

On the Eighty-Fifth Birthday of Oleg Nikolaevich Krokhin



Oleg Nikolaevich Krokhin, an eminent physicist and science organiser, Lenin Prize and State Prize winner and editor-in-chief of the *Kvantovaya Elektronika* (Quantum Electronics) journal, turned 85 years old on 14 March.

In 1955, after graduating from the Department of Physics, M.V. Lomonosov Moscow State University, the young scientist started his career at the Snezhinsk Nuclear Center (now the Zababakhin All-Russia Research Institute of Technical Physics), where he participated in research of vital importance to the national nuclear security.

In 1959, Krokhin became a research fellow at the P.N. Lebedev Physics Institute (LPI), USSR Academy of Sciences. Together with N.G. Basov and other researchers, he substantiated the possibility of light amplification and generation by quantum systems, i.e. the possibility of lasing (1960). Krokhin performed ground-breaking research into the relaxation kinetics of a degenerate electron gas in semiconductors, formulated criteria for population inversion in semiconductors and investigated lasing processes. Those studies (carried out in collaboration with Basov and Popov) were the first to demonstrate the possibility of creating injection lasers (1964 Lenin Prize).

In 1962, together with Basov, he put forward the idea of nuclear fusion via the laser heating of a target, opening a new research direction: laser fusion. Krokhin laid the foundation for the physics of interaction of high-power laser light with strongly absorbing media and plasmas and proposed a record-high-power explosion shock wave-pumped photodissociation laser for specialty engineering and laser fusion applications. Together with Pantsyrev, he participated in the first study of the effect of laser light on stomach tissue, which culminated in the development and implementation of new techniques for stopping a severe stomach haemorrhage using endoscopy. Krokhin directed extensive studies of laser–matter interaction processes (1982 State Prize). Under his guidance, specialised laser systems were created, including equipment for investigating fast processes with high temporal and spatial resolution and a combination of techniques which are still widely used in a variety of application areas.

For a number of years, Krokhin directed research aimed at creating neutron, X-ray and UV point sources based on fast-pinch discharges, with high electrical-to-optical power conversion efficiency. Under his initiative, researchers at LPI developed methods for the fabrication of complex-structured laser fusion targets. In the Russian Academy of Sciences (RAS), Krokhin directs research under the Coherent Light Emission from Semiconductor Materials and Structures Programme. For his work on semiconductor lasers, Krokhin was awarded the 2005 Demidov Prize.

Krokhin is head of a renowned school of thought in the field of quantum radiophysics and plasma physics. There are more than twenty doctors and candidates of sciences among his pupils. He is professor at the National Nuclear Research University MEPhI and scientific head of the Basov Higher School of Physicists, MEPhI. For his great contribution to the training of highly qualified researchers, he received the 2000 RF President's Award in Education. Krokhin actively participated in the development and implementation of the State Support to the Integration of Basic Research and Higher Education Federal Targeted Programme. He is the president of the Physics and Education Movement.

In addition to *Quantum Electronics*, Krokhin is editor-in-chief of the *Journal of Russian Laser Research and Physics in Higher Education*.

Almost all his scientific activity is connected with LPI. He was deputy director at this famous institute from 1972 to 1979 and its director from 1994 to 2004. The latter period was very hard for Russia, which could not but influence the situation at LPI. The economic crisis led to a sharp drop in research funding, but the institute managed to minimise the stuff, equipment and research activity losses. In particular, significant advances were made at the time in the technology of semiconductor lasers, as well as in the fabrication of microwave transistors, necessary for the development of modern electronic devices.

Krokhin has authored over 250 scientific papers and three monographs. His scientific work has gained universal recognition: he was elected a corresponding member of RAS in 1991 and Academician in 2000. At present, he is a member of the Physical Sciences Division Board, RAS.

Krokhin was awarded the Order of the Red Banner of Labour (1971), the Order of the Badge of Honour (1976), the Order for Merit to the Fatherland 4th class (1999) and the 2nd class Commander's Cross (Poland, 2001).

His scope of interests is not restricted to science. He is a great reader of fiction and historical books, an expert in fine arts and a fervent admirer of impressionism. Moreover, he himself is excellent at drawing. Krokhin is a true sportsman: he played volleyball for the Torpedo Youth Sports Association and the Moscow State University team when he was a student and for the LPI team for many subsequent years. His fine human qualities are worthy of admiration: decency, fine sense of humour, self-irony, kindness and responsiveness. We congratulate Oleg Nikolaevich on his anniversary and wish him many happy returns, health and new achievements to the glory of Russian science.

Editorial Council, Editorial Board and Editorial Staff of *Quantum Electronics*, friends, colleagues and pupils