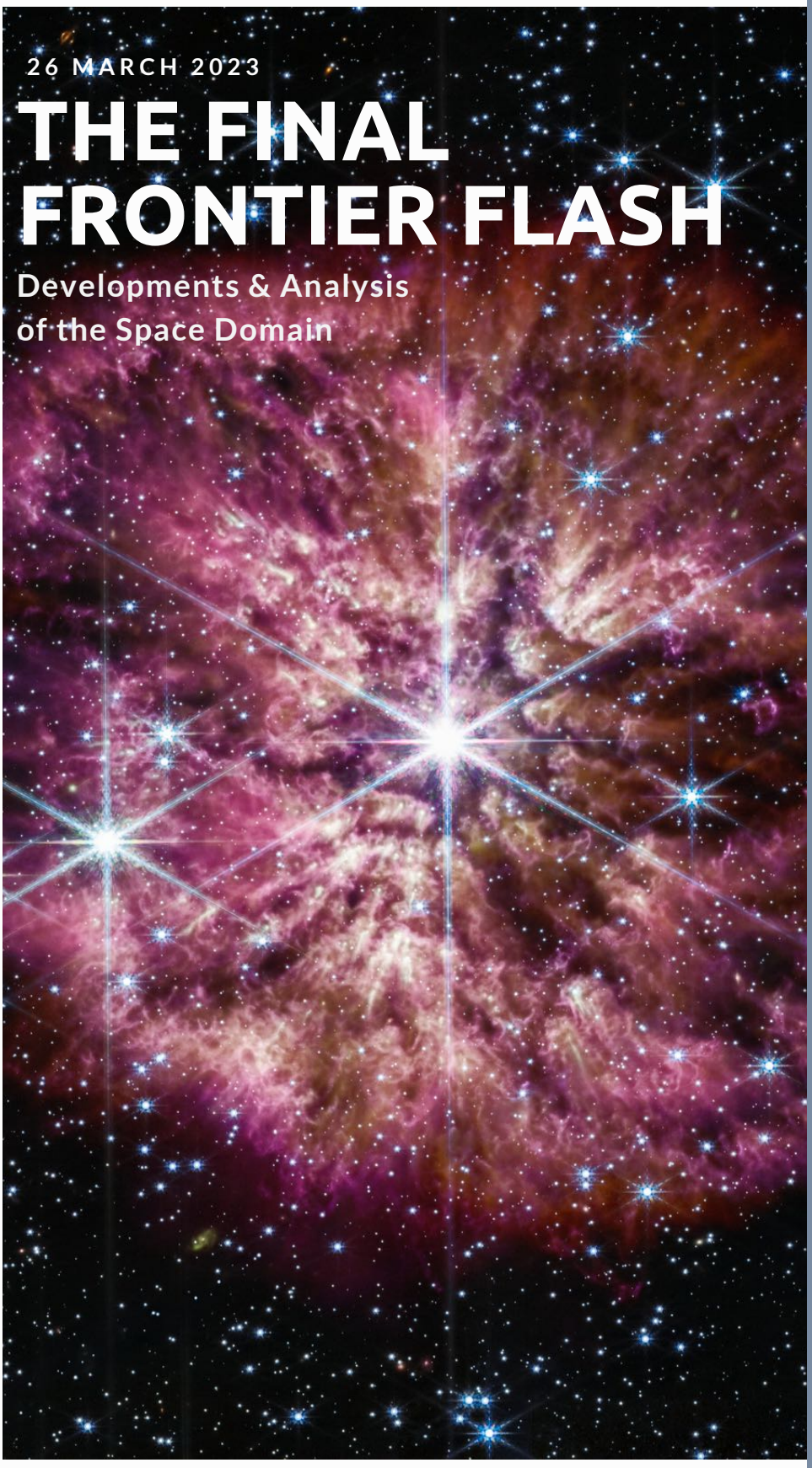

26 MARCH 2023

THE FINAL FRONTIER FLASH

Developments & Analysis of the Space Domain

ISR UNIVERSITY

SFA
SPACE FORCE ASSOCIATION

In This Issue

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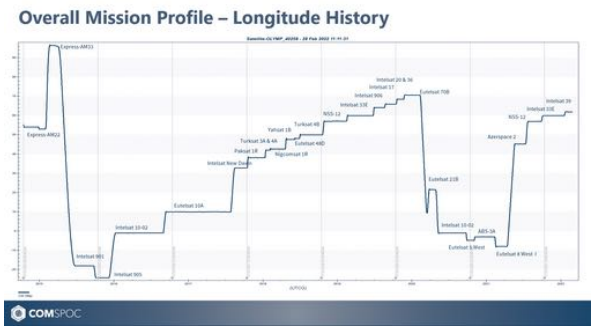
Catalog

Russia Launches Olymp-K-2 Military Satellite

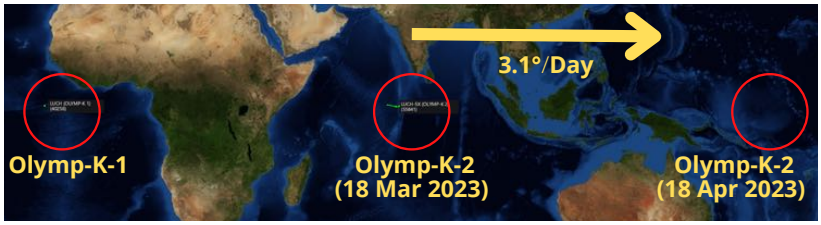
12 Mar 2023: Russia launched a Proton-M rocket from the Baikonur Cosmodrome, carrying the Olymp-K-2 satellite, also referred to as Luch-5X (catalog 55841 or 2023-031A) . The Olymp-K satellites are Russian geostationary satellites built for Russian military and intelligence use. Russia has not released any Launch Video.

- The Proton launched the Olymp-K-2 satellite directly into geostationary orbit (GEO).
- As of 14 Mar Olymp-K-2 was at 57.3°E, ~240km under the GEO belt and drifting eastward. Reporting indicates the satellite will park at 167°E.
- Given current drift rate of 3.1° per day, Olymp-K-2 should arrive at 167°E on 18 Apr 2023.
- The Olymp-K satellites, also referred to as Luch, are Russian geostationary satellites built for the Russian Ministry of Defense as well as the Russian intelligence agency FSB.
-Russia did not disclose the purpose of the satellites, however they are believed to serve two purposes. The first is conducting signals intelligence (SIGINT) and the second to provide secure communications lines for government use.
-Early unofficial reports about plans to launch the second Olymp-K payload on a Proton rocket surfaced in 2020. At the time, the launch of what was officially identified as the Luch-5 data-relay satellite was expected during 2021.
-The previous Olymp satellite, Olymp-K-1, was launched in Sept 2014 by a Proton-M/Briz-M and moved into a position at 18.1° W seven months after launch. This positioned the satellite directly between the Intelsat 7 and Intelsat 901 satellites, which are located within half a degree of each other in geostationary orbit.
- As recently as Dec 2022 Olymp-K-1 operated in the vicinity of Intelsat 37E, it has since moved on and is not in proximity with any active satellite (it is near an old Russian SL-12 Rocket Body.) *Information courtesy of Palski SDA Reports (2 Dec 2022 & 17 Mar 2023)*
-Normally Russian military satellites are given "Kosmos" designators, as US military satellites are listed as "USA." Olymp-K-1 didn't get a Kosmos designation; supporting the idea that it is owned not by the MoD, but by the FSB.

Proton-M Lift Off w/ Olymp K-2



Busy Traveler: Orbital History of Olymp-K-1 (courtesy of COMSPOC)



SMA and Longitude History of Olymp-K-2

China Launches Shiyan-19 Experimental Satellite

15 Mar 2023: China launched a Long March (LM)-11 from Jiuquan carrying the Shiyan-19 satellite, into a Sun-synchronous orbit. China officially described the mission as "land census, urban planning, and disaster prevention and mitigation." This description has been given to multiple satellites in the past, and a more exact purpose is unclear. Launch Video. *(note "cold-boost" phase of the LM-11 is not displayed in launch video for some reason.)*

-Shiyan-19 is currently in a 492x511km, 97.5° inclination...sun-synchronous orbit.

-Shiyan-19 is in a unique orbit compared to other Shiyan, Shijian, Yaogan and Gaofen satellites.

-The Shanghai Institute of Satellite Engineering (509th institute) of the Shanghai Academy of Spaceflight Technology (SAST) developed the satellite. SAST stated the mission uses a platform providing low-cost miniaturized, lightweight, and high-functional density satellites. SAST itself is a major space launch vehicle and satellite maker under CASC.

-While not releasing any specific statements on Shiyan-19's mission or capabilities, the image on China's Success Announcement appears to be a synthetic aperture radar (SAR) satellite. *<huge grain of salt>*

-Shiyan are understood to be a series of test satellites, with the first launched in 2004. Shiyan satellite numbers are often non-sequential and sent into a variety of orbits.

- This is the second Shiyan payload the LM-11 has placed into orbit, The LM-11 most recently launched the Shiyan-21 satellite from Xichang in southwest China. There have been 4 LM-11 launches of Gaofen satellites.

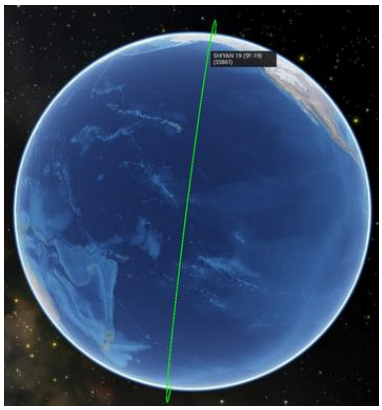
-The LM-11 is a silo-launched rocket, which is ejected from a tube on a truck before igniting its engines in the air. It is designed to be a short-notice rocket that can be launched quickly and flexibly. This is also why it is based on solid propellants, and makes storing the rocket in an already readied configuration easier.

-In a second configuration, CZ-11H, it can be launched from sea assets in the Yellow Sea. It can lift up to 700kg to LEO and 350kg to SSO and is more for the smaller payloads of the Chinese fleet.

- This is the first LM-11 launch of 2023, but Chinese officials hinted in the past that a few more LM-11 launches could be flown this year. So far, the rocket has a perfect track record.

LM-11 Launches from Cannister

Big Red Board-INT: Possible SAR??



SY-19 In Sun-Synchronous Orbit

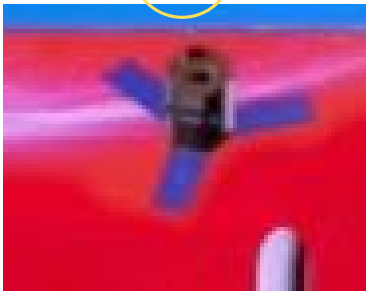
China Launches 2nd Horus Satellite for Egypt

13 Mar 2023: China launched a LM-2C from Jiuquan. The payload was the second of two Horus satellites (likely imagery) and is now in a 489x502 km orbit with an inclination of 97.5°. The Horus-2 satellite is co-planar with its predecessor. Launch Video.

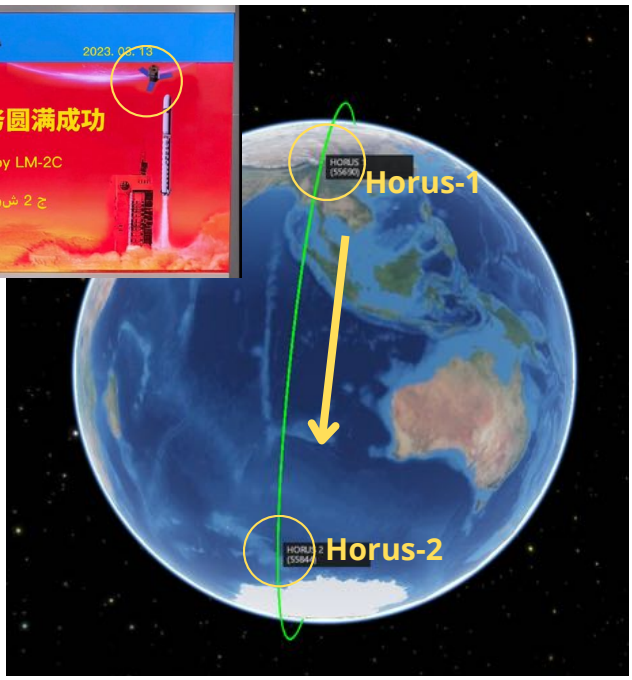
- Horus 2 is an Egyptian satellite partially built by the China Academy of Launch Vehicle Technology (CALT). Horus-1 launched in February of this year, just weeks ago, on the same rocket configuration. Besides the fact that it is an Earth observation satellite, very little is known about the payload, including mass, size, and detailed purpose.
-The Egyptian Space Agency (EgSA) confirmed the satellite would help with sustainable development goals with "high-resolution imaging cameras."
- The design of the mission patch mentions the "One Belt One Road Initiative," referring to the Chinese initiative to build transportation and trade links throughout Asia, Europe, Africa, and the world.
- IF the satellite on the launch announcement is accurate (big IF) it resembles the Gaofen-9.

Horus 1 & Horus 2 Mission Patches

- China launched the 1st GF-9 in 2015, then another 4 launched in 2020.
-The orbits of the Horus satellites do closely resemble those of the GF-9 satellites China launched in 2020 (GF-9 02/03/04 & 05). All have SMA values within 2.5km and identical inclinations.
- The GF-9 satellite provides sub-meter class resolution optical images for city planning, road network design, land ownership determination purposes.



More Big Red Board-INT…Displayed with Yemen flag again. Satellite resembles Gaofen-9.



China Launches Newest GEO Imaging Satellite

17 Mar 2023: China launched a Long March 3B from Xichang and successfully sent the Gaofen-13 (02) satellite into geosynchronous transfer orbit. CASC announced only that GF-13-02 was a high-resolution, high-orbit optical optical remote sensing satellite with great significance to the development of China's space technology. GF-13-02 joins Gaofen-13-01 (2020) and Gaofen-4 (2015) as other optical satellites in GEO. Launch Video.

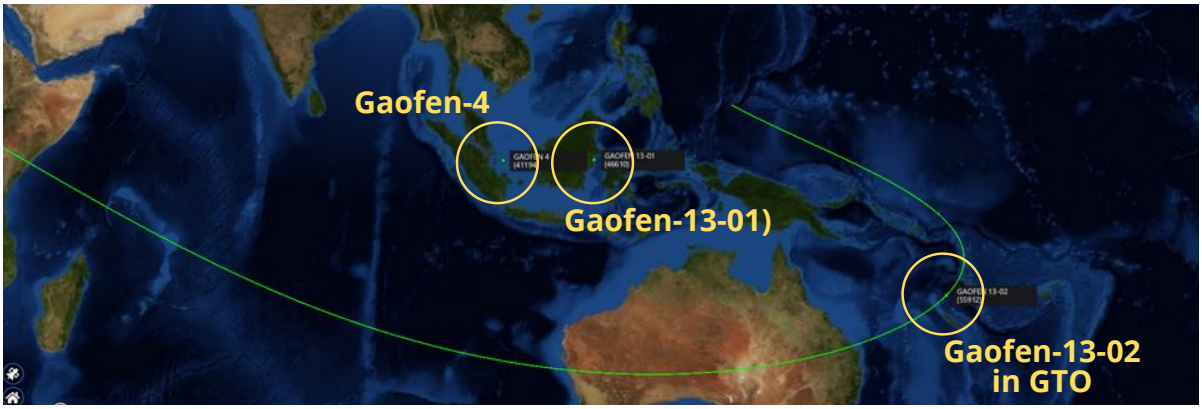
- The Gaofen-13 (02) (gaofen means high resolution) satellite is nominally part of the civilian China High-resolution Earth Observation System (CHEOS). Land surveys, crop yield estimation, environmental governance, meteorological early warning and forecasting, as well as comprehensive disaster prevention and mitigation are noted as the main uses of the satellite, according to Chinese state media.

-CHEOS started in 2010 to provide all-weather, all-day coverage with optical and synthetic aperture radar satellites. The constellation includes a range of optical and synthetic aperture radar satellites in Low Earth Orbit. Prior to Gaufen-13, the Gaofen-4 was previously the only CHEOS GEOSAT.

-The first Gaofen-13 satellite was launched in Oct 2020, also using a Long March 3B rocket. The pair are thought to be more capable versions of the Gaofen-4 geostationary optical satellite launched in Dec 2015. Gaofen-13 is expected to have a resolution of 15m. Gaofen-4 has a reported ground resolution of 50m.

-As of 25 Mar Gaofen-13-02 was still listed in Geostationary Transfer Orbit (GTO). Last updated orbit in Spacetrack.org was from 18 March. Check back in a couple of weeks to see where 13-02 settles in GEO.

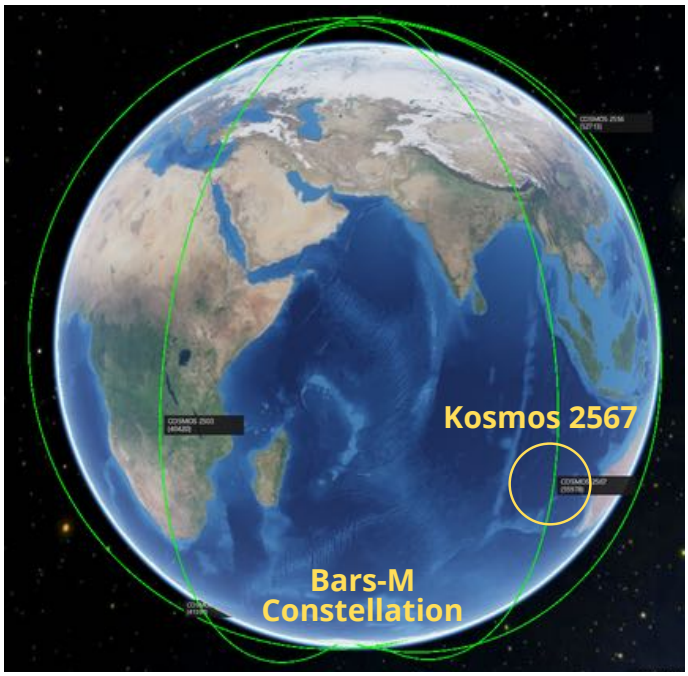
-It may replace Gaofen-4 which has been on orbit for nearly 8 years, or the potential to move westward to increase surveillance of the Central Pacific.



Russia Launches Bars-M Reconnaissance Satellite

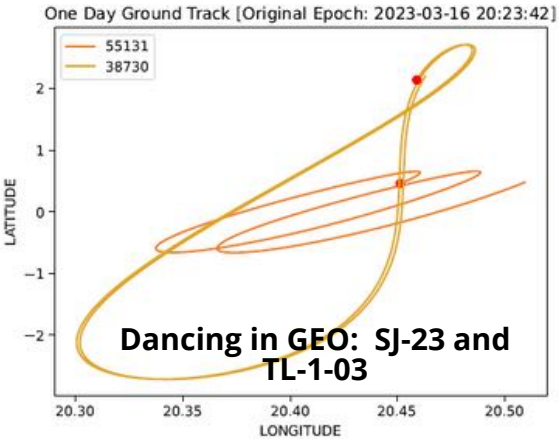
23 Mar 2023: Russia launched a Soyuz-2.1a rocket with likely a Bars-M reconnaissance satellite (now renamed Kosmos 2567) into Sun-synchronous orbit. The Soyuz lifted off from the Plesetsk Cosmodrome. Launch Video.

- The orbit into which Kosmos 2567 has been deployed is consistent with the Bars-M series of satellites, which carry out electro-optical surveillance.
-Kosmos 2567 is in a 338 x 499km x 97.64° orbit, similar to the initial one for previous one identified as Bars-M (Kosmos 2556 last May).
-Previous Bars-M satellites were initially launched into orbits with apogees about 40-60km higher than this, however Kosmos 2556 was moved into its lower orbit last year. The likely intent allows satellites to take higher-resolution images, although the increased fuel consumption required to maintain orbit at these lower orbits could also shorten their operational lifespan.
- It is not clear whether the first and second Bars-M satellites are still operational, and they have not been maneuvered into the new, lower, orbit.
-Bars-M is one of several series of reconnaissance satellites that Russia introduced in recent years in attempts to fill the gap left by the retirement of its obsolete film-return Kometa and Kobal't-M satellites. Other imaging satellites included the now-ended Persona series and the smaller EMKA. Thursday's launch has placed the fourth Bars-M satellite into orbit.



March Madness: SJ-23 comes within 4km of TL-1-03

18 Mar 2023: It appears SJ-23 had a Point of Closest Approach (POCA) of 3.537kms with the Chinese Relay Satellite TL-1-03: 3.537 km on 18 Mar 2023 at 16:38:42 UTC. Information courtesy of the Palski Space Domain Awareness Report.



Dancing in GEO: SJ-23 and TL-1-03

- Based on catalog information, SJ-23 did not have to execute many maneuvers to actually achieve that POCA. Upon SJ-23's relocation to GEO from its insertion orbit, it was already on the trajectory needed to reach that POCA with Tianlian 1-03. Given the proximity it is likely this was intentional.

-It does appear (based on 18 SDS GP data), that both satellites may have maneuvered just prior to the predicted close approach.

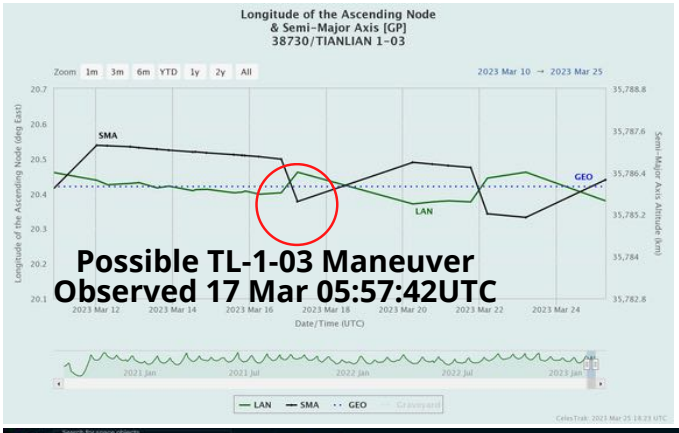
- That might suggest the close approach was planned, or the two operators were not talking and conducted a maneuver to increase miss distance.

- It is possible that the observations were mis-associated due to the proximity.

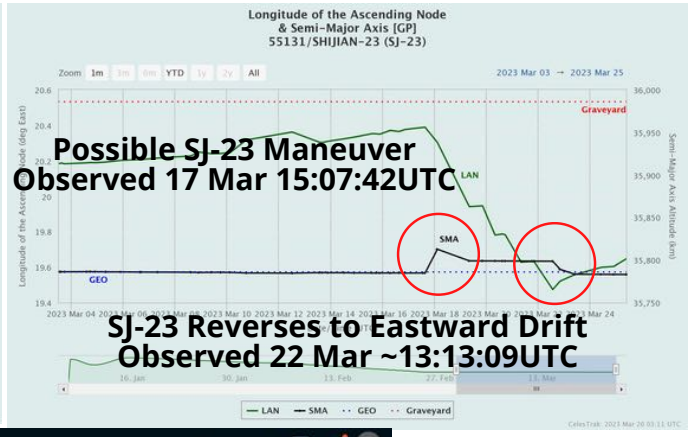
-SJ-23 continued to drift West until it was .9° away from TL-1-03. On 22 Mar ~13:13:09UTC, SJ-23 decreased SMA 15.6km reversing it's drift. **SJ-23 is now 3km beneath the GEO belt and slowly drifting eastward back toward TL-1-03. At current SMAs the two spacecraft will again be in proximity on 9 Apr.**

-China launched Shijian-23 on 9 Jan 2023 from Wenchang using a LM-7A. Launch Video.

-Shijian-23, released a small object on ~19 Jan 2023. SJ-23 was initially thought of as a likely follow-on to SJ-13, a communications satellite. However, the release of a sub-payload is more indicative of SJ-17, TJS-3 and SJ-21.

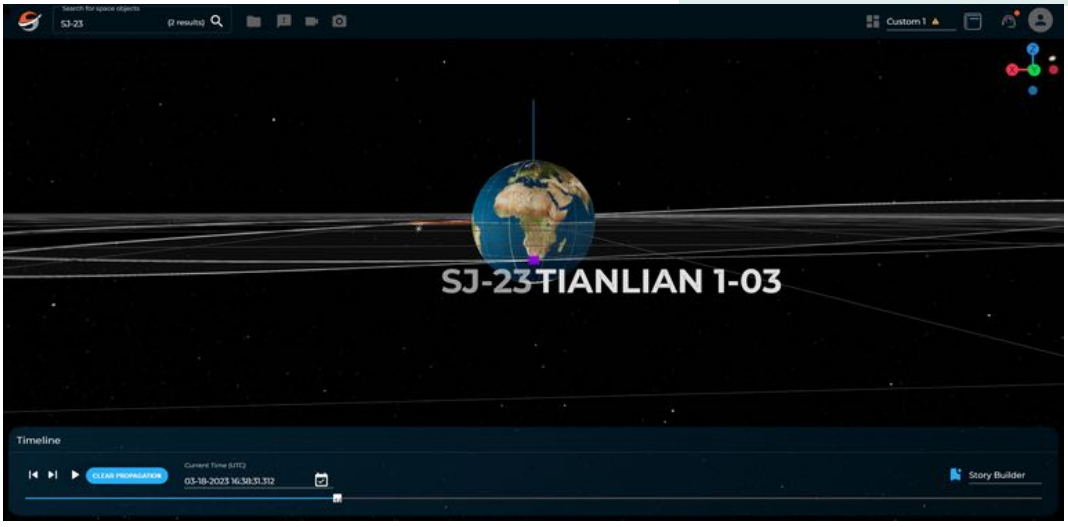


Possible TL-1-03 Maneuver Observed 17 Mar 05:57:42UTC



Possible SJ-23 Maneuver Observed 17 Mar 15:07:42UTC

SJ-23 Reverses to Eastward Drift Observed 22 Mar ~13:13:09UTC



SJ-23 & TL-1-03 at POCA via Slingshot Visualization Tool

China Space: The View from India

19 Mar 2023: An opinion article written by Air Marshal Anil Chopra, the Director General, Centre for Air Power Studies argues Space superiority is key for modern information-centric wars and then describes developing Chinese capabilities and posits China is in a position to dominate the future of space and replace the US as the number one space nation in the world. He argues that while India has a successful space program there is much more to be done.

-China invests heavily on spy satellites, dozens of which snoop around the world at any given time. The Yaogan series and JianBing satellite constellations can accurately pinpoint signal emissions and provide surveillance. They cut down revisit time, and will eventually give continuous coverage. China is also developing a series of data relay satellites.

-China continues to improve its counter-space weapons capabilities. The PLA routinely incorporates jamming and anti-jamming techniques against multiple communication, radar systems, and GPS satellite systems in exercises. PLA will target space-based C4ISR assets. China continues to develop jammers to target SAR aboard military reconnaissance platforms, including LEO satellites, and to target SATCOM over a range of frequency bands.

-China is pursuing space and ground based laser weapons to disrupt, degrade, or damage satellites and their sensors. China is developing on-orbit satellite inspection and repair capabilities, some of which could be used to remove an adversary satellite. PLA already has operational ASAT units. They are working on ASAT to destroy GEO satellites.

-China is well on its way to becoming the world leader in space technology through its new "Space Silk Road". China claims to have shipped millions of BeiDou receivers to nearly 120 countries. These systems include microchips and modules which could give China information access.

-India has a robust space program and is among the top four space faring nations. But clearly China is pulling way ahead.

-The Indian military has dedicated ISR, ELINT and communication satellites. These also support network-centric warfare capabilities. India needs many more satellites with high resolution sensors and cameras to reduce revisit time, have continuous coverage of specific areas, and redundancy,

-There is a need to enhance space-based, jam-resistant ISR, ELINT, and EW capability. As military requirements for space capability increased, India set up the Defence Space Agency, now headquartered in New Delhi. It may upgrade to a Space Command in the future.

-Indian Regional Navigation Satellite System "NavIC" currently has 8 of the 11 satellites in place. It reportedly covers the whole of China, Pakistan and most of the Indian Ocean. Global Indian Navigation System (GINS) with 24 satellites is still a work in progress. ISRO proposed to expand the constellation for global coverage by initially placing twelve satellites in Medium Earth Orbit (MEO).

China's space program requires a close watch. It has serious implications for its adversaries, including India. The high investment is difficult to match. India would need to keep pushing its space program to not let the gap grow too large.

Kazakhstan's seizure of Russian space assets threatens the Soyuz-5 rocket

21 Mar 2023: An Ars Technica article describes how Kazakhstan's seizure of equipment and material at the Baikonur Cosmodrome may further delay a $1 billion development project.

- The Soviet Union created the Baikonur Cosmodrome in 1955 to serve as a test site for intercontinental ballistic missiles. It later became the world's first spaceport with the launch of the historic Sputnik 1 and Vostok 1 missions. The sprawling cosmodrome was a mainstay of the Soviet space program.

-Since the early 1990s Russia has leased the spaceport from the government of Kazakhstan and currently has an agreement to use the facilities through the year 2050. Russia pays an annual lease fee around $100 million.

-Russia began developing the Soyuz-5 rocket in 2017. The Soyuz-5 is a three-stage rocket powered by RD-171 engines that burns kerosene fuel. Russia is counting on this vehicle to replace its aging Proton-M rocket and be more cost-competitive with commercial rockets such as SpaceX's Falcon 9 booster.

-Russia plans to launch the Soyuz-5 rocket from the "Baiterek" launch pad at Baikonur and intended to initiate preliminary construction work on the site in 2022. But those plans now face significant uncertainty.

-In early Mar 2023, the Republic of Kazakhstan seized TsENKI's (a subsidiary of Roscosmos) Center for Utilization of Ground-based Space Infrastructure, in Kazakhstan.

-TsENKI is responsible for launch pads and ground support equipment for the Russian space corporation.

-Russia has spent nearly $1 billion on the development of the new Soyuz-5 rocket as well as plans for its launch site and ground services originally slated to debut in 2021. Now it is unlikely until at least 2024—and given the current dispute with Kazakhstan, it will be delayed even further.

-Russia's invasion of Ukraine appears to have changed the calculus of the Russia-Kazakhstan relationship. Kazakhstan's president, Kassym-Jomart Tokayev, apparently sees Russia's preoccupation with Ukraine as a window of opportunity to assert greater autonomy for Kazakhstan.

-Kazakh Communications Minister Bagdat Musin spearheaded the dispute over TsENKI's assets in Kazakhstan, and sees political value in asserting their independence from Russia. Musin said his government needed to seize the assets, in part, because of a lack of communication with Yuri Borisov, the Roscosmos Chief, regarding payments.

ЦЭНКИ ROSCOSMOS

Ракета космического назначения
(предварительный технический облик, уточняемый на последующих этапах работ)

Согласно ФКП России на 2016-2025 гг., предусматривается ОКР «Феникс» по созданию КРК с РН нового поколения на космодроме «Восточный». Использование научно-технического и технологического задела по ОКР «Феникс» при создании новой РН является вкладом России в создание КРК «Байтерек»

Характеристика	Значение
Стартовая масса РКН, т	520
Масса полезной нагрузки, т:	
- низкая круговая орбита (Нкр=200 км, i=51,6°)	17,0
- геопереходная орбита	до 5,0[1]
- геостационарная орбита	до 2,5[1]
Количество ступеней	2 + РБ
Длина / диаметр РКН, м	60 /4,1
Компоненты топлива РН	O_2+РГ-1
Масса запаса рабочего топлива, т:	
- I ступень	398
- II ступень	60
Маршевые двигатели РН:	
- I ступень	1ЖРД РД-171М[3]
- тяга (на Земле / в пустоте), тс	740/806,4[1]
- II ступень	2ЖРД типа РДО124А
- тяга (в пустоте), тс	2Х30

1) При использовании трассы выведения с наклонением i=46° и форсирования тяги ЖРД первой ступени на 10%.
2) Возможен вариант использования вместо одного ЖРД РД-171М двух ЖРД РД-180.
3) Возможно форсирование тяги ЖРД на 10%.

Soyuz-5 Performance Characteristics

Russia's Space Program is in Big Trouble

20 Mar 2023: A Wired article describes Russia facing evidence that its already-struggling space program is falling apart. In the past three months alone, Roscosmos scrambled to resolve two alarming incidents. First, one of its formerly dependable Soyuz spacecraft sprang a coolant leak. Then the same thing happened on one of its Progress cargo ships. Russia's space agency is staring into the abyss.

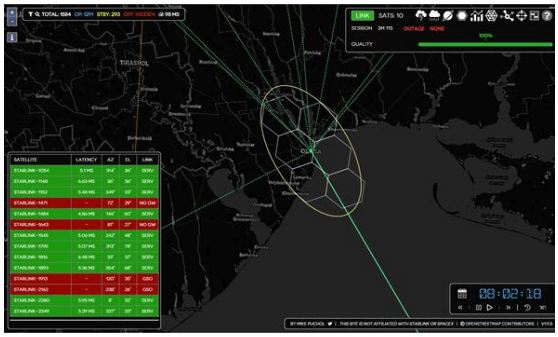
- Russian leaders chose to prioritize the country's military space program approximately 10 years ago—to focus on satellite and anti-satellite technologies over its civilian capabilities, and it shows.
- Roscosmos attributed the leaks to "external impacts." The odds of meteors damaging two spacecraft cooling systems—but nothing else on the ISS—in such a short period of time are very close to zero.
- NASA still relies on Russia for some cargo deliveries and a few astronaut flights, but that may soon change.
- Roscosmos has no commercial space program to support or fall back on.
- Russia long depended on Baikonur spaceport in Kazakhstan. But the nation has charged costly annual fees, and Kazakhstan seized Russian spaceport assets in Mar, reportedly due to Roscosmos' debt.
- The Vostochny Cosmodrome in eastern Russia, near the Chinese border, is bogged down by construction problems, delays, and corruption scandals.
- China may have political reasons for collaborating with Russia, but its space program has little to gain from working with its Russian counterpart.
- As its civil space program collapses, Russia heavily invests in its military one. The country has highly developed anti-satellite weapons, including a missile system tested in Nov 2021 that generated thousands of bits of debris in orbit.
- Russia also used electronic weapons against space systems and has been testing laser weapons that could be used against satellites. Russia appears to have tested a potential weapon prototype in 2019 and 2020, with a "nesting doll"-like spacecraft, Cosmos 2543, which released a sub-satellite in orbit
- The Soviet Union may have put the first human into space—but now, 60 years later, Russia faces a near-future in which it is no longer able to do that.

How it Started...

How it's going

Challenged but Resilient: Starlink in Ukraine

23 Mar 2023: A Defense One article describes how Russia is learning to locate and jam Starlink communications. Ukrainian soldiers say the device is key to their operations, notably its ability to help coordinate devastating artillery strikes. On the other, they report a variety of ways in which the Russians can locate, jam, and degrade the devices, which were never intended for battlefield use.



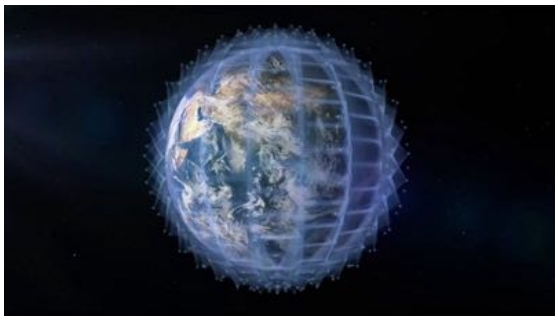
- Russian signals-intelligence equipment likely pinpoints the devices by scanning for suspect transmissions.
- Ukrainian drone operators also report prolonged jamming that kept them from using Starlink units…the jamming began two to three months ago, and that its intensity varied from place to place.
- Starlinks are particularly vulnerable to GPS jamming. Each terminal uses a GPS unit to determine which passing satellite should provide an internet connection.
- Fortunately for Ukraine, GPS jammer signals are low power. This means that dirt or concrete can block the jammer signal. As long as a Starlink device has a barrier between it and the Russian jamming signal, it can continue to function

-Another countermeasure is to place a cheap GPS-receiver device outside jamming range and then manually enter its location into their Starlink terminal, offset by their distance to the GPS receiver.
-Ukrainians began to experience Starlink uplink degradation near Bakhmut in Jan to the point that units often couldn't make audio calls. Instead, the device could only send and receive text messages. The Starlink terminal also took longer to find satellites.
- These problems were likely due to advanced jamming systems that attack the uplink of information to a satellite. Russia typically keeps these systems in reserve to defend Russian territory itself. They are theoretically vulnerable to Ukrainian strikes as they must be deployed near their target and are not highly mobile.

- Other Ukrainian units report no issues with Starlink connectivity.
- Russian forces could be rotating jamming operations across the front, focusing on high-priority areas. Ukraine may also be targeting Russian electronic-warfare units. Ukraine regularly shoots down Russia's Orlan drones, for example, which can carry electronic-warfare payloads.

OneWeb Completes Constellation

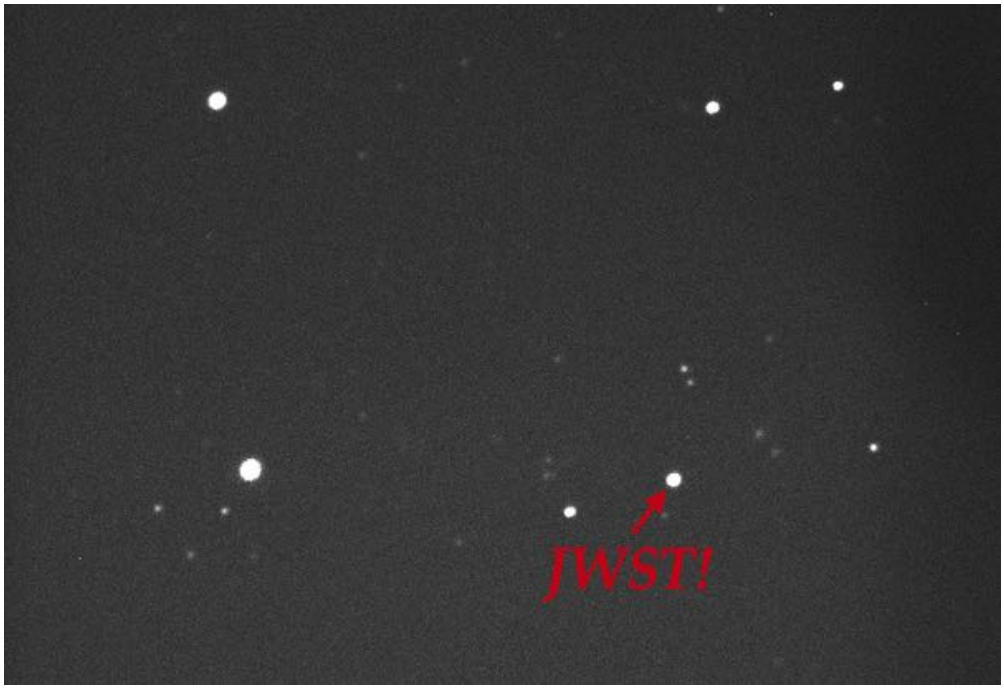
25 Mar 2023: BBC reports on the completion of the OneWeb proliferated Low Earth Orbit (pLEO) constellation. India successfully launched the 36 OneWeb satellites on 26 Mar. The launch take the in-orbit constellation to more than 600 and will enable OneWeb to deliver broadband internet to every corner of the Earth. Launch Video.



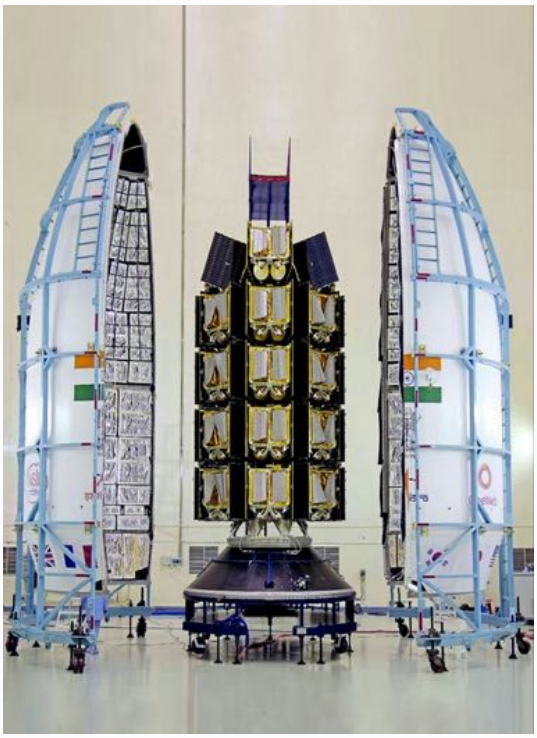
- The 36 spacecraft rode on India's biggest rocket, the LVM3, in the latest launch from Sriharikota Spaceport. The launch brings the number of satellites from 582 to 618. Another 15 spares will launch in May and be joined by technical demonstration spacecraft.
- It will take some months to test the satellites and move into the right part of the sky, but when they are in position OneWeb will have the capability to deliver a global service.
- OneWeb is not selling broadband connections direct to the individual user. Its principal clients are internet service providers. Additionally, they might also employ the increased connectivity to supplement, or expand, their mobile phone network infrastructure.
-The system requires ground infrastructure for satellite command and control and link them to the internet. This should be fully up and running by the end of 2023.
- OneWeb spacecraft operate from 600-1,200km, about twice the altitude of Starlink.
- OneWeb plans to expand its network in the coming years to include bigger, more powerful spacecraft. But contrary to earlier indications, the constellation will probably be kept under 1,000 satellites.

Pics o' the week!

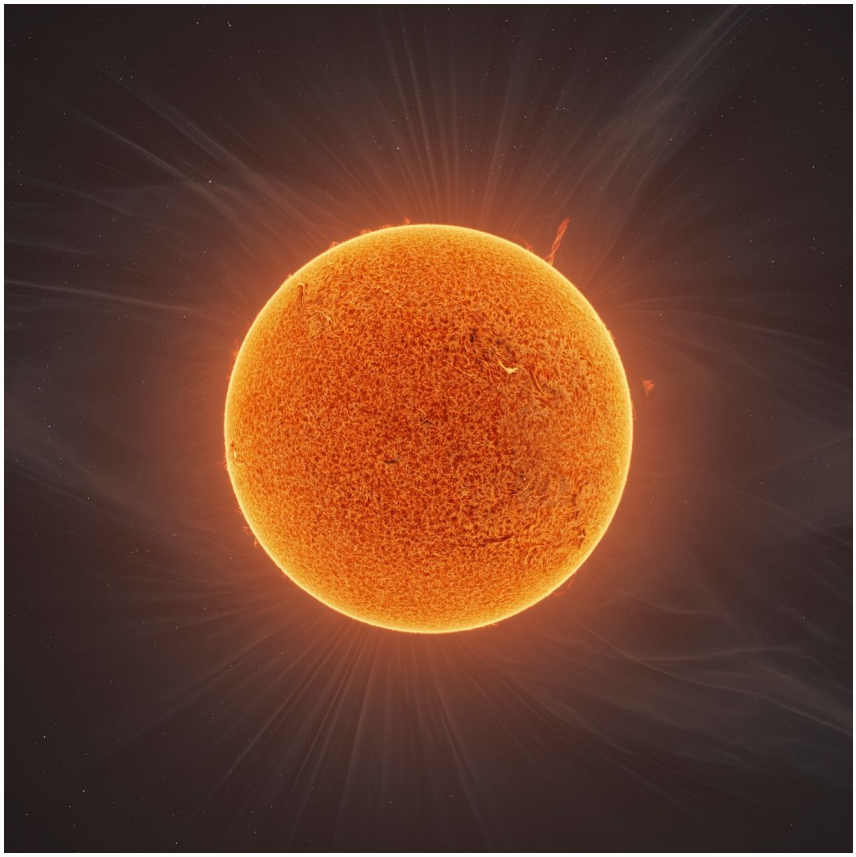
Communications Gear Jettisoned from International Space Station Re-enters over Northern California



Sunlight reflecting off James Webb Space Telescope even though it's more than 1 million miles away

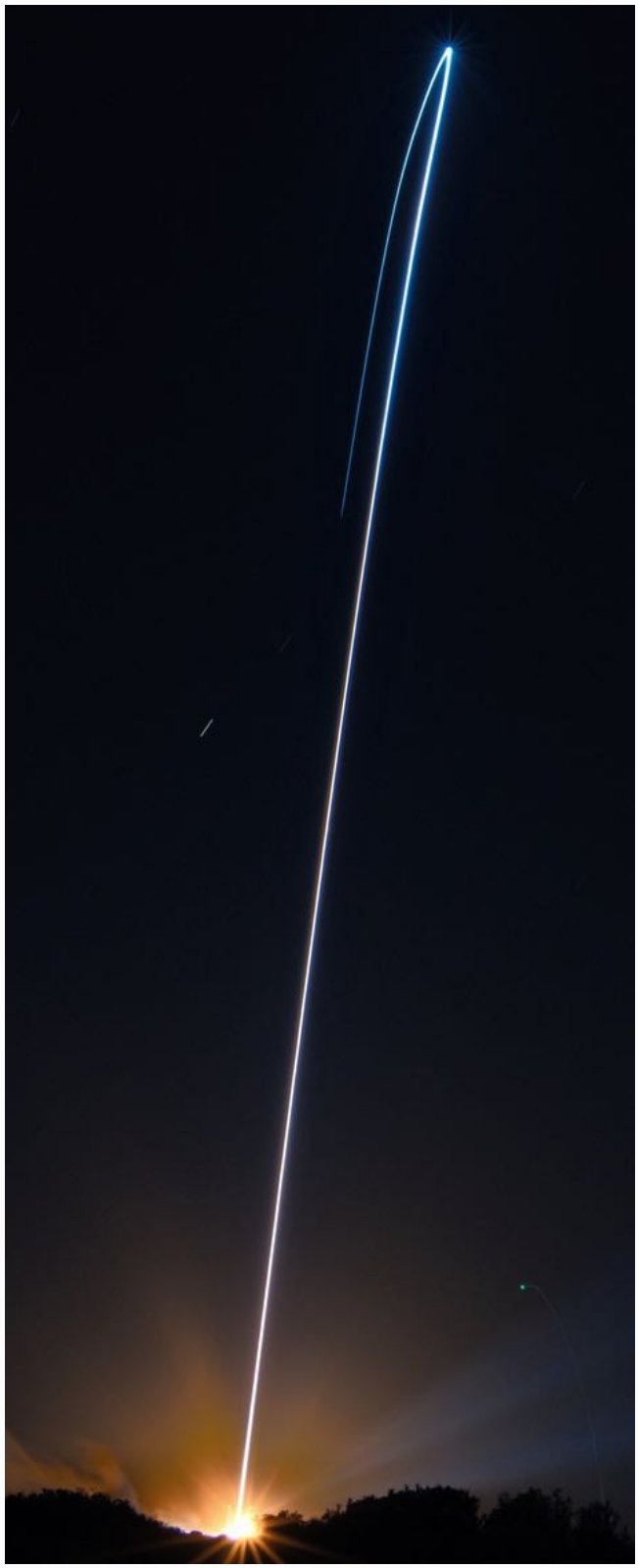


Completing OneWeb Constellation. India Preparing to Launch Final Batch of Satellites



High-Res Image of our Star

Terran-1 Methane Fueled (Burns Blue)
&
3D Printed Rocket Takes Flight



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SP101 - Introduction to Space Operations
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Space Specializations - Coming This Fall!
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SP470 - Space Acquisitions
SP480 - Intelligence Support to Space

Analytic Thought
AW100 - Foundations of Analytic Writing
AW200 - Analytical Writing
AW300 - Collaborative Analytical Writing
CT100 - Foundations of Critical Thinking & Structured Analysis
CT200 - Critical Thinking for Analysts
CT300 - Advanced Critical Thinking for Analysts
CT500 - Leading Critical Thinkers
CT600 - Critical Thinking for Learning Professionals
CT700 - Critical Thinking for Executives
DA100 - Foundations of Data Analytics
DA200 - The Art & Science of Data Analytics

Cyber
CYBER900 - Cyber Security Strategy
ENG200 - English for Cyber

Faculty Development
FD600 - Facilitation for Learning Professionals
CT600 - Critical Thinking for Learning Professionals

ISR - Analysis
PED100 - Intelligence Planning Cycle
EM110 - Electromagnetic Spectrum Fundamentals
IADS100 - IADS Foundations
IADS200 - Rethinking IADS
IADS310 - Advanced IADS Analysis

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TGT110 - Fundamentals of Targeting
TGT210 - Target Development I
TGT211 - Target Development II
TGT212 - Target Capabilities Analysis
TGT213 - Target Force Assignments
TGT214 - Mission Planning & Force Execution
TGT215 - Combat Assessment
TGT310 - Weaponeering and Collateral Damage Assessment
TGT311 - HVI Target Development
TGT312 - Precision Point Mensuration
TGT315 - Targeting Professional

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WHO WE ARE

Integrity ISR employs a diverse group of former military service members, national security experts, and academic professionals to deliver innovative C4ISR, Space & Cyber solutions.

WHAT WE DO

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Our number one priority is to strengthen US national security - increasing US readiness and lethality, building C4ISR, Space & Cyber capabilities for the US and our allies, and fostering increased interoperability for tomorrow's coalition.

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CONTINGENCY INTELLIGENCE NETWORK INSTRUCTOR – MOBILE TRAINING TEAM

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