

*Dear friends,*

*Our new issue traditionally addresses some of the most outstanding achievements in the world science made in 2012, which have are on the TOP -10 list of the journal "Science". Comments on these breakthroughs by well-known scientists will help the readers assess their importance and prospects for the world and national science.*

*First and foremost, we are referring to the discovery of the Higgs carrier particle – a new elementary particle necessary to construct the so-called Standard Model, which describes processes occurring in the microcosm. This discovery may have been the last "within the reach" of modern physical tools: a further increase in the size and cost of devices similar to the Large Hadron Collider is hardly possible. It cannot be ruled out, however, that if the significant deviations from the exact predictions of the Standard Model revealed in the decay of the new particle are confirmed, the scientists will peep over the modern concepts of the elementary particle physics.*

*In contrast to this sensational discovery, the massive experiment carried out at Daya Bay (China) on the mutual transformations of the three types of neutrinos has recently been known only to specialists. And yet, the world-level results of this experiment have augmented our understanding of the Standard Model. It is appropriate to recall that Russian physicists, making part of the international collaboration teams, have participated in the creation of the Large Hadron Collider, discovery of the Higgs boson and development of the unique 80-ton detectors of electronic antineutrinos at Daya Bay.*

*In 2012, LCLS, the X-ray Free Electron Laser, has turned out its first "product": the structure of a protein that is the causative agent of the African human trypanosomiasis. The brightness of the radiation of this unique setup makes it possible to examine the crystals that are one-hundredth of the ordinary size. Though this laser has first operated at SLAC National Accelerator Laboratory, the idea of the new method was put forward by the scientists of the Nuclear Physics Institute, Siberian Branch, USSR Academy of Sciences (Novosibirsk) back in 1980, and a dozen of its former workers were directly involved in LCLS development and start.*

*Academician Nikolay L. Dobretsov,  
Editor-in-chief*



*Operating in the Institute of Nuclear Physics, Siberian Branch, Russian Academy of Sciences, is the world's most powerful free-electron terahertz laser, whose production was financed by the Institute itself. However, according to the institute's Deputy Director Academician G.N. Kulipanov, if we wish to be within the framework of the world science, it is the government that should be concerned about the development of a new-generation national source of X-ray synchrotron radiation.*

*In this issue we are approaching, once again, a topical medical problem related to the treatment of oncologic diseases. This time we are referring to a revolutionary form of therapy based on the innate ability of viruses to kill the cells they have infected. This discovery was made in mid-last century but only in the recent decades, thanks to the outstanding achievements in molecular biology, genetics and biotechnology, specific interactions between the carcinolytic viruses and cancer cells have been described and strains advanced for therapy have been detected.*

*In October 2010, Novosibirsk State University won the first academic mega-grant competition held by the Russian government. The grants are intended to support the research conducted in Russian universities under the supervision of leading scientists. The funds received were used to start, at the university, an up-to-date laboratory system (the first to the east of the Urals) to study microorganisms and develop, on their basis, biomedical applications. It will be a perfect base at which highly qualified specialists, future personnel of research institutes and biotechnological companies, will be trained.*

A handwritten signature in black ink, appearing to be 'N. Dobretsov'. The signature is stylized and written in a cursive-like font.