reusable launch vehicle.

July: Launch of Astrobiotic's *Griffin Mission 1*, including lunar lander, FLIP lunar rover, and CubeRover on a Falcon Heavy. This will land at Nobile Crater near the South Pole of the Moon. For more information, [https://en.wikipedia.org/wiki/Griffin\\_Mission\\_One](https://en.wikipedia.org/wiki/Griffin_Mission_One).

July 28: Jupiter is in conjunction with the Sun.

August: China launches the lunar mission *Chang'e 7*, which includes an orbiter, a lander and a hopping probe. For more information, see [https://en.wikipedia.org/wiki/Chang'e\\_7](https://en.wikipedia.org/wiki/Chang'e_7).

August 2: Mercury is at greatest elongation, 19.5° west of the Sun (hence can be seen before sunrise).

August 12: Total eclipse of the Sun. This one is on an unusual curve that begins on the north central coast of Siberia, goes over Greenland and Iceland and finally ends by crossing northern Spain and a bit of northern Portugal. This is the first total eclipse in Europe since 2006. Interestingly, the next one is August 2, 2027, and starts in Spain.

August 12: Peak of Perseid meteor shower.

August 15: Venus is at greatest elongation, 45.9° east of the Sun (hence can be seen after sunset).

September [moved up from May 2027—it can happen]: Launch of the *Nancy Grace Roman Space Telescope* [formerly known as WFIRST] to the Earth-Sun L2 point. For more information, see [https://en.wikipedia.org/wiki/Nancy\\_Grace\\_Roman\\_Space\\_Telescope](https://en.wikipedia.org/wiki/Nancy_Grace_Roman_Space_Telescope).

September 25: Neptune is at opposition.

Fourth quarter of 2026: *Starship* launch of the *Starship HLS* lunar lander and FLEX, Astrolab's demo lunar lander to the lunar south pole. *Starship HLS* is the craft SpaceX will use to transfer astronauts to the Moon.

Fourth quarter of 2026 In-flight fuel transfer from Starship to a target.

Fourth quarter of 2026: First *Dream Chaser* demonstration mission, not to ISS as originally planned.

Fourth quarter of 2026: China launches its *Xuntian* space telescope, which will orbit close to orbit close to *Tiangong* for easy servicing. For more information, visit <https://en.wikipedia.org/wiki/Xuntian>

Fourth quarter of 2026: Launch of iSpace's *Mission 3*. First flight of iSpace's APEX 1.0 lunar lander, to Schrödinger Basin on the far side of the Moon near the lunar South Pole.

Fourth quarter of 2026: Launch of *Griffin II*, the third lunar lander mission by Astrobiotics, which will land near the lunar south pole.

October 4: Saturn is at opposition.

October 12: Mercury is at greatest elongation, 25.2° east of the Sun (hence can be seen after sunset).

October 21: Peak of Orionid meteor shower. This is the second meteor shower associated with Halley's Comet.

October 23: Venus is in inferior conjunction with the Sun.

November: *BepiColombo* enters Mercury orbit.

November 5: Peak of South Taurid meteor shower.

November 12: Peak of North Taurid meteor shower.

November 17: Peak of Leonid meteor shower.

November 20: Mercury is at greatest elongation, 19.6° west of the Sun (hence can be seen before sunrise).

November 25: Uranus is at opposition.

December 14: Peak of Geminid meteor shower.

December 22: Peak of Ursid meteor shower.

December 28: *Hera* arrives at the binary asteroid Didymos (the one we hit with an impactor).

Sometime in 2027: Launch of Blue Moon Pathfinder Mission 2, which will carry VIPER to the Moon.

Sometime in 2027: Launch of *NEM-1*, the core module of the *Russian Orbital Service Station*, or *ROS*. For more information, see [https://en.wikipedia.org/wiki/Russian\\_Orbital\\_Service\\_Station](https://en.wikipedia.org/wiki/Russian_Orbital_Service_Station).

Sometime in 2027: USSF's *DRACO* demonstration of a nuclear thermal rocket in low-Earth orbit. For more information, see [en.wikipedia.org/wiki/Demonstration\\_Rocket\\_for\\_Agile\\_Cislunar\\_Operations](https://en.wikipedia.org/wiki/Demonstration_Rocket_for_Agile_Cislunar_Operations).

Sometime in 2027: Launch of the *Payload Power Thermal Module*, the first module of Axiom's space station. It will dock with ISS and await *Hab-1*, which it will dock with as part of a free-flying space station.

Sometime in 2027: Launch of first two Lunar Gateway modules.

Sometime in 2027: India launches *Chandrayaan-4*, a lunar sample return mission. For more information, <https://en.wikipedia.org/wiki/Chandrayaan-4>

Sometime in 2027 [moved from June 2026]: first crewed mission to Vast's *Haven-1* space station. For information, <en.wikipedia.org/wiki/Haven-1>.

First quarter of 2027 [Moved from May 2026]: launch of Vast's *Haven-1* space station. For more information, <en.wikipedia.org/wiki/Haven-1>.

First quarter of 2027: India launches its first crewed orbital flight *Gaganyaan 4*.

January 2027 [moved from December 2026]: Launch of PLATO, (PLANetary Transits and Oscillations of stars—couldn't you just name it Plato and not create a pseudo-acronym?) This is a mission dedicated to finding Earth-sized exoplanets in habitable zones around nearby stars.

January 2027 [Moved from May 2026]: *Axiom-5*, a four-person fourteen-day mission to the ISS.

January 3, 2027: Peak of Quadrantid meteor shower.

Mid 2027: Launch of *Artemis 3*. This has been changed from a lunar landing to a Near-Earth mission to test out equipment for a Moon landing in 2028. For information, see [en.wikipedia.org/wiki/Artemis\\_3](en.wikipedia.org/wiki/Artemis_3).

August 12; 2027: *Lucy* flies by asteroid 3548 Eurybates in its first encounter with a Trojan asteroid. It will fly by at least 3 more Trojans in 2027 and 2028.

September 2027: Launch of *Luna 26*, Russia's Luna-Resurs-Orbiter. This mission is in tandem with next year's Luna 27 lander. For more information, see [https://en.wikipedia.org/wiki/Luna\\_26](https://en.wikipedia.org/wiki/Luna_26).

September 2027 Launch of the *NEO Surveyor* which will be able to detect more than 90% of near-earth objects greater than 460 feet in diameter. For information, see [https://en.wikipedia.org/wiki/NEO\\_Surveyor](https://en.wikipedia.org/wiki/NEO_Surveyor).

Fourth Quarter of 2027: Launch of the *ZeusX* Orbiter and lander and *LIBER* (the Lunar Integrated Bulk Extraction Rover). The last is a lunar miner rover. These are being produced by the Singapore-based private company Qosmosys.

Sometime in 2028: Launch of Habitat One to the Axiom space station.

Sometime in 2028: India launches its second crewed orbital flight *Gaganyaan 5*.

Sometime in 2028: India launches *Mars Lander Mission* (MLM 2 or *Mangalyaan 2*). This seems to be the same as MOM2. For more information, [https://en.wikipedia.org/wiki/Mars\\_Lander\\_Mission](https://en.wikipedia.org/wiki/Mars_Lander_Mission)

Sometime in 2028: Launch of the first module of India's *Bharatiya Antariksha* space station. For more information, see [https://en.wikipedia.org/wiki/Bharatiya\\_Antariksha\\_Station](https://en.wikipedia.org/wiki/Bharatiya_Antariksha_Station).

Sometime in 2028: Launch and landing of Japan/India *LUPEX* (Lunar Polar Exploration) lander. India knows this as Chandrayaan-5. For more information, see [https://en.wikipedia.org/wiki/Lunar\\_Polar\\_Exploration\\_Mission](https://en.wikipedia.org/wiki/Lunar_Polar_Exploration_Mission).

Sometime in 2028: Launch of *Chang'e 8*, which will include a lander, rover and a 3D printing experiment using lunar resources. This will be the last Chang'e mission before China sends a human crew to the Moon.

Sometime in 2028: First crewed flight to the Russian Orbital Space Station (ROS).

Sometime in 2028 [moved from July 2026]: *ClearSpace-1* will capture and deorbit *PROBA-1*.

First half of 2028: Launch of *Artemis IV*, which, with the revised launch schedule will be the first manned landing on the Moon since 1972. This was to use *Lunar Gateway*, it looks like this will be cut, and with the administration also wanting to cut the SLS, timing of this and further Artemis missions will probably change.] For more information, [https://en.wikipedia.org/wiki/Artemis\\_IV](https://en.wikipedia.org/wiki/Artemis_IV).

First quarter of 2028: Launch of the *Emirates Asteroid Mission* to the asteroid belt, where it will make at least seven flybys of asteroids, the largest of which are Chimaera and Justitia. [See May 2035.]

March 29, 2028: Launch of India's *Shukrayaan-1* Venus orbiter. This is also called VOM (Venus Orbiter Mission). For more information, see <https://en.wikipedia.org/wiki/Shukrayaan-1>.

April 2028: Launch of JAXA's *DESTINY+*, an asteroid flyby mission to Near Earth Asteroid Apophis and later Phaethon, the parent of the Geminid meteor shower. It will arrive there in 2029. For information, see [en.wiki-  
dia.org/wiki/DESTINY%2B](en.wikipedia.org/wiki/DESTINY%2B). On same launch is the ESA's *Ramses* spacecraft, which will also fly by Apophis. For more information, [https://en.wikipedia.org/wiki/Ramses\\_\(spacecraft\)](https://en.wikipedia.org/wiki/Ramses_(spacecraft))

Between July 5 – 25, 2028: Launch of *Dragonfly*, the Titan helicopter mission. For information, see [en.wiki-  
dia.org/wiki/Dragonfly\\_\(spacecraft\)](en.wiki-<br/>dia.org/wiki/Dragonfly_(spacecraft)).

Second half of 2028: Probable launch of *Artemis V* to land on the Moon.

October 2028: ESA launches the *ExoMars Mars Rover*, which has been christened *Rosalind Franklin*. For more information, visit <https://en.wikipedia.org/wiki/ExoMars>.

November 2028: JAXA, the Japanese space agency, launches *OPENS-0*, which will fly by the rings of Saturn in 2039.

Sometime in 2028: Probable launch of *Artemis VI* to land on the Moon.

Sometime in 2029: Launch of *Luna 27*, the Luna-Resurs Lander which will land in the South Pole-Aitkin Basin on the far side of the Moon. This mission is in tandem with 2027's Luna 26 orbiter. For more information, see [https://en.wikipedia.org/wiki/Luna\\_27#Science\\_payload](https://en.wikipedia.org/wiki/Luna_27#Science_payload).

Sometime in 2029: Launch of the *ARIEL Space Telescope* and *ESA/JAXA Comet Interceptor* via Ariane 62 to the Sun-Earth  $L_2$  point, where the Interceptor will wait for a long-period comet or interstellar object to come by.

April 21, 2029: *OSIRIS-APEX* rendezvous with the asteroid Apophis. Note: *OSIRIS-APEX* is the same spacecraft as *OSIRIS-REx*; it is renamed "Apophis Explorer" for this part of its mission.

August 2029: The *Psyche* asteroid probe arrives at asteroid 16 Psyche. For more information, visit [https://en.wikipedia.org/wiki/Psyche\\_\(spacecraft\)](https://en.wikipedia.org/wiki/Psyche_(spacecraft)).

September 2029: Launch of *Tianwen 4* which will carry Jupiter and Callisto orbiters and a mission to Uranus. The Uranus spacecraft will eventually leave the solar system, something that only the US has achieved.

Sometime in 2030: *DESTINY+* flies by asteroid 3200 Phaethon, the parent body of the Geminid meteor shower.

Sometime in 2030: Russia launches *Boomerang*, aka *Fobos-Grunt 2*, which will return samples from Mars's moon Phobos. (*Fobos-Grunt 1*) failed in low-Earth orbit in 2011.)

Sometime in 2030: Launch of China's *Tianwen-3* Mars sample return mission and orbiter.

Sometime in 2030: China will land a crewed mission on the Moon.

Sometime in 2030: Launch of Russia's *Luna 28* sample return mission.

Sometime in 2030: Launch of *UVEX*, NASA's Ultraviolet Explorer wide-field ultraviolet telescope.

Sometime in 2030: Launch of ISS Deorbit Vehicle by Space X. This will bring the ISS era to a close.

Sometime in 2030: Maiden flight of Sirays, Taiwan's first orbital flight vehicle.

April 11, 2030: *Europa Clipper* arrives at Jupiter.

Sometime in 2031: Launch of Russia's *Venera-17* Venus orbiter and lander.

Sometime in 2031 or 2032: Launch of DAVINCI, a NASA Discovery Program mission to Venus.

Spring 2031: *Europa Clipper*'s first flyby of Europa.

June 2031: Launch of *VERITAS* Venus orbiter. For more information, see [https://en.wikipedia.org/wiki/VERITAS\\_\(spacecraft\)](https://en.wikipedia.org/wiki/VERITAS_(spacecraft)).

July 2031: *Hayabusa 2* arrives at asteroid 1998 KY26.

July 2031: *JUICE* flies by Ganymede, inserts into Jupiter orbit.

December 2031: Launch of the ESA's *EnVision* Venus orbiter.

Sometime in 2032: Launch of the first South Korean lunar lander and rover, *KLLR*.

Sometime in 2032: Launch of the pressurized *Lunar Cruiser*, a crewed lunar rover.

Sometime in 2033: Launch of the Foundational Surface Habitat, the first component of the Artemis Base Camp.

March 2, 2033: *Lucy* flies by the double Trojan asteroid 617 Patroclus-Menotius. I believe these are the largest asteroids it will encounter.

December 2034: *JUICE* achieves Ganymede orbit.

Sometime in 2035: Launch of *LISA* gravitational wave observatory.

21 January 2035: *Tianwen-2* rendezvous with comet 311P/PanSTARRS.

May 2035: The *Emirates Asteroid Mission* touches down on Justitia.

2038 or 2039: Launch of *Chandrayaan-H1*, India's first crewed mission to the Moon (a flyby, not a landing).

Sometime in 2036: *Dragonfly* arrives at Titan.

August 12, 2045: The next total solar eclipse visible in Oklahoma City. This one is also visible in Salt Lake City, Denver, Little Rock (again), Tampa Bay and New Orleans.

## Oklahoma Space Alliance Officers, 2026

Clifford McMurray, President and *Update* Editor

405-329-4326 (H) 405-863-6173 (C)

Dave Sheely, Vice-President, 405-821-9077 (C)

Syd Henderson, Secretary & *Outreach* Editor,

405-321-4027 (H) 405-365-8983 (C)

Tim Scott, Treasurer, 405-740-7549 (H)

**OSA E-mail Addresses and Web Site:**

cliffmcmurray at hotmail.com (Clifford McMurray)  
 sheely at sbcglobal.net or david.sheely.1 at us.af.mil (David Sheely)  
 ahemphil at gmail.com (Adam Hemphill)  
 sydh at ou.edu (Syd Henderson)  
 sswift42 at aol.com (Steve Swift)  
 ctscott at mac.com (Tim Scott)  
 t\_koszoru01 at cox.net (Heidi and Tom Koszoru)  
 john.d.northcutt1 at tds.net (John Northcutt)  
 lensman13 at aol.com (Steve Galpin)

E-mail for OSA should be sent to sydh at ou.edu. Members who wish their e-mail addresses printed in Outreach, and people wishing for space-related materials e-mailed to them should contact Syd. Oklahoma Space Alliance website is <http://osa.nss.org> . Webmaster is Syd Henderson.

**Other Information**

Oklahoma Space Industrial Development Authority (OSIDA), 401 Sooner Drive/PO Box 689, Burns Flat, OK 73624, 580-562-3500. Website is <http://airspaceportok.com/#home>,  
 Science Museum Oklahoma (former Omniplex) website is [www.sciencemuseumok.org](http://www.sciencemuseumok.org). Main number is 602-6664.  
 Tulsa Air and Space Museum, 7130 E. Apache, Tulsa, OK 74115.  
 Web Site is [www.tulsaairandspacemuseum.com](http://www.tulsaairandspacemuseum.com). Phone (918) 834-9900.  
 The Mars Society address is The Mars Society, 11111 West 8<sup>th</sup> Avenue, Unit A, Lakewood, CO 80215. Phone: (303) 980-0890 Their web address is [www.marsociety.org](http://www.marsociety.org).  
 The National Space Society's Headquarters Executive Director e-mail [nsshq@nss.org](mailto:nsshq@nss.org). The Chapters Coordinator is Bennett Rutledge 720-641-7987, [rutledges@chapters.nss.org](mailto:rutledges@chapters.nss.org). The address is: National Space Society, 1300 I Street NW, Suite 400E, Washington, DC 20005. Phone (321)452-2448. The web page is [space.nss.org](http://space.nss.org).  
 The Planetary Society phone 626-793-5100. The address is 60 South Los Robles Avenue, Pasadena, California, 91101, and the website is [www.planetary.org](http://www.planetary.org). E-mail is [tps@planetary.org](mailto:tps@planetary.org).  
 NASA Spacelink BBS 205-895-0028. Or try [www.nasa.gov](http://www.nasa.gov) .  
 Congressional Switchboard 202/224-3121.  
 Write to any U. S. Senator or Representative at [name]/ Washington DC, 20510 (Senate) or 20515 [House]

**OKLAHOMA SPACE ALLIANCE**  
A Chapter of the National Space Society  
**MEMBERSHIP ORDER FORM**

Please enroll me as a member of Oklahoma Space Alliance. Enclosed is:

\_\_\_\_\_ \$10.00 for Membership. (This allows full voting privileges but covers only your own newsletter expense.)  
\_\_\_\_\_ \$15.00 for family membership  
\_\_\_\_\_ TOTAL amount enclosed.

National Space Society has a special \$20 introductory rate for new National Space Society regular membership rates are \$62, Student memberships are \$40, Senior \$51. You can save five dollars off if you auto-renew. Part of the cost is for the magazine *Ad Astra*. If you choose to receive the magazine digitally, memberships are \$52 for regular, \$30 for students and \$41 for seniors (with the same \$5 off for auto-renew. Mail to: National Space Society, PO Box 98106, Washington, DC 20090, or join at [www.nss.org/membership](http://www.nss.org/membership). (Brochures are at the bottom with the special rate.) Be sure to ask them to credit your membership to Oklahoma Space Alliance.

To join the Mars Society, visit [www.marssociety.org](http://www.marssociety.org). One-year memberships are \$50.00; student and senior memberships are \$25, and Family memberships are \$100.00. Three-year memberships are double one-year memberships. Their address is Mars Society, 11111 W. 8<sup>th</sup> Ave, Unit A, Lakewood, CO 80215.

Do you want to be on the Political Action Network?

\_\_\_\_\_ Yes \_\_\_\_\_ No. [See brochure for information.]

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_ ZIP \_\_\_\_\_

Phone (optional or if on phone tree) \_\_\_\_\_

E-mail address (optional) \_\_\_\_\_

OSA Memberships are for 1 year, and include a subscription to our monthly newsletters, *Outreach* and *Update*. Send a check & form to **Oklahoma Space Alliance, 102 W. Linn, #1, Norman, OK 73071.**