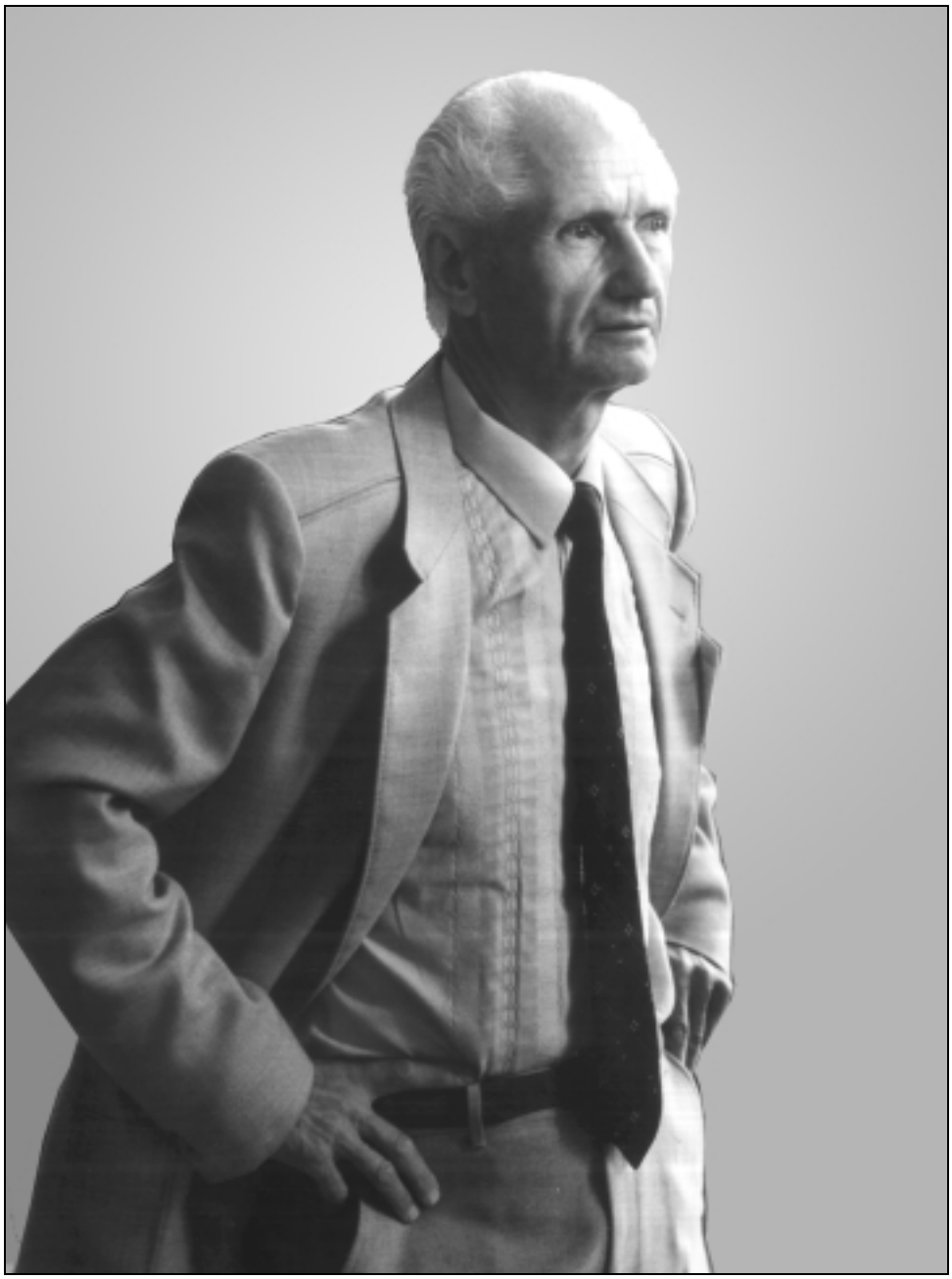
In memory of Academician V.E. Zuev



Internationally known physicist, founder of one of the research fields in modern physics — atmospheric optics, father and first director of the Institute of Atmospheric Optics SB RAS, initiator and permanent editor-in-chief of the *Atmospheric and Oceanic Optics* journal, Academician **Vladimir Evseevich Zuev** died on June 6th, 2003 in Tomsk at the age of 78.

Vladimir Evseevich Zuev has lived a rich, dynamic life. He was born on January 29th, 1925 in Irkutsk Region. He took part in the Great Patriotic War (World War II) of 1941–1945.

In 1946 Vladimir Zuev entered Tomsk State University as a student of the Physical Department and graduated from it in 1951. Yet a student, Vladimir Zuev began his scientific carrier under supervision of Professor N.A. Prilezhaeva and then continued it at Siberian Physical-Technical R&D Institute at Tomsk State University. He defended his candidate thesis in 1954 and in 1964 became a doctor of physical and mathematical sciences.

In 1955 young scientist Vladimir Zuev was entrusted performing a governmental order, which served as a basis for initiation and further successful development of a new research field – atmospheric optics.

The following research activity of Vladimir Zuev, covering almost five decades, was devoted to investigation of the interaction of optical waves with the atmosphere as an absorbing, scattering, and randomly inhomogeneous medium. He formed a program of combined research, including the development and usage of theoretical and experimental methods and facilities with the allowance for all physical phenomena accompanying the interaction with such a complex object as the Earth's atmosphere. The advent of lasers had a huge effect on the development of atmospheric optics and atmospheric research.

The name of Vladimir Zuev is associated with the initiation and development of numerous areas in modern atmospheric optics, in particular, spectroscopy of atmospheric gases, optical sensing of the atmosphere, nonlinear atmospheric optics.

Vladimir Zuev was always aimed at maximum use of basic knowledge in practice. Thus, the effect of laser beam transfer of the brightness contrast to abnormally large optical depths in scattering media that was first discovered in laboratory modeling (1965) made the basis for the development of laser navigation facilities for airplane landing and ship navigation under severe weather conditions.

In the investigations into spectroscopy of atmospheric gases, the basic results whose significance is far beyond the scope of only atmospheric optics should be especially emphasized. These results include hundreds of novel spectral lines of atmospheric gases obtained by use of laser spectroscopy methods, a considerable progress in the theory of rotational-vibrational spectra, results concerning the spectral line shape, namely, the collisional and Doppler line broadening, description of line wings. Unique laser spectrometer produced by the initiative and with the help of Vladimir Zuev and new methods of the theory of rotational-vibrational spectra caused many-year priority of the Institute of Atmospheric Optics in molecular spectroscopy.

As applied to atmospheric gases and gaseous pollutants, the results of these investigations form the basis for solution of numerous problems of atmospheric optics, in particular, laser sensing, gas analysis, laser radiation propagation, etc.

Laser sensing of the atmosphere occupied the central place in the scientific program of Vladimir Zuev. Combined basic research into the interaction of optical waves with atmospheric constituents allowed development of the methodology of laser sensing. The progress in laser technology, electronics, and computers provided for fast development of lidars for thorough investigation of the atmosphere and the processes in it. Ground-based, shipborne, and airborne lidars were designed, manufactured, and widely used in practice. The first Russian domestic spaceborne BALKAN lidar installed on board MIR station was developed under the leadership of Vladimir Zuev.

Zuev's idea of the combined approach to research allowed a smooth transition from the development of optical methods for monitoring of atmospheric parameters to investigation of geophysical processes.

The filtering properties of the atmosphere significantly depend on the weather conditions, as well as laser beam parameters, whose specific properties, such as high monochromaticity, coherence, giant pulse and mean power, led to the need of revising the existing concepts and theories of atmospheric optics. The results obtained in basic research formed the foundation for taking into account and predicting the atmospheric effect on characteristics of high-power laser radiation with the use of routine measurements of the weather atmospheric parameters as input data.

Now these results are successfully used in the development of principally new methods of remote sensing.

Vladimir Zuev always paid significant attention to management in science. He founded the Institute of Atmospheric Optics SB RAS and headed it for 28 years. He also took a leading part in creation of the Tomsk Scientific Center and Tomsk Akademgorodok.

In 1970 Vladimir Zuev became the Corresponding Member of the Academy of Sciences of the USSR and since 1981 he was Academician of the Academy of Sciences of the USSR.

Since 1991 till 1996 Academician V.E. Zuev was the Secretary of the Division of Oceanology, Atmospheric Physics, and Geography of the Russian Academy of Sciences, and in recent years he was the Counselor of the Presidium of RAS.

Since 1988 V.E. Zuev was the editor-in-chief of the *Atmospheric and Oceanic Optics* journal organized by him. He was a member of the editorial boards of such journals as *Integral Optics* (USA), *Meteorology* (China), and Russian journals: *Issledovanie Zemli iz Kosmosa, Zhurnal Prikladnoi Spektroskopii, Izvestiya RAN. Ser. Fizika Atmosfery i Okeana, Izvestiya VUZov. Fizika*.

Practical implementation of basic scientific results was also of highest priority for Academician V.E. Zuev. In 1972 he initiated creation of a specialized "Optika" Design Bureau aimed at making the research instrumentation as one of the departments of the Institute of Atmospheric Optics. For many years this office satisfied the requirements of the IAO and many other research institutes taking part in atmospheric investigations in the instrumentation. Now it is an independent research institute – Institute of Optical Monitoring SB RAS.

Academician V.E. Zuev was also a talented teacher. He headed the faculty of optoelectronic devices organized by him in 1962 at the Radiophysics Department of Tomsk State University and showed himself as a prominent lecturer, who could clearly explain even the most intricate problems to students. Four his students became the corresponding members of the Russian Academy of Sciences and more than fifty are professors.

For his indefatigable and fruitful activity, Vladimir Zuev was awarded the Gold Star of Hero of Socialist Labor, USSR State Prize, Prize of the Soviet of Ministers of the USSR, Compass Industrial Award of the Marine Technology Society (U.S.), six orders and sixteen medals. Vladimir Zuev was an Honored Citizen of Tomsk.

All people, who had the opportunity to meet Vladimir Zuev and work with him, remember him not only as a prominent scientist but also as a wise and kind man.

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