

Ukraine in Space

Compiled by Joachim Kehr Editor, May 2022

The **State Space Agency of Ukraine** (SSAU) state policy concepts are in the sphere of research and peaceful uses of space, as well as in the interests of national security; organization and development of space activities in Ukraine and under its jurisdiction abroad; contributing to state national security and defense capability; organization and development of Ukraine's cooperation with other states and international space organizations.

Many of the achievements of the Soviet Union in space were directly connected with Ukraine, its high scientific and technical potential and powerful industrial production. Numerous Ukrainian scientific institutions, design bureaus, industrial enterprises have been involved for many of the most important space achievements of the USSR – from the first flights in space to the creation and launch of space-rocket complex «Energy-Buran». [1]

Many scientists who greatly influenced the development of space exploration have Ukrainian roots. Their ideas and research played a huge role in the further development of astronautics. **Konstantin Tsiolkovsky**, whose ancestors hail from Volyn, Ukraine, is praised by NASA as 'one of the fathers of rocketry and cosmonautics, along with Goddard and Oberth.' The rocket theoretician **Yuriy Kondratiuk** who was born in Poltava, Ukraine, paved the way to the Moon. He developed the first known lunar orbit rendezvous, which was later used for the planning of the Apollo program's first actual human spaceflight to the Moon. Under the leadership of **Serhiy Korolov**, who was born in Zhytomyr, Ukraine, the first human-made satellite, Sputnik 1 was launched on October 4, 1957. [2]

Therefore, on February 29, 1992 the decree of the President of Ukraine created the National Space Agency of Ukraine (from 2011 - State Space Agency of Ukraine - SSAU). The State Space Agency retained the production and scientific base of the industry, development and production of modern launch vehicles, space vehicles, engines, control systems, command links, telemetry and other components of the high-tech complex, including more than 30 industrial enterprises, scientific-research institutes and design bureaus in which there are about 27 000 highly qualified specialists. [1]

Since 1991 162 launches of Ukrainian Launch Vehicles (LV) have been conducted and over 370 spacecraft delivered into orbit for the benefit of 20 countries worldwide.

Ukraine is one of the few countries in the world that has a closed rocket production cycle, ranging from rocket fuel to airframes, launch vehicles, and spacecraft. The Ukraine-designed Zenit and Cyclone booster rockets are well-known in the world. Moreover, successful launches of the Vega and Antares rockets could not be possible without the Ukrainian contribution. [2]

Ukrainian Cosmonauts and Astronauts participated successfully in Russian and on an international mission to the ISS. (image: Google.com/search...Ukrainean Astronauts, screenshot) [3]

Astronauts / Ukraine



Leonid Kadeniuk	In 1997 became the first citizen of independent Ukraine to make a trip into space. He was a member of the international team on the US Space
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	Shuttle Columbia STS-87. Before the flight, military pilot Kadaniuk trained for three years at NASA. The astronaut spent 15 days and 16 hours in space. During this time, he performed several biological experiments and planted a whole garden on the spaceship for scientific tests. After the flight, Leonid Kadaniuk continued his career in the State Space Agency of Ukraine.
Paval Popovich	1962 Pilot of Wostok 4, first tandem flight with Wostok 3 1974 Commander of Salyut 3 Born in Usin (region Kyiv)
Vitaly Zholobov	1976 as flight engineer on Salyut 5 Born in Sbiurewka (Ukrainian SSR)
Vladimir Lyakhov	1979 Commander of Salyut 6 1983 Commander of Salyut 7 Born in Antrazit (Ukraine, region Woroschilowgrad)
Leonid Kizim	1980 as Commander of Salyut 6 (T-3) 1984 as Commander of Salyut 7 (T-10) 1986 as Commander of MIR (T-15) Born in Krasny Liman (region Donezk)
Leonid Popov	1980 as Commander Salut 6 1981 as Commander of Salyut 6 1982 as Commander of Salyut 7 Born in Alexandrija (Ukrainian SSR)
Yaroslav Pustovyi	1997 trained and nominated as back-up astronaut as payload specialist for STS-87, but did not fly Born in Russia, grew up in Kyiv, Ukraine [5]

No surprise then that even Elon Musk recognized the contribution made by Ukrainian scientists and engineers: “Ukraine did play a major role” (twitter March 7, 2019)

Ukraine’s accession to the European Space Agency (ESA) and the way ahead.

Ukraine began its gradual EU integration in 2014 when it signed its Association Agreement with the bloc.

The Association Agreement, designed until 2022, was created to expand Ukrainian cooperation with the European Space Agency. *Volodymyr Taftay*, the head of the State Space Agency, is also convinced that Ukraine can enter the ESA. Thus, this past autumn, Ukraine’s State Space Agency presented its plans to make Ukraine’s accession a reality.

Following the Russian aggression against Ukraine in February 2022, ESA’s Director General has initiated a comprehensive review of all activities currently undertaken in cooperation with Russia and Ukraine. The objective is to determine the possible consequences of this new geopolitical context for ESA programs and activities and to create a more resilient and robust space infrastructure for Europe. The ESA Council on 13 April acknowledged the following findings and took the following decisions.

ESA will discontinue cooperative activities with Russia on Luna-25, -26 and -27, as with ExoMars, The Russian aggression against Ukraine and the resulting sanctions put in place represent a fundamental change of circumstances and make it impossible for ESA to implement the planned lunar cooperation. However, ESA’s science and technology for these missions remains of vital importance.

A second flight opportunity has already been secured on board a NASA-led Commercial Lunar Payload Services (CLPS) mission for the PROSPECT lunar drill and volatile analysis package (originally planned for Luna-27). An alternative flight opportunity to test the ESA navigation camera known as PILOT-D (originally planned for Luna-25) is already being procured from a commercial service provider.

Meanwhile, a way forward for the PILOT precision landing and hazard avoidance technology is already being defined. This capability is needed for European Lunar exploration activities such as the European Large Logistic Lander (EL3), proposed for decision at CM22. Further, the ESA Director General and the President of the Japanese agency JAXA last week signed an agreement to fly ESA's EMS-L, the Exospheric Mass Spectrometer instrument, on board the JAXA/ISRO LUPEX lunar rover mission. This adds to the growing list of European experiments flying to the Moon in the next few years.

Although all the elements of the ExoMars Rover mission (the launcher, carrier module, descent module and Rosalind Franklin rover) have now passed their flight readiness reviews, because cooperation with Roscosmos on ExoMars has been suspended, the mission will not be launched in September this year. Instead, a fast-track study is now under way led by Thales Alenia Space of Italy to assess options for the way forward. [4]

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