

# THE PROJECT OF TWO MAIN SPACEPORTS ON EARTH: FAR EASTERN ON THE KURIL ISLANDS [FESC] AND THE WESTERN CAPE CANAVERAL AND CUBA ISLAND [WSC].

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**Abstract.** "It must be recognized that our country has lost its leadership in space. The great Soviet past can no longer serve as a screen for the lagging space industry in the present."

The number of single-use rocket launches in Russia has decreased by more than 10 times since 2024. They are not in demand by the market. In order not to remain on the sidelines of technological progress, the Russian space industry needs radical reforms.

Urgently needed reusable rockets are not produced in Russia today. "Otherwise, we will be watching the exploration of Mars and the construction of lunar bases exclusively as spectators (Kaleev D.N.)."

*Since 2024, we have been observing a 50-year plan for the development of reusable spaceports at Cape Canaveral in the United States. At the same time, we also observe the complete absence of a mirror plan for the construction of reusable spaceports in Russia.*

**Keywords.** The Kuril Islands. The Far Eastern Reusable Space Complex (FESC). The Western Reusable Space Complex (WSC). Marine platform. A single linear reference lunar standard time. The unified worldwide lunar transport schedule in four environments: in space, in the atmosphere, on land and at sea.

## I. THE TECHNOLOGICAL DEAD END OF COSMONAUTICS IN RUSSIA

Today, there is a revolutionary transition from disposable spaceports and rockets to reusable ones.

The limited number of reusable spaceports in the United States, for example, threatens the country with congestion in terms of launches, as reported by *The Wall Street Journal*.

Today, NASA is implementing a 50-year plan [2024-2074] for the development of the three main reusable spaceports in the United States at Cape Canaveral. This is a plan to stimulate modern reusable rocket launches.

All space technologies and vehicles were disposable until 2010. This statement is true for all space objects - both satellites and space probes designed for long-term stays in space, as well as for any objects designed to return to Earth, such as space capsules by people on board or sample return canisters on missions to collect cosmic matter such as stardust. (1999-2006)] or Hayabusa (2005-2010).]

But after 2010, the history of reusable rockets began, which spans several decades and includes both early conceptual designs and practical implementations in different periods.

The main goal of such reusable systems is to make them cost—effective and reduce the cost of space launches by reusing the most important rocket components. *cyberleninka.ru cyberleninka.ru.*

Критерий	Россия («Роскосмос»)	США (NASA + частный сектор)	Китай (CNSA)
<b>Ориентировочный годовой бюджет</b>	~2-3 млрд USD	~25 млрд USD (NASA) + частные инвестиции	~12-14 млрд USD
<b>Ключевые ракеты-носители</b>	Союз-2, Ангара-A5 (одноразовые)	Falcon 9, Starship, SLS (многократные / сверхтяжелые)	Семейство «Чанчжэн» (разных классов)
<b>Орбитальная станция</b>	Стареющий сегмент МКС, отдаленные планы на РОС	Сегмент МКС, активные планы на частные станции	Собственная станция «Тяньгун» (эксплуатируется)
<b>Статус лунной программы</b>	Авария «Луны-25», неясные сроки пилотируемых полетов	Программа Artemis (подготовка к высадке астронавтов)	Успешный сбор грунта, план лунной базы к 2030-м годам

Engineering company "Complex KAD". [1]

## II. ROSCOSMOS DID LOSE THE MARKET FOR PROFITABLE ONE-TIME LAUNCHES IN 2024. THE END OF THE ERA OF DISPOSABLE SOVIET SPACEPORTS AND DISPOSABLE SOVIET ROCKETS

In the early 2010s, Russian Proton and Soyuz launch vehicles launched the lion's share of foreign commercial satellites into orbit, which brought the country stable income [up to 50% of all launches in the world].

The situation was turned around by the appearance of the American company SpaceX, which relied on reusable, cost-effective rocket stages of the Falcon family.

In 2024, Russia accounted for only 2.35–5.0% of all launches in the world - there was a sharp decrease of 10-20 times.

With the current trends of negative growth in the economy, industry, and science, Russia's technological gap with the United States and China will only increase.

American private companies are putting superheavy Starship-type systems into regular operation, which dramatically reduces the cost of flights, makes them profitable and opens the way to large-scale space exploration, its industrialization and colonization of the Moon.

### III. THE FIRST ATTEMPTS TO CREATE REUSABLE SPACE TECHNOLOGIES BEFORE 2010

1. The most famous project of 1952. This is *Wernher von Braun's* «Ferry Rocket».

A German designer who moved to the United States has developed a project for a giant orbital "ferry" or "shuttle" rocket weighing about 6,400 tons with a wingspan of 48 meters.

*The first stage* was supposed to return to Earth using a steel mesh parachute, and on approach to the surface, the engines would turn on for a gentle descent into the ocean. The project was implemented as part of the creation of modern automatic offshore platforms for landing spent stages.



Falcon 9 landing on an automatic marine platform

*The second stage* would return in the same way as the first, and *the third stage* would land on the airfield like a shuttle ferry. This project was implemented in the «Buran» systems in the USSR and the «Shuttle» in the USA. *bcs-express.ru; siriusmag.ru*

2. Projects from the 1960s. Engineer *Philip Bono* from Douglas Space and Missiles Company has developed a series of rockets capable of reaching orbit with just one stage (SSTO system) and taking off/landing vertically (VTOVL system). – The State Corporation named after Makeev in Russia is implementing this project today in a single-stage "Crown" project.

3. Similar projects included ROOST, ROMBUS, Ithacus, Hyperion, and Pegasus. *dzen.ru*

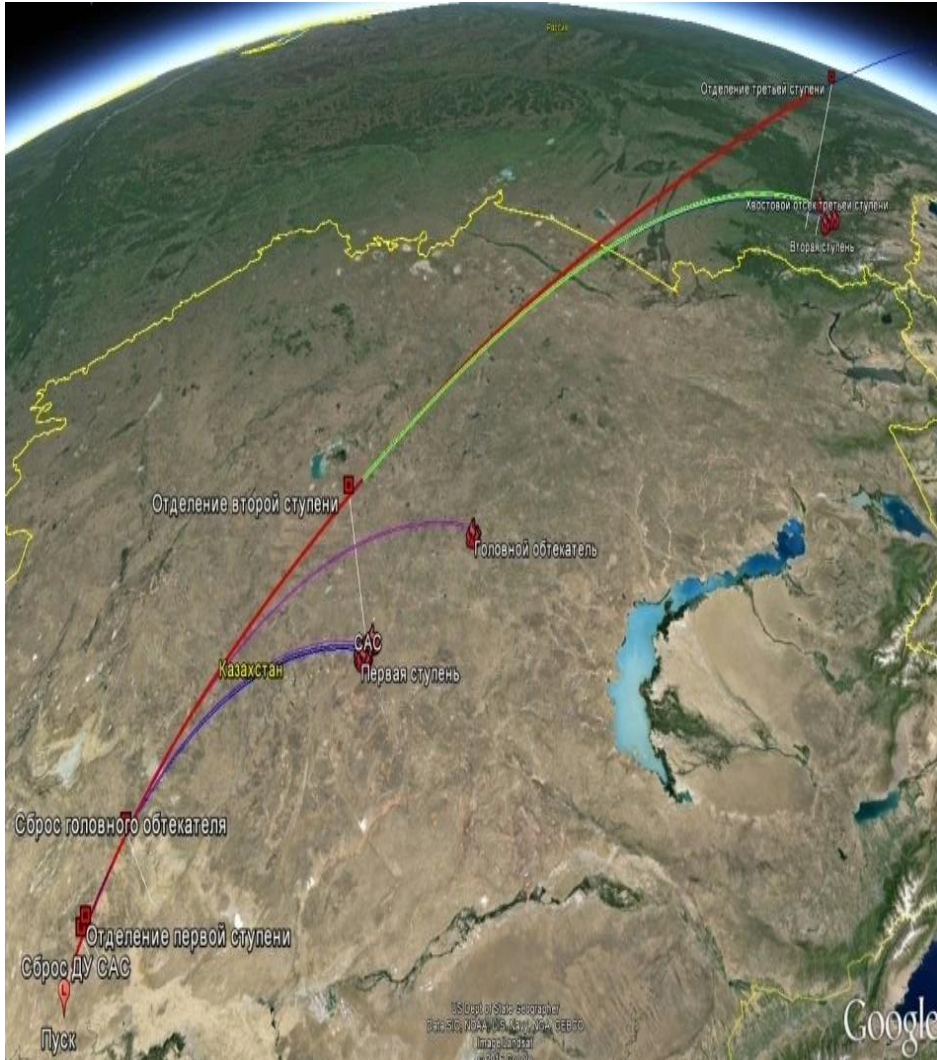
Today, Russia has 6 obsolete Soviet continental single-use spaceports, which are a technical dead end in the development of cosmonautics.



- 1). Plesetsk;
- 2). Kapustin Yar;
- 3). Yasny;
- 4). Baikonur;
- 5). Free;
- 6). Vostochny

The Vostochny cosmodrome has two launch complexes [the third in the project]. Vostochny has completed 20 orbital launches in 10 years [2016-2025], with an average of 2 launches per year.

The estimated theoretical load of Vostochny is about 10 one-time launches per year. Murtazin [RSC Energia] believes that full-fledged reusable launches are fundamentally impossible today from any of Russia's 6 continental cosmodromes - this is a "technical dead end" in the development of cosmonautics in Russia.



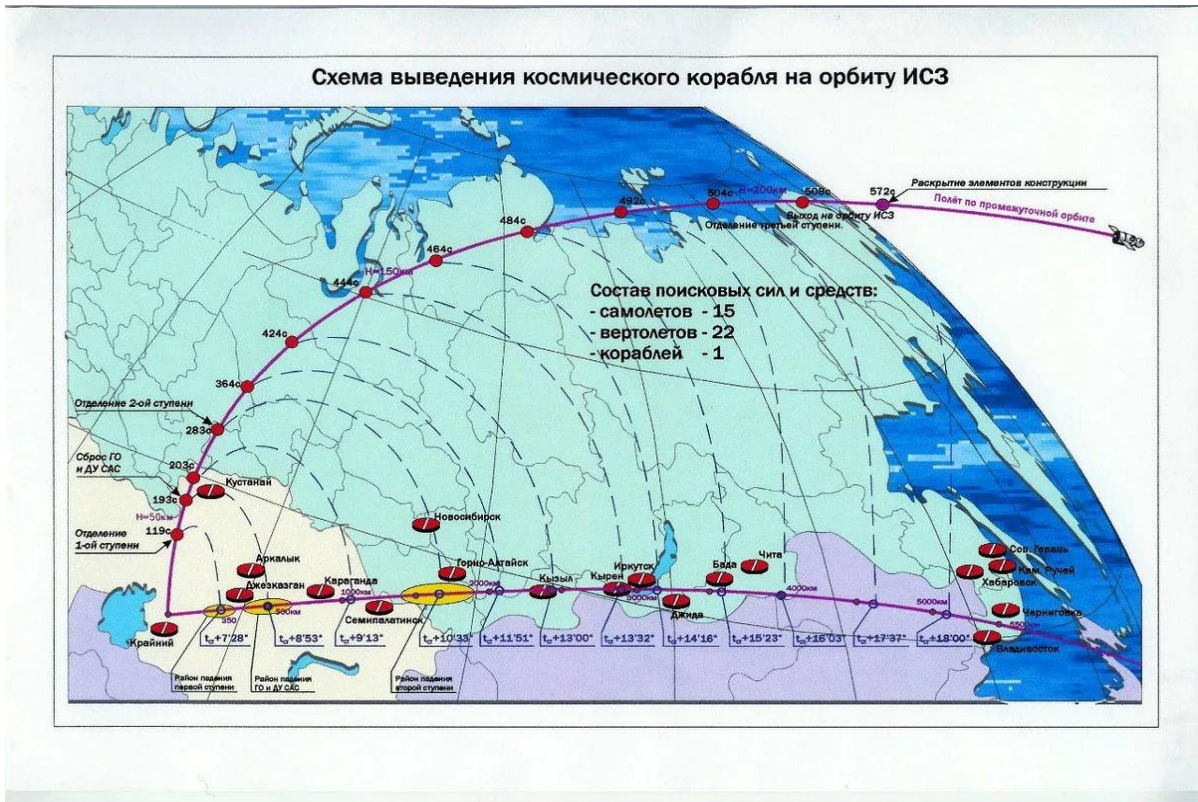
The trajectory of the launch of disposable rockets from the Baikonur cosmodrome

Baikonur allows launching spacecraft at an orbital inclination to the equator from 20 to 95 degrees. The inclination angle of the orbit of manned spacecraft launched from the Baikonur cosmodrome is usually 51.6 degrees.

The smaller this angle, the cheaper it is to launch one kilogram of cargo. During takeoff, rockets leave a lot of debris in the form of spent steps.

*The spent first stage and the head fairing fall into the territory of Kazakhstan, and the second stage falls towards us, along the border with Mongolia.*

Baikonur was leased to Russia until 2050 with a fixed payment of \$115 million per year. Russia must pay Kazakhstan separately for the transportation of equipment and for environmental damage caused by falling rocket stages.



A "dirty" footprint on the Ground from the launch of rockets into orbit Artificial Earth Satellite [AES] from Baikonur, passing through 18 large settlements

#### IV. R. MURTAZIN'S "CONCLUSION" ON "DISPOSABLE SPACE" IN THE USSR AND IN RUSSIA.

In May 2025, the head of the ballistics department of RSC Energia, Rafail Murtazin, publicly pointed out in an interview with MK that reusable flights from the Vostochny cosmodrome were objectively impossible.

1. "Our rockets, when launched from the Vostochny cosmodrome, fly over mountains and gorges at almost all inclinations. And where there are no mountains, there is a frozen, uninhabited tundra." "In the case of disposable rockets, it does not matter what kind of terrain is under it."

2. "But since there was no program to create reusable launch vehicles in 1993, no one took this circumstance into account when choosing the location of the Vostochny cosmodrome.

And even if there was such a reusable program, no one offered another place for the cosmodrome, except for Vostochny."

"To carry the return stage after landing [by parachute] Roscosmos planned, theoretically, on the world's largest Mi-26 helicopter. But there are no guarantees that such an operation will take place without damage to the stage or helicopter?"

3. In short, in our conditions of continental cosmodromes, it is possible not to get any economic effect. " The use of mobile sea-based landing platforms on land is, of course, impossible. [2]

## V. "CONCLUSION" BY IVAN MOISEEV, HEAD OF THE INSTITUTE OF SPACE POLICY

During the development of «Soyuz-5», the possibility of [passive] return of the first stage by parachutes was considered.

This made it possible to make the rocket [passively] reusable. The «Falcon 9» and «Soyuz-5» are almost comparable in payload capacity, but on condition that the first stage of the «Falcon 9» is non—returnable.

If the first stage of the «Falcon 9» is dynamically returned to earth on the engine, then its payload capacity automatically becomes 15.6 tons instead of 22.8 tons [part of the fuel is spent on breaking the rocket before landing].

The single-use (non-returnable) «Soyuz-5» is larger than the returnable version of Elon Musk's rocket by about 10-15%. In the «Falcon 9», the first stage returns when there is an excess of power, when the rocket is not fully loaded with payload.

In the reusable version, it flies with an underload of about 25-30%. And when it is necessary to launch a heavy satellite, the first stage of the Falcon 9 is made disposable, it does not return, and then the «Falcon-9» becomes more powerful than the Russian «Soyuz-5».

**In the Russian «Soyuz-5», the first stage is heavier than the «Falcon-9» by almost 10 tons.**

This is because the domestic rocket is made of massive aluminum-magnesium alloys, while «SpaceX» uses aluminum- and lithium-based alloys. The latter are 40% lighter than aluminum and magnesium alloys.

Therefore, the payload of the «Soyuz-5» is  $\approx 10$  tons less than that of the «Falcon 9», all other things being equal.

**Instead of additional fuel for a reusable landing rocket, "10 tons of ballast are being carried"? [3]**

Therefore, the first stage of the Soyuz-5 rocket is not returnable? *3dnews.ru*. In 2020, the head of the RCC Progress announced that there are no plans to create actively recoverable stages [on engine braking] for «Soyuz-5».

On March 30, 2026, an absolute record for reusable space launches was set: Elon Musk's Falcon 9 flew into space and returned 34 times. March 30, 2026 from Cape Canaveral Space Center (SLC-40).

The «Falcon 9» rocket launched another batch of 29 Starlink satellites into low Earth orbit.

A few minutes after launch, the first stage, the absolute leader of the SpaceX fleet, made an accurate landing on the Just Read the Instructions marine unmanned platform ship in the Atlantic.

It was a dynamic, powered, fully controlled, precise landing at a pre-arranged location at sea, rather than a passive parachute landing.

This is the 34th flight of the same accelerator in just over five years of operation. B1067 has already flown with NASA cargo (including Crew and CRS missions), with European and Asian satellites.

A significant part of the flights is devoted to the deployment of the Starlink constellation. The 33rd flight took place about a month ago. The company continues to increase the life of boosters: the goal is to bring them up to 40 or more flights. *Today, this is the cheapest optimal option for the reuse of rocket stages from all possible ones.* [4]



The «New Glenn» rocket is ready for launch: Blue Origin reused the first stage for the first time on April 19, 2026 [5]



«Starship V3» received an increased height (124.4 m), an improved design and a significantly increased payload capacity — the rocket will be able to launch more than 100 tons into low-Earth orbit in a fully reusable version. April 12, 2026.



«Starship» is a fully reusable superheavy rocket system being developed by Elon Musk's «SpaceX» company. It is designed to deliver cargo and people to near-Earth orbit, the Moon and Mars.

VI. THERE IS AN ACUTE SHORTAGE OF REUSABLE SPACEPORTS AND REUSABLE ROCKETS ALL OVER THE WORLD TODAY.:  
 IN THE UNITED STATES, ALMOST ALL NASA SPACE LAUNCHES ARE CARRIED OUT ONLY FROM ITS THREE MAIN REUSABLE SPACEPORTS AT CAPE CANAVERAL

Today, there is a revolutionary transition from disposable spaceports and rockets to reusable ones. The limited number of reusable spaceports in the United States threatens the country with congestion in terms of launches, according to *The Wall Street Journal*.

Almost all American launches are carried out only from three eco-friendly reusable spaceports located in Cape Canaveral, Florida, due to strict environmental restrictions. In 2023, 145 rockets were launched, 134 of which were carried out by Elon Musk's SpaceX company.

In 2024, the Cape Canaveral Space Center in Florida became the most popular and busiest — 93 rockets were launched from it (21 more than in 2023).

The problem is particularly acute for small space companies, which have to adjust to the schedule of larger players in the space industry.

In search of a solution, the space industry has turned its attention to alternative sites, including the northern spaceport on Kodiak Island in Alaska, right on the border with Russia.

Currently, the American Kodiak cosmodrome in Alaska is undergoing a permit procedure for up to 25 launches per year, which may partially relieve existing spaceports and provide new opportunities for small space companies. [the Vostochny cosmodrome in Russia is designed for about 10 one-time launches per year]. [7]

The possibility of reuse of launch vehicles has had a huge impact on the space industry, on the development of reusable spaceports.

In 2024, the Cape Canaveral Space Station launched a 50-year plan for the development of a reusable spaceport at Cape Canaveral, which provides for extensive infrastructure upgrades (including at the Port of Canaveral) to ensure a higher expected launch frequency and the creation of landing sites for new reusable spacecraft.

**Today, Russia does not have such a strategic multi-year plan for the development of new reusable spaceports for the next 50 years.**

Russia has 6 disposable spaceports. All of them were planned back in the USSR for disposable missile systems.

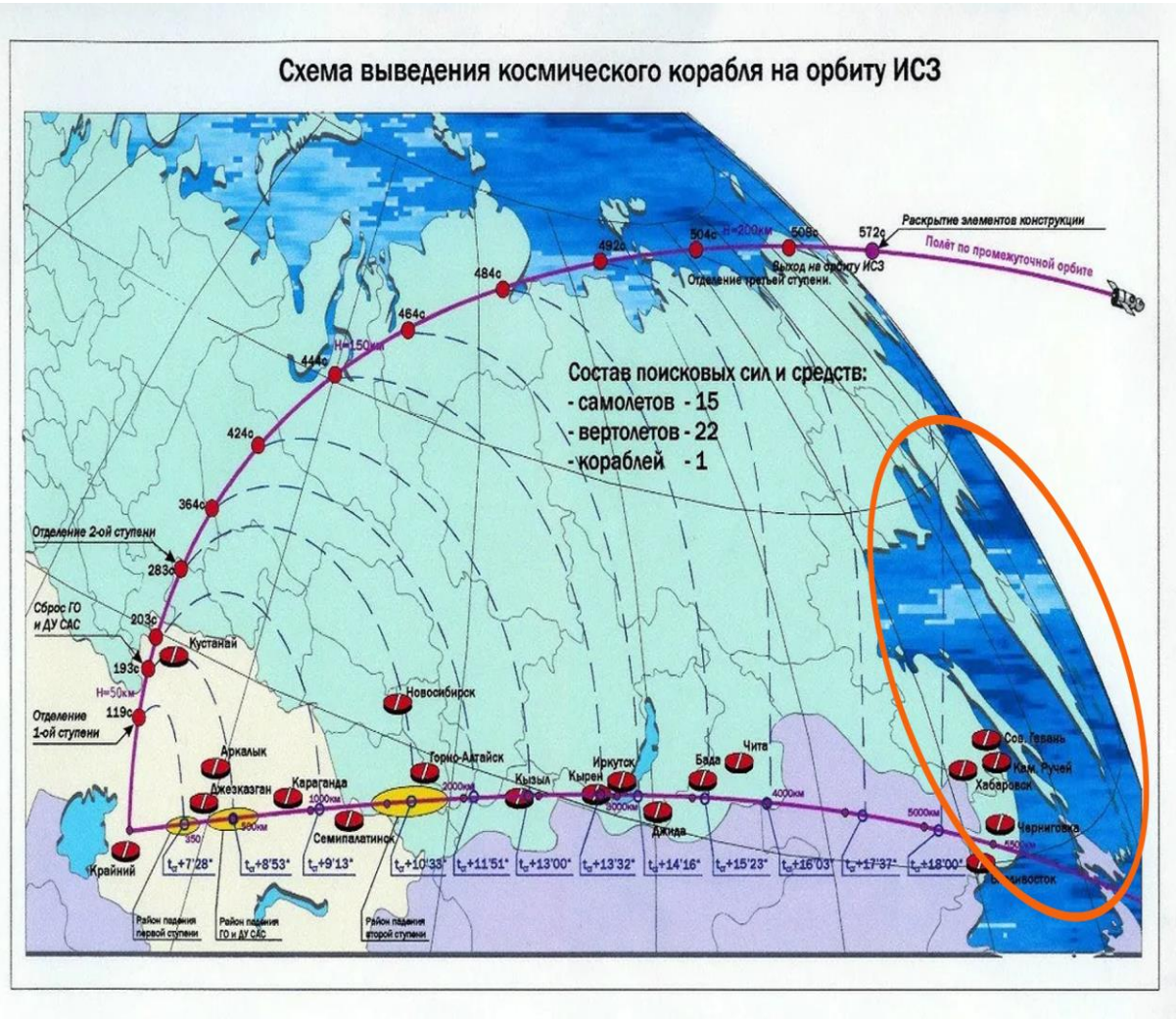
Therefore, even if Russia acquires or manufactures reusable missile systems itself, it will not be able to physically use them.

The "conclusion" on the entire "disposable space" in the USSR and in Russia, as a technologically backward dead end, was made by Rafail Murtazin, head of the ballistics department of RSC Energia.

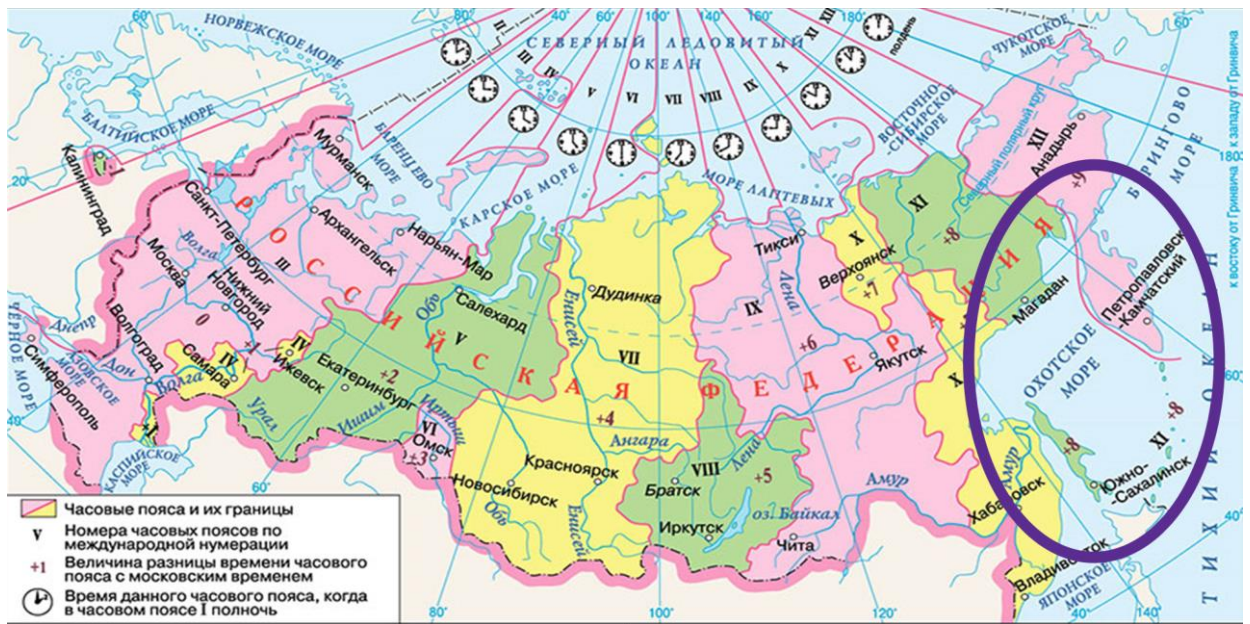
To stay in the space trend, Russia must build new reusable spaceports for the use of reusable rocket systems.

Russia should have a strategic plan for the development of reusable spaceports for the next 50 years. Therefore, we have proposed to build:

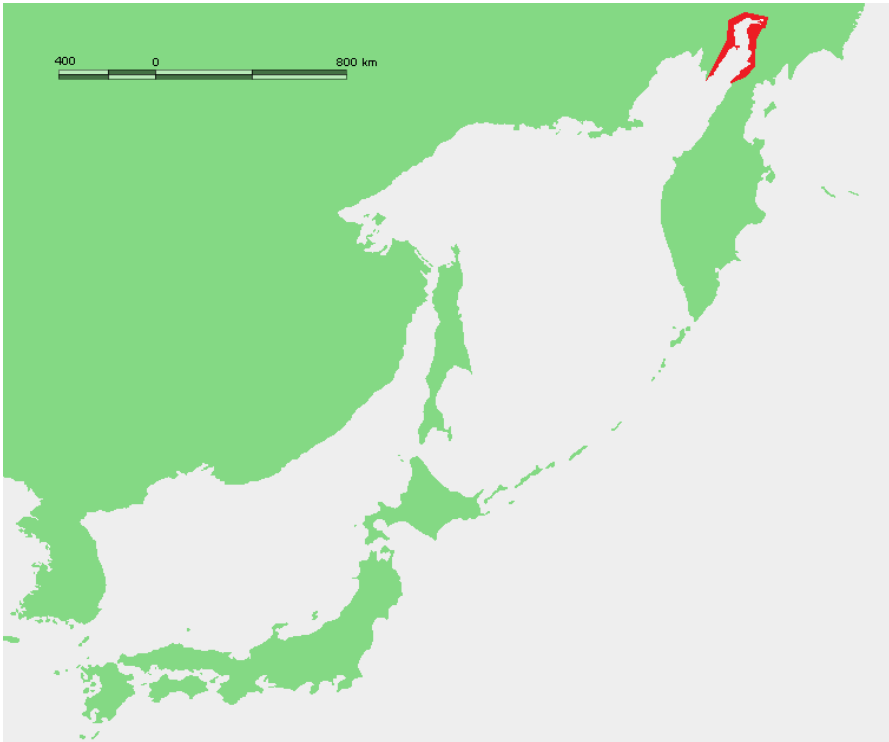
- 1). The Russian Far Eastern Reusable Space Complex (FESC) on the Kuril Islands**, as well as to participate in the creation of
- 2). The Reusable Western Spaceport on the island of Cuba and Cape Canaveral [WSC]**. Technically, these two projects are very similar to each other and are closely related technologically and navigationally.[2]



Location of Russia's "clean" zone for reusable space launch of rockets into orbit Artificial Earth Satellite (AES) [located in the red circle]



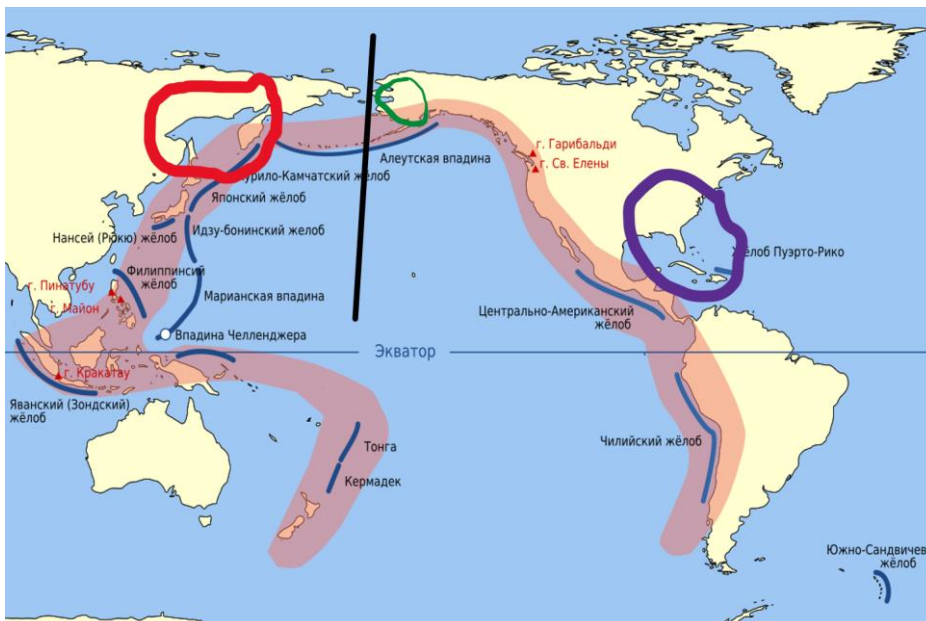
Far Eastern Space Complex [FESC]



Overview of the proposed territory of the FESC

The FESC should include:

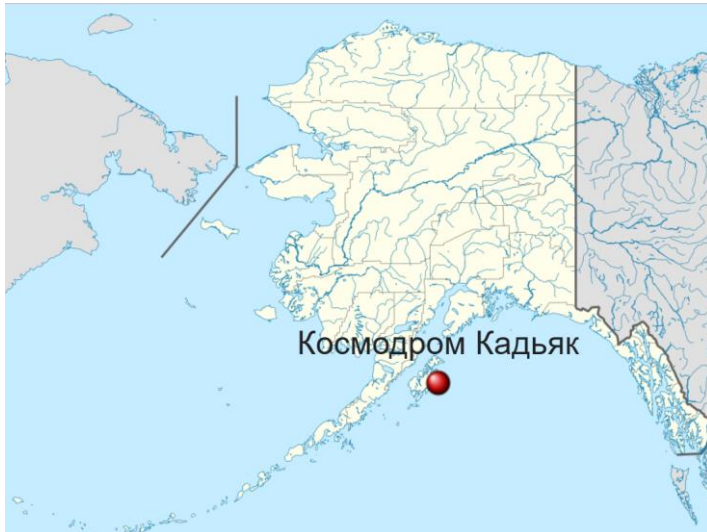
- 1). Sakhalin Island;
- 2). Kuril Islands;
- 3). Kamchatka Peninsula;
- 4). Penzhinskaya Bay;
- 5). shipbuilding plant;
- 6). aviation plant



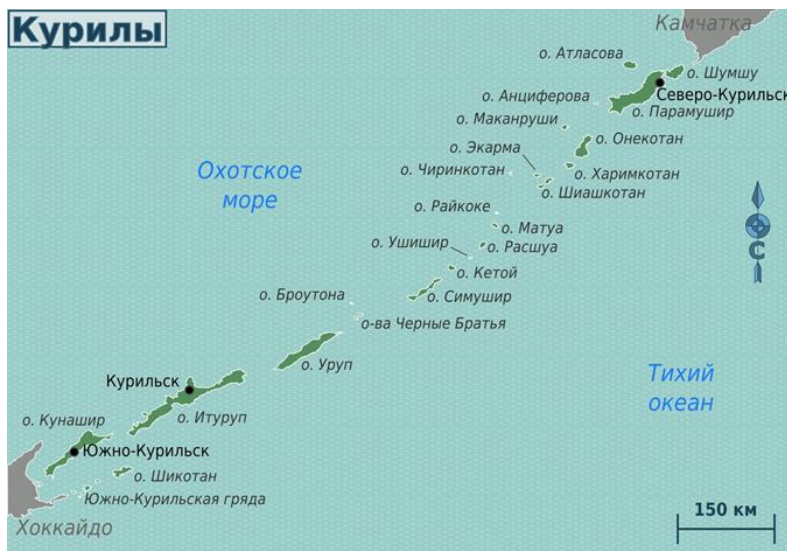
The geopolitical alignment of the Far Eastern [FESC] and Western [WSC] world spaceports of the "Japan-Kuril-Sakhalin" Pacific seismic belt

Designations:

- 1). The territory of the proposed Far Eastern Space Complex [FESC – red circle], a reusable spaceport on the Kuril Islands, has been allocated.
- 2). Reusable US Kodiak Space Center in Alaska [green circle].
- 3). The reusable U.S. spaceports at Cape Canaveral in Florida and the proposed reusable Western Space Complex in Island of Cuba [WSC - purple circle]



The westernmost and northernmost Kodiak cosmodrome in the United States was built in Alaska at Cape Narrow of Kodiak Island.



The FESC should include:

- 1). Sakhalin Island;
- 2). Kuril Islands [56 islands];
- 3). Kamchatka Peninsula;
- 4). Penzhinskaya Bay;
- 5). shipbuilding plant;
- 6). aviation plant



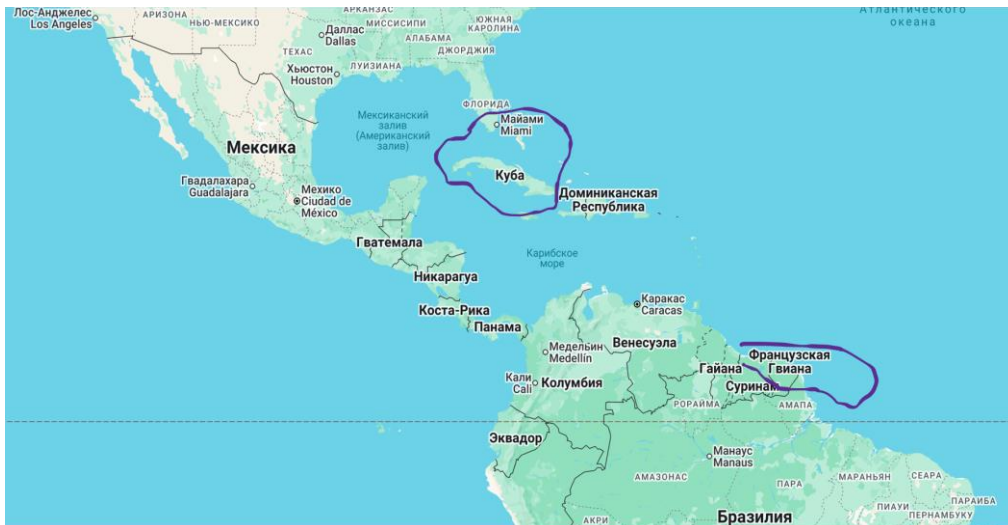
Tanegashima Cosmodrome in Japan. It is inconvenient in terms of wind roses blowing towards the Japanese islands.



The Uchinoura Cosmodrome in Japan. It is inconvenient in terms of proximity to the civilian infrastructure of the Japanese islands. [Near the cities of Hiroshima and Nagasaki, affected by the atomic bombing in 1945]



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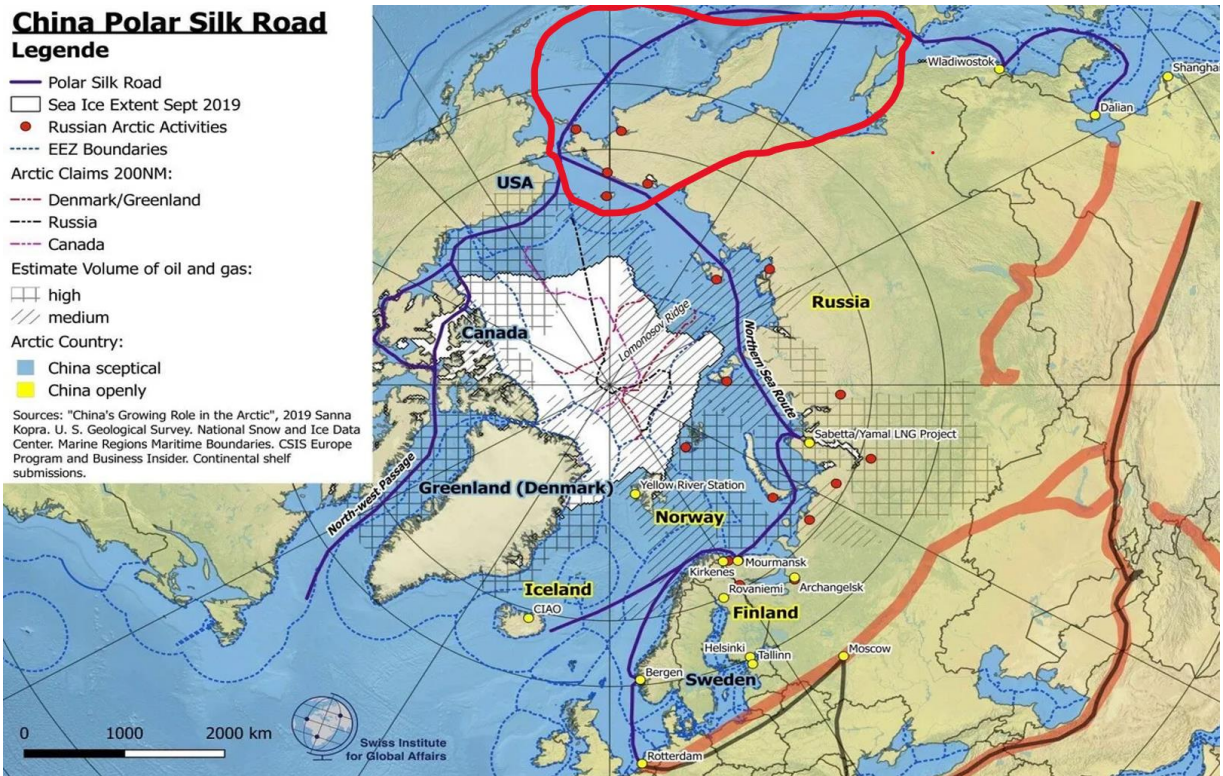


The reason and motives of the United States in seizing and controlling the Panama Canal, as well as the island of Cuba. Western Spaceport in Cuba and Cape Canaveral [WSC].

Texas has 5 spaceports, of which 3 are private, as well as rocket factories. But the largest rockets need to be installed and launched from launch sites at Cape Canaveral for environmental reasons. Special large-sized transport vessels are used for this purpose.

But the largest rocket factories are located in California, and it is necessary to transport super-large missiles through the Panama Canal, which therefore becomes strategically important. Cuba is becoming an attractive territory for the expansion of the Western Space Complex [WSC].

In French Guiana, a spaceport was leased from Russia, conveniently located near the equator. Now Russia has lost it, having lost all its unique infrastructure there.



FESC [red circle: Kuril Islands, Sakhalin, Kamchatka, Chukotka] – and the Chinese double bipolar Silk Road to the USA, Canada, Europe and Russia.

## VII. THE NAVIGATION PROBLEM OF TIME SYNCHRONIZATION IN SPACE BETWEEN TWO GLOBAL SPACEPORTS: FAR EASTERN [FESC] AND THE WESTERN [WSC] ON THE MAGELLANIC LINE DATE CHANGES

A particular problem is the era of colonization of the Moon, which began in 2017. It will be necessary to introduce a unified global order for regulating launches of rocket systems to the Moon so that they do not interfere with each other and do not create emergency situations out of the blue.

1). For steam locomotives, such a schedule was introduced by President Woodrow Wilson and astronomer and Rear Admiral of the U.S. Navy S. Newcomb. The U.S. Congress approved the "Standard Time Act" or "Calder Act" on March 19, 1918. The whole world still uses this Calder Law.

Example: in 1969, «Luna-15» and «Apollo-11», whose lunar trajectories were corrected simultaneously through the same «Jodrell Bank» radio observatory in the UK.

2). Musk is building two dedicated rocket factories in Texas at Gigabay, which he plans to launch at full capacity in 2026. These plants are designed to produce at least 1,000 lunar rockets per month.

The United States intends to launch 10,000 rockets per year and launch up to 1,000 rockets per month to the moon alone. For one launch window, you will have to launch about 200 rockets per day. [The Germans launched the V-2 up to 100 times per day in England in 1944]

The anarchy in the dates and frequency of rocket launches into space at the beginning of 2026 led to the appearance of approximately 9,000 tons of space debris in low-Earth orbits up to 550 km high, consisting of millions of objects at their total estimate.

And this mass of space debris continues to grow rapidly and uncontrollably. Dangerous spontaneous chain cascade reactions between space debris fragments are increasingly occurring [the "Kessler effect"].

3). *The new unified worldwide transport schedule* is needed, synchronizing all space flights along with aviation, sea and land transportation.

*The unified linear reference lunar standard time will be used in parallel with the circular earth time scale.* [8]

#### VIII. LUNAR NAVIGATION OF THE JOINT FLIGHT OF THE «APOLLO 11» AND «LUNA 15» SPACECRAFT IN 1969 USING THE JODRELL BANK RADIO ASTRONOMY OBSERVATORY [GREAT BRITAIN]



«Apollo 11» crew:

Neil Armstrong, Michael Collins, Buzz Aldrin

The Soviet AMS «Luna-15» was launched three days before the «Apollo 11» mission. The launch of the «Luna-15» automatic interplanetary station took place on July 13, 1969 at 02:54:42 UTC. On July 17, «Luna-15» entered the Moon's orbit and completed 52 revolutions around it. This was the second attempt by the Soviet Union to bring lunar soil to Earth in order to beat the United States in the lunar race. *NASA feared a collision between both ships in lunar orbit.*

The launch of the «Apollo 11» spacecraft took place on July 16, 1969 at 13:32 UTC (Universal Coordinated Time). The launch took place from launch complex LC-39A of the Kennedy Space Center in Florida.

On July 20, at 20:17:39 UTC, crew Commander Neil Armstrong and pilot Edwin Buzz Aldrin landed the lunar module of the spacecraft in the southwestern region of the Sea of Tranquility. They remained on the surface of the moon for 21 hours, 36 minutes and 21 seconds.

The first man to set foot on the Moon was Neil Armstrong. It happened on July 21, at 02:56:15 UTC. Aldrin joined him 15 minutes later. They stayed on the surface of the moon for 2 hours, 31 minutes and 40 seconds. During this time, the US flag was set up and 21.55 kg of lunar soil samples were collected, which were then delivered to Earth.

The «Luna-15» lander landed on the surface of the Moon on 53 orbits at 15:50 UTC on July 21, 1969, 2 hours before the scheduled departure of the Americans from the Moon. Astronauts recorded how «Luna-15» hit a mountain on the Moon and crashed.

*The same thing was observed at the **Jodrell Bank Radio Astronomy Observatory** [Great Britain], which accompanied both space objects in flight at the same time.*

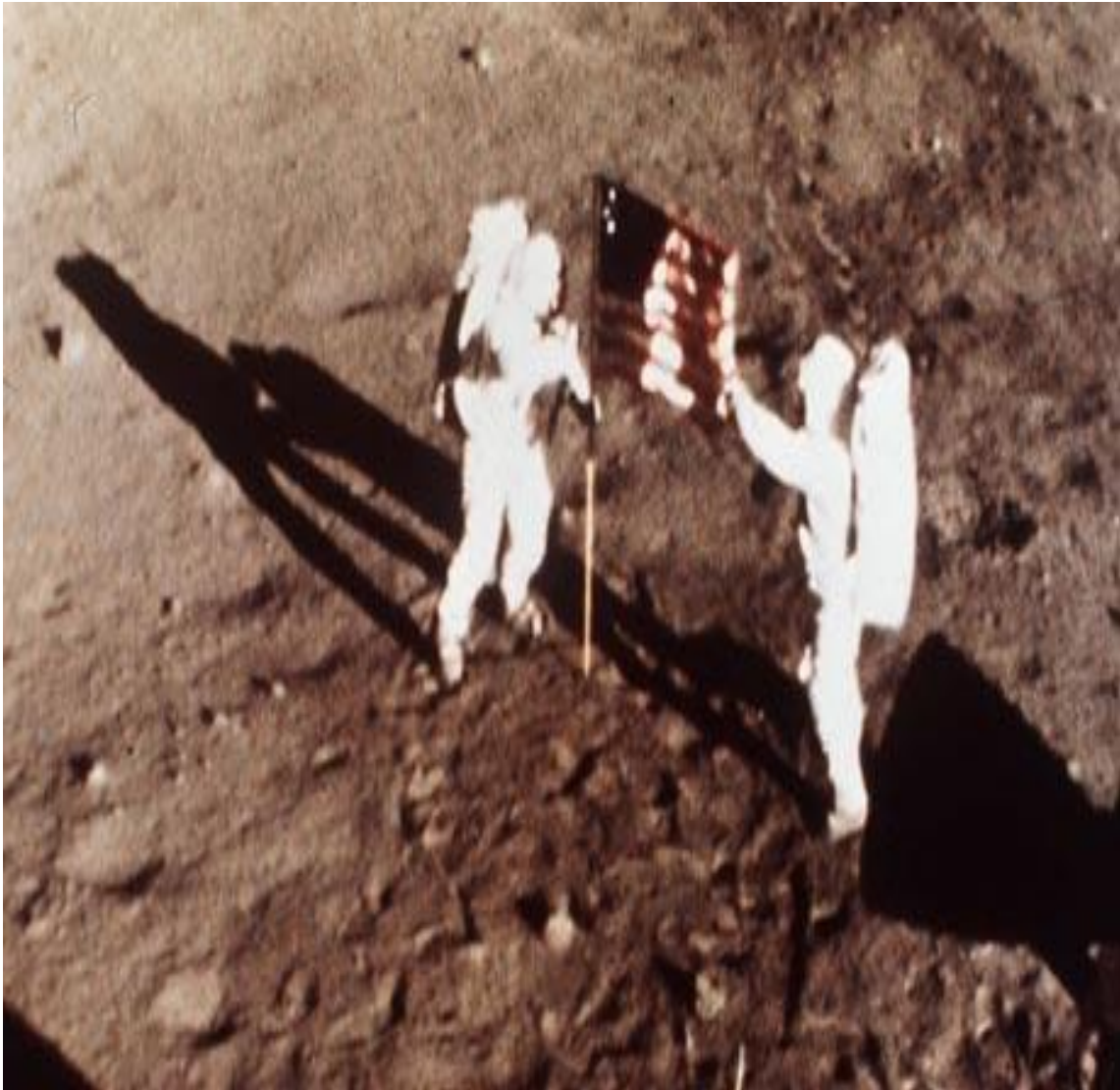
**But there are people who, in principle, deny the flight of «Apollo 11» and its landing on the Moon?**

The cyclogram turned on the engine of the lunar module's take-off stage automatically, as planned, 124 hours and 22 minutes after the start of the flight time [continuous unique time tracking from the moment of the «Apollo 11» launch on Earth].

The launch of the «Apollo 11» lunar module from the lunar surface took place on July 21, 1969 at 17:54 UTC. The «Apollo 11» spacecraft landed on July 24, 1969, at 16:50:35 UTC in the North Atlantic Ocean.

A previously unreleased recording of the Russian «Luna-15» spacecraft trying to overtake NASA's «Apollo 11» in the 1969 race to the Moon has been released. The recordings were made from the **Jodrell Lovell** radio telescope, which were hidden in the archives until they were found by researchers.

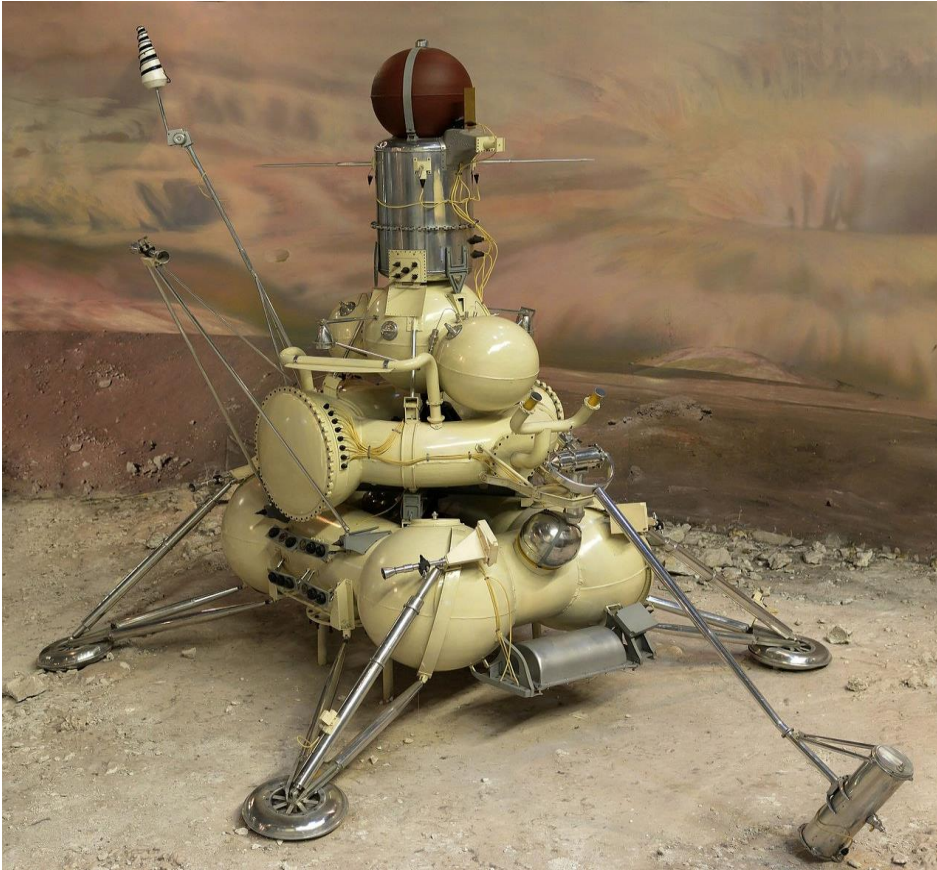
Records show that the Russian spacecraft circled the Moon 52 times and made an emergency landing on its surface at 15:50 UTC on July 21, 1969. This happened 2 hours before American astronauts Neil Armstrong and Buzz Aldrin launched from the Moon back to Earth.



The accident of the Soviet AMS «Luna-15» on the Moon was under control the «Apollo 11» astronauts and the Jodrell Bank Radio Observatory

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The Russian spacecraft [Luna-15] crash-landed on the Moon 2 hours before the launch of the American NASA Apollo 11 spacecraft in 1969 from the Moon.

A previously unheard recording of a Russian spacecraft attempting to beat NASA's Apollo 11 in 1969's race to the Moon has been released.

The recordings from Jodrell's Lovell radio telescope, which were hidden in archives until researchers found them, show the Russian craft orbited the Moon and *crash-landed* onto its surface at 15:50 on July 21 1969- just the 2 hours before the Americans lifted. Photo: AP [6]

## IX. LITERATURE AND SOURCES

1. Vlad Falcon [Dmitry Nikolaevich Kaleev] The author of the article: "The decline of Russian cosmonautics or why we are lagging behind the leaders." This article reflects the author's private opinion and may not coincide with the official position of the engineering company Complex KAD. Smolensk. info@complexcad.ru For consultations on design and technological services, please call ☎ +7 (495) 127-72-03 [Electronic resource]  
URL: <https://dzen.ru/a/afCB1LA5TGF1LLQN>  
(Date of application: April 28, 2026)

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URL: <https://www.mk.ru/science/2025/06/29/vostochnyy-kamen-pretkoveniya-na-puti-realizacii-kosmicheskikh-proektov-est-podvodnye-kamni.html>  
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[Electronic resource]  
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4. The absolute record for reusable space launches: Elon Musk's Falcon flew into space and returned 34 times already  
[Electronic resource]  
URL: <https://dzen.ru/a/acth-Q2DMQBBC12->  
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5. The New Glenn rocket is ready for launch: Blue Origin is going to reuse the first stage for the first time  
[Electronic resource]  
URL: <https://dzen.ru/a/aeRnw23-tUNFOfkR>  
(Date of application: April 19, 2026)
6. Russian spacecraft landed on Moon hours before Americans.  
[Electronic resource]  
URL: <https://web.archive.org/web/20190718032735/https://www.telegraph.co.uk/news/science/space/5737854/Russian-spacecraft-landed-on-moon-hours-before-Americans.html>  
(Date of request: 04 July 2009)
7. An acute shortage of spaceports is already being felt in the United States: almost all launches are carried out from only three spaceports.  
The authorities are looking at alternative sites.  
[Electronic resource]  
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