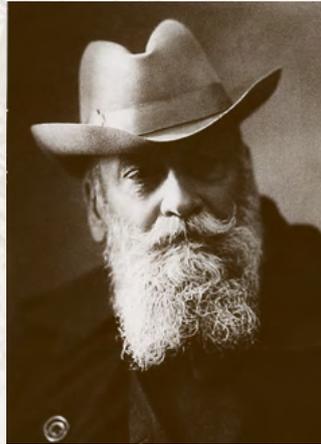


**TO THE 175TH ANNIVERSARY FROM THE
BIRTHDAY OF N. YE. ZHUKOVSKY –
THE FATHER OF RUSSIAN AVIATION
AND RUSSIAN GALILEO
(1847-1921)**

The genius of the great Russian scientist Nikolai Yegorovich Zhukovsky stands at the origin of aeronautics and space exploration. Moreover, thanks to him it became possible. For the first time since Galileo, his gigantic mind «managed to embrace the grandiose science - mechanics in its entirety» - this is exactly what his closest disciple Academician L.S. Leibenzon said about him.



Named in honor of the Russian Galileo are a crater on the far side of the Moon, academies and institutions, a science city, where the International Aviation and Space Show (MAKS) is held annually, a department of theoretical mechanics he founded almost 150 years ago at the Imperial Moscow Technical School (IMTS) – as of today, it is the Bauman Moscow State Technical University (BMSTU). The Bauman University, or Moscow Rocket College on Yauza as it is called in the West, became a cradle of modern engineering education and world aeronautics. It was from the walls of the Bauman University, humanity made a step into space.

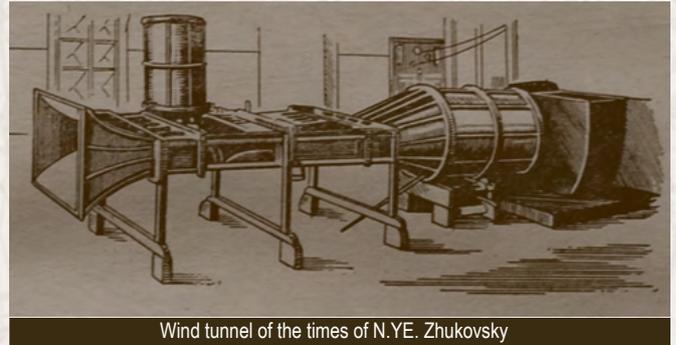


Bauman Moscow Higher Imperial College, Slobodskoy Palace, Central part

Since 1871 and for the next 50 years, this educational institution was a scientific and pedagogical home for Zhukovsky. Of all universities in the Russian Empire, only here the theoretical and engineering problems of aeronautics of flight vehicles heavier than air were studied. Within the walls of IMTS, the Russian method of engineers training was developed and cultivated, and in 1873, awarded the Great Gold Medal at the World Exhibition in Vienna. «Russia is recognized as a complete success in solving this important task of engineering education. After that, no other system will be used in America», wrote J. Runkle, the President of the Massachusetts Institute of Technology.

It was working at the IMTS that Zhukovsky gained fame as «the father of Russian aviation». In 1890, he said fatidic words: «A man ... will fly relying not on the strength of his muscles, but on the strength of his mind».

In 1904, Zhukovsky was the first in the world who gave us a formula for wing lift that laid the basis for aerodynamic calculations. And thus, he taught aerial vehicles to fly. He laid foundations of modern aero- and hydrodynamics, published dozens of pioneering research works devoted to aeronautics.



Wind tunnel of the times of N.YE. Zhukovsky

And most importantly, Zhukovsky united around him young aeronautics enthusiasts who, in the XX-th century, became creators of Russian and world aviation. Many of them came out of the Aeronautical Circle he organized in 1908 within the walls of the IMTS, including such outstanding aircraft designers as A.N. Tupolev, P.O. Sukhoi, V.M. Petlyakov. All of them were graduates of the Moscow Higher Technical School (MHTS, former IMTS).

Andrey Nikolaevich Tupolev — he is a whole era in aviation. More than hundred types of aircraft were designed under his leadership, and they are still flying all over the world. He was a companion of Zhukovsky in establishment of the Central Aerohydrodynamic Institute (TsAGI) that became a leader in world strategic aircraft manufacturing.



Tupolev Design Bureau. ANT-2

Pavel Osipovich Sukhoi is an innovative designer, one of the founders of jet and supersonic aviation. Under his leadership, more than fifty aircraft designs were developed, including famous fighters, strike and attack aircraft in «Su» family – they got designation by his surname. Sukhoi was the Chief Aircraft Designer at the Experimental Design Bureau.



Sukhoi Design Bureau. An experimental Su-3 fighter

Vladimir Mikhailovich Petlyakov was an outstanding designer of heavy «ANT-» series aircraft. Antoine de Saint-Exupéry flew on the ANT-20 («Maxim Gorky») aircraft – the largest for that time. In 1937, the ANT-25 aircraft set two flight range records when crossing the North Pole in flight to the USA. The first was 10148-km straight-line flight made by V. Chkalov, G. Baidukov and A. Belyakov pilots and the second – 11,500-km broken-line flight made by M. Gromov, A. Yumashev and S. Danilin.



Petlyakov Design Bureau. Pe-8. Heavy long-range bomber

Zhukovsky's students were involved in education of brilliant design engineers.

Among those students was Igor Ivanovich Sikorsky, the Russian and American aircraft designer, who developed about fifteen types of aircraft and helicopters of «S» series. The last one he built was indexed as «S-58». In 1908, when studying at the Kiev Polytechnic Institute, Sikorsky became a member of a mathematics circle that emerged from the Aeronautical Section organized by Professor N. Artemiev, one of Zhukovsky's educatees.

Among the most outstanding students was Sergey Pavlovich Korolev – the scientist, academician, chief designer of the first earth satellite and the first manned spacecraft. Tupolev supervised the diploma work of this glorious graduate of the Moscow Higher Technical School – the future founder of practical cosmonautics. He made Russia a leading rocket and space country.



Korolev Design Bureau. Launch vehicle 8K72 or «Luna»

According to a vivid expression of Yuri Alekseevich Gagarin, the first cosmonaut of the planet, Korolev became his cosmic father. Gagarin graduated from the Air Force Engineering Academy named in honor of Professor N.Ye. Zhukovsky. It was founded in 1920 as the Institute of Engineers of the Red Air Force. N.Ye. Zhukovsky was elected as its first rector. Forty years later, in the city named in honor of the Russian Galileo, future cosmonauts were trained to be ready for their first escape missions. So the big chain of generations of

pioneers in aeronautics and space exploration was closed.

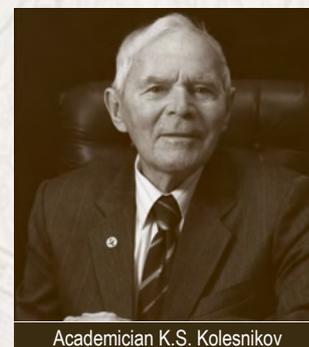


The First Cosmonaut of the Planet – Yuri Alekseevich Gagarin

The scientific and pedagogical heritage of N.Ye. Zhukovsky became ingrained into the Russian scientific and social program for youth and schoolchildren, that was initiated more than thirty years ago within the walls of the BMSTU. It lives in traditions of the University and is transmitted through the «from a follower to a follower» line of the great compatriot. The successor of this heritage was Konstantin Sergeevich Kolesnikov, who headed the Department of Theoretical Mechanics at the Bauman University that was founded by N.Ye. Zhukovsky as the first such department in Russia.

K.S. Kolesnikov was the first chairman of the Expert Council in the «Step into the Future» program, who devoted more than twenty years of his life to education of schoolchildren-researchers. K.S. Kolesnikov was a war veteran who went through the war, a participant in defense of Moscow and Leningrad, capture of Bucharest and Budapest, student, professor, vice-rector of the Bauman University, academician, associate of S.P. Korolev, one of pioneers in astronautics. In 2008, the Cambridge International Biographical Center listed him among one hundred leading engineers of the planet.

The legacy of N.Ye. Zhukovsky lives and is embodied in projects of participants of the «Step into the Future» program – young researchers from 23 countries in Europe, Asia and Africa. Today, it goes far beyond the scope of aerospace topics – it covers the most relevant areas of scientific and engineering ideas. These include energy of the future, artificial intelligence, safe environment, bioinformatics, smart machines and materials, quantum chemistry, digital economy, conflict management, health engineering and many others.



Academician K.S. Kolesnikov

The name of Zhukovsky has become a symbol of international movement of the «Step into the Future» program daring to horizons of the future under the stellar motto: «Youth of the world – to challenges of our time».