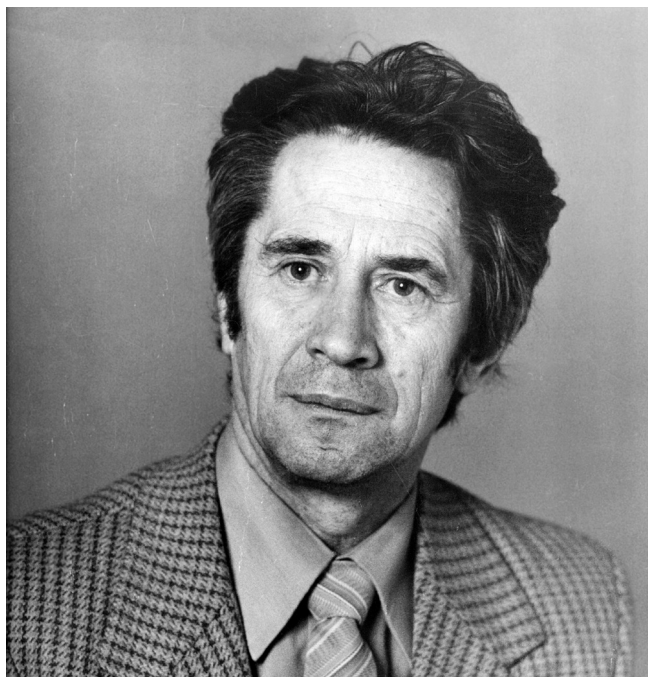


On the Ninetieth Birthday of Yu.M. Popov



Yurii Mikhailovich Popov, a notable Russian scientist, was born on 24 May 1929 in Penza. After graduating with honours from the Moscow Engineering and Physics Institute in 1953 he joined the Lebedev Physical Institute (FIAN) of the Russian Academy of Sciences (RAS) where he actively works now.

Under the supervision of I.E. Tamm, Yurii Mikhailovich wrote and defended his candidate of science dissertation in 1957 on the interaction of π -mesons with nucleons. Then, he performed several theoretical studies at the Laboratory of Luminescence at FIAN, in particular, the pioneering work in which he substantiated the existence of the limiting efficiency of cathodoluminescence (no more than 40%). This result proved to be also valid for electron-beam-excited lasers.

Yurii Mikhailovich begins to collaborate simultaneously with N.G. Basov to realise the idea of using semiconductors for lasing. In 1958 Yu.M. Popov together with N.G. Basov and B.M. Vul put forward for the first time an assumption of the possibility of creating lasers based on semiconductors excited by a pulsed electric field. Further studies (1961) performed together with N.G. Basov and O.N. Krokhin allowed them to propose and substantiate the methods for creating semiconductor lasers excited by electron beams, optically pumped, and excited by the injection of current carriers through the p–n junction. Yurii Mikhailovich in a group with

other researchers was awarded the Lenin Prize for these investigations (1964). The doctoral thesis of Yu.M. Popov ‘Methods for obtaining states with the negative temperature in semiconductors’ (1963) was the first dissertation in the field of semiconductor lasers. However, the scientific interests of Yu.M. Popov were not restricted only by these studies. A comprehensive list of his scientific works (about 300) includes papers on self-transparency in semiconductors, arithmetical calculations with the help of optics, optical memory, etc. The contribution of Yurii Mikhailovich to the development of first excimer lasers in the world (1970) should be especially pointed out (the State Prize in 1978).

The investigations of electron-beam-pumped semiconductor lasers performed with his participation resulted in a considerable increase in their output power and efficiency and in the extension of their spectral range. Y.M. Popov was awarded the Ioffe Prize of the Presidium of RAS for a series of works on cathodoluminescence and cathode-beam-pumped semiconductor lasers.

In the last years Yurii Mikhailovich has paid a great attention to the improvement of injection lasers and the development of high-power, efficient and long-lived injection lasers for pumping solid-state and fibre lasers, materials processing, medical and other applications. Under his supervision two clean rooms were equipped at FIAN, in which the technology for mounting crystals of high-power laser diodes was developed and a record output power (more than 25 W) for an individual laser diode was obtained at 808 and 975 nm.

Using these radiation sources, efficient diode-pumped cw solid-state Nd:YAG and Nd:YLF lasers were developed. A compact source of THz radiation was fabricated based on the method of generating a difference frequency of dual-wavelength solid-state diode-pumped lasers. Active work is underway to create technologies for domestic laser ceramics and lasers based on it. For the series of works ‘High-power injection lasers and their applications’ Yu.M. Popov was awarded the N.G. Basov gold medal of the RAS in 2015.

The education of young scientists always took an important place in the activity of Yu.M. Popov. Yurii Mikhailovich is the founder of the scientific school ‘Semiconductor lasers’. For more than 50 years he is a professor at the Moscow Institute of Engineering and Physics. The works performed at scientific laboratories headed by Y.M. Popov were awarded four State Prizes.

Yurii Mikhailovich is awarded the Order of the Red Banner of Labour and many medals. He has been a member of the Editorial Board of *Kvantovaya Elektronika* since the journal foundation.

We heartily congratulate the hero of the day with a glorious date and wish him good health and new creative success.