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A THINK-TANK,
NOT JUST A
TRAINING CENTRE

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Scientists training telecom engineers...

Our University, then the Institute of Telecommunications Engineers, was established 13 October 1930 when there were difficult times in Russia. With sweeping industrialization gaining momentum, telecommunications technology was changing rapidly and telecom engineers were sought in vast numbers everywhere. To qualify, they had to be more than just hands-on specialists; they had to be able to apply scientific achievements to real life.

This is part of the reason why, right after the institute was established, its faculty was recruited from a number of leading telecommunications specialists, researchers from the Nizhny Novgorod Radio Lab (which had been relocated to the banks of the Neva), and top scientific talent. Our first students were lectured by such luminaries as professor Boris Aseyev and professor Mikhail Bonch-Bruevich, among others. One of our first professors was the future academic Alexander Mintz, who at different points in his career would supervise the design and construction of powerful broadcasting centres and accelerators of elementary particles.



Alexander Mintz



Having established a Department for Wireless Transmission Technology at our Institute, Mintz staffed it with such greats as professor Joseph Gonorovsky, Grigory Zeitlenok and other eminent developers of powerful wireless transmission technology for broadcasters, the Army and the Navy. Mintz also invited Zinovy Model, who had designed transmitting centres for customers in Russia and Europe, to teach at the Institute. Model had trained many of those who subsequently taught or still



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NEW IDEAS AND TECHNOLOGIES...



Mikhail Bonch-Bruevich

For decades, the research and academic life of our University was centred around the scientist whose name it now bears, Mikhail Bonch-Bruevich. One of the founders of wireless communication in Russia, he embarked on his scientific career in St. Petersburg, then stood at the helm of the legendary Radio Lab in Nizhny Novgorod before returning to the banks of the Neva. During his trips to Berlin, Paris and London he found that the research results from his laboratory were on par with the level of those abroad.

Bonch-Bruevich returned to St. Petersburg, then Leningrad, years later as a celebrated scientist and set about to study the travel of radio waves in the upper reaches of the atmosphere, as well as radar, ultra-short waves, horn aerials and wave guides. Bonch-Bruevich earned worldwide acclaim for his research in receiver/amplifier and generator electron tubes. Pioneered at the Nizhny Novgorod laboratory, this research formed the groundwork for Russia's electric vacuum industry.



Tuning the submarine television installation, made at the Chair headed by P. Shmakov to the order of the builders of the Sayano-Shushenskaya and the Krasnoyarskaya hydro-electric power stations.

Bonch-Bruevich combined his vast studies with teaching at our University. He was head of the Department of Wireless Technology Theory, dean of the School of Radio and vice-president for academic work and research. Professor Bonch-Bruevich remained on our faculty until his death on 8 March 1940.

Today, as was the case decades ago, information technology and telecommunications are essential for economic development. Science has come up with many new ideas and technologies; computers and the Internet are common; most natural phenomena and engineering solutions can be modeled on a computer, but the need for specialists is as high as ever, especially in the field of electronic data exchange. To keep abreast of technological progress, our University has introduced new subjects, departments and high-technology centres which are, in essence, mini-think-tanks in their own right, engaged in promising research and development.



9 July 1952.
V. Zvorykin's visit to Leningrad.
In the photograph (from left to right): academician G.D. Nalivkin, V. Zvorykin, his sister V. Zvorykina (D. Nalivkin's wife), P. Shmakov

Our Physics Department, for one, conducts fundamental research in solid-state physics. Our physicists have made a number of internationally recognized discoveries in explosive electronic and ion emission and the super-permeability of gases. Some of them have won Russian National Prizes.



One of the first models of the super-conoscope-the transmitting television tube, made in P.Shmakov's laboratory. 1937

Considerable scientific and practical successes have been achieved by our departments of Electric Circuit Theory and Wireless Transmission Technology, particularly in the theoretical ratiocination and practical implementation of new types of powerful key microcircuits, which are a vital component of high-performance, small-size transistor transmitters for various applications. The University's work in special-purpose emulator complexes conducive to more reliable operation and the longer life of high-cost, high-power electronic vacuum devices are of immeasurable value.

During its short-lived existence, our Department of Digital Signal Processing - the first of its kind in the former Soviet Union - and our Research, Engineering and Training Centre for Digital Signal Processing (SPC) both developed and implemented a range of high-tech study subjects and lab assignments. In collaboration with France Telecom and St. Petersburg State University, our university developed the best software package so far to synthesize Russian speech from text. When you key a random text into the computer, you can hear it reproduced by a voice. The SPC centre has developed the richest speech code library in the former Soviet Union, and possibly all of Europe. Speech codes are computer programs that represent speech and/or sounds (of music) in digital format as a relatively slow-moving flow of numbers, customized to suit different environments and applications.

It is the University's ambition to remain a top-notch study centre and think-tank generating the most sophisticated technology. It is also our duty to make sure our graduates are not only proficient in existing technology, but are capable of innovation in every area of information science and telecommunications.

Dmitrikov.

Professor Leopold Slepian made telecommunications history seventy years ago by having established a Department for Radio Receiving Technology at the Institute, where such celebrated scholars and published authors as Nikolai Krylov, Vladimir Sidorov, Georgy Voishvillo and Nikolai Buga worked.



Mikhail Shuleikin

Yet another scientist who is part of the University's history is Boris Rosing, the inventor of an electronic television image reproduction system using a cathode-ray tube, an invention widely acclaimed in Russia and abroad. He had patented his new electric image rendering system in Russia, England and Germany as early as 1907, but the invention was never applied on a mass scale until 1931-1933 when Rosing's disciple Vladimir Zvorykin, a Russian émigré living in the United States, and Soviet scientist Pavel Shmakov, published their research papers on commercial electronic television.



Pavel Shmakov

Pavel Shmakov headed the Department of Television at our Institute for fifty years. In 1924, he teamed up with Mikhail Shuleikin to set up a duplex wireless telephone link with a moving train. Three years later, he supervised a long-distance photo-telegraphic connection between Moscow and Berlin. Shmakov developed short-wave television in 1931, and a television system for oil-well monitoring in 1955. Shmakov invented many other things as well, including ultrasound television, which he patented in 1933. In collaboration with Pyotr Timofeev, Shmakov improved the architecture of the television transmitting tube with image transposition. He also contributed extensively to colour and 3D television research.



The construction of the Sayano-Shushenskaya hydro-electric power station. Members of the Chair of Television are assembling an experimental submarine television installation in one of the workshops. (1982).

Even now, this distinguished scientist's students are still developing his ideas. Shmakov, for example, realistically conceived the practically unrealistic idea of creating television with smells. In his department, up to the present day, they have been continuing to work in this sphere, as before, studying prospects for improving the overall quality of television systems.

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