Dear Friends,

When science was in its infancy, there were no separate, clear-cut fields of knowledge. All the scientists were, in fact, generalists, and all the studies were, in modern parlance, interdisciplinary. Further on, the process of cognizing the world went along two distinct yet inseparable paths: the deepening specialization and the desire to give a whole picture of nature and man from the knowledge accumulated in the various fields of science. However, assembling such a global "mosaic" from the enormous amounts of information accumulated within the narrow disciplines is now becoming ever more complicated.

An outstanding example of a modern universal research instrument applicable in a wide range of fields of science and technology is synchrotron radiation. Today, it is used to decrypt the elemental and molecular composition of a substance down to the individual isomers, investigate fast processes such as shock wave propagation, conduct continuous monitoring of the internal state of engineering structures, and even explore the microstructure of paleontological and archaeological finds without damaging the latter.

The applications of synchrotron radiation (SR) were the focus of the UK–Russian roundtable "New Horizons of Accelerator Technology: The Present and Future of Bright Synchrotron Radiation Sources" in Novosibirsk Akademgorodok, which brought together physicists from Novosibirsk and Moscow and the leaders of Diamond Light Source Ltd and the John Adams Institute for Accelerator Science (United Kingdom). This issue of SCIENCE First Hand not only presents the results of scientific research conducted with the use SR and new technical solutions aimed at the development of new generations of SR sources but also shows why the Budker Institute of Nuclear Physics RAS, which participated in the development of almost all the major synchrotron centers in the world, is itself a "shoemaker who goes barefoot" since it only has a nonspecialized synchrotron radiation source of the first generation.

In addition to building bridges between the different disciplines, there is another global challenge in science and innovation, i.e., the existence of the so-called "Death Valley," a formidable barrier between science and industry. The path from an idea to its practical implementation is often long and fraught with high risks and costs. However, this does not mean that we should not step on that path. Creating synergies between cutting-edge research and industry to overcome the "Death Valley" is the focus of the article by Andrei Seryi, a graduate of Novosibirsk State University, who now heads the John Adams Institute for Accelerator Science (United Kingdom).

An epitome of multidisciplinarity is the unique project to create a new center for art and culture in Berlin, which is implemented by the Prussian Cultural Heritage Foundation. This institution, which includes the sixteen State Museums of Berlin, the National Library of Berlin, and other research organizations, is by far the largest cultural institution in Germany and one of the largest of its kind in the world. The main goal of the project is to create an "integral image of the Universe in a limited space," using the latest tools and knowledge. The project involves large-scale works to restore and modernize the libraries and museums on the famous Museum Island, a complex of museums that was created in 1830, whereby each museum is dedicated to the cultural and artistic heritage of a particular historical epoch and particular cultural tradition. Eventually, four of the five museums on the Museum Island will be connected by underground galleries, the so-called Archaeological Promenade, which will serve, in a sense, as the sixth "universal" museum designed for interdisciplinary exhibitions. It will reflect the multifaceted themes that occupied the human mind irrespective of the epochs and regions, such as life after death, the concept of beauty, etc. For more details about the project read the article by the president of the Prussian Cultural Heritage Foundation and the world-famous archaeologist Hermann Parzinger.

One more way to create a complete picture from the kaleidoscope of data and hypotheses is to implement projects that bring together scientists from around the world, who add to these projects their own vision, culture, and experience. One such project has been the exciting and fruitful expedition of Siberian archaeologists to another side of the Earth—Ecuador—to address one of the most engaging problems of pre-Columbian archeology.

We have called this journal issue The Epoch of Acceleration to draw parallels with the Epoch of Revival. The scope of this metaphor goes beyond the recent development of accelerating science and technology to encompass the acceleration of information flows between the various scientific disciplines, between academia and industry, between people from different countries and cultures. The content of this issue has been selected to reflect these crucial current tendencies.

We believe that today is a time when the humankind has a chance to consciously accelerate the "light flux" of scientific knowledge.

Academician Nikolay L. Dobretsov,
Editor-in-Chief