Vladas Bronislovo Leonas (Obituary)

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On October 12, 1992, Vladas Bronislovo Leonas died at the age of 61 after a brief period of severe illness. He was a professor, Doctor of Theoretical Physics, and a well-known specialist in the physics of atomic collisions.

V. B. Leonas was born September 29, 1931 in Berlin. After graduating in 1953 from the Physics Department of Moscow State University he began to work in the molecular physics division, and then in the Space Research Institute. Beginning in 1987 he was in charge of the laboratory for physical kinetics in the Institute of Problems in Mechanics of the Russian Academy of Sciences. His name is associated with the development and popularization of molecular beam techniques in our country as a new means of studying atom—molecule interactions. With his characteristic talent, steadfastness, and energy he began the development of the technique for small-angle scattering of fast molecular beams. This method is distinguished by the use of relatively high-energy particles (~ 1 keV) and very small scattering angles ($\sim 10^{-3}$) for studying the interesting energy range 0.1-10 eV of interacting atomic particles, in which high-temperature nonequilibrium processes occur. A device for studying energy losses by means of the time-of-flight technique in particle scattering in the keV range was first developed in our country under his direction and was used to obtain interesting results.

Vladas Bronislovo Leonas
(1931–1992)

Vladas Bronislovo was distinguished by the thoroughness he displayed in everything in which he was involved. In developing experimental techniques for small-angle scattering of atoms colliding with atoms and molecules, he tried to incorporate in them everything that was then feasible. Consequently, he and his collaborators always achieved outstanding results. It suffices to note that the data of V. B. Leonas on the interaction potential of atoms and molecules at small separations, which he and his collaborators in the 1960s, went into handbooks of atomic physics and have been widely used by specialists. This can easily be demonstrated by looking through recent reviews on atomic physics in *Uspekhi*. In recent years, when, to put it mildly, experimental physics in our nation has become difficult, and experimental studies in fundamental physics have practically ceased, V. B. Leonas staunchly continued to develop his technique as before for measuring the excitations of the electronic states of molecules in close encounters with atoms.

However, V. B. Leonas's interests were not restricted to molecular beam studies of atomic collisions. He devoted serious attention to "pure" space studies as well. One of these space experiments led to the design of the "Puma" device [the Russian acronym for "colliding-dust mass spectrometer"], prepared for studying the composition of Halley's Comet. The successful operation of this instrument was largely possible due to the participation of V. B. Leonas.

The work on the experimental study of solar and interstellar neutral-particle beams was carried out under the direction of V. B. Leonas (including the development of the "Gaz" device for the "Relikt-2" program). He also directed the development of a new technique for studying neutral beams for use in the "Mars-94" program.

V. B. Leonas devoted a great deal of attention to developing a new type of detection device, which was responsible for the highest in the world sensitivities and spatial resolutions in detecting energetic particle beams and hard photons.

In recent years studies of the effects of secondary electron emission produced by bombarding with atoms having energies up to hundreds of keV have begun under the direction of V. B. Leonas. Their results have evoked a worldwide response.

V. P. Leonas enjoyed high stature among his colleagues. This enabled him to involve various specialists in formulating and discussing the results of his experiments. He maintained close relationships with a number of exper-

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imental groups overseas. A contributory factor in this was the world-class level at which Leonas performed his experiment, as a result of which the shortcomings of domestic measurement apparatus were compensated by high-quality ideas, clear experimental design, and special experimental techniques.

The activity of V. P. Leonas in scientific societies deserves special mention. He was a member of several scientific councils, played a major part in the publication of *Plasma Chemistry*, was a member of the editorial staff of the journal *Instruments and Experimental Techniques*, and was also closely associated with *Progress in the Physical Sciences*. Every editorial board is largely built on specialists, who act as reviewers and in so doing improve an article, injecting into it their effort, breadth of understanding of the problem, and viewpoint. In the person of V. P. Leonas, *Uspekhi* has lost just such an individual, who helped raise the quality of many papers without formally participating in them as an author.

V. P. Leonas devoted a great deal of effort to educational work as professor of the Moscow Physico-Technical Institute. His selfless devotion to science, his scientific conscientiousness, and his uncompromising attitude attracted to him students, of whom he had many.

Vladas Bronislovo Leonas was a person of exceptionally high principles, rare modesty, and intelligence. He was tall, handsome, and strong. His untimely departure from life is a blow to all who knew him.

Translated by D. L. Book