

## Yurii Georgievich Abov (on his 90th birthday)

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On 7 November 2012, the outstanding Russian physicist, Corresponding Member of the Russian Academy of Sciences (RAS) Yurii Georgievich Abov, celebrated his 90th birthday.

This exceptionally long life in science started in 1947 when Abov, having graduated from the Department of Physics of Moscow State University (MSU), walked into the Institute of Experimental and Theoretical Physics (ITEP; known in 1947 as Laboratory No. 3 of the USSR Academy of Sciences; now A I Alikhanov ITEP, established and supervised by Academician Abram Isaakovich Alikhanov). Yu G Abov took an active part in the first experimental heavy-water nuclear reactor start-up in the country. He has been a pioneer in creating the Cauchois type neutron crystalline diffractometer and measuring neutron cross sections of fissionable nuclei. Later on, he supervised the building of a multicrystal neutron spectrometer with a high angular resolution and the discovery of dynamic (coherent) phenomena under diffuse scattering of neutrons by nearly perfect crystals and of correlation effects in multiple small-angle scattering. For the first time, he used the method of a double-crystal diffractometer in studying interference phenomena in multiple small-angle neutron scattering.

Yu G Abov executed a large-scale research program in the physics of nuclear reactors; he thus designed and built a critical testing line for the heavy-water reactor of the first Czechoslovakian atomic power station and measured the main constants that were later employed in reactor design calculations. For the contribution that he made in the 1940s–1950s to the technology of heavy-water reactors, he was later decorated with the Order ‘Sign of Honor’.

The main field of Yu G Abov’s scientific interest after 1960 was the study of manifestations of parity nonconservation in nuclear interactions. Having then become the head of the laboratory, he inspired the first Soviet successes in producing beams of polarized thermal neutrons, thereby creating a tool for the study of parity nonconservation in nuclear reactions. These studies led him to the discovery (jointly with P A Krupchitskii and Yu A Oratovskii) of the weak interaction of nucleons in nuclei, after experimentally observing the asymmetry of gamma-quanta emission during radiation capture of polarized neutrons. For a series of studies on this topic, he was awarded the Lenin Prize 1974 [along with P A Krupchitskii (ITEP), V M Lobashev, and V A Nazarenko (the B P Konstantinov Petersburg Nuclear Physics Institute, PNPI)].

In the early 1960s, Yu G Abov and his colleagues developed a new approach to the study of nuclear magnetic resonance and of the relaxation of short-lived beta-active nuclei in crystals—beta-NMR spectrometry. This method



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had unprecedented sensitivity; it is by this method that physicists discovered the enhancement of the relaxation process occurring during simultaneous action of cross-relaxation and two-spin resonance. It was also applied to studying the migration of spin excitation in a disordered spin system, and to obtaining some other outstanding results in the kinetics of defect formation and in spin dynamics.

In the 1980s, Yu G Abov headed the program of generating a beam of ultracold neutrons in the ITEP reactor, and building the first magnetic trap for neutron confinement.

Yu G Abov was always aware of the importance of working with the younger generation. Since 1978, he has taught at the Moscow Engineering and Physics Institute, currently the National Research Nuclear University MEPhI, where he delivers special courses on neutron physics and fundamental interactions. He co-authored a monograph *Polarized Slow Neutrons*, textbooks on *Neutron Beams and Neutron-Optics Phenomena*, *Neutrons and Fundamental Symmetries*, and some others. Abov’s personal example and striking research enthusiasm have inspired many young scholars to become actively engaged in the quest for knowledge. His students include the biggest names amongst experts on nuclear physics and solid state physics.

It is hard to overestimate the scope of Yu G Abov's activities in the challenging realm of science administration: for many years, he was Editor-in-Chief of *Nuclear Physics*, one of this country's leading scientific journals; he was also a member of the Bureau of the Nuclear Physics Division of the Russian Academy of Sciences, sat on a number of specialized supreme attestation boards, ITEP's Scientific and Technical Council, and MIFI's Learned Council, and chaired MIFI's State Examination and Attestation Commissions. In the capacity of Chair of the State Examination Commission, Yurii Georgievich was capable of spotting a young scholar's brilliant abilities as early as at the viva voce of their diploma work.

People who know Yurii Georgievich admire his ability not to lock himself into the narrow field of purely scientific interests. He is a known art lover whose spheres of interest include painting, poetry, and music. Fully dedicated to a consistent fundamental way of thinking, Yurii Georgievich does not limit himself to mere contemplation; he has a keen understanding of these spheres, which he is always willing to share. He has a vast erudition in philosophy; in fact, for a long time he led a study group in the philosophy of natural sciences. Yu G Abov's personal traits, such as his objectivity, modesty, empathy, and readiness to support others, give his current and past colleagues a feeling of profound satisfaction with the collaboration.

With all their hearts, Yurii Georgievich Abov's friends, colleagues, and disciples wish him good health, many more years of invariably fruitful work in the field he loves, and happiness!

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