

What is known about Russian current Space Station- and Moon Projects.

In order to get an overview of current and future Russian space station- and Moon projects I submitted the question to DeepSeek and chatGPT, tried to verify the results, edited and combined them with other reliable internet sources into the following overview.

Russian Orbital Service Station (ROSS)

Key points include a timeline starting in 2027 with the Science and Power Module (NEM), and plans for additional modules by 2033. The station is intended for polar orbit, enabling Earth observation, especially the Arctic.

- > By reiterating the roadmap for the launch of the NEM module in 2027 from Vostochny using the A5M version of the Angara launcher, the close collaboration between the space vehicles' end users, the cosmonauts themselves, and the companies involved in the project was also established. [1]
- > Four core modules and two specialized modules will be added by 2033, forming an X-shaped station
- > Initial crewed missions are planned for 2028, with crews visiting twice yearly (no permanent occupancy).

Capabilities

- > Polar orbit (sun-synchronous) at 400 km altitude, enabling full Earth coverage—especially the Arctic and Northern Sea Route.
- > AI-assisted operations for satellite fleet coordination, a first for any space station.
- > Pressurized volume of 387 m³ (twice Russia's ISS segment) and 54 kW power capacity.

Challenges

Challenges like budget constraints and redesign needs for the NEM module, which was originally designed for the ISS have to be addressed. There's skepticism about feasibility due to resource shortages exacerbated by the Ukraine war.

- > Estimated cost of \$6.7 billion is likely underestimated; Russia's 2024 space budget is only \$1.59 billion. [2]
- > Technical delays: NEM requires redesign (e.g., no toilets in initial ISS-compatible design).
- > Workforce shortages: Labor productivity is low, and sanctions impede technology access.
- > Former cosmonauts (e.g., Svetlana Savitskaya) warn of a potential gap in Russia's crewed space program post-ISS.
- > The Russian space agency has recently undergone leadership change: Yuri Borisov was replaced by Dmitry Bakanov in early 2025, following criticism over Luna 25 and other setbacks, though ambitious plans for ROS and Moon missions remain in place. [3]

Moon Projects

Luna missions

- > Luna-25: Intended South pole landing, crashed (Aug 2023) due to engine malfunction, loss of \$130M+ investment.
- > Luna-26: Lunar orbiter for mapping, planned 2025–2026 (delayed from 2024), sanctions disrupting ESA partnerships.
- > Luna-27: South Pole regolith study, 2027+ (delayed from 2025), dependent on Angara rocket delays.
- > Luna-28/29: Sample return & rover missions, concept phase, funding uncertainty.

Nuclear Power Plant

Roscosmos announced a lunar nuclear power plant to support future Moon bases. A tentative timeline was provided, and it is framed as a "cornerstone" for sustained presence.

The nuclear power unit on the Moon is tentatively planned between 2033 and 2036 to support year-round operations and infrastructure at the South Pole. [4].

International Lunar Research Station (ILRS)

Under a joint China–Russia agreement (2024), the ILRS aims to build lunar orbital and surface infrastructure via five joint missions (ILRS-1 through ILRS-5), leading up to eventual crewed lunar landings in the third phase (2035+) [5].

The ILRS is intended to support scientific research, energy, communications, in-situ resource use (ISRU), and facilities like lunar astronomy and Earth observation labs.

Crewed Lunar ambitions and Launch Vehicles development

Russian's war effect on resources is emphasized, with delays in the Orel spacecraft and Yenisei rocket.

> A crewed mission using the Yenisei super-heavy rocket (main rocket of the Lunar program) was postponed indefinitely due to funding cuts in 2021 – however in 2024 it was announced work to be resumed in 2025. [6]

> The Orel spacecraft (replacing Soyuz) faces also further delays, with un-crewed tests now expected post-2028.

Orel (formerly "Federation") is a next-generation crewed spacecraft in development, intended to carry 4–6 occupants to LEO or lunar orbit. Crewed lunar-arc flights are expected in the 2030s. [7] [8]

For the first time, the components of the Russian space station ROS and new PTK-Orel (Eagle) piloted vehicle in various stages of construction was reviewed during a meeting held on Oct. 21, 2024, at the RKK Energia facilities. [1]

Geopolitical and Technical Headwinds.

> ESA withdrew from Luna missions and ExoMars after the Ukraine invasion, crippling Russia's access to advanced technology.

> U.S. ended reliance on Russian RD-180 engines, reducing leverage.

> Russia now targets BRICS nations (e.g., China, India, South Africa) for ROSS collaboration.

> Russian Lunar projects rely on China's Chang'e program after Western isolation.

The war in Ukraine redirects funds and talent from space projects; Roscosmos lost 70% of foreign launch revenue.

However the cooperation on the ISS with the Western partners and NASA still works, Russia is reliably sending cosmonauts and material to the ISS in regular intervals, including the current ISS Expedition 73 with cosmonauts Sergey Ryzhikov, Flight Engineer and Alexey Zubritsky, Flight Engineer).

Outlook

Summary (chatGPT)

Russia is transitioning from reliance on the ISS toward building its own Russian Orbital Service Station (ROSS), with initial module launches by 2027 and cosmonaut visits by 2028. Simultaneously, the Luna Glob program seeks to redevelop robotic lunar exploration (orbiter and landers in the late 2020s), leading to the ILRS project—a joint China–Russia effort to build a permanent lunar research station with eventual human landings in the 2030s.

Experts express concern over funding and industrial constraints that may delay or halt parts of these programs despite official schedules

Summary (Deep Seek)

Russia's space ambitions are strained by isolation, underfunding, and technical hurdles. While ROSS and lunar projects symbolize national prestige, their feasibility hinges on political stability and partnerships with non-Western powers. For now, skepticism prevails among experts.

Images

While the search results confirm the existence of images for Luna-25 and Luna-3, they are not reproduced here. For ROSS and lunar nuclear plans, only conceptual descriptions exist. I recommend monitoring Roscosmos' official channels or space-focused databases like Alamy/NASA Image Gallery for future updates.

References

- [1] <https://www.spacevoyaging.com/news/2024/10/23/new-russian-ptk-orel-pilotable-spacecraft-finally-shown/>
- [2] <https://jamestown.org/program/the-dubious-future-of-russias-proposed-orbital-station/>
- [3] <https://spacepolicyonline.com/news/borisov-replaced-as-head-of-russias-space-program/>
- [4] Russia and China plan nuclear power unit for the moon
- [5] SpaceNews+2interfax.com+2Universe Today+2
- [6] [https://en.wikipedia.org/wiki/Yenisei_\(rocket\)](https://en.wikipedia.org/wiki/Yenisei_(rocket))
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