Yuriĭ Efremovich Nesterikhin (on his sixtieth birthday)

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Academician Yuriĭ Efremovich Nesterikhin, outstanding experimentalist and head of Applied Electronics Section of the I. V. Kurchatov Institute of Atomic Energy, celebrated his sixtieth birthday on October 10, 1990.

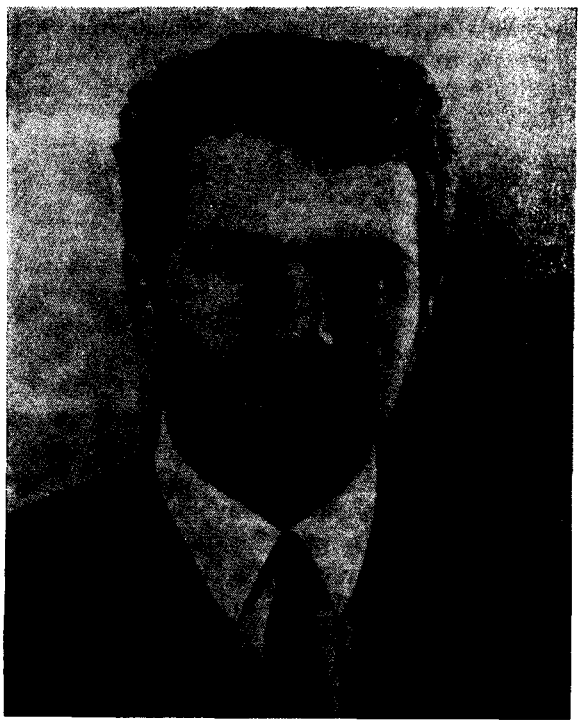
Yu. E. Nesterikhin was born in the town of Ivanovo. After graduating from the Physiocotechnical Department of Moscow State University in 1953, he went to work at the I. V. Kurchatov Institute of Atomic Energy. In 1961 he moved to the Institute of Nuclear Physics of the Siberian Branch of the USSR Academy of Sciences, where he became head of laboratory and defended his doctoral dissertation. At the Institute of Nuclear Physics, Yu. E. Nesterikhin developed into a scientist with a worldwide reputation in the fields of plasma physics, physical electronics, and automation of scientific research.

Historically the 1950's witnessed great advances in controlled thermonuclear reactions in the high-temperature plasma. Yu. E. Nesterikhin's research of those years laid the groundwork of a number of effective plasma diagnostic techniques. Some of his designs–high-speed oscilloscopes, oscilloscopes with internal image generation, light amplifiers–served as prototypes for devices currently in industrial production.

Yu. E. Nesterikhin was one of the outstanding scientists who came out of the experimental physics group headed by L. A. Artsimovich. Among his studies, those that brought him the greatest recognition were devoted to collisionless shock waves, which he discovered and investigated together with A. M. Budker an R. Z. Sagdeev. This topic evolved into a new direction of plasma physics research. Yu. E. Nesterikhin carried out a large series of experiments that tested the theoretical understanding of these shock waves, as well as their practical applications in plasma heating. He designed a number of new experimental installations, enabling him to discover shock waves with wavefronts smaller than the mean free path, study the bending of the wavefront and its fine structure, and confirm theoretical predictions on the possibility of employing these shock waves to heat plasma to thermononuclear temperatures. Some of these effects proved fundamental to many phenomena (for example, the interaction of "solar wind" with the magnetic field of the Earth).

The experimental research direction originally pursued by Yu. E. Nesterikhin gained wide acceptance. His results were confirmed by experimentalists in England, Italy, West Germany, and U. S. His unique, ultrafast electrooptical and laser systems profoundly altered the experimental equipment and methodology employed in studies of fast processes in high-temperature plasma.

After becoming head of the Institute of Automation and Electrical Measurement of the Siberian Branch of the



YURIĬ EFREMOVICH NESTERIKHIN

USSR Academy of Sciences in 1967 and head of the Council on Scientific Automation of the Presidium of the Siberian Branch of the USSR Academy of Sciences shortly thereafter, Yu. E. Nesterikhin concentrated his efforts on scientific automation and particularly on the application of new physical methods and instruments based on lasers and electrooptical devices. He formed a group which promoted cooperation among specialists from various disciplines (physicists, mathematicians, computer scientists, engineers, and technologists). He directed and personally participated in the design of problem-oriented systems that could be used to automate experiments in plasma physics, semiconductor electronics, hydrodynamics, gravitmetry, and biology. He directed the design and construction of effective automated machines for industrial design in machine building and radioelectronics. Finally, he managed the introduction of modern automation techniques based on CAMAC standards in the USSR Academy of Sciences and several industrial sectors and initiated mass production of CAMAC equipment.

Another essential project pursued by E. A. Nesterikhin and his group was the construction of specialized computers

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and systems tailored to particular problems requiring high efficiency. Among his great successes in this field we should mention the design of visual simulators for aviation and cosmic training machines, systems for processing atmospheric space images, multiprocessor switching units for digital communication networks. Together with his colleagues and students, Yu. E. Nesterikhin contributed many advances to the design of precision measurement instruments and new technologies that combined laser and computational elements. The final result of this research was the creation of a scientific-research section at the Institute of Automation and Electrical Measurement of the Siberian Branch of the USSR Academy of Sciences charged with constructing automated systems for applications in scientific research and industry.

In 1987 Yu. E. Nesterikhin returned to the I. V. Kurchatov Institute of Atomic Energy, where he is working today, energetically pursuing new scientific ideas.

The colleagues, students, and friends of Yuriĭ Efremovich congratulate him on his birthday and wish him good health and all manner of success in his creative endeavors.

Translated by A. Zaslavsky