September 14, 2002, marked the 90th birthday of Vladimir Aleksandrovich Krasil’nikov—a prominent scientist, one of the founders of nonlinear acoustics and the physics of waves propagating in turbulent media, a winner of the State Award and the Lomonosov Prize, ex-head of the Acoustics Department of the Faculty of Physics of Moscow State University, and an Honorary Professor of Moscow State University. Two scientific events were dedicated to this anniversary: the 16th International Symposium on Nonlinear Acoustics, which was held at the Faculty of Physics of Moscow State University on August 19–23, 2002, and the Anniversary Session of the Acoustics Department of the Faculty of Physics of Moscow State University. Unfortunately, Krasil’nikov did not live till these days. In March 2000, his life ended as a result of a tragic accident. Possibly, if it were not for the fatal encounter with a careless driver on the pedestrian crossing of Volgina street, Krasil’nikov himself would be able to receive the congratulations on this anniversary.

In the last years of his life, Krasil’nikov made an impression that time had no power over him. He never mentioned his health problems or any difficulties of everyday life. He always looked fit and full of energy. He expressed keen interest in new scientific achievements and in the work carried out at the Acoustics Department. One could remember his good-humored teasing (sometimes about himself) and his fatherly attitude toward students and young scientists. To the last days of his life, Krasil’nikov retained his creative abilities in science and his keenness of mind. He continued writing scientific papers. In particular, two of his reviews appeared in 1998 and 1999 in *Acoustical Physics*: on the sound propagation in a turbulent medium and on nonlinear acoustics. He continued lecturing at the Acoustics Department and took active part in the work of the editorial board of *Acoustical Physics*. He also participated in scientific conferences. In 1998 and 1999, despite his age, Krasil’nikov flew to United States, where he was invited to give papers at the Meeting of the Acoustical Society of America and at the International Congress on Acoustics. After one of his trips, he told a funny story about a young Russian border guard who could not believe that the year of birth indicated in his passport was really 1912 and that there was no mistake in the document. At the Anniversary Session of the Faculty of Physics of Moscow State University devoted to his 85th birthday, which was held in one of the grand physical auditoriums, Krasil’nikov made a speech that was bright and charming and full of jokes. Although Krasil’nikov physically was no giant and never raised his voice in everyday life, he was able to talk without a microphone at any meeting in any large hall so that the audience could hear every word. This “acoustic ability” (which was used by him on rare occasions) was developed by Krasil’nikov at the time of his childhood near Volga: there, a strong voice was necessary to communicate between people in a boat and those on the bank of the great river.

Krasil’nikov was born and grew up in Simbirsk (now Ul’yanovsk). His first research projects were carried out in Moscow at Moscow State University, while he was a student. At that time, the Faculty of Physics was located in the central part of Moscow, in a small building made of red brick and situated behind the Intourist hotel (in Tverskaya street), which has now been demolished. Today, this building belongs to the Institute of Radio Engineering and Electronics of the Russian Academy of Sciences, where Krasil’nikov is
well known as a specialist in acoustics: some research projects carried out at this institute are concerned with acoustics of solids and acoustoelectronics. As a graduate student, Krasil’nikov was supervised by Academician M.A. Leontovich (who, in his turn, was one of the first students of L.I. Mandel’shtam). After his graduation from the university in 1935, Krasil’nikov worked for two years at Gorki (now Nizhni Novgorod) State University. Then, he returned to Moscow and started working at the newly founded Institute of Theoretical Geophysics of the Academy of Sciences of the USSR. In 1939, according to the proposal put forward by S.E. Khaitkin (professor of Moscow State University and, simultaneously, head of a laboratory of the Institute of Theoretical Geophysics), Krasil’nikov began experimental studies of sound propagation through a turbulent atmosphere. The results of these studies served as a basis for his candidate’s dissertation, which was entitled “Sound Propagation through a Turbulent Atmosphere” (1942).

During World War II, Krasil’nikov was involved in the development of radar equipment and also in artillery engineering. In addition, he developed the equipment for acoustic detection and ranging of airplanes. Later, remembering this period of his life, Krasil’nikov characterized his work as rather hard and pressing: sometimes, it was necessary to test the new equipment on the planes by making a series of flights over two or three days without sleep and almost without food. In 1944, Krasil’nikov was invited to work as a part-timer at the Acoustics Department, which was newly established at the Faculty of Physics of Moscow State University by S.N. Rzhevkin.

In 1950, Krasil’nikov left the Institute of Theoretical Geophysics, and the Faculty of Physics of Moscow State University became his main place of work. In 1953, he defended his doctoral dissertation entitled “The Effect of the Refractive Index Fluctuations in Atmosphere on the Propagation of Acoustic and Electromagnetic Waves.” In 1955, he received the title of Professor. Soon, Doctor of Science Professor Krasil’nikov was offered a part-time job at the Laboratory of Anisotropic Structures of the Academy of Sciences of the USSR, where experiments on cancer treatment with intense ultrasound were carried out. The scientists and engineers working at this laboratory designed focusing ultrasonic transducers with a record high radiation intensity. Unfortunately, these unique medical-physical experiments were interrupted by the early death (in 1957) of the leader and head of the laboratory A.K. Burov. However, these studies attracted Krasil’nikov’s attention to the physics of nonlinear acoustic waves, and this area of research became the main subject of investigation for Krasil’nikov.

For years, Krasil’nikov was on the editorial board of the Moscow University Physics Bulletin, and in 1975–1980, he was the editor-in-chief of this journal. From 1969 to 1980, Krasil’nikov was a part-time head of the Ultrasound Department of the Acoustics Institute of the Academy of Sciences of the USSR. From 1969 to the end of his life, Krasil’nikov was a member of the editorial board of Acoustical Physics.

In 1975, two important events occurred in Krasil’nikov’s career: first, he organized the 6th International Symposium on Nonlinear Acoustics, which was held at Moscow State University, and, second, he became the head of the Acoustics Department. Although the Organizing Committee of the symposium was chaired by Head of Moscow State University Academician R.V. Khokhlov, obviously the major part of the work was performed by Krasil’nikov, who was deputy chair of the committee. As the head of the Acoustics Department, Krasil’nikov worked until 1987, after which he remained a professor.

It so happened that, on the day of Krasil’nikov’s death, he became the winner of the main prize of the Russian Academy of Sciences in Radio-Wave Physics, namely, the Mandel’shtam prize. Earlier, in the application for the prize, Krasil’nikov summarized his scientific achievements as follows:

1. The first experiments on sound propagation in a turbulent atmosphere (1939–1953) and the phase and amplitude fluctuations of the signal. The results are interpreted using the Kolmogorov–Obukhov statistical theory of locally isotropic turbulence (which was published in 1941) and substantiate this theory within its limits of applicability. Quantitatively, the experiments also justify the Kolmogorov–Obukhov two-thirds power law.

2. The theory of the sound amplitude fluctuations agrees well with the aforementioned experiments only for small distances between the source and the receiver. As this distance increases, diffraction effects come into play. These effects were taken into account by other authors, and the results obtained by them coincide with the experimental results.

3. The first explanation based on the two-thirds power law was given for the twinkling of stars (fluctuations of intensity and angle of arrival).

4. The first explanation of the amplitude fluctuations (fading) and phase fluctuations (bearing fluctuations) in the propagation of ultrashort radio waves through a turbulent atmosphere: the phenomenon is explained by the fluctuations of the refractive index.

5. The first direct experimental observation of harmonics in a plane ultrasonic wave propagating in a low-viscosity fluid, the formation of a sawtooth wave (a weak periodic shock wave), and the nonlinear attenuation of ultrasonic and hypersonic waves. Before these experiments were carried out, it was believed that, at low intensities (which were used in the experiments), the nonlinear properties of the fluid should not manifest themselves. However, for dispersionless fluids with a weak sound absorption, it was found that the wave propagation is accompanied by the accumulation of wave distortions.