Russian Moon exploration program

Russian Moon exploration program currently consists of three successive missions, using the legacy of earlier Soviet lunar missions, which included orbiters and landers, sample returns and rovers. The last in the row of Soviet missions was Luna 24 (“Luna” is Russian for “Moon”) sample return mission in 1976.

New missions, unlike their predecessors, are targeted at lunar poles, which were poorly explored during early lunar programs in 1960's and 1970's. However, recent discoveries made by NASA's Clementine, Lunar Prospector, and most recent Lunar Reconnaissance Orbiter gave strong evidence in support of various lunar volatiles, and above all, water ice, in lunar regolith near poles. Roscosmos has contributed important scientific results in these studies with Russian-contributed neutron telescope LEND [ССЫЛКА http://l503.iki.rssi.ru/LEND-en.html] onboard the LRO spacecraft. This may indicate more diverse and dynamic environment on the Moon, than assumed. Moreover, such volatiles may be used later as possible sources for lunar base.

Currently Russian Moon missions are as follows:

- **Luna-25** (also known as *Luna-Glob-Lander*) mission to land the spacecraft on the Moon and the first in a row of a new lunar program, which should eventually lead to exploitation of the Moon. The spacecraft should land in the vicinity of lunar South pole and analyse lunar regolith samples *in-situ*. Launch planned for 2018.

- **Luna-26** (or *Luna-Resurs-Orbiter*) orbital mission to study Moon from low polar orbit (approximately 50–100 km). After main mission is complete, the spacecraft will rise the orbit to about 500 km to study cosmic rays (LORD experiment). Launch planned for 2019.

- **Luna-27** landing mission (or *Luna-Resurs-Lander*), which shall study lunar regolith *in-situ*. ESA is considering the possibility to install a drill and a sampling device on the spacecraft. Launch planned for 2020 or later.

All these mission are currently included in the next Federal Space program of Russia for 2016–2025, which is now under consideration in the Government. Also, the joint efforts are now in progress with colleagues of the European Space Agency to establish the commonly beneficial cooperation in Moon exploration, which should include both the contribution of ESA elements and service for *Luna 25–27* missions and the joint implementation of the LPSR/*Luna-Grunt* project.

The next step after the first three missions is to make the Lunar Polar Sample Return mission (LPSR, or *Luna-Grunt*) to study polar samples in Earth's laboratories. Several technological issues are to be solved, such as cryogenic delivery of the Moon's permafrost from the poles.

[ДАЛЕЕ ССЫЛКИ НА ОТДЕЛЬНЫЕ СТРАНИЦЫ]

Luna-25 (Luna-Glob Lander) payload

Luna-27 (Luna-Resurs-Lander) payload

[СТРАНИЦЫ ОТДЕЛЬНЫХ МИССИЙ]

Luna-25 (Luna-Glob Lander) Payload

	Instrument	Measurements/Operations	Mass (kg)	Organization
1	*ADRON-LR*	Active neutron and gamma-ray analysis of regolith	6,7	IKI
2	*ARIES-L*	Measurements of exosphere' plasma	4,6	IKI
3	*LASMA-LR*	Laser mass-spectrometer	2,7	IKI + U of Bern
4	*LIS-TV-RPM*	IR spectrometry of minerals. TV imaging	2,0	IKI
5	*LINA-XSAN*	Measurements of neutrals and ions	0,7	ISP (Sweden)
6	*PmL*	Study of dust and micrometeorites	0,9	IKI
7	*TERMO-L*	Study of thermal properties of regolith	1,2	GEOKHI
8	*STS-L*	TV imaging of panoramas and area near Lander (rover and Robotic arm)	4,6	IKI
9	*Laser Retro Reflector*	Moon libration and Moon ranging	1	NPO SPP
10	*BUNI*	Power and data support of science	2,3	IKI

[ИЛЛЮСТРАЦИЯ]

Luna-Glob payload accommodation. (c) IKI

Luna-27 (Luna-Resurs-Lander) payload

	Instrument	Measurements/Operations	Mass (kg)	Organization
1	*ADRON-LR*	Active neutron and gamma-ray analysis of regolith	6,7	IKI
2	*Analytic complex*	Chromatographic and mass spectroscopy analysis of volatiles content and chemical composition	10,4	IKI+ U. of Bern
3	*ARIES-L*	Measurements of plasma of exosphere	4,6	IKI
4	*LASMA-LR*	Laser mass-spectrometer	2,8	IKI+ U. of Bern
5	*LIS-TV-RPM*	IR spectrometry of minerals and TV imaging	2,0	IKI

6	*LINA*	Measurements of plasma and neutrals	4,6	IKI+ ISP (Sweden)
7	*PmL*	Measurements of dust and micrometeorites	1,5	IKI
8	*Radio-Beacon*	Radio signal with very high stability	1,7	IKI
9	*RAT*	Radio measurements of thermal property of regolith	0,5	IKI
10	*SEISMO-LR*	Measurements of seismic activity	1,6	IFZ
11	*TV-Spectrometer*	UV and optical imaging of minerals with UV excitation	0,5	IKI
12	*TERMO-L*	Measurements of thermal properties of regolith	2,0	GEOKHI
13		TV imaging of panoramas and area near Lander	4,6	IKI
14	*Laser Retro Reflector*	Moon libration and Moon ranging experiments	1	NPO SPP
15	*BUNI*	Power and data support of science	5,0	IKI

[ИЛЛЮСТРАЦИЯ]

Luna-Resurs-Lander payload accommodation