# Everything Hinges on Personalities: Long Interview about the Present and Future of Siberian Federal University

On November 4, Siberian Federal University celebrated its birthday. Since 2006, the university has changed a lot, especially in recent years. Ruslan Baryshev, vice-rector for research of Siberian Federal University, told Newslab how the coronavirus affected it, how successfully the university managed to switch to online, what the university scientists have achieved at the international level, and what SibFU is doing for ordinary Krasnoyarsk residents.

**Has the coronavirus affected research at SibFU?**

If we take the research process at the university in general, unlike the educational process, we did not need any radical alternations in it. We had grants obligations, and scientific thought cannot be stopped, so it involved only the necessary measures related to social distancing and some limitations of the access to the laboratories. Another thing is that working with funds has become more complicated: some of the competitions were postponed until autumn, so many universities did not receive the funds they were counting on.

The pandemic affected international communication the most. We shift to remote, kept in touch, wrote articles together, but scientists from different countries did not have a chance for a face-to-face meeting. Of course, we had to either postpone or transfer into a hybrid format (or completely into a remote format) the conferences that the university regularly held. This year, 12 conferences we reduced to only 4 in-person, the rest were held online, and some moved to 2021.

In this challenging situation, we had to strengthen the scientific infrastructure and material base. Firstly, we have seriously strengthened the digital, strengthened video conferencing platforms, took advantage of offers from Google and Zoom, when they gave their packages for free.

> *"We had a fleet of unoccupied computers, we distributed them to those researchers who had to work remotely, but did not have their own computer. It turned out that there are such people even in our time. By the end of the year, we are planning to improve this too."*

Amid the pandemic, we made a rather bold decision to open a new scientific laboratory on artificial intelligence. The average age of its employees is 25 years. This is rather unique because the university is quite a conservative structure. However, we looked at the results of young people, offered to write a roadmap for development – and an interethnic team was fused of 3 young researchers from Russia and one from Iraq. They have several scientific areas in their work. The key one – the so-called computer vision – is the analysis of images. And it does not matter which ones: from pictures of forests obtained with the help of drones to X-rays and CT scans of a chest for the prompt diagnosis of lesions caused by Covid-19.

Another scientific project that has been developed despite the pandemic is being implemented jointly with St. Petersburg State University. This is an assessment of the results of intellectual activity based on blockchain technology. The project is called EDEMES, it is funded by Russian Venture Company (scientific

and technological initiatives), and provides for the formation of data management chains from raw information from a conventional microscope to obtaining the result of intellectual activity by a scientist on its basis.

We began to pay more attention to the issues of the city. For example, creating smart traffic lights, shaping the image of the urban environment, or preserving the heritage and conducting archaeological excavations in areas where large-scale construction is to begin following the city's plans.

**What research areas at the university can be classified as leading?**

We managed to keep most of the areas that had been actively developing in the basic universities that were assembled into SibFU. The top scientific areas in which SibFU is known in the country and the world include radiophysics and photonics, biology (biotechnology and hydrobiology). The environmental theme is stated at the university quite robustly. In the field of dendroecology, we have a very serious cast of researchers working on climate change, the state of forests, and the dating of historical monuments of wooden architecture.

Our classics are metallurgy, new alloys. Thanks to the support of the Ministry of Education and Science and the Ministry of Industry and Trade of the Russian Federation, in collaboration with other organizations of the city, unique high-strength alloys have been created for use in road transport and shipping, a super-powerful energy-efficient technology for aluminium production has been developed, and technical solutions have been designed to reduce the hydrogen content in alloys. In metallurgy, our scientists are also very noticeable.

*"Genetics is one of the new areas which have appeared and began to develop in SibFU. We were the first to decipher the larch genome. We also have a joint genetics laboratory with Federal Medico-Biological Agency, where scientists study blood cancer and some other areas. The new areas also include quantum physics and artificial intelligence."*

A significant part of our research is related to the defence industry. In terms of the volume of R&D in this area, we stand out distinctly against the general background of Russian universities.

**Does SibFU participate in national projects?**

We participate in the national projects Science, Education and Ecology. National projects, in particular, the Science national project, is actually a request formulated by the state for what is now in demand. It is the task of universities and academic institutions to get involved in this work. Besides, the university will not receive project funds without participating in national projects, and the current funding is not enough for development. As part of national projects, we have created a regional mathematical centre. Now we are sending an application for an engineering centre. We hope to enter federal projects for the commercialization of intellectual activity.

**What is the applied value of the discoveries and developments of SibFU's scientists for the residents of Krasnoyarsk? Yenisei Siberia?**

The military makes communication systems for satellites (GLONASS systems); this is a very crucial state task. Our metallurgists develop alloys for ships. We also solve social problems, for example, we recently tested snus (chewing tobacco), and it came down to that the tobacco company that imports it sent us a claim but eventually withdrew it. Our research was done following the request of the city deputies, and later was turned into a bill, and we managed to safe some children at least. Law enforcement agencies turn to us if they need to prove that timber from this or that area was cut down illegally. We examine road reagents, and the quality of roads as a whole – there is a whole mobile laboratory that allows giving an opinion on how well the road has been built and how long the asphalt will last.

*“We remotely conduct research on sounding the earth, for example, we monitor the quality of crops or the migration of deer in the North. Our university has about 15 patents sorbents. It is a good start. At the request of the regional government, we went on an expedition to the place of the diesel spill in Norilsk. We took soil and water samples, and we will monitor this area in the future.”*

**SibFU is known for its popularizing activity. Every year, dozens of scientific events are held here, giving everyone, young and old, a touch of science, for example, NAUKA 0+ or the Big Lecture Hall. How has this format changed during the pandemic?**

The situation is changing. More recently, the closing of the All-Russian festival NAUKA 0+, which was opened in Moscow and which voyaged through several cities of Russia, was supposed to take place at Siberian Federal University. But now this science festival has moved to online. Sure, we have not given up the entertainment, or example, it ended at the end of November with a cool light show, we launched 500 drones. I will not reveal all the secrets, but we expected to surprise the townspeople.

As for the Big Lecture Hall, this is a very serious project, not trivial. Of course, many universities deliver public lectures, but from the very beginning we had the task of not just giving one popular-science lecture for outsiders, but we prepare a whole block related to the current problems of science and society. And it is called, respectively, SibFU Big Lecture Hall. This project is a title project for the university in the field of scientific and popularization work; we invite leading scientists. Now, taking into account the pandemic, everything is remote, but here remote work is only an advantage because we can invite those who previously had to take a long trip and who could refuse (some popular scientists have a schedule for a year in advance.)

**Will the “scientific profile” of the university change in the future?**

Over the past 14 years, the university's scientific activity has strengthened, acquired its own pattern. Today we combine the best achievements of universities merged into SibFU, but we do not stop there. We will introduce new scientific areas. we are forced to do so – the scientific world is very dynamic.

The formats are definitely going to change . First of all, we are talking about the collaborative nature of science. We would like to develop the potential of scientists from Yenisei Siberia by combining scientific thought and resources. We have good biologists, and there are good doctors at Medical University. That's great – we can do something together. Krasnoyarsk has Agricultural University, and SibFU has got a base associated with our botanical garden, and there is an agro-mathematics in the Academy of Sciences – this is a good triangle to create a science that will allow us to conduct fundamental research and solve quite applied problems. And testing them, say, is possible at Tuva State University.

Another trend which we intend to follow is multidisciplinarity. Now even dissertations are defended at the intersection, for example, of linguistics and medicine, or history and ecology. World science is moving towards the intersection of disciplines.

We also understand that the federal university must change the nature of the industries that have developed in the region and solve regional problems. We want to be useful to companies in the region. And we are actively working with them.

*“Now we are writing the University Development Program for several years ahead. Approaches to the organization of scientific work, priorities, goals and objectives – all this will go there and become our guidelines. It will be presented publicly soon.”*

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