

Oleg Nikolaevich Krokhin (on his 90th birthday)

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March 14, 2022 was the 90th birthday of the outstanding Russian scientist and academician of the Russian Academy of Sciences (RAS), Oleg Nikolaevich Krokhin.

Oleg Nikolaevich Krokhin was born in Moscow into a family of chemical engineers. After graduating from the Physical Department of Lomonosov Moscow State University in 1955, he began working at the Nuclear Center (now All-Russian Scientific Research Institute of Technical Physics in the town of Snezhinsk), where he joined in particularly important studies on nuclear security of the country.

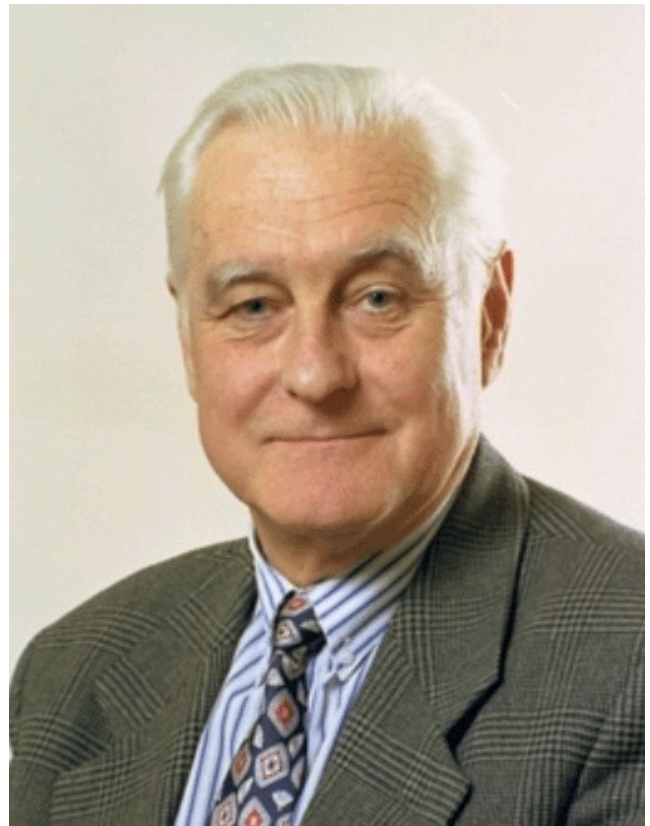
In 1959, Oleg Nikolaevich began working at the Lebedev Physical Institute of the USSR Academy of Sciences (LPI or FIAN in Russian abbreviation), with which all his further scientific activity was tied up. From 1994 to 2004, he was director of this celebrated institute.

From the beginning of his work at LPI (FIAN), O N Krokhin took an active part in topical studies, guided by N G Basov, on the extension of maser operation principles to the optical band, which shortly after led to the creation of lasers.

In 1960, N G Basov, O N Krokhin, and Yu M Popov published in the journal *Uspekhi Fizicheskikh Nauk (UFN)* (*Soviet Physics Uspekhi* in English translation) the paper, “Generation, amplification, and detection of infrared and optical radiation by quantum-mechanical systems,” considering essential problems associated with the possibility of creating lasers (see *UFN* 72 161 (1960) [*Sov. Phys. Usp.* 3 702 (1961)]).

Oleg Nikolaevich is the author of fundamental studies concerning the relaxation of a degenerate electron gas in semiconductors. He formulated criteria for the occurrence of inverse population in semiconductors and investigated the generation of optical radiation. The result of these studies was the top-priority proposition and justification for the possible creation of semiconductor lasers (together with N G Basov and Yu M Popov, 1961). For the fundamental research that led to the creation of semiconductor lasers, O N Krokhin (with his co-authors) was awarded the 1964 Lenin Prize.

In 1962, O N Krokhin, together with N G Basov, suggested the idea of realizing thermonuclear fusion through target heating by laser radiation, which was the starting point of a new scientific and technical domain—laser thermonuclear fusion (LTF). For a series of pioneering studies on the interaction between laser radiation and matter carried out under O N Krokhin’s guidance, he (and his co-authors) received the 1981 State Prize of the USSR. Very important was O N Krokhin’s suggestion to create a photodissociation laser pumped by a shock-wave front from an explosion or a powerful open electromagnetic discharge. Investigations in this area led to the creation of a laser with record energy parameters for use in specialized technical devices and LTF.



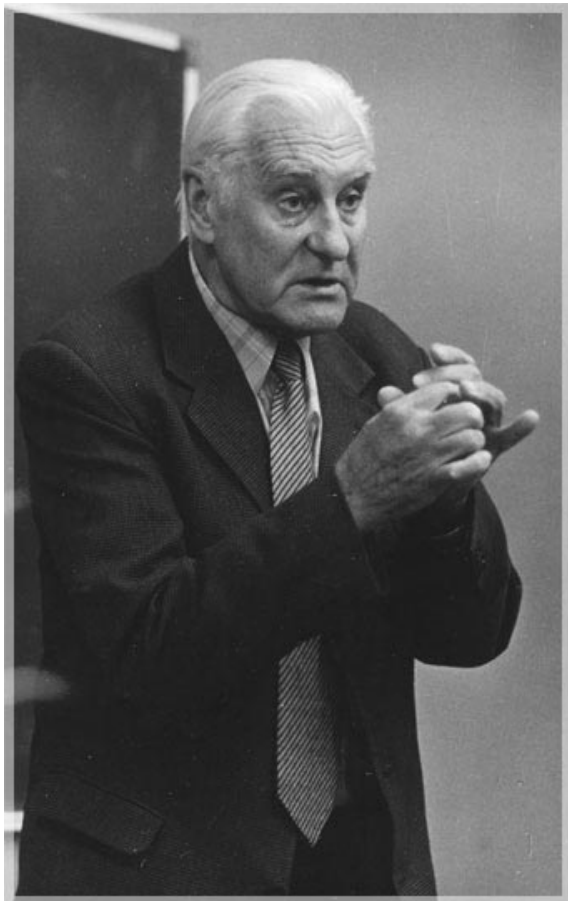
Oleg Nikolaevich Krokhin

Oleg Nikolaevich is known for his deep scientific erudition and profundity of thought, scientific courage, insight, and intention to obtain fundamental results. The scientific achievements of Oleg Nikolaevich Krokhin have been acknowledged by the scientific community. In 1991, he was elected a corresponding member and in 2000 a full member of the Russian Academy of Sciences.

O N Krokhin was decorated with the 2005 Demidov Prize and the 2010 N G Basov Gold Medal.

Academician O N Krokhin is doing serious scientific organizational work as member of the Bureau of the Physical Science Division (PSD) of RAS and chair of the RAS Commission for awarding the N G Basov Gold Medal. He is editor-in-chief of the journals *Kvantovaya Elektronika* (*Quantum Electronics* in English translation), *Journal of Russian Laser Research*, and *Fizicheskoe Obrazovanie v vuzakh* (*Physics in Higher Education* in English translation). O N Krokhin had for many years headed the PSD RAS program in the field of semiconductor lasers.

O N Krokhin is head of a recognized scientific school in the field of quantum radio physics and plasma physics. His disciples include over 30 candidates and doctors of sciences. Oleg Nikolaevich made a weighty contribution to training new generations of scientists and engineers and to the



research supervisor. For his efforts in preparing highly qualified specialists, O N Krokhin and his co-authors were awarded the Russian Federation President's Prize in the field of education in 2000 year.

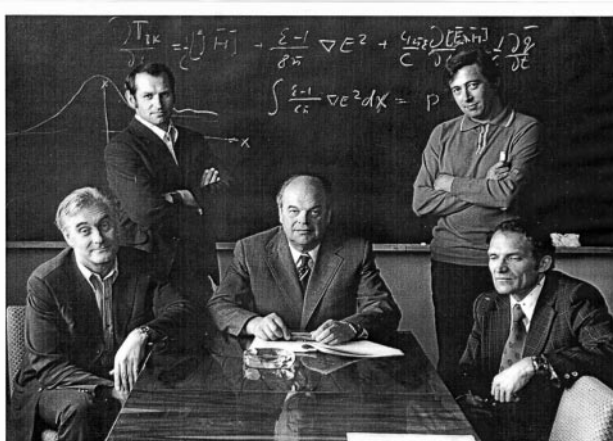
O N Krokhin is bearer of the Orders of the Red Banner of Labor (1971), the Badge of Honor (1976), and the Order of Merit for the Fatherland, 4th degree (1999) and 3rd degree (2008). He received the higher Order of Poland — Commander's Cross, 2nd class (2001).

The area of Oleg Nikolaevich's interests is not restricted to science alone. He is very fond of historical literature and is a connoisseur of painting; he paints very well himself. His wonderful personal qualities — benevolence, responsiveness, decency, the ability to hear out and understand people, and a light vein of humor — arouse admiration.

Oleg Nikolaevich's friends, colleagues, and the editorial board of the journal *Uspekhi Fizicheskikh Nauk* (*Physics–Uspekhi*) heartily wish him longevity, sound health, and further creative achievements for the glory of Russian science.

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V I Konov, Yu N Kul'chin, V Ya Panchenko,
Yu M Popov, G N Rykovanov, A M Sergeev,
R A Suris, A M Shalagin, I A Shcherbakov*

Oleg Nikolaevich Krokhin giving a talk on photonics to students in the Department of Semiconductor Quantum Electronics and Biophotonics at MEPhI.



Panel discussion on laser thermonuclear fusion in N G Basov's office. From left to right: seated — O N Krokhin, N G Basov, V B Rozanov; standing — E G Gamalii, Yu V Afanas'ev (roughly 1981, FIAN, photo by Yu P Lisovets).

development of physics education in our country. For many years, he has taught at the National Research Nuclear University MEPhI (MEPhI) and has been head of the Department of Semiconductor Quantum Electronics and Biophotonics at this university. He took an active part in the foundation of a special physics department — now the N G Basov Higher School of Physics at MEPhI, where he is