Lithuanian Space:
from K. Simonavičius to LitSat.
Lithuanians’ contribution to Space Programs

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Each country of this amazing Planet Earth has more or less contributed to the Space exploration.
Their Philosophers, People, Scientists, Technicians, Engineers, Thinkers, Writers, Painters.
Lithuania with its very very complicated and difficult history really stands not aside.
Formally the space history in Lithuania began in the middle of the seventeenth century.
Let’s try to read this history together within ... 15 minutes.
The earliest known manuscript with lectures on astronomy dates back to 1629. In the treatise of J. Rudamina *Illustriora theoremata et problemata mathematica*, published in 1633, we find a description of Galileo's telescope and observations of the satellites of Jupiter in Vilnius.

The book of A. Dyblinski *Centuria Astronomica* published in 1639 was exclusively devoted to astronomy. It was a comprehensive, though popular, review of astronomy based on works of the most eminent astronomers of that time.

It might have been one of the best books on astronomy in the 17th century.
Albertas Dyblinskis
Pioneer of Rocketry

1651
Kazimieras Simonavičius (1600 - ~1651)  
Born in the Grand Duchy of Lithuania,  
District of Raseiniai

Noble  
General of artillery, gunsmith, military engineer, artillery specialist and pioneer of rocketry.
The 1651 graduate of the Vilnius University Kazimieras Simonavičius in his work "Artis Magnae Artilleriae pars prima" submitted a multi-stage rocket projects.
This treatise, which discussed rocketry and pyrotechnics, remained a standard work in those fields for two centuries.
Drawing of a Staged Rocket
NASA Marshall Space Flight Center
In Memoriam, Monument in Telšiai
First Observatory

1753
Tomas Žebrauskas (1714 - 1758)

Lithuanian architect, mathematician and astronomer

First ever in 1753 constructed and demonstrated electrical machine
He designed a plan of an astronomical observatory. The building of the astronomical observatory was started in 1753. He was the first Director of it.

The observatory was erected on the top of the three-storey university building.

It was a 13.5cm reflecting telescope.

The other 10cm telescope-reflector
Pioneer of Aviation

1851
In 1851 Aleksandras Griškevičius published the manuscript “Samogitian Steam-flyer” describing an aerostat and steam-powered flying machine.
Aleksandras Griškevičius (1809 - 1863)
Born in Krakiai district, Kėdainiai region

Lithuanian scientist, philosopher, inventor, aircraft designer, aviation pioneer Lithuania.
Work remained unpublished, the manuscript is stored in the Central library of Lithuanian Academy of Sciences.
Before 150 years the Censorship Committee prohibited the printing of this manuscript.
In Memoriam, Monument in Vieksniai
Pioneer of Space panoramas

1905/07
Mikalojus Konstantinas Čiurlionis (1875 - 1911)
Born in Varėna

Painter
Composer

Pioneer of Space paintings: Mars, Signs of Zodiac
Pioneer of gliding

1911
Jonas Garalevičius (1871 - 1943)
Born in Žalпiai, Raseiniai district

Constructor and builder of first glider in Lithuania

In at his workshop in Kaunas constructed and produced the first gliders in Lithuania.

During WW I led the military factories in Russia.

http://www.vgc.lt/page.php?31
In Memoriam, Monument in Žalpiai
Aviation of Lithuania
1919-1940
Lithuanian Aero Club in 1927-1940

On 1st of May 1927 the group of officers and invited representatives of government, business and famous artists founded Lithuanian Aero Club (Lietuvos Aero Klubas - LAK).
Jurgis Dobkevičius (1900 – 1926.6.8)
Lithuanian pilot, aviation engineer and constructor
Antanas Gustaitis (1998 – 1941.10.16)
Lithuanian brigadier general, aviation constructor

70 years ago executed in Moscow jail Butyrki
1941 10 16

http://www.plienosparnai.lt/page.php?58
Steponas Darius (1896 – 1933.7.17)
Stasys Girėnas (1893 – 1933.7.17)
Lithuanian pilots. Transatlantic flight
ANBO, Rome, Italy 1934

July 6-11, 1934
Feliksas Vaitkus (1907 - 1956)

Lithuanian-American pilot

Sixth pilot to fly solo across the Atlantic.

1935
The end of Lithuanian aviation 1941-01-01
After WWII, since 1945 until 1989, Lithuanians, living in Soviet Union, worked at Soviet Union Space program.
Cosmonauts
The first Lithuanian origin cosmonaut Alexei Jelisejev-Kuraitis went into space as the spaceship Soyuz member.

He was FIRST:

- cosmonaut in open space at the same time with other one!
- ever for the 3rd time being in Space!
- ever participated during docking of spacecraft and space station!
Aleksey Stanislavovich Yeliseyev (Kuraitis) was born in Kaluga region, Russia in 1934.07.13. He is a Scientist, ex-rector of N.Bauman technical school.

**SOJUZ 5/4**

2 cosmonauts first are in open space at the same time! 1969.01.15

**SOJUZ 8**

1969.10.13

**SOJUZ 10**

First ever for the 3rd time in Space! First ever docking of spacecraft and space station! 1971.04.23
Lithuanian Rimantas Stankevičius in 1989 was scheduled to become a commander of the Soviet space shuttle Buran.
Rimantas Antanas Antano Stankevičius (1944 - 1990)
Born in Marijampolė

Lieutenant Colonel, Soviet Air Force, Civilian test pilot

Lithuanian cosmonaut who test flew Soviet space shuttle Buran and its test vehicles

Selected as cosmonaut for Buran-flights on 1977.07.12

Co-Pilot for the first Buran flight; he performed 14 training flights;

Died in a crash of a Su-27 in an air show in Treviso (Italy).
Buran spacecraft; for the Soviet reusable space vehicle program
In Memoriam, Monument in Kaunas Aukštieji Šančiai
A lot of Lithuanian scientists, technicians and engineers have been involved in space activities and space missions of USSR.
Planetary George A. Burba
(programs Luna/Lunochod, Mars and Venus)
The Institute of Botany studied plant physiology in zero gravity conditions. Lithuanian scientists designed micro-greenhouse and controlled gravity devices which were used on the Soviet orbital stations *Salyut* and *Mir* and on unmanned satellites.
The Lithuanian Energy Institute took part in the development of a nuclear reactor for spacecraft and investigated materials at high temperature and supersonic speed.
The Institute of Biochemistry developed biosensors for life support and bio-waste recovery systems. Biosensors for the detection of more than 20 biologically active compounds in fluids and air were designed. Both institutes participated in the Soviet space programme *Mars*. 
An imaging quantum-counting detector for space applications was developed at the Institute of Physics.
The Institute of Semiconductor Physics designed sensors to measure high power microwave pulses for space communication systems.
The Faculty of Physics of Vilnius University developed ultraviolet and infrared sensitive detectors for space applications; photo-detector arrays were used for the tests of the robot vision system of Lunokhod (the Soviet lunar rover).
The Lithuanian Textile Institute developed technology for the heat insulation panels for the shuttle and designed working suits and underwear for cosmonauts.
Kaunas University of Technology designed an ultrasonic flow-meter for the Energy-Buran programme.
Buran spacecraft; for the Soviet reusable space vehicle program

During 1988-1990 at Academy of Science of Lithuania – 48 themes
- 10,514 mln. roubles (8 institutes);

Ministry of Education – 36 themes
- 7,86 mln. roubles (4 institutes);

Directly with Moscow – 15 and 20 themes
1990s
Lithuanian scientists and engineers lost direct access to Russian hi-tech space and military programmes.
During last century a lot of Lithuanian people emigrated to the United States.
Lithuanian's "Jules Verne"

1960
Algirdas Jonas Budrys (1931-2008)  
Born in Königsberg, East Prussia

Budrys has a variety of workshops for writers of science fiction at Harvard, Brigham Young, Rice and Pepperdine Universities, Library of Congress, NASA

It was a 1961 Hugo Award nominee

Rogue Moon included in the anthology The Science Fiction Hall of Fame
Rogue Moon is largely about the discovery and investigation of a large alien artifact found on the surface of the Moon.
Astronaut
Karol Joseph Bobko “Bo”

April 4, 1983
Pilot

April 12, 1985
Commander

October 3, 1985
Commander

Grandparents from Kėdainiai district, Lithuania
Hundreds of scientists and engineers of Lithuanian origin have been involved in space activities and space missions at NASA
Today in Lithuania almost everybody know the name of Čiurlionis and Kudirka.

But they has relatives who delivered their knowledge to Space technologies.

They are Boleslovas Čiurlionis ir Alvydas Kudirka.

**Boleslovas (Balys) Čiurlionis** (b. 1919) In 1967 under NASA's Marshall Space Flight Center order constructed High Energy forming facility for the high explosive power tests.

**Alvydas A. Kudirka** (g. ~1935, USA) Argon National Laboratory, carried out NASA's Jet Propulsion Laboratory orders for high temperature ceramics. A. Kudirka has a patent for "Jet pump with labyrinth lock" (General Electric) for nuclear reactors functioning.
Arvydas Kliore (Mariner, Pioneer, Venus, Galileo, and Cassini);

Anthony Dobrovolskis (Pioneer and Venus);

Vytenis Vasyliunas (Voyager and Galileo);

Arvydas Vaisnys (Mars Global Surveyor, Mars Reconnaissance Orbiter, Mars Odyssey, Mars Express);

Romualdas Kasuba (Saturn IV and Lunar Excursion Module);

Martynas Kregzde (Apollo and the Space Shuttle programmes);

Julius Jodele (Ranger and Mariner);

Algirdas Avizienis (principles of fault-tolerant design for computer components used in space).
Emanuelis K. Jarašūnas (b. 1932) Polaris, Minuteman rocket engines;  
Henrikas V. Bankaitis (b. 1932) heat exchange and rocket engines;  
Algirdas Basiulis (b. 1931); designer of heat pipes for thermal control in space, air and industrial applications;  
Kazys Sekmakas (b. 1919) World scale specialist in polymer chemistry. 273 patents;
Raimondas Viskanta (b. 1931) thermal physics and heat transfer;
George A. Paulikas (g. 1936) member of which described the guidelines for the future of NASA;
Antoinette Songaila – Cowie, the most cited article in 1994 of Space thematic;
Sallie L. Baliunas – 20 years ago recognized as the most famous scientist in the USA;
Lithuania has never had and has no ambition to create a large Space program.

However, the Space history of small country is not written yet.
Today is already clear that the Lithuanians made a solid contribution to Space history.

This is evidenced by hundreds of Lithuanian names, thousands of articles and citations, hundreds of patents and so on.
The case unknown in Lithuania
Eugene Julius "Gene" Ziurys (1909-2008)

Born in US, grew up and studied at Kaunas Aušros (Dawn) gymnasium.

At aerospace company TRW headed hydrogen-oxygen fuel cells development team for the Apollo spacecraft.

Co-author of chrestomatic textbook about internal combustion engines, experts have used for several decades.

Program NERVA - Nuclear Engine for Rocket Vehicle Application
Atomic Energy Commission
Space Nuclear Systems Office
Lucy M. Ziurys (relative of “Gene”)

Astronomer, astrobiologist astrochemist.
Arizona Radio Observatory's director.

The search for life in space expert at the world's most powerful telescope ALMA (just started operations in Chile), a team member.
History of today
Let’s go!
~10 km
Highest Air Balloon Flight

2006-11-27

Vytautas Samarinas
Vladas Vitkauskas
~30 km
~33 km
Project Glory I, Glory II

Constructed and realized by 19 year of age
Ernestas Kalabuckas
from Molėtai district, Joniškio place.

Latitude: 55.356"
Longitude: 25.443"
2011-08-15
One Passenger Rocket HEAT 1-X: Copenhagen Suborbitals Mini SpaceCraft

10 lithuanians - sponsored

2011
Universe
Lithuanian Museum of Ethnocosmology
Molėtai district

One of the largest public telescopes in Europe

Ø 80 cm

2008

http://www.cosmos.lt/
SEMWO 2010 & 2011 and projected 1st nanosatellite LitSAT improves Lithuanian will of return from oblivion to XXI century’s Space activities.
Thank you!

www.kmti.lt
www.space-lt.eu