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70 YEARS OF KOTELNIKOV INSTITUTE OF RADIOENGINEERING AND ELECTRONICS OF RAS

Editorial board RENSIT journal

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Abstract: Information is presented on the organization and activities of Kotelnikov Institute of Radioengineering and Electronics of Russian Academy of Sciences. Its scientific directions are covered, the main results of fundamental scientific, exploratory and applied research are noted, as well as the training of highly qualified personnel (candidates and doctors of science) and the presence of close international scientific ties.

Keywords: radiophysics, micro- and nanoelectronics, radio electronics, photonics, telecommunications, information technology

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*Kotelnikov Institute of Radioengineering and Electronics
of Russian Academy of Sciences,
Moscow, Mokhovaya st., 11, building 7.*

On September 28, 2023, the celebration of the 70th anniversary of the V.A. Kotelnikov Institute of Radioengineering and Electronics of RAS.

The Institute of Radioengineering and Electronics (IRE) was formed in the Department of Technical Sciences of the USSR Academy of Sciences by a resolution of the USSR Council of Ministers dated August 29, 1953 and the corresponding resolution of the Presidium of the USSR Academy of Sciences dated September 18, 1953.

The purpose of creating IRE was to develop 5 (at that time) main problems of radioelectronics:

- research of physical processes and development of a theory of phenomena occurring in electronic devices at radio frequencies;
- physical research and development of semiconductor materials, as well as the development of methods for using semiconductors in electronics and radio engineering;
- study of the propagation, radiation and channeling of high-frequency electromagnetic energy in free space, limited volumes and various environments;
- development of new methods for measuring electrical and magnetic quantities at high and ultrahigh frequencies;
- exploring new areas of application of radio engineering methods in science, the national economy and defense technology.

Academician and engineer-admiral Aksel Ivanovich Berg was appointed acting director of the IRE. At the end of October – beginning of November 1953, Vladimir

FOUNDERS OF THE IRE AS USSR



БЕРГ
Ахсель Иванович



КОТЕЛЬНИКОВ
Владимир Александрович



ВВЕДЕНСКИЙ
Борис Алексеевич



ДЕВЯТКОВ
Николай Дмитриевич



КОБЗАРЕВ
Юрий Борисович



ЗЕРНОВ
Дмитрий Владимирович

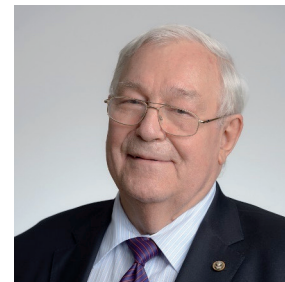
Aleksandrovich Kotelnikov, who had just been immediately elected as an academician, and at the same time Dmitry Vladimirovich Zernov, who was simultaneously elected to a corresponding member of the USSR Academy of Sciences, were appointed deputy directors of the IRE.

To house the IRE, the building of the Physics Faculty of Moscow State University was allocated on Mokhovaya st., 11.

To develop large-scale research, strengthen the material and technical base of the Institute and accelerate the implementation of development results in industry, in 1955 in the Fryazino city, Moscow region, by decree of the USSR Council of Ministers, the Fryazino part of the IRE was formed (now the Fryazino branch of the V.A. Kotelnikov IRE of RAS). In 1979, by the



Nikitov Sergey Apollonovich
Dr Phys Math Sci, Professor,
Academician of RAS



Gulyaev Yuri Vasil'evich
Dr Phys Math Sci, Professor,
Academician of RAS

decision of the State Committee for Science and Technology of the USSR and the resolution of the Presidium of USSR Academy of Sciences, the Saratov branch of the V.A. Kotelnikov IRE of RAS, and in 1990, by resolution of the Presidium of the USSR Academy of Sciences, the Ulyanovsk branch of the V.A.Kotelnikov IRE of RAS.

In order to perpetuate the memory of the outstanding Russian scientist Academician V.A. Kotelnikov – in 2006 the Institute was named after him.

From 1988 to 2014, the director of the Institute was Academician of the Russian Academy of Sciences Yu.V. Gulyaev. Now he is the scientific director of the Institute. Since 2015, the director of the Institute is Academician of the Russian Academy of Sciences S.A. Nikitov.

Currently, the Institute consists of 4 structural parts: the Moscow part of the IRE (22 laboratories), the Fryazino branch (29 laboratories and 2 thematic groups), the Saratov branch (9 laboratories), the Ulyanovsk branch (2 laboratories).



FRYAZINO BRANCH
Fryazino Moscow areas,
Vvedensky sq., 1



SARATOV BRANCH
Saratov, st. Zelyonaya, 38



ULYANOVSK BRANCH
Ulyanovsk, st. Goncharova, 48/2

The main task of the institute is to conduct fundamental, exploratory and applied research in the field of radiophysics, micro- and nanoelectronics, photonics, telecommunications, information technology, as well as the development and development of the physical, mathematical and technical foundations of a new element base of radio electronics and photonics.

The Institute conducts fundamental and applied scientific research in 15 scientific areas in the field of physical sciences, nano- and information technologies, which include radiophysical research of the Solar system, methods of remote sensing of the Earth, studying the propagation of radio waves in the Earth's atmosphere, near-Earth and outer space, development methods of generation, reception and conversion of electromagnetic waves, fundamental problems of radiophysical methods of communication, location and diagnostics, current scientific problems of optics and laser physics, research of nonlinear dynamic systems, creation of new materials and structures, including metamaterials, research in the field of quantum macrophysics, mesoscopics, physics nanostructures, spintronics and superconductivity, research in the field of biomedical radio electronics, etc. The results of the work are published in leading Russian and world scientific publications. The Institute trains highly qualified personnel (candidates and doctors of science) and has close international scientific connections.

The total number of the Institute is 930 people, including 587 scientists. Currently at the V.A. Kotelnikov IRE of RAS employs 5 academicians of the RAS: Yu.V. Gulyaev, S.A. Nikitov, N.A. Kuznetsov, V.A. Cherepenin and A.S. Bugaev, 6 professors of the Russian Academy of Sciences, 98 doctors of science, 220 candidates of science.

In 1969, the Institute was awarded the Order of the Red Banner of Labor. The Institute's works were awarded high awards:

2 prizes of the European Physical Society, 2 Lenin Prizes, 24 State Prizes of the USSR, 6 State Prizes of the Russian Federation, 4 Prizes of the Council of Ministers of the USSR, 3 Prizes of the Government of the Russian Federation, 3 Lenin Komsomol Prizes, 2 State Prizes of the Ukrainian SSR, 1st Prize of the Government of the Russian Federation in the field of education, 1st State Prize of the Russian Federation named after Marshal of the Soviet Union G.K. Zhukov in the field of military science, 4 awards from the Moscow Government for young scientists.

The main major achievements of the Institute, awarded with international and state awards:

- The world's first radar studies of the planets Venus, Mercury and Mars (Lenin Prize, 1964)

- The world's first detailed radar survey of the surface of the planet Venus from the spacecraft "Venera-15", "Venera-16" (Lenin Prize, 1986; USSR State Prizes, Lenin Komsomol Prize, 1985)

- Development of methods and equipment for remote sensing of the Earth using radiophysical methods (2 USSR state prizes)

- Experimental detection of electron-hole drops and multiparticle exciton-impurity complexes in semiconductors (European Physical Society Prize, 1975, USSR State Prize, 1988)

- Development of the scientific foundations of acoustoelectronics and acoustoelectronic information processing devices (European Physical Society Prize, 1979; IEEE W.G. Cady Award, 6 USSR State Prizes, 2 Russian Federation State Prizes, Lenin Komsomol Prize, 1984)

- Creation of the scientific foundations of spin-wave electronics (USSR State Prize, 1988, Lenin Komsomol Prize 1984, State Prize of the Ukrainian SSR, 1986).

- Development of THz superconductor receivers with quantum sensitivity (the

Van Duzer Prize awarded by the IEEE Superconductivity Council, 2012).

– Creation of a unique scientific installation "Cryointegral" - a technological and measuring complex for the creation of superconducting nanosystems based on new materials.

– Development of the scientific foundations of biomedical radio electronics (Russian Federation State Prize, 2000).

The total level of financing is 1.2 billion rubles, of which 0.7 billion rubles. allocated by the budget for the implementation of 16 topics of the state task.

Within the framework of the national project "Science and Universities", 3 youth laboratories have been created and are successfully operating, the average age of whose employees does not exceed 35 years. In addition, as part of integration with leading Russian universities, 8 basic departments have been created at the Institute. The Institute also has its own graduate school and two dissertation councils. In the graduate school of the IRE named after. V.A. There are 40 people studying at Kotelnikov RAS. In recent years, a number of young scientists from the Institute have been awarded prizes from the Moscow Government in the field of science. In 2021-2023 more than 20 researchers of the Institute were awarded state and departmental awards.

The Institute's staff annually publishes more than 350 articles in highly rated foreign and Russian journals, indexed in Web of Science and Scopus; more than 1000 articles and theses indexed in the RSCI. About 10 monographs and textbooks are published annually, Russian and international patents are registered. The results obtained by the Institute's staff have received unconditional international recognition. In 2022, the number of citations to articles published by Institute staff amounted to more than 28 thousand.

The editorial staff and editorial board of the journal "RENSIT: Radioelectronics. Nanosystems. Information Technologies" wish the V.A. Kotelnikov IRE of RAS prosperity and further scientific and production achievements, congratulate all employees, scientists and engineers on the anniversary and wish new creative successes on the path of technical progress of our country.

**The editorial team and editorial board
of RENSIT journal**