

Germogen Filippovich Krymsky (on his 70th birthday)

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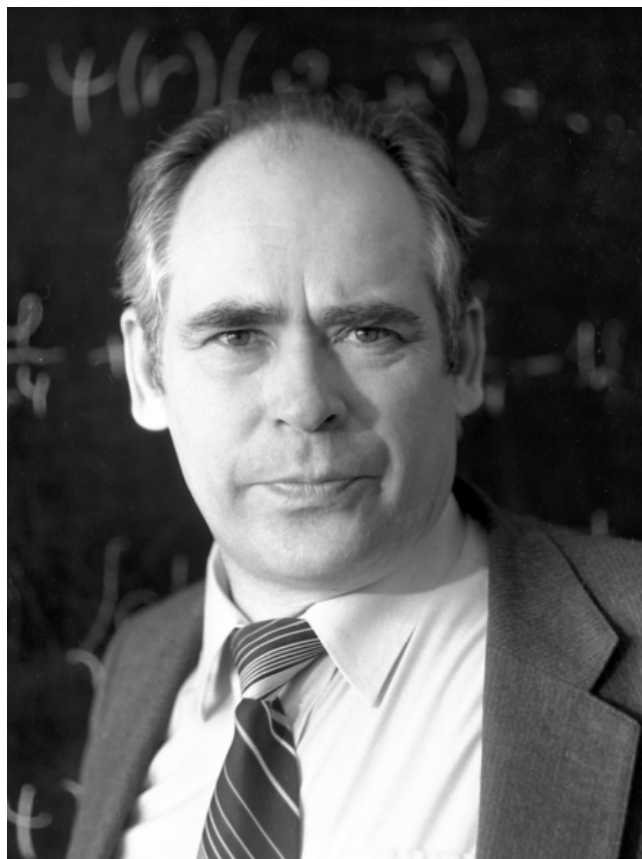
Academician Germogen Filippovich Krymsky, an outstanding theoretical physicist, had his 70th birthday on 18 November 2007.

He was born in Olekminsk of the Yakutsk Autonomous Republic into a family of workers, F V Krymsky and N N Krymskaya.

G F Krymsky's main field of interest came to the fore in the first years of his work at the Institute of Cosmophysical Research and Aeronomy (IKFIA in Russ. *abbr.*) of the Siberian Branch (SB) of the Russian Academy of Sciences (RAS) (the Institute operated at the time under the auspices of the Yakutsk affiliate of the SB of the USSR Academy of Sciences). G F Krymsky started working there in 1959 after graduating from the Physics Department of Yakutsk State University. From his very first days of working in IKFIA under the guidance of Professor A I Kuz'min, he took active part in the creation of the then-unique complex of underground spectrograph for recording high-energy cosmic rays. Rich experimental data was accumulated with this facility as early as the beginning of the 1960s; it played an important role in clarifying the physical nature of the interaction of cosmic rays with interplanetary media. The capabilities of experimental setups recording high-energy cosmic rays (10^9 – 10^{11} eV) were extended substantially owing to a method proposed and implemented by G F Krymsky: the global survey for which the global network of ground-based stations acted as a unified multidirectional instrument. The application of this method made it possible to achieve appreciable advances in the experimental investigation of intensity fluctuations in cosmic rays.

At the stage when a conceptual basis was being built in the first half of 1960s in the physics of interaction between cosmic rays and the interplanetary medium, decisive progress was achieved through theoretical work done by G F Krymsky. In 1964, he gave an exhaustive explanation of the so-called diurnal variation in the intensity of cosmic rays. It was shown that this phenomenon essentially consists in the formation of the anisotropy of angular distribution of cosmic rays by a modulating action of solar wind, and that the unusual direction of anisotropy is caused by the effect of the interplanetary magnetic field. The quantitative description of this and of a number of other phenomena became possible through the diffusive cosmic-ray transport equation introduced by G F Krymsky in 1964. This equation lies at the foundation of the modern theory of propagation and acceleration of cosmic rays in interplanetary and interstellar media.

At the beginning of the 1970s, G F Krymsky started the study of the mechanisms of acceleration (generation) of cosmic rays. He was able to achieve important progress in 1977 when he established theoretically the reality of the



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process of regular acceleration of charged particles by shock waves. As with any other breakthrough idea, the discovery of regular acceleration gave rise to an entire research area in the physics of cosmic rays. Numerous experiments carried out in space leave us in no doubt that the process of regular acceleration plays an important role in forming the spectrum of high-energy particles in outer space. We have every reason to believe that the main part of observed galactic cosmic rays are generated in the supernova remnants by regular acceleration. A detailed theory of acceleration of cosmic rays in supernova remnants, developed by G F Krymsky and his disciples, allows one to generate predictions that permit direct experimental testing. In all cases of young, not too distant supernova remnants for which we have detailed measurements of nonthermal radiation produced by cosmic rays in different spectral bands, including high-energy gamma radiation, the predictions of the theory are in good agreement with experimental data. This fact confirms that cosmic rays are efficiently produced in supernova remnants. Energetic progress in gamma-ray astronomy allows us to anticipate the emergence in near future of new conclusive evidence that the main part of cosmic rays is indeed generated in supernova remnants, and the role played by

theory in solving this important problem is extremely important.

The scientific results obtained by G F Krymsky made a profound impact on the unfolding of cosmic ray physics. All his main results are widely known and are recognized and respected by the world scientific community. At the present moment the field of research founded by G F Krymsky — that is, the theory of acceleration of cosmic rays by shockwaves — is one of the core tools at the Yu G Shafer Institute of Cosmophysical Research and Aeronomy. His ideas were extended and expanded by his many students, of which five gained DSc degrees and more than 20 Candidate of Sciences degrees.

G F Krymsky has an expansive personality, is always warm, responsive, and helpful to colleagues and his numerous students, and never refuses help to anyone needing it. His inexhaustible optimism is infectious and helps people to overcome the twists and turns of life. No wonder he enjoys the sincere respect of colleagues, disciples, and friends.

G F Krymsky devotes much time and effort to managerial tasks. For more than 20 years he headed the Theoretical Department at the IKFIA, was Director of IKFIA for ten years, chaired the Presidium of the Yakutsk Scientific Center for five years, and for five years was President of the Academy of Sciences of the Republic of Sakha (Yakutiya).

G F Krymsky is still full of energy and fresh ideas. We wish him full success in implementing them.

*E G Berezhko, A V Gurevich, V V Zheleznyakov,
G A Zherebtsov, A N Skrinsky, R A Sunyaev,
A M Cherepashchuk, D V Shirkov*