Preface

This topical issue of the *Atmospheric and Oceanic Optics* journal is devoted to the 125th anniversary of Tomsk State University (TSU), the 50th anniversary of the Radio-Physical Department (RPD) of the TSU, the first and the only one in Russia located in the Asian part of the Russian Federation, and to the 100th birthday of its first dean — Vladimir Nikolaevich Kessenikh. The activity of the Radio-Physical Department and Physical Department on manpower development for academic and university science made it possible the foundation of the Institute of Atmospheric Optics and then, based on it, of Tomsk Affiliation of the Siberian Branch of the Russian Academy of Sciences.

The history of radio physics in Tomsk dates back to 1926, when V.D. Kuznetsov, who later on became an academician of the Russian Academy of Sciences, initiated training of specialists in the electromagnetic waves at Tomsk State University. In 1928 the first large R&D institute in Tomsk — Siberian Physical-Technical Institute (SPTI) was opened. This Institute was the base for wide development of research, in particular, in radio physics. Vladimir Nikolaevich Kessenikh and Alexander Borisovich Sapozhnikov have played the decisive role in foundation of the Radio-Physical Department. From the very beginning, their main activities were urgent researches and manpower training. The urgency of investigations was determined by practical needs. Investigations were conducted by young scientists and their followers. As a result, the basis was laid for further development. The main principles of this development did not change since that time.

Foundation of an ionospheric station and a shortwave radio station in Tomsk was a significant progress at that time. The first serious trial for them was the research mission aimed at the investigation of Tomsk—Moscow railway that was organized by Kessenikh and Sapozhnikov in 1939. All the way was divided into parts each about 200 km long, which were tested simultaneously with a homemade electromagnetic defectoscope. Thirteen groups were involved in this work. This allowed the state of the railway track a long as 4479 km to be tested for very short time (one month). The results of successfully completed test were described in four-volume report. All members of the team, whose leaders already were Kessenikh and Sapozhnikov, were awarded the State awards. Thus, the creative potential of two people born in different Russian cities: Tiflis and Kazan, was focused in Tomsk State University.

In the period of the World War II, the research did not stop, but became more specific, connected with the military needs. Kessenikh, being in the front-line forces, worked to increase the reliability of radio communications and developed new antennas and techniques of their use. Sapozhnikov continued the works on rail defectoscopy at Tomsk State University and Siberian Physical-Technical Institute for railway forces, electromagnetic control of the quality of mortars and bearings, the search of mine fragments in wounded men, and on manpower training.

After the war and completion of the period of reconstruction, the chair of radio physics was opened at Tomsk State University in 1952, and in 1953, once Professor Kessenikh returned to Tomsk, the Radio-Physical Department was organized based on the resources of three faculties: the chair of radio physics, the chair of electromagnetic oscillations, and the chair of physics of dielectrics. It was just after the World War II that the radio physics began to develop especially intensely, since it became clear that progress in communications, as well as in detection and ranging is impossible without in-depth physical investigations and training of highly qualified specialists. Vladimir Nikolaevich Kessenikh became the first dean of the Radio-Physical Department, and he occupied this position for three years.

The RPD curriculum was aimed at deep training in physics, mathematics, and radio physics. The adherence to this principle still allows the RPD graduates to master new fields in current radio physics and related sciences in a short time.

In the following years, the range of research at RPD and SPTI became wider, new laboratories were organized, scientific relations with other research institutions were established new faculties and specializations were opened. Thus, in 1962 the chair of opto-electronic devices (now the chair of opto-electronic systems and remote sensing) was founded. The presence of this chair, development of the laboratory of infrared radiation at SPTI, and sufficient number of specialists, as well as the chair of optics and spectroscopy of the Physical Department have led to creation of the Institute of Atmospheric Optics headed by Professor V.E. Zuev in 1969. In 1987 Academician V.E. Zuev organized the journal *Atmospheric and Oceanic Optics* and became its editor-in-chief.

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Now the Radio-Physical Department incorporates seven chairs: the chair of radio physics; the chair of radio electronics; the chair of semiconductor electronics; the chair of opto-electronic systems and remote sensing; the chair of quantum electronics and photonics; the chair of information technologies in investigations of discrete structures; the chair of space physics and ecology. All the faculties are headed by professors – RPD graduates. The Radio-Physical Department is an intensely developing division, whose faculties and laboratories present almost all fields of modern radio physics: radio communication, antenna equipment, ultrabroadband electrodynamics, ionospheric physics, physics of magnetic phenomena, radio electronics, semiconductor electronics, opto-electronic systems, laser physics, holography and tomography, quantum electronics and photonics, fiber optics, telecommunication methods and tools, information technologies, electromagnetic ecology, and many others.

All over the period of existence of the Radio-Physical Department, it is traditionally characterized by strong integration of training and research processes. The results of intense research activity of lecturers and chair members are used in training, what allows specialists to be trained at up-to-date research level. As a result, the Radio-Physical Department always occupies one of the leading places at Tomsk State University in the number of awards received by students for their research. More than 50 RPD graduates are winners of the Lenin Prize, State Prizes of the USSR and RF, Lenin Komsomol Prize, Prize of the Soviet of Ministers of the USSR, Prize of the RF Government in the science and technology. Among graduates of the Radio-Physical Department there are academicians, university rectors, directors of research institutes and research & production associations.

We are glad to heartily congratulate the lecturers, chair members, graduates, and students of the Radio-Physical Department on the occasion of the 50th anniversary! Continuous renovation of the Radio-Physical Department allows optimistic prospect for its future. With all our hearts, we wish to the RPD team new scientific discoveries and training progress, worthy students and skilled graduates!

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Atmospheric and Oceanic Optics