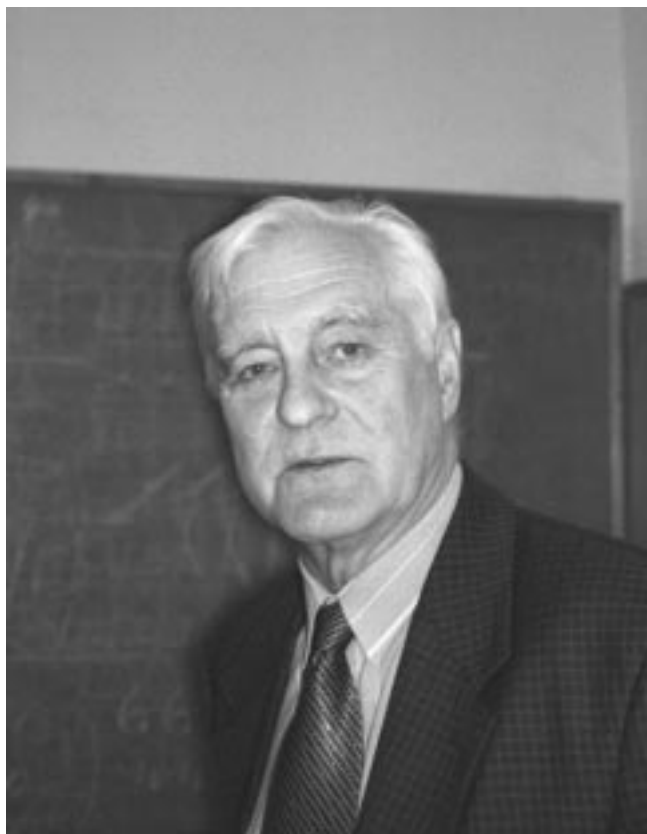


Oleg Nikolaevich Krokhin



Academician Oleg Nikolaevich Krokhin, Director of P.N.Lebedev Physics Institute, Russian Academy of Sciences, Editor-in-Chief of *Quantum Electronics* was 70 on 14 March 2002.

Oleg Nikolaevich was born in Moscow in a family of chemical engineers. After graduating from the Department of Physics at Moscow State University in 1955, he began to work at a new nuclear centre of our country in Ural, which is now called the All-Russian Research Institute of Technical Physics (Snezhinsk city).

In 1959 O.N.Krokhin became a staff member of P.N.Lebedev Physics Institute, Russian Academy of Sciences and became engaged, under the supervision of N.G. Basov, in studies on the extension of principles of maser operation to the optical region, which were the most urgent at that time. These studies very quickly resulted in the creation of lasers. In 1960, N.G.Basov, O.N.Krokhin, and Yu.M.Popov published a review (in fact an original paper) in *Soviet Physics Uspekhi* on 'Generation, amplification, and detection of infrared and optical radiation by quantum systems' – the first comprehensive work in which the principal problems related to the possibility of creation of lasers were considered.

Oleg Nikolaevich performed basic studies on the relaxation of a degenerate electron gas in semiconductors, formulated criteria for producing the population inversion in semiconductors in the case of direct and indirect interband transitions, and investigated the generation of optical radiation. The peak of these studies was a priority substantiation of the possibility of creating an injection laser (together with N.G.Basov and Yu.M.Popov, 1961). In 1962 O.N.Krokhin defended a candidate thesis on 'Negative absorption upon indirect transitions in semiconductors'. In 1964 Oleg Nikolaevich was awarded, among the group of authors, the Lenin Prize for fundamental studies resulting in the creation of semiconductor lasers.

Together with N.G.Basov, O.N.Krokhin put forward the idea of thermonuclear fusion by heating a target with laser radiation. Here, his insight and scientific daring were manifested because the pulse energy of lasers at that time did not exceed one joule. This proposal initiated the development of a new scientific and technical field – laser thermonuclear fusion (LTF). At present a program of studies on the LTF is one of the most major international programs.

Oleg Nikolaevich supervised a large series of studies of the interaction of laser radiation with matter. These studies led to the development of special laser systems, including the equipment for imaging of fast processes, as well as of methods based on the detection of the amplitude and phase variations introduced by an object under study to a transmitted optical wave (shadowgrams, interference and schlieren patterns). These methods, which feature high temporal and spatial resolutions, are widely used at present in various scientific fields. In 1967 O.N.Krokhin defended a doctoral dissertation on 'The study of the interaction of laser radiation with opaque condensed materials'. In 1981 Oleg Nikolaevich was awarded, among the group of authors, the State Prize of USSR for the studies of the interaction of laser radiation with matter.

O.N.Krokhin proposed to create a photodissociation laser and participated in the development of a photodissociation laser pumped by radiation of the front of a shock wave produced in explosion or by a powerful open electric discharge. These studies resulted in the creation of a laser with record energy parameters for special applications and LTF.

Oleg Nikolaevich was always interested in the problems of using laser radiation in a variety of applications. He participated (together with Yu.M.Pantsyrev) in the first investigations of the action of laser radiation on the stomach tissue, which resulted in the development of new methods for cessation of strong stomach hemorrhage using the endoscopic technique. At present, this method is used in practice.

Many studies initiated by O.N.Krokhin are now being developed for applications in technological problems of the interaction of laser radiation with matter. For several years

under his supervision, the studies are performed aimed at the development of 'point' sources of neutrons, X-rays, and UV radiation based on fast pinch discharges. As a result, a point soft X-ray source was fabricated, which has a high efficiency of conversion of the electric energy to radiation and is intended for X-ray lithography.

In the laboratory of technology of laser targets, which was created in P.N.Lebedev Physics Institute by O.N.Krokhin and A.I.Isakov, the methods for fabricating targets of a complicated structure for LTF were developed. At present, these targets are successfully used in leading scientific centres over the world.

O.N.Krokhin is the author of more than 250 scientific papers and three monographs. His scientific achievements are generally acknowledged. He was elected an Associate Member of RAS in 1991 and an Academician of RAS in 2000. Having begun his studies in P.N.Lebedev Physics Institute as a junior researcher, he became a Director of the Institute in 1994.

O.N.Krokhin pays much attention to the science organisation. He is a member of the Bureau of the Department of General Physics and Astronomy of RAS, a member of councils of a number of federal specific scientific and technical programs, Editor-in-Chief of Quantum Electronics, Proceedings of FIAN, Short Communications on Physics, Journal of Russian Laser Research, Physical Education in Higher Institutes of Learning, and a member of editorial boards of other scientific journals. Oleg Nikolaevich has been a member of a number of Scientific Councils of RAS for many years. At present, he is a member of the Council of Directors of Institutes of RAS, Chairman of the Commission of RAS on awarding the P.N.Lebedev Gold Medal for outstanding studies in physics.

O.N.Krokhin is a head of the acknowledged scientific school in the field of quantum radiophysics and plasma physics and a professor of Moscow Engineering and Physics Institute. There are more than twenty doctors and candidates of sciences among his pupils. For his great contribution to the creation and activity of the centre for education of highly qualified specialists, the MEPhI–FIAN Higher School of Physicists, Oleg Nikolaevich was awarded a Prize of the President of Russia in 2000. O.N.Krokhin is a member of the Council of the Federal Specific Program 'Integration of Science and Higher Education of Russia' and a head of one of the largest teaching and research centres of this program – International Teaching and Research Centre Fundamental Optics and Spectroscopy .

O.N.Krokhin was awarded an Order of the Red Banner of Labour (1971), the Badge of Honour (1976), and an Order for Merits to the Motherland of the IV degree (1999). The President of Poland awarded O.N.Krokhin in 2001 a highest order of Poland – Commander Cross of the II degree, for his service in the development of scientific cooperation between Russia and Poland.

The scope of interests of Oleg Nikolaevich is not restricted by science only. He is a great amateur of fiction and historic literature and fine arts, a connoisseur of impressionism, and excellently draws himself. Oleg Nikolaevich is a devoted sport admirer. He played volleyball for the FIAN team for many years and still is keen on mountain skiing. Oleg Nikolaevich possesses remarkable human qualities – kindness, sympathy, decency, the ability to listen to and understand an interlocutor.

Friends, colleagues, pupils, Editorial Council, Editorial

Board, and Editorial Office of Quantum Electronics wish the dear hero of an anniversary good health and further creative successes to the glory of the Russian science.