INTRODUCTION

International Conference – Gravitation, Cosmology and Mechanics of Continuous Environments (devoted to the 100th anniversary K.P. Stanyukovich’s birth) was held in Bauman Moscow State Technical University on the 3th and 4th of March. More than 100 papers were presented by K.P. Stanyukovich’s students, faculty, various universities staff and representatives of the Russian Academy of Sciences.

Kirill Petrovich Stanyukovich (3 March, 1916 – 4 June, 1989) – an outstanding physicist, mathematician and engineer made a significant contribution to the development of various fields of science: gas dynamics, physics of explosion, magnetic hydrodynamics, astronomy. He developed a hydrodynamic model of gravity, the theory of gravity with a variation of the effective gravitational constant, with a variable number of particles, he offered one of the first Universe evolution scenarios from the initial vacuum stage.

Kirill Petrovich was the author of a number of inventions and of 330 scientific and popular-sciene works. He came from an old noble family – the Stanyukovich. (The famous writer and marine painter Konstantin Stanyukovich was his granduncle).

Not yet having finished school, K.P. Stanyukovich got seriously interested in astronomy and became a member of the observers’ team of the Moscow Society of Astronomy Fanciers (MSAF) where he met Leonid Alekseevich Kulik, the famous Tunguska meteorite investigator and one of the national meteoritics founders. In 1932 the first K.P. Stanyukovich’s research article on meteor astronomy (in co-authorship with I.E. Vasilyev) “Lyrids in 1930” was published in the "Bulletin of MSAF Observers. In 1931 K.P. Stanyukovich took part in the MSAF meteors observation expedition on the Karadag scientific station in the Crimea, and in 1932 proposed a new method for estimating the meteor extinction height, based on an empirical relationship between meteor brightness and path length. In the same year he was involved in the processing of bright bolide observations over the town Shepetovka (Ukraine), and, in co-authorship with V.V. Fedynskiy, he carried out experiments on photographing meteors with obturator camera. Successful basic images of bright meteor in August 14, 1932 allowed them to calculate not only the height, path length and meteor speed but also the upper atmosphere basic parameters in the span place.

In 1933 he proposed one more method of meteor astronomy - the comparison method - according to which one of the meteor stream parameters made it possible to determine the parameters of another meteor. In 1934, a group of MSAF observers led by K.P. Stanyukovich received the first in the USSR and the 35th in the world bright meteor spectrum with 47 spectral lines. And in 1936, 20-year-old K.P. Stanyukovich was charged to prepare and conduct the solar eclipse observations on board of an airplane that helped to minimize interference from the atmosphere and increase the total phase observations time. The observation results were published in the "Mirovedenie" journal in the same year.

In 1936-1939 K.P. Stanyukovich worked as a researcher of the Committee on Meteorites of the Academy of Sciences of the USSR, and in the same time studied at MSU Faculty of Mechanics and Mathematics correspondence department (specialty - "Astronomy"). In 1939 he was drafted into the Red Army, where he served in Poltava aviation courses, in the rank of junior commander, but in May 1941 he was discharged
because of an eye disease, which enabled him to pass state exams and get a university diploma.

The Great Patriotic War brought significant changes in K.P. Stanyukovich scientific specialization and he was actively engaged in the gas dynamics and physics of explosion problems. There is no reliable information what the father was doing in the first months of the war, and family legends about his short service in the bombers haven’t had documentary evidence yet, but it is known that in September 1941 he was working on specialized subjects following the instructions of the State Defense Committee commissioner C.V. Kaftanov, first in People's Commissariat of Mortar Weapons, and then in the Engineering Committee of the Red Army. We also know that in 1945 with the rank of engineer–major in a group of military experts he was sent to Tallinn and Berlin to study German explosives and ammunition. The published biography of K.P. Stanyukovich is silent about these trips but his son Andrew K. Stanyukovich remembers well his father’s stories about Russian soldiers’ autographs on the Reichstag ruins and about the group return from Berlin to Moscow on "Douglas", where during the flight the passengers and the crew, fighting cold, warmed themselves with alcohol they had, with the result that instead of Moscow they landed at Thule.

In 1944 K.P. Stanyukovich defended his candidate’s thesis, and in 1946 - a doctoral thesis. After the war he worked as a senior teacher at the F.E. Dzerzhinsky Artillery Academy, then he worked as a head of the laboratory at the Institute of Problems of Chemical Physics of the Academy of Sciences of the USSR and then as a head of the department in the Bauman Moscow Higher Technical School, apparently without interrupting his cooperation with the so-called "Kaftanov Commission " , resulting in his theoretical solution (co-authored with Landau) on the problem of a convergent shock wave (implosion), which was the basis of one of initiation embodiments of a nuclear explosion in the Soviet atomic bomb development, first tested in 1949.

In 1950 - 1960 K.P. Stanyukovich, continued theoretical developments in the field of gas dynamics and magnetohydrodynamics, he related them to the problems of meteor astronomy and meteoritics, such as the theory of cratering in a collision of meteoroids with planet surface, calculation of planetary substance fragment emission at cratering, theory of thermal explosion at the ice body hypersonic flight in the atmosphere (with reference to the comet's version of the Tunguska phenomenon), description of air shock waves system during the flight of large bolides and others. Independently and in co-authorship with V.V. Fedynskiy, F.A. Baum, G.I. Pokrovskiy, S.K. Vsekhsvyatskiy, V.A. Bronshten, A. K.Mukhamedzhanov, V.P. Shalimov and others) he worked on some problems of cosmogony, using higher mathematics and gas dynamics methods. In 1952 he was awarded the title of professor. In 1958, in co-authorship with F.A. Baum and S.A. Kaplan he published the monograph "Introduction to the cosmic gas dynamics".

Among K.P. Stanyukovich's fundamental works in the field of physical gas dynamics and physics of explosion we should mention the monograph "Unsteady motion of a continuous medium (1955, 1960, 1971) and" Physics of Explosion "(1959, 1975, 2002, co-authored), that withstood several editions. His active lecture and popularization activity in the field of astronomy, cosmology, rocket and space technology are widely known. Back in the late 1950s K.P. Stanyukovich became interested in the universe
structure and evolution problems and this came to reality in the monograph "The gravitational field and elementary particles" (1965).

Since 1967 until his death K.P. Stanyukovich scientific activity took place mainly in the system of the State Standard of the USSR, where he formed a unique team of theoretical physicists specializing in astrophysics, cosmology and gravitation fields.

In the years 1969-1972 K.P. Stanyukovich was a chairman of the Moscow branch of the All-Union Astronomical and Geodetic Society. In 1974 he was awarded the honorary title "Honored Worker of Science and Technology of the RSFSR" and in 1981 for his work on special subjects he was awarded the State Prize of the USSR.

In 1983 he co-authored with V.N. Melnikov published a monograph "Hydrodynamics, Fields and Constants in the Theory of Gravitation".

This publication contains selected papers presented at the conference.
Presidium

Participants