

# The First Electrotechnical Institute on the Threshold of its 125-th Anniversary

*Saint Petersburg State ElectroTechnical University  
"LETI" n.a. V.I. Ulyanov (Lenin)*

**V.M. Kutuzov, D.V. Puzankov, L.I. Zolotinkina**

**This article describes the history and development of the oldest electro-technical institution in Russia and one of the leading technical universities in our country-Saint Petersburg State Electrotechnical University "LETI" n.a. V.I. Ulyanov (Lenin). Many outstanding Russian scientists have worked and are working in this University, who furthered research development of global and Russian priority meaning.**

**Key words:** *electrical engineering education, the oldest in europe, electrotechnical university, teaching and scientific research, recognized academic and research schools, electrical engineering and electronics.*



V.M. Kutuzov



D.V. Puzankov



L.I. Zolotinkina

June 15, 2011 marks the 125-th anniversary of the foundation of Saint Petersburg State Electrotechnical University "LETI" n.a. V.I. Ulyanov (Lenin) – one of the largest institutions in HR training, basic and research studies in electric engineering, radio engineering, telecommunications, electronics, management, computer engineering and IT, control processes, instrumentation engineering and others.

The forthcoming XXI century is defined as an IT century, while the past XX century - century of electricity, where research, inventions and projects were connected with electricity in one way or another. This, in its turn, changed the world, dramatically changed the life of mankind and became the development basis for numerous new research trends.

Whatever the name of the oldest electrotechnical institute in Russia was-Engineering College of the Department of Post and Telegraph of Russia (1886), Electrotechnical Institute, Imperial Institute of Electrical Engineering, Electrical Engineering n.a. V.I. Ulyanov (Lenin), Leningrad Electrical Engineering n.a. V.I. Ulyanov (Lenin), Saint Petersburg

State Electrotechnical University "LETI" n.a. V.I. Ulyanov (Lenin) - the notion "the first" is present throughout the history-record of the institute's development and within the titles and names of all research and technical disciplines, associated with electric engineering, radio engineering and electronics.

Electric engineering had to pave its way throughout Russia. The introduction of electricity began during the last decades of the XIX century. The development of electrical communication means gave the onset to a country-wide network of telegraphs and telephone lines. This resulted in a high demand of HR personnel and engineers. However, practically all electrical equipment and installation were produced in foreign companies or, in some cases, in a few Russian enterprises, where the employed engineers and technicians were also foreigners.

Working as an inspector of Postal & Telegraph Services in 1868-1886, the outstanding engineer in electrical communication means and public figure Nikolai Grigoreevich Pisarevskiy (1821-1895), justified the demand in the foundation of a special electrotechnical



N.G. Pisarevskiy

Building of ETI, 1903  
(Photo by K. Bulla)

education institution - Post and Telegraph Institute of Russia [1]. Although such an education institution – electrotechnical – did exist in the world, the new concepts in electric engineering, such as fundamental principles of physics, mathematical complexity in research problem-solving, determined the necessity of engineering training.

June 3 (15) 1886 – Emperor Alexander III adopted the Provisional Statute on the establishment of Engineering College of the Department of Post and Telegraph of Russia. This Status defined a 3-year training course and degree in engineering only after a 2-year internship [2].

September 4(16) 1886 the Engineering College of the Department of Post and Telegraph of Russia was inaugurated to be the first civil electrotechnical education institution in “training professional engineers for post and telegraph service”.

The first five year results showed the essential demand in increasing the teaching period and expanding the curriculum and, thus, in June 11 (23), 1891 Emperor Alexander III adopted the Decree on the reformation of the Engineering College into the Electrotechnical Institute with a 4-year academic course

and degree in electrical engineer after a 1-year internship.

At the end of the XIX century there was a progressive development in electric engineering, i.e. not only in telegraphy but also in telephone services. There was a further development of such spheres in Russia as electrical illumination, electrometallurgy, electric operation (traction), power distribution, electrical engineering. And in June 4 (16), 1899 the ETI was granted the status of higher education institution, including a 5-year academic course in training professionals of all electrical engineering [2].

In August 12 (24) 1899 the institute was renamed into Imperial (Alexander III) Institute of Electrical Engineering, and in 1900 the graduates received the qualification of electrical engineer.

Graduates of St. Petersburg University - M.A. Shatelen and V.V. Skobeltsin as well as the first graduates of the Engineering College – P.S. Osadchiy and P.D. Voinarovskiy were the first professors in electrical engineering of ETI. Professor of St. Petersburg University I.I. Borgmann established the first Russian Department of Fundamental Principles in Electrical Engineering at ETI in 1891.



Library



A.S. Popov's telephone receiver



Study hall (2011)

To solve the problem of the development of new professional spheres and satisfy the high demand in such professionals, the State Council allocated resources and facilities, in view of contemporary requirements and the achievements in electrical engineering to construct new buildings for ETI on the Aptekarskiy Isle. The construction was based on the architecture project by A.N. Vekshinskiy, an instructor in architecture and construction course in ETI.

At the turn of the XIX and XX centuries ETI became the acknowledged center of electrical engineering and education in Russia. The most outstanding pioneers in electrical engineering and those who contributed to the establishment of the institute itself and furthered its future development as well as distinguished inventors from 1899 to 1903 were awarded the honorary title "electrical engineer". This title was awarded by the Academic Council of ETI and approved by the Secretary of State for Home Affairs in Russia. The following honored electrical engineers were awarded: N.N. Kachalov, I.A.

Evnevich, D.A. Lachinov, I.I. Borgmann, N.G. Egorov, N.L. Kirpichev, N.N. Kormilev, A.A. Krakaya, A.I. Smirnov, E.P. Tveritinov, E.П. V.J. Florensov, N.N. Benardos, A. N. Lodigin, A.S. Popov, A.A. Voronov, K.F. Simens, M.O. Dolivo-Dobrovolskiy [2].

The director\rector in the face of a leading scientist and administrator played and plays an important role in the development and effective organization of this institute. The most striking pages in the history of the institute are connected with the first director of Engineering College and ETI - N.G. Pisarevskiy (1886 - 1895), N.N. Kachalov (1895 - 1905), first elected director Prof. A.S. Popov (1905), prof. P.D. Voynarocskiy (1906-1912), prof. N.A. Bikov (1912 - 1918), prof. P.S. Osadchiy (1918 - 1924), academician of Academy of Science, USSR G. O. Grafitio (1924 - 1925), prof. A.A. Cmurov (1925 - 1929), prof. N.P. Bogoroditskiy (1954 - 1967), correspondent member of Academy of Science, USSR A.A. Vavilov (1968 - 1983), prof. O.V. Alekseev (1984- 1998), prof. D.V. Puzankov (1998- 2009).

And even during the difficult prewar – war – post-war period of our country's development (1929-1953), the institute staff toiled to solve the major problems of the country, mainly military defense. The Institute directors of this period were N.O. Shmuilovich (1929 – 1932), A.S. Aleksandrov (1932 – 1934), A.F. Shingarev (1934 – 1937), P.I. Skotnikov (1937 – 1954).

Students and the teaching staff of ETI always actively participated in the social and political life of Russia. This can be marked by the following facts: during the years of the first Russian revolution (1905) ETI became active Russian Social Democratic Labor Party nucleus; in 1918 the students of this institute appealed to the Government to award the Institute the name "Lenin", thus in November, 1918 in accordance with the Decree of People's Commissariat of Postal & Telegraph Services (P&TS) awarded ETI the name "V.I. Ulyanov (Lenin)".

At the beginning of the XX century the three basic application spheres of electricity – ELV electrical engineering (communication), high current electrical engineering (industrial electrical engineering and electrical energy) and electrochemistry were introduced as courses in ETI [3].

Head Department of Postal & Telegraph Services (HD P&TS) designed a policy in the development of electrical communication and postal services in Russia. The first domestic professionals in wire electrical communication were trained in ETI. At that time there was not another state institution in electrical engineering. During 1900-1918 the department heads and members of the ET committee of HD P&TS were mainly graduates and teaching staff of ETI. From 1904 to 1915 the assistant Director of HD P&TS was prof. Petr Semenovich Osadchi, head of the Telecommunication Department.

During these years HD P&TS put into operation thousands and thousands of kilometers of electrical telegraph and telephone communication lines, constructed powerful wireless telegraphy



**A.S. Popov**

stations, organized training courses for radiotelegraph professionals. ETI graduates, prof. V.I. Kovalenkov and P.A. Azbukin and their students established the fundamental principles of line telecommunications and solved the problem of multiplex telephony.

The fundamentals of radio engineering education were established by A.S. Popov and his predecessors' prof. A.A. Petrovskiy and N.A. Ckritskiy. Based on the ETI Academic Council decision, dated 24 October, 1916, a new curriculum "Radio-telegraph stations" was first introduced in Russia, i.e. it became the starting point in the training of radio technology engineers. In 1917 the supervisor of this school was the ETI graduate I.G. Freeman [4]. The transition from "spark and arc" to electrical bulbs as communication means for the navy was performed under the supervision of I.G. Freeman as well as projects in hydro-acoustic and underwater radio communication. His followers who developed their own scientific schools, were academicians A.I. Begr, A.N. Shukin, A.A. Kharkevich; correspondent members of the Academy of Science USSR S.Ja. Sokolov, V.I. Siforov, prof. B.V. Aseev, M.P. Dolukhanov, M.I. Kontorovich, G.A. K'jandskiy, V.N. Lepeshinskaya, S.I. Panfilov, E. G. Mo-

mot, E. Ja. Schegolev, A. F. Shorin and many others [3].

The development and initiation of power energy (energetics) in Russia is connected with the basis and development of the energetic trend in ETI. Here new scientific schools were organized by the professors: P.D. Voyanarovskiy, V.V. Dmitriev, G.O. Graftio, Ja. M. Gakkelja, I.V. Egiazarov, A.A. Smurov and others.

In 1904 the first Russian high-voltage (200000V) lab in a new building was equipped by prof. P.D. Voynarovskiy [5]. In 1910 the Volkhovskiy HPP (Hydro Power Plant) project was designed by G.O. Graftio. A significant contribution in the construction of the first thermal-hydroelectric power stations was made by the graduates of the above-mentioned schools. The electrical engineering school of ETI played an important role in the development of the methods and means of energy transmission, different power station projects and electric operation (railway and city transport).

Many professors and teaching staff, scientists and graduates of ETI participated in the electrification development plan of Russia (State Committee in Electrification of Russia). At the beginning of the XX century they developed a series of pioneer projects, becoming the foundations of HPP projects, which, in its turn, provided the possible development plan of State Committee in Electrification of Russia.

The electro-economic basis of the electricity-energy power supply of large industrial centers and electrification of industrial enterprises was developed by the ETI graduates- professors V.V. Dmitriev, S.A. Rinkevich, V.A. Timofeev and their students. Prof. A.A. Voronov and the ETI graduate prof. F.Ja. Kholujanov were the founders of the domestic school in electric machine engineering. Today's executives of "Electrosila" Plant, professors R.A. Luter, V.K. Goreleichenko, A.E. Alekseev, V.T. Kasjanov, M.I. Moskovskiy and others have developed powerful hydro-turbine generators for electrical

stations, electrical machinery and motors for bloomers for gigantic metallurgical plants.

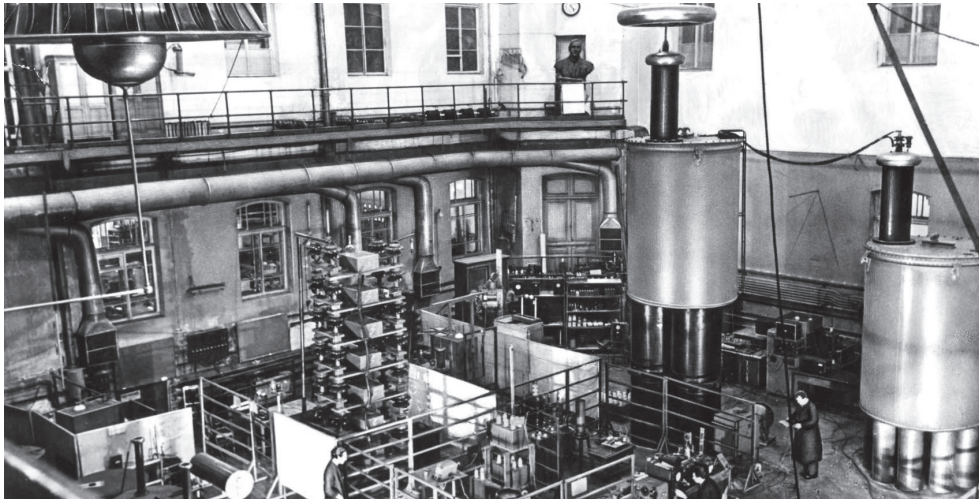
The development of domestic electrochemistry industry is connected with the names of such teachers and graduates of ETI as: academician N.S. Kurnakov, I.V. Grebenshikov, professors A.A. Krakay, N.A. Pushin, M.S. Maximenko. Within the four walls of the institute, the following engineering projects were developed: industrial methods in processing aluminum and manganese from domestic ore fields (1915) and optical glass.

The works and research of the 20's and 30's in the XX century was furthered in the works of above-mentioned scientists and reflected in different scientific school [3].

ETI graduate A.A. Smurov established a scientific school in high-voltage engineering and electric power transmission (1919) [6]. From 1932 one of the major research topics of this school was development of protection projects for overvoltage power systems Donenergo, Centrenergo, Uralenergo. A.A. Smurov followers- prof. G.T. Tretjak, V.I. Ivanov and their colleagues furthered the development of gigantic electrosystems with quick-response protection generators, transformers and power transmission lines.

The first department of electric operation, as a new trend in electrical engineering, (1922) was organized by prof. S.A. Rinkevich. On the basis of this department, other departments were established to solve electrification problems in different industrial areas. In 1927-1929 he founded the first Russian research laboratory in electric operation. On the basis of this, other labs were organized in LPI (1931), MEI (1934) and LIERT (1936). Prof. S.A. Rinkevich followers – A.V. Fadeev, G.V. Odintsov, A.V. Berendeev, B.I. Nornevskiy, A.V. Basharin founded their own scientific schools.

A new domestic scientific school- electric welding- arose within the four walls of the institute in the 20's. The most outstanding representatives of this



Largest high-voltage lab in Europe (prof. A.A. Smurov)

school were academicians AS USSR K.K. Khrenov and A.A. Alekseev.

Other examples of the first new profession in LETI were engineering acoustics and high-frequency electrothermics. Two trends in electric acoustics of the 20's and early 30's were established in LETI: broadcasting acoustic developed by prof. A.F. Shorin and ultrasonic vision, the Father who was the outstanding scientist, correspondent member of AS USSR S.Ja. Sokolov. In 1931 he established the Department of Electric Acoustics, which was a part of radio engineering. During these years the first ultrasonic defectoscope was designed at this department.

The development of electrothermics in LETI is connected with correspondent member of AS USSR V.P. Vologdin who had worked at this Institute from 1924. In 1935 he established a lab in high-frequency electro-engineering, which in 1947 was reorganized into Research Institute of High-Frequency Circuits, which, in its turn, furthered the development of a new profession – “High-Frequency Technology” under the supervision of V.P. Vologdin.

Development of radio engineering, technology and electrical energy involved the onrush of technology in a new industrial sphere-electrovacuum

technology. The fundamental principles of this topic were described in the works of professors V.I. Kovalenko, S.I. Pokrovskiy and N.A. Skritskiy in 1913–1917. The supervisor of the first training electrovacuum lab was prof. in Physics M.M. Glagolev (1923). The facilitator of the Department of Electrovacuum Technology became prof. A.A. Shposhnikov in 1931. It is important to underline the fact that the engineer-technician personnel at the “Svetlana” Plant are graduates of LETI.

In the early 20's the first research in electrical insulating materials was conducted under the supervision of A.A. Smurov in the high-frequency lab at LETI. In the 30's the research was continued by N.P. Bogoroditskiy in the pilot projects of ceramic materials for radio technical devices. The establishment of the Department of Dielectric and Semi-Conductor Materials in 1946 by N.P. Borogoditskiy triggered as a powerful stimulus in the research development and significant organization stimulus in the academic process in radio material engineering and later, in microelectronics.

In 1930 the new specialty “Telecommunications” was introduced in LETI by professors V.I. Kovalenko and A.A. Skritskiy, and later another



**Prof. S.A. Rinkevich in the lab of the first Department of electric operation in the world**



**Rector (2009) , Prof. V.M. Kutuzov**

specialty “Automation and telecommunications” came into existence. In 1935 the Department of Automation and Telecommunications was organized and headed by prof. V.A. Timofeev. The major research spheres were automation of industrial processes, telecontrol of distant and complex objects, which, in its turn, furthered the development of several departments. Correspondent member of AS USSR A.A. Vavilov supervised this research area for many years.

In the early 30’s the problem of the day was to equip and supply the army, navy and aviation with high-quality guidance computer artillery device systems, torpedo launchers and bombing sight. The first in the USSR department to train engineer-electricians in computer device systems was organized in February, 1931 in LETI – Department of Fire Control System Devices [4]. The first Head of this department was the navy engineer, graduate of this Institute, V.G. Naumov. Later similar departments were organized in such universities and institutes as LI TMO (1938) and MHTU n.a. N.E. Bauman (1939). This department was headed by engineer S.A. Izenbek, authority in mathematical instrument engineering. The Computing Technology Department which included from electrical engineering to electronics, from analog and digital-analog computer devices, machines and systems became the leading one in this sphere.

During 125-year history of ETI the following departments were established: telegraph, telecommunication, electric machinery, radio-technology, high-voltage technology, electro-welding, X-ray and electron-optical devices, hydro- and thermal electrical stations, hydroacoustics, ultrasonic defectoscope, automation, telecommunications, high-frequency electrothermics, computer engineering, electro-vacuum engineering, remote control systems, synchronous-tracking system and biomedical devices.

The first departments in the world were the Departments of Elec-

tric Operation (1922 – founder S.A. Rinkevich), Electro-Acoustic (1931 – founder S.Ja. Sokolov), High-Frequency Electro-thermics (1935 – founder V.P. Vologdin). Research in the spheres of ultrasonic defectoscope, ultrasonic imaging (1931- S. Ja. Sokolov), methods of induction heat treatment of metals and high-frequency electrothermics (1936- V.P. Vologdin) today have global priority.

A particular page in the history of the institute was the years of the Great Patriotic War. Practically 2000 students and teachers enrolled in the army and navy. Most of them defended Leningrad and many were toilers in many war cities, constructed defense lines, cleared debris, extinguished fires after bombardments [3].

In 1942 the Research People's Commissariat Bureau in Shipbuilding Construction was organized at LETI. The teaching staff under the supervisor of prof. S.A. Rinkevich, director of LETI, remained in the blockade city and participated in the blockade, executed all tasks of the Baltic Fleet command in the reinforcement of the air defense system, developed new materials and devices which could be used in different industries, military units, and hospitals. During the war years the headquarters and politic administration of the Baltic Fleet was located in LETI. Throughout the Blockade Days (from December 1941 to 1944) the director of the Institute P.I. Skotnikov was the Chairman of Petrograd District Executive Committee of Leningrad. Evacuated Research Labs under the supervision of V.P. Vologdin and S.Ja. Sokolov performed important tasks in improving armament. They were awarded with Stalin rewards for their contributions in science: prof. V.P. Vologdin for the development of high-frequency tank armor heat treatment technology; prof. S.Ja. Sokolov for methods and devices of non-destructive testing of military equipment by ultrasonics. Prof. N.P. Bogoroditski was also awarded with the Stalin Reward for his contribution in the development of

high-frequency ultraporcelain radioceramics, which was used in military transmit-receive radio equipment.

More thousands of LETI-personnel were awarded medals and orders for their bravery, courageous labor and sacrificial contribution in the victory at Fascism.

During the first post-war years the Institute personnel reconstructed the buildings and different objects of the city. Students worked at different construction sites of agricultural structures, including Krasnobor Electrical Station.

At the same time the teaching and research processes were reorganized in accordance with the achievements in science-technology progress in different spheres-electronics, automation, computer engineering, instrument engineering, and atom energy. The creative atmosphere within LETI promoted not only furthered perspective research areas but also the development of new spheres as radio-electronics and cybernetics, electrification and industrial automation, high-frequency electrothermics, electrical technical materials, automatics and telecommunications, computer engineering, optical electronics and others. The birth of the atom industry involved an urgent demand in relevant engineers and the development of a modern system in training these engineers in several USSR institutes. In the first decades of 1947 the Department of Physics and Power Engineering was organized in LETI (dean- S.Ja. Sokolov), and existed up to 1951. This department showed a high training level in physics-mathematics. About 200 electrophysics engineers and electrical engineers graduated from this department. A number of executives in the atom industry finished this department (L.I. Nadporozhskiy, A.I. Il'in and others) [8].

In the early 1960s the scientists in LETI elaborated the following aspects: basic principles in nuclear spectrometry, development of devices for space research, and construction of a unique zero-gravity space station training facility. In the 1970s LETI was the first



institution in the country to develop problem-solving industrial research labs, to establish a network of basic departments in large research enterprises, in a number of organizations AS USSR and research-and-production complexes. Graduates of LETI headed such major enterprises as: RPA "Altair", RPA "Svetlana", RPA "Pozitron", CRI "Aurora", CRI "Granit", Elektron, Russian Research Institute of Radio Design, Ltd. Co. "Plant n.a. Kozitski", RPA "Vector" and others [9].

In 1986 interacademic department of microelectronic technology of Ministry of Higher Education (from 1961 - Center of Microtechnology and Diagnostics) was established in LETI. Further it became a fundamental base for research projects and training of highly-qualified professionals in microelectronics. There was a gigantic development leap in the spheres of electronic, plasma, high-frequency and laser technology. Large-scale works in the spheres of flexible computerized manufacturing systems, robot technology, APS, automation, microprocessor technology and IT was executed at this Institute. The Institute participated in the sphere of high-thermal hyper-conductivity research [10].

LETI was awarded with Lenin Order (1966) and October Revolution Order (1986) for its contribution in the training of highly-qualified professionals and in RD (Research Development).

LETI, as the foremost institute in Russia, participated in the organization, establishment and development of daughter institutes (St. Petersburg State University of Telecommunications n.a. Prof. M.A. Bonch-Bruevich, Rjazan Radio Engineering Academy, Novgorod State University n.a. Jaroslav Mudriy, Penzen Polytechnic University, Vladimir Polytechnic University) and tens of departments in many cities of Russia.

The Institute's authority was acknowledged in the following facts: participation in the development of new engineering profile professions and the establishment of Institute Education

and Methodics Association of the USSR in automation, electronics, micro-electronics and radio engineering on the base of LETI in 1987. Council chief of EMA was Rector of LETI, prof. O.V. Alekseev [10].

At the end of the 80s and the beginning of the 90s, not only engineering but also natural science, economic and humanitarian academic disciplines were introduced. In 1992 the Institute acquired the status of technical university and renamed St. Petersburg State Technical University "LETI n.a. V.I. Ulyanov (Lenin)" (SPSETU).

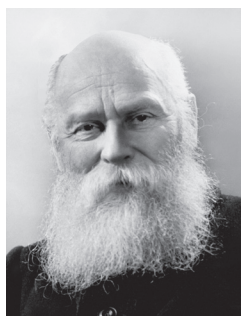
The crisis of the 90s turned over a new page in the understanding of reality. Administrations of institutes and other public organizations, establishments and departments began to see this reality in a new light, pragmatically evaluate all research results and, at the same time, were forced to search and find non-budgetary funding. An important funding source became different programs and grants, international scholarships, cooperative innovations. LETI reorganized its work to maximal use all possible new opportunities in solving the problems of HR training and RD.

Based on the agreement with Belgian partners - Catholic University Leuven, Catholic University de Louvain and Association "Universities-Industries" in 1990 the International Management School "LETI-Lovanium" was established in LETI (supervisor prof. A.E. Janchevski). This School promotes 1-year program: "Expert in business administration". Owing to the experience of the leading foreign professionals, the Scholl gained great reputation and established itself in the dominating rating among the Russian education institutions.

In 1991 the first Russian university Research Park (Technopark) was established in SPSETU, while in 1998- the first Russian innovative technological center, promoting the development of small enterprises and innovative university infrastructure complex. Technopark united 25 small and medium innovative



N.P. Bogoroditskiy



V.P. Vologdin



S.Ja. Sokolov

enterprises, producing high technology products. This Park also participates in European innovative projects and cooperates with foreign partners [10].

The University is one of the initiators and participants in the transfer of Russian institutions to a level-education system: in 1996 the graduates with Bachelor Degree; in 1998 Master Degree in Engineering and Technology. Tens of SPSETU personnel participated in the development project of higher professional education standards of the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generations.

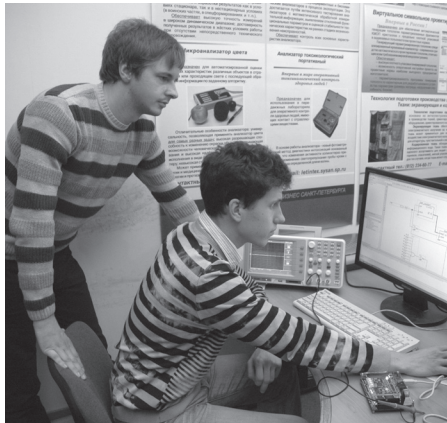
In 1999 there were 14 disciplines at 7 departments (full-time education): radio engineering and telecommunications, electronics, IT and informatics, electrical engineering and automation, measuring-information and biotechnological systems, management, humanitarian, as well as, open curriculum and further training and professional departments established in the Institute.

In 1998 SPSETU in cooperation with Ugorsk (Khanty-Mansi Autonomous Territory) administration and core company "Tumentransgas" opened a new affiliated institution with a 2-year uniform higher education professional program (director- A.G. Klikov). Due to the two-sided cooperative efforts of the partners, this institution has become not only well-known all over the country but also the best education center in Western Siberia with an excellent material and technical base. At the same time our Institute has a constant inflow of 3-year students from different department of this institution.

At the turn of the 21<sup>st</sup> century the hard days of the crisis were left behind. This can be highlighted in the following three major factors- increase in funding, growth demand in professionals for high-technological enterprises and research project institutes, volume increase in research contracts and pilot design and experimental projects. A significant contribution in the development of above-mentioned factors was Microtechnology and Diagnostics Center (director- prof. V.V. Luchinin), establishment of Research Lab in radio systems and Signal Processing (2002) and reorganization of RI Radio Engineering and Telecommunications (2010: executive- prof. V.N. Ushakov).

In 2001 the University in cooperation with more than 40 St. Petersburg organizations designed target-oriented program "Strategic partnership", including mutual profitable and integrated partnership in the spheres of science, research, innovation and education [11].

The strategic partners are: LtD. "Avangard", FSUE RRI "Vector", LtD. "Svetlana", LtD. "Inteltech", LtD. "Concern CRI Electropribor", LtD. RRI "Radar mms", LtD. "Russian Institute of Radio Design", FSUE "Research Institute of Transport", CJSC "Roselectroprom Holding", LtD. "Power Machines", LtD. "Concern RPA Avrora", LLC "Simens", CJSC "St Petersburg Motorola", CJSC "EleSi", FSUE "RRI Control Devices", FSUE Production Engineering Design Office "Biophyspribor", FSUE "RRI of HFC", LtD. "Chemical Enterprise Leninet's", LtD. "LOMC", Ioffe Physi-



**System-on-chip Lab**



**Microprocessor System Lab**



**Nanotechnology center**

cal-Technical Institute of the Russian Academy of Sciences, St.Petersburg Institute of Informatics and Automation of RAS and others.

During the last 10 years the successful development and dynamic progress of above-mentioned program was determined by the widely-distributed experience of SPSETU in the system of higher professional education in Russia. The growing integration between universities, enterprises and other education institutions resulted in the organization of a research-education syndicate of higher and technical professional education, hi-technology enterprises, research and project organizations in St. Petersburg (2009) - "Corporate Institute of Research and Continuous Education in radio-electronics, instrument engineering, communication tools, inform-telecommunications".

The problem-solving dimension and complexity, including teamwork of university-enterprise-organization, increasing resources and temporary solution parameters, predetermined the necessity to use strategy planning methods within the management system of SPSETU.

University development strategy plan 2001-2005 was based on an innovation development model, which in its turn, furthered the development of an innovative university complex, uniting all research institutes, technoparks, innovation-technology centers and small innovation enterprises.

University development strategy plan 2006-2010 involved the development of the institute as a research entrepreneurial university, providing practical contribution in the economic development of the region and core enterprises. All this is based on priority development of fundamental and applied sciences, systematic integration with research organizations and core enterprises and international partnership in education and RD.

During the period the university personnel and staff performed a series of large system projects "Federal Target Program of Education Development"

(FTPED), target programs: “Development of Nanoindustry Infrastructure RF: 2008–2010”, “Training of Scientific and Pedagogical HR in Innovative Russia: 2009–2013”.

Twenty large-scale research-methodological projects were conducted in accordance with Ministry of Education RF mission: concept project of organization-methodological base for multi-level higher professional education system and development of state education standards of HPE of the first, second and third generation. In SPSETU the implementation of these projects included the transition of the University to the multi-level education system oriented on large-scale professional oriented training of Master degree students together with the strategies of partners and major employers.

SPSEU is one of the base universities - executors of the target-oriented program “Training and retraining of HR for hi-technology enterprises in St. Petersburg: 2007–2009”. During these years the University trained more than 150 students from special purpose entity and retrained more than 300 employers from enterprises.

The University significantly contributed to the development of the Quality Management System in training professionals for Russian institutes, which included the design and implementation of standard model of QMS in RF education establishments. In accordance with the decision of the Federal Supervision Agency for Education and Science the Interacademic Center headquarters to implement standard model of QMS in RF education establishments on the base of SPSEU.

Within the framework of the FTPED “Infrastructure Development of RF Nano-industry: 2008–2010” several projects were implemented and within the national nano-technology network, the research center “Nano-technology in Security System” was developed.

During the first decade of the XXI century the systematic and complex progress of SPSEU forwarded it to be one of the leading scientific-education



J.I. Alferov

and innovative centers in Russia. This is endorsed in the fact that the University was the winner in the competition of innovative education programs – Priority national project “Education” (2007–2008). The implementation of this project resulted in principal innovative changes in the teaching process and research development, accelerated intelligent potential progress and expansion of university material and technical base. The results of this project included the following: 30 new academic programs for Master Degree, and 15 for post-graduates, more than 50 sophisticated equipped research labs, centers and specialized rooms, modernization of corporate information computer network, reconstruction of library, establishment of room-base videoconferencing, design of all standards, methodological and information facilities, and more than 1000 University instructors and personnel improved their qualifications in large education and research centers in Russia and other countries. SPSEU stepped towards the transformation of the university into a modern competitive university within the framework of the Russian and global market of research and education activities.



**St. Petersburg Technical Trade Fair  
Laureates O.I. Bureneva and N.M. Safjannikov**



**Control Unit for landing runway Engineering  
project of department ACS**



**Lab of Marine Control Systems**

Today more than 1600 students graduate from this University annually. There are about 10 000 students, post-graduates and trainees, among which, approximately 1000 Master students. Professorship – instructor staff include 1100 teachers, among which 8 members of the Russian Academy of Science, 20 laureates of national and international rewards, more than 200 professors and PhD in Science and about 600 candidates.

Personnel professional training is conducted in 42 areas: 27 engineering, 6 natural sciences and 9 humanitarian. Annually, 80 students finish the post-graduate studentship. In the university there are 9 Dissertation Council in 24 research areas.

SPSEU is active in the global market of education services: foreign partners from 44 universities of Europe, Asia and USA. From 1952 to 2010 the University trains about 4000 engineers, candidates and professors for 95 world countries and there are about 400 foreign students studying in this University.

Nowadays the University trains Bachelor and Master Degree students and engineers in 100 education programs within the framework of 14 education areas.

There is Institute of RD in education, 4 research institutes: Research, Design and Technology Institute in Biotechnological systems, Research, Design and Technology Institute in Modeling and Intellectualization of Complex Networks, Research, Design and Technology Institute in Radio-electronic Systems Forecasting Emergency Situations and Research, Design and Technology Institute in radio-engineering and Telecommunications.

During the 125 years of the existence of SPSEU, "LETI" about 100 000 students graduated from this University, including 4000 graduates from 95 foreign countries. How different was the fate of either! Most of them became highly-qualified professionals making considerable contributions in the development of Russia and other coun-

tries. We are proud of the outstanding graduate Zh. I. Alferov, Nobel laureate in physics 2000 as well as many other significant scientists, executives of different enterprises and research institutes, chief design engineers. We also

acknowledge those graduates for their professionalism in different spheres of economy, defense potential, and science.

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