To the memory of Dr. V.P. Koptev

On January 12th 2012, Vladimir Petrovich Koptev, the Head of the Laboratory of Meson Physics and Condensed Matter at the Petersburg Nuclear Physics Institute (PNPI) died suddenly. He was an outstanding physicist who devoted his entire life to the service of science.

After graduating from the Leningrad Polytechnic Institute, Vladimir entered a branch of the LPTI (now the PNPI) in 1963. While working at the institute, he rose steadily from trainee to become head a research laboratory.

Over his many years in PNPI, Vladimir initiated, organized, and led many experimental programmes. From the start of the operation of the 1 GeV proton synchrocyclotron in PNPI, he was actively involved in laying the foundations for good experiments. This involved the setting up and measurement of the characteristics of the low and medium energy pion channel and a unique muon channel as well as the creation of high-energy neutron beams. Vladimir made an enormous contribution to the design and installation of the first detection system (hodoscope) on the pion line. A full programme of high precision measurements of the differential cross sections for elastic pion-nucleon scattering was the topic of his doctoral dissertation (1977). Under his supervision, studies were carried out on $\pi^{\pm}$-mesons and sub-threshold K^{+}-meson production in proton-nucleus collisions, as well as precision determinations of the pion and kaon lifetimes, the results of which are still some of the most accurate in the world.

In 1986 Vladimir was appointed head of the Laboratory of Meson Physics and Condensed Matter. Under his direction, the Muon Spin Rotation (μSR) facility was created, and

this is still unique in Russia. This apparatus allows one to measure internal magnetic fields inside condensed matter in the temperature range from 4 to 300 K and in external magnetic fields up to 1.5 kG. Investigations of different materials (such as spin-glasses, high-temperature superconductors, shape-memory alloys, rare-earth manganites and manganates, ferrofluids, chromium steels, and many more) have been carried out using this setup.

Vladimir's group worked simultaneously on the design, construction and setup of the ANKE magnetic spectrometer at Jülich in Germany. He was a driving force there on experiments on sub-threshold K^+ production in proton-nucleus interactions as well as on the production of mesons and hyperons close to threshold in proton-neutron as well as proton-proton collisions.

As a person, Vladimir Petrovich was indeed a unique character. Although his methodology preferred a fundamental approach to a problem's solution, he did not disdain practical things. It is perhaps not widely known that, though Vladimir was a first-class experimentalist, he possessed great mathematical skills and could have made a career in theoretical physics.

Vladimir had also a wonderful gift of teaching and he trained more than a dozen doctoral students. His special features were his versatility, the ability to explore new directions in a short time, to go deep into new physics as well as engineering problems, and to obtain the desired results from them. He was able to absorb the ideas and knowledge of his colleagues and staff very fast in order to achieve the maximum success of his laboratory. Work under the leadership of Vladimir Koptev was fascinating but, of course, very hard. He constantly put forward new ideas. Some of these led nowhere but others were crucial and they all had to be tried.

A lot of important work was done under his direction. He always aimed to keep his institute as a world leader in works with which it was involved (e.g. the μSR-studies, as well as the investigation of sub-threshold kaon production). Vladimir's huge contribution in fundamental science was made possible by his talent, dedication and perseverance in reaching this goal; he was uncompromising in dealing with scientific issues. The name of Vladimir Petrovich will be forever remembered by members of his laboratory, by staff of the St. Petersburg Institute of Nuclear Physics, as well as by his foreign colleagues.

To honour his memory, the organizing committee of the 11th Workshop on Existing and Future Projects between PNPI (Gatchina) and FZJ (Jülich) decided to bring together this selection of his scientific publications.

Stuff of the Meson Physics and Condensed Matter Laborotary