

**Georgii Ivanovich Petrov (Obituary)**

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The outstanding Soviet scientist, Academician Georgii Ivanovich Petrov, passed away on May 13, 1987. Soviet science and Soviet physicists have suffered a great loss.

G. I. Petrov was born on May 31, 1912 in the town of Pinega, in the Archangel region, where his parents were in internal political exile. At the age of 16 he began working at the Ivanovo textile plant, simultaneously preparing for university entrance examinations.

In 1930 he was accepted in the faculty of mechanics and mathematics at Moscow State University; he graduated in 1935. Already in his student years G. I. Petrov began scientific research at the Central Aerohydrodynamic Institute (CAHI) in S. A. Chaplygin's laboratory. The creative atmosphere at CAHI, fostered by such older scientists as V. P. Vetchinkin, V. V. Golubev, A. I. Nekrasov and others, as well as interaction with talented coevals like M. V. Keldysh, N. E. Kochin, M. A. Lavrent'ev, L. I. Sedov and others, quickly helped to mold G. I. Petrov into a scientist. These were the years of explosive growth for our country's aviation and G. I. Petrov became fully immersed in solving the numerous theoretical and practical problems.

G. I. Petrov's outstanding scientific accomplishment of the prewar period was his rigorous mathematical generalization of Galerkin's method to nonconservative systems whose eigenvalues do not have extremal properties. He was the first to apply this method to the study of flow stability in viscous, incompressible fluids: from then on the Galerkin-Petrov method has proved to be one of the most powerful and promising research techniques in hydrodynamic stability theory, as well as in other important problems in mechanics, physics, and astrophysics.

Georgii Ivanovich combined deep theoretical investigations with a strong interest in specific experimental projects. Precisely this need for the invigorating spirit of experimental research led him, as early as the late 1930s, to create our country's first flying laboratory for studying air flow under natural conditions. In the years of the Second World War he gave his utmost to the war effort: as a result of one of his studies the speed of the Yak-3 interceptor was improved by adding jet nozzles.

The most fruitful period of G. I. Petrov's scientific career began in 1944. He was the originator and leader of a number of research programs in the field of hypersonic aerodynamics. This research was stimulated by the birth and development of national space technology. G. I. Petrov stood at the wellspring of Soviet astronautics together with



GEORGII IVANOVICH  
PETROV  
(1912-1987)

S. P. Korolev and M. V. Keldysh; his research brought him deserved fame and found widespread application.

For his outstanding contributions to our national science G. I. Petrov was elected to the Academy of Sciences of the USSR as a corresponding member in 1953, and then as a full member in 1958.

In 1966 Georgii Ivanovich embarked on a new phase: he came to devote much of his creative efforts to creating the Institute of Space Studies and developing a wide-ranging research program focused on interplanetary space and Solar system planets by way of manned and automated machines. He was personally involved in the scientific "exploration" of the Moon, Mars, and Venus. During the last ten years

Georgii Ivanovich chaired the Scientific Council on Lunar and Planetary Research at the USSR Academy of Sciences, actively participating in the development of research programs aimed at various bodies in the Solar system.

G. I. Petrov's space research led to the birth of a new branch of science—cosmic gas dynamics. His innovative explanation for the Tunguska meteorite event of 1907 met with wide scientific acclaim. After studying the problem of deceleration in a low-density atmosphere, G. I. Petrov suggested a new, explosive mechanism by which a cosmic body could enter the atmosphere and decay leaving no apparent traces (unlike regular meteorites).

Georgii Ivanovich was also attracted by another aspect of cosmic collisions: the problem of formation and evolution of craters on the Moon and a number of terrestrial planets. Here he proceeded from the fundamental idea that a sufficiently complete understanding of the formation and subsequent erosion of impact craters would permit us to decipher celestial photographic data. Surface photographs of such celestial bodies and, later, the moons of giant planets taken from space vehicles contain information on the temporal evolution of meteorite fluxes that bombarded the solar system. By deciphering these photographs we could "glimpse" at the early, formative stages of the solar system. This intriguing possibility of "backtracking in time" by several billion years fascinated G. I. Petrov. Hence his natural interest in the problem of hypersonic (up to 80 km/s) collisions of celestial bodies, which arose in the course of the scientific program intended to study Halley's comet using traversing space probes.

Moscow State University occupied a large part in G. I. Petrov's scientific biography. There, from 1954 onward, he headed the department of aeromechanics and gas dynamics, devoting much time to direct contact with students, introducing them to classic and nonstandard problems in hydroaerodynamics. He directed several scientific seminars in which he combined the creative talents of specialists in mechanics and mathematics. Georgii Ivsanovich's main features—his goodwill and readiness to help in problem solving—came to the fore and attracted younger scientists.

His attitude to younger people and his philosophy as a whole is summed up in a surviving draft of an address to students: "Dear lads! As you become more knowledgeable in mathematics and mechanics you should find more cause for surprise, if you pay attention to the world around you. Never

lose the ability to be surprised. He who is never surprised will always be dull and unhappy. Also, you must learn to work and develop the habit of work. Never, whatever may come, should you transgress on ordinary decency, no matter under what threat this might place you at the moment. And then you will never let happiness slip away, the happiness that I wish you."

Once every two years, from 1976 onward, G. I. Petrov directed a winter school on nonlinear problems in theory of hydrodynamic stability, which was attended by specialists in the fields of mathematics, mechanics, physics, astronomy, and geophysics, who would discuss the latest developments in nonlinear stability theory, appearance of chaos, and transition to turbulence. For many years, G. I. Petrov was the editor of *Mekhanika Zhidkosti i Gaza* (from the *Izvestiya Akademii Nauk SSSR* series, translated into English as "Fluid Dynamics") and served on editorial boards of a number of other scientific journals.

G. I. Petrov's scientific accomplishments were recognized by the Hero of Socialist Labor distinction; he was the recipient of numerous state honors: three Orders of Lenin, three Red Banner of Labor medals, many other medals, and two USSR State Prizes.

Everyone who met him knew Georgii Ivanovich to be not only a remarkable scientist, but also a Citizen. While always striving for absolute scrupulousness and democracy in scientific polemic and remaining absolutely indifferent to personal affronts from enemies, G. I. Petrov led an implacable struggle for the purity of science, for ridding science of hangers-on and other harmful people.

He devoted the last years of his life to the equally implacable struggle against the dangerous plan of turning Northern rivers to run South. His impassioned speeches joined the chorus of other leaders of our country's science and culture, as well as the common people.

Georgii Ivanovich's sensitivity and goodwill, his breadth of interests were known to multitudes of people who met him and received good advice or help.

The memory of Georgii Ivanovich Petrov, an outstanding scientist and a kind, wise man, will always live in our hearts.

Translated by A. Zaslavsky