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PERSONALIA

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Gennadiĭ Nikolaevich Kulipanov (on his sixtieth birthday)

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January 25, 2002 is the 60th anniversary of the vice chairman of the Siberian Branch of the Russian Academy of Sciences (SB RAS), deputy director of the G I Budker Nuclear Physics Institute of the SB RAS, director of the Siberian Centre of Synchrotron Radiation, corresponding member of the RAS, Gennadiĭ Nikolaevich Kulipanov.

Gennadiĭ Nikolaevich is a world-famous expert on charged particle accelerators. In 1963, having graduated from the Novosibirsk Electrotechnical Institute, he joined the Nuclear Physics Institute of the SB RAS. G N Kulipanov began his life in science working on VEP-1 — the first in the USSR and one of the first storage rings in the world with colliding beams — and took part in a series of unique experiments on the nonlinear dynamics of electron beams.

Later Gennadiĭ Nikolaevich was one of the most active participants in launching the new electron – positron storage ring VEPP-3 (1971) which implemented a number of novel technical approaches and novel techniques for working with beams. By 1973 it became clear that electron storage rings, and VEPP-3 among them, could be used not only for high energy physics but also to generate high-power synchrotron radiation (SR) with a spectral brightness that exceeded the brightness of X-ray sources by many orders of magnitude. To achieve this, it was necessary to develop techniques for extracting SR from the vacuum chamber of the storage ring, and to develop methods for running experiments utilising this radiation. It was necessary to run an intense campaign of spreading the knowledge of the unique properties of the synchrotron radiation among researchers in biology, chemistry and physics who did not yet recognise its potential. The famous review published in *Soviet Physics Uspekhi* 1977 (together with A N Skrinskiĭ) became a desktop must for each scientist using SR in their research.

About this time G N Kulipanov organised the all-USSR Conference on SR Problems in Novosibirsk. Since then he has chaired these conferences every two years in Novosibirsk (only in 1990 was Moscow chosen to host this conference). The workshops and conferences proved very fruitful for the growth and spread of the new field in Russian and world science.

Immediately after the very first experiments based on synchrotron radiation, it became obvious that the spectral brightness of SR sources needed intensification. The simplest method of raising the SR brightness is to use magnetic wigglers in linear gaps of the storage system. The use of wigglers with high magnetic fields also leads to expansion of the spectrum of the emitted radiation and to the generation of high-energy photons. Gennadiĭ Nikolaevich headed the work on developing several original wiggler designs at the Nuclear Science Institute (including the world-first designs based on superconducting coils) which nowadays operate in Russia, Germany, Korea, the USA, Switzerland and Japan.

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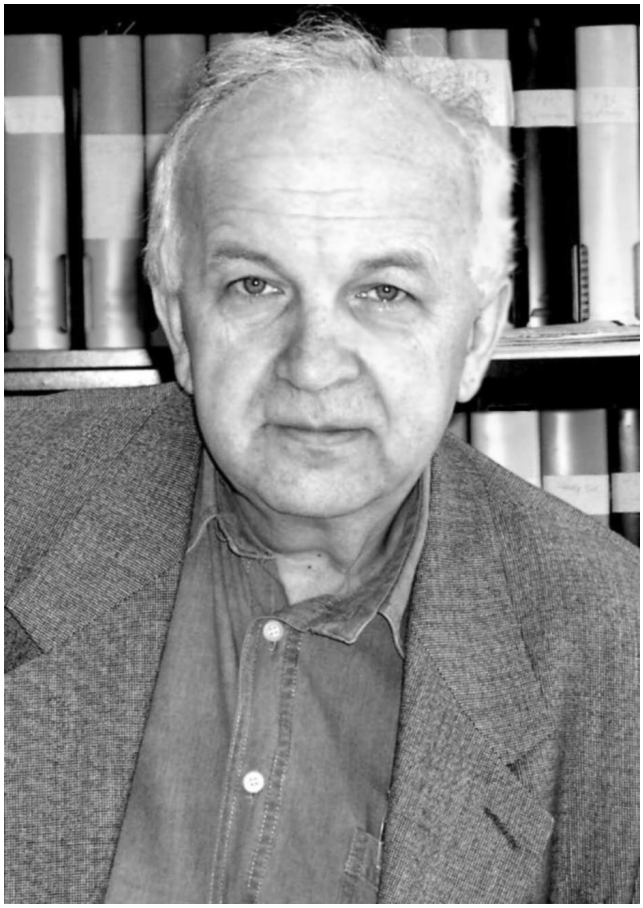

Gennadiĭ Nikolaevich Kulipanov

Kulipanov's hard work and enthusiasm led to the creation, on the basis of storage rings at the Nuclear Physics Institute (NPI) of the Siberian Branch of the Academy of Sciences, of one of the first research centers on synchrotron radiation in the world. Numerous groups of Soviet (Russian) and foreign scientists worked on the experimental facilities of the center during its lifetime (since 1973); and many original results were obtained and reported.

G N Kulipanov and his colleagues suggested methods of building an optimal magnetic system for the storage ring (optimising the intensity and brightness of the SR emitted from wigglers). Today this approach is universally accepted and applied the world over when storage rings are designed as sources of synchrotron radiation. One such source created at the NPI of SB RAS under G N Kulipanov's guidance recently started operations at the Kurchatov Institute.

Several years ago Gennadiĭ Nikolaevich proposed to stop using storage rings as a means to further increase the brightness of sources. If electrons are accelerated in a high-frequency accelerating system to several GeV and passed through a long wiggler, and if then this (processed) electron

beam is decelerated in the same acceleration system, then the cross-section of the electron beam in this recuperating accelerator will be much smaller than in a storage ring. This design produces significant gains in brightness. Experts appreciated the promise of this type of design relatively rapidly and nowadays such projects are being discussed in many countries.

In addition to work on SR generation, G N Kulipanov's laboratory conducts research on free electron lasers (FEL). Having implemented several brilliant new ideas, the NPI of SB RAS built experimental facilities with record-high parameters and now occupies the leading position in this field. G N Kulipanov is currently supervising the construction of a powerful FEL for research in photochemistry. Once this facility starts operating, Russian scientists will have a unique tool for fundamental research and for testing promising technologies.

His extensive knowledge in various fields and highly professional approach allow G N Kulipanov to formulate interesting and important problems which may be solved using synchrotron radiation and FELs, and to take part in working out successful solutions. A brilliant and emotional personality, eager to share with people his vision and his optimism, G N Kulipanov always attracts colleagues. Gennadiĭ Nikolaevich combines his research activities with teaching, having created in Russia a new field of research — applications of synchrotron radiation — and a new science school in this field.

We congratulate Gennadiĭ Nikolaevich on his 60th anniversary and wish him enviable health, happiness and new achievements.

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