

Vladimir Vasil'evich Migulin (On his seventy-fifth birthday)

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July 10 of this year marked the seventy-fifth birthday of the well-known Soviet radio-physicist, corresponding member of the Academy of Sciences of the USSR Vladimir Vasil'evich Migulin.

V. V. Migulin was born in 1911 in the city Sereda (now the city of Furmanov, of the Ivanovskaya region) into the family of a textile engineer. In 1928 he entered and in 1932 graduated from the Leningrad Polytechnical Institute.

After going to Moscow in 1934 V. V. Migulin was employed as a scientist at the P. N. Lebedev Physics Institute of the Academy of Sciences where under the guidance of Academician L. I. Mandel'shtam and N. D. Papaleksi he carried out investigations on the parametric excitation of oscillations and parametric regeneration which have become the basis of the theory and design of modern parametric amplifiers and transducers.

Migulin carried out a series of pioneering investigations on radio interferometry which enabled him to determine the phase structure and the velocity of radio waves in the course of their propagation along the earth's surface. The results of these investigations formed the basis of a number of radio navigation systems, radio geodesy and other practical applications of the methods of radio interferometry.

In 1935 Academician L. I. Mandel'shtam attracted the talented young scientist to teaching at the Moscow State University in the department headed by him devoted to oscillations. Since that time Migulin practically never broke his association with the physics faculty of the Moscow State University having progressed from being an assistant to the head of the department.

During the years of World War II Migulin, just as the rest of the Soviet people, devoted all his energy to improving the defense potential of the USSR. In 1946 he was awarded the State Prize of the USSR, and earlier than that was awarded the Order of the Red Star.

In 1951 Migulin was appointed director of the Sukhumi Physicotechnical Institute (Georgian SSR) in which he carried out extensive scientific and organizational projects. The results of this work were rewarded by a second State Prize of the USSR in 1953.

Between 1957 and 1959 Migulin served as the deputy General Director of the International Atomic Energy Agency (Vienna, Austria).

From 1962 up to 1969 he headed the department of the Institute of Radio Engineering and Electronics of the Academy of Sciences of the USSR in which at that time development was taking place of low-noise parametric amplifiers and work was carried out on the construction of receivers for millimeter and submillimeter radiowaves using indium antimonide detectors with sensitivity down to 10^{-12} W/Hz.



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These receivers were awarded gold medals at the Leipzig fair of 1966 and at the Exhibition of the Achievements of State Economy of the USSR in 1967.

In 1969 Migulin was elected to be the director of the Institute of Terrestrial Magnetism, Ionosphere and Radiowave Propagation of the Academy of Sciences of the USSR where he was directly involved in guiding the work on the investigation of the earth's ionosphere and magnetosphere. He was the principal participant of the Soviet experiment "Zarnitsa" (summer lightning) on the injection of electron beams into the ionosphere leading to the excitation of artificial aurora, and also of the Soviet-French experiment "Arax" on injecting electron beams into the earth's ionosphere and magnetosphere with the passage of electron beams from the southern hemisphere into the northern one.

He was also the scientific leader of the programme for the artificial earth satellite "Interkosmos-19" launched in February 1979 which successfully operated until April 1982. With the aid of this artificial earth satellite a number of new

phenomena was discovered associated with the interaction of electromagnetic radiation and charged particles. He also directed work on the investigation of the influence of natural and artificial perturbations of the ionosphere on the work of radio systems utilizing the distant ionospheric propagation of short radio waves.

Migulin's innate feeling of the new and promising directions in science and the breadth of his scientific interests facilitated the rapid organization and the conduct of investigations in different scientific directions. Thus, in 1967–1968 in the department of the physics of oscillations in the Moscow State University together with Ya. B. Zel'dovich and V. B. Braginskii he carried out work on searching for free quarks and establishing the upper limit on the possible number of quarks: less than 1 quark per 10^{20} nucleons.

Since 1968 and up to the present time investigations of systems with Josephson junctions have been carried out under the direction and with participation of V. V. Migulin at the Moscow State University, the Institute of Radio Engineering and Electronics and the Institute of Terrestrial Magnetism, the Ionosphere and the Propagation of Radiowaves of the Academy of Sciences of the USSR. The theory of the behavior of Josephson junctions in electrodynamic systems has been developed. The effect of single frequency parametric regeneration in oscillatory systems with Josephson junctions was observed and was registered as a discovery in 1984. In the industrial laboratory for cryogenic electronics headed by V. V. Migulin within the physics faculty of the Moscow State University new logic and memory elements for new generation computers are being successfully developed utilizing the Josephson effect. A theoretical basis has been given for limiting noise characteristics of receivers utilizing Josephson junctions. Within the Institute of Terrestrial Magnetism, the Ionosphere and Propagation of Radiowaves a radiometer for waves in the millimeter range based on utilizing the Josephson effect has been constructed with the fluctuation sensitivity of 0.01 K.

V. V. Migulin has always combined active scientific work with training on its basis of highly qualified specialists—radiophysicists with a wide ranging background, candidates and doctors of science who are now working successfully within the Institutes of the Academy of Sciences of the USSR and of other scientific enterprises of our country.

In 1970 V. V. Migulin was elected a corresponding member of the Academy of Sciences of the USSR, since 1972 up until the present he is the deputy academician-secretary

of the Division of General Physics and Astronomy, responsible for work on radiophysics, radioengineering and geophysics, and also for the international contacts of the institutions within the Division of General Physics and Astronomy of the Academy of Sciences of the USSR. From 1972 until 1978 he was the vice-president of URSI, and is the chairman of the Soviet national committee on URSI. He is also the deputy chairman of the scientific council on the complex problem "Propagation of radiowaves" and the chairman of the Soviet commission on the international research on the magnetosphere.

Migulin actively participates in All-Union, and also in international scientific conferences and meetings, and at many of them he was the head of the Soviet delegation.

He is a member of the physics sections of the committee on Lenin and State Prizes, a member of the editorial board of the journal "Radio Engineering and Electronics" and a member of a number of scientific councils.

A communist since 1945, V. V. Migulin has always actively participated in the work of Party organs at the place of his work. He was repeatedly elected a member of the city committees of the Communist Party of the Soviet Union in the cities of Sukhumi, Podol'sk, and a candidate-member of the Abkhaz regional committee of the Communist Party of Georgia, and also into the elected party organs in his place of work. He has been elected a deputy of the Moscow regional Soviet of People's Deputies.

His indefatigable and fruitful scientific, pedagogical, scientific-organizational and community activity has been rewarded by government awards: two Orders of Lenin, the Orders of the October Revolution and of the Red Banner of Labor, the Orders of the Red Star, "Badge of honor," many medals including medals for participating in the Second World War.

V. V. Migulin is highly respected as a well-known scientist, as a good organizer and as a talented educator of the next scientific generation. He is also characterized by wide erudition, modesty, benevolence, conviviality and sense of humor.

We congratulate Vladimir Vasil'evich on his seventy-fifth birthday, and we wish him health, vitality and new successes in laboring for the benefit of the motherland.

Translated by G. M. Volkoff