This Report describes the strategy of the university as of a higher education institution of digital transformations, and captures the significant achievements and results of the educational, research, innovative, international, extracurricular, and sports activity of the university over the time span of 2016 through 2018. The Report aims at being used as a basis for determining the new points of growth for SUSU as an entrepreneurial university, while fully taking into account the possible difficulties and risks for successful fulfilment of the global tasks set before the university in compliance with the Project 5-100 Road Map.
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FROM MECHANICAL ENGINEERING INSTITUTE TO A UNIVERSITY OF DIGITAL TRANSFORMATIONS

Dear friends!

Three years ago, South Ural State University became part of the innovative program on the enhancement of competitiveness of Russian universities among the world’s leading research and educational centres, Project 5-100.

And this is the Report on the university’s activities aiming at reaching this global goal. The three years of the maximum concentration of the resources, expanding the research and entrepreneurial experience, and searching for new options and forms of development have yielded significant results.

Today we can confidently say that since the moment of becoming part of Project 5-100 in 2015 we have succeeded in an active breakthrough in the international, scientific and educational activity of the university.

Daily meeting the challenges of the times, SUSU has successfully evolved from a Mechanical Engineering Institute into a SMART university, which has chosen digital transformation of educational and scientific activity as a strategy for its development.

In 2018, when the university was celebrating its 75th Anniversary, South Ural State University was for the first time in its history listed in the prestigious ranking of the world’s top universities by Quacquarelli Symonds (QS) British consulting company, as well as was included in the RUR Ranking of the world’s best engineering universities for the first time.

In QS BRICS ranking, we climbed from place 138 up to 112. The university also improved its standing in Webometrics international ranking having climbed from position 2089 up to 2055. In the National University Ranking published by Interfax, the university climbed up to position 33. In the RAEX invention activity ranking, the university occupies places 12–14.

We implemented a new brand concept of SUSU as of a multinational and multicultural university uniting Europe and Asia; and acted as a venue for holding of the Forum of Rectors of the Leading Universities of Russia and Kazakhstan. In November of 2018, it was for the first time that the university organized a unique-for-Russia 2018 Global Smart Industry Conference, having gathered the world’s best minds in the field of digital production from Russia, USA, China, Germany, Portugal, Turkey, Italy, India, Poland, and other countries of the world.

In the past year SUSU successfully presented its experience in internationalization at the annual international EAIE Conference and Exhibition in Geneva, as well as took part in the APEA 2018 Exhibition Conference by Asia-Pacific Association for International Education, which was held in Singapore, and signed a number of agreements on collaboration with the leading universities in China, Japan, Taiwan, Malaysia, Republic of South Africa, Germany, France, the Netherlands, the United States of America, and Canada.

Today a new organizational structure is efficiently functioning at the university. The SUSU schools and institutes have moved up to the international level with regard to attracting foreign colleagues to teaching and scientific activities: 7 postdocs and 60 international postgraduates from the universities of Russia and from around the world were attracted in 2017. In 2018, SUSU Postdoc Contest was held once again, and as a result 7 more postdocs are in the process of being hired at the moment.

Over the three years a polylingual environment has been created at the university. Training is being carried out using the method of blended learning, which is based on the developments by Cambridge University Press and Oxford University Press. More than 3000 students, academics and administrative staff members have taken English training under the new method.

Starting from September 1st of 2018, project-based learning is implemented at SUSU. Most of the projects are ordered by the region’s companies and businesses, as well as by international companies such as Emerson, SMS Group, Siemens.

Currently, 33 projects are running, which involve Master’s students, postgraduates and Bachelor’s students of the Centre of Elite Training. These projects are being fulfilled at all 10 schools and institutes.

In 2017, SUSU became the first one in Russia to release Bachelor’s degree holders in Construction who obtained their education within the distance training programme. Today, 13 Bachelor’s and Master’s distance education programmes are being fulfilled at SUSU with their total number of students exceeding 3000 people.

To improve the quality of training, virtual laboratories were added to the four programmes opened in September of 2018. It is planned to expand the coverage of the distance education technology in the university.

In 2017, Children’s Internet University project was launched. It aims at popularizing scientific knowledge among children aged 8 and older, as well as at promoting SUSU in the educational space. Over 100 video lessons were recorded, which were viewed more than 250000 times.

A Massive Online Open Courses (MOOC) studio was created at SUSU. 7 MOOCs are located on federal Internet platforms Lektorium and Pushkin Institute (online course on alternative energy and Russian Language courses) with the total number of attendees exceeding 5000 people.

The university is successfully developing the blended learning. One third of the staff members use the LMS system on a regular basis; they receive new materials, constantly update information, and test their knowledge. To achieve this, 500 academics took training on using the LMS system, and on creating customized online courses. In 2018, we launched 6 blended-learning-format courses on social sciences and humanities, which are already now training around 1000 students.

It is planned to make 100% of the disciplines for students of the 1st and 2nd years of studying available in the blended-learning format by 2020.

Over the three years of the university’s participation in Project 5-100, the scientific and innovative work in all the SUSU schools and institutes has become significantly more active. The majority of the university
FROM MECHANICAL ENGINEERING INSTITUTE TO A UNIVERSITY OF DIGITAL TRANSFORMATIONS

THE PATH TO OUR SUCCESS!

1943
CHELYABINSK MECHANICAL ENGINEERING INSTITUTE

1951
CHELYABINSK POLYTECHNIC INSTITUTE

1990
CHELYABINSK STATE TECHNICAL UNIVERSITY

1997
SOUTH URAL STATE UNIVERSITY

2010
NATIONAL RESEARCH UNIVERSITY

2015
PROJECT 5-100

Subdivisions published their papers in the journals of the highest quartile Q1. Three journals of the university are included into prestigious databases Web of Science and Scopus. The biggest share of publications in the highly rated journals is in the fields of Engineering and Material Science. Our scientists took part in the international archaeological collaboration, which united 11 countries and 4 fields of science: Archaeology, History, Virology and Biology. The most outstanding results of this work are the publications in Nature journal.

The university is a strategic partner of the world’s leader in automation and the world’s biggest electrical engineering company, Emerson, and has supplied trained-to-modern-standards engineering staff to practically all the enterprises of this international corporation in Russia.

Jointly with Emerson, the university is performing research-and-development work, organizing the systems of grants for scientific activity, and developing the scholarship fund for students. Thanks to the collaboration with our university, Emerson created a Global Engineering Centre in Chelyabinsk, and built an enterprise on manufacturing measurement instrumentation in South Ural region, having invested more than 40 million dollars into its construction.

For many years South Ural State University has been fruitfully collaborating with Roscosmos State Space Corporation, with Kamaz, the major manufacturer of heavy trucks in Russia, and with many other businesses.

Over the span of 2017–2018, big world-class laboratories were opened at SUSU: Information Security Research and Education Centre of Kaspersky Laboratory; Laboratory of additive Technologies. Mechanics, Laser Processes and Digital Production Technologies; Siemens Laboratory at the SUSU Computer Engineering Centre; and Online Technologies Laboratory.

Samsung Industrial Internet of Things Laboratory is opened. And 8 international research laboratories are successfully functioning – these were created in 2016–2017 and are headed by the leading foreign scientists from the United Kingdom, Germany, India, Canada, Mexico, USA, France, and Slovakia.

In the past year, with the support from the head of the SUSU international Laboratory for Self-Monitoring and Self-Validating Sensors and Systems, Professor of University of Oxford Manus Henry, the university was included in a unique joint project on engineering a three-phase flow meter for oil-and-gas industry with the performance requirements higher than those of its world analogues.

And this is the proof to the fact that on its path towards joining the world’s education and science elite South Ural State University is successfully fulfilling its mission under Project 5-100: creation and application of scientific knowledge and training of a new generation of leaders capable of solving global tasks on sustainable development and changing this world for better. I am sure that many more victories and accomplishments are awaiting us!

Rector of South Ural State University,
Doctor of Sciences (Engineering), Professor,
Chairman of the Council of University Rectors of the Ural Federal District

Alekandr SHESTAKOV
The global transformation, currently in the process at SUSU, turns the higher education institution into a digital entrepreneurial university and defines its development for many years in advance.
SUSU MISSION

Creation and application of scientific knowledge and training of a new generation of leaders capable of solving global tasks on sustainable development and changing the world for better.

Education using SMART technologies is a modern-times necessity in the context of the fast development of Industry 4.0. According to the 2017 world survey by PWC Digital IQ, companies most of all are willing to invest into the field of IoT (Internet of Things). The Industrial Internet of Things is a set of solutions for collection, transmission, and aggregation of data, as well as platforms allowing to process data and use them for the fulfillment of "smart" solutions in industry. IoT takes the first place among all the breakthrough technologies, which according to researchers will change the traditional business-models in the nearest future.

South Ural State University is reconsidering the concept of the university educational, scientific-research, commercial, and social activities.

Forming of a world-class research and entrepreneurial SMART university in order to ensure sustainable development of the Big Ural region is the integral strategic goal of SUSU.

STAGES OF SUSU TRANSFORMATION

According to the university’s Road Map under Project 5-100, over the reporting period SUSU has passed the first stage of transformation (2015–2017) when the main mechanisms of transformation were determined and its first results became obvious.

At the second stage of transformation (2018-2020) SUSU focuses on developing the breakthrough fields – the research topics integrating computer sciences and engineering, and related to active implementation of the Internet of Things into industry.

By the year 2025 SUSU is planning on becoming a leading university with an efficient management structure, high international academic reputation, and on meeting the world trends in development.

SUSU TASKS

New economics
Development of entrepreneurship in high-technology fields.

Innovations
Digital Ural as a territory of sustainable development.

Attracting talents
Ensuring high attractiveness of the university to students and academics from around the world.

Education
Creating an open model of education focusing on individual development of each student and providing the best opportunities to SUSU graduates.

Scientific and research activity
Making world-class breakthroughs in the priority fields of research.

Efficient management
Ensuring the university’s sustainable development thanks to efficient system of management and sustainable financial model.

Making breakthroughs in science and research will allow to use the breakthrough solutions in improving the industry efficiency and the recognizability of the university across the world. Transformation of the training process will attract the best staff to the region and will ensure a head start for its sustainable development. The sustainable financial model and efficient system of management will allow for successful fulfillment of the initiatives in order to reach all the goals mentioned above.

ENTREPRENEURIAL UNIVERSITY

RISK-TAKING CULTURE

MO tivating BY AN ENTICING VISION

LEVERAGING REGIONAL ADVANTAGES

BENEFITING FROM GLOBAL TRENDS

CULTIVATING UNIVERSITY’S UNIQUENESS

CHAMPIONING MODERN TECHNOLOGIES

IMPLEMENTING THE TRANSFORMATION MECHANISMS

SETTING ON THE LEADERS – FOCUSING ON THE BREAKTHROUGH FIELDS

WORLD-CLASS RESEARCH AND ENTREPRENEURIAL UNIVERSITY

2015–2017

2018–2020

2025
SUSU, A SMART UNIVERSITY OF TRANSFORMATIONS

INSTRUMENTS OF THE UNIVERSITY TRANSFORMATION

ADMINISTRATIVE AND MANAGERIAL ACTIVITIES

Optimization of the management structure
New management bodies were created at the university: the International Scientific Council and the Supervisory Council, the members of which include the leading foreign and Russian scientists, heads of governmental authorities, as well as business-leaders. Among the above mentioned people are President of the Business Council of the Eurasian Economic Union Victor Khrustenko, President of Emerson Corporation Michael Anton, and prominent international scientists.

A model of university management was developed and adopted, according to which the rector makes the strategic decisions based on the decisions by the advisory collegial bodies, that is the Supervisory Council and the International Scientific Council. The transformation is controlled by the University Senior Management, the members of which include vice-rectors and heads of the leading subdivisions of the university. Each vice-rector supervises over the field entrusted with him/her: development of science, or development of the system of education (elite training, project-based learning and distance education, or advanced language training for students). All the fields of the internal digital transformation are being fulfilled under the guidance of the Vice-Rector for Informationization. Project-based approach is being fulfilled in all the mentioned fields at the faculties and departments under the supervision of directors of the schools and institutes.

Concentration of resources
South Ural State University performed the transformation of the organization structure aiming at concentration of the main resources of the university. Over 30 SUSU faculties were organized into 10 schools and institutes. Meanwhile, the optimization equalled 41%.

EDUCATIONAL ACTIVITY

Elite training programmes
In the course of the last three years, SUSU implemented 20 elite training programmes in economics, computer sciences and engineering, developed jointly with employers. These programmes include advanced studying of mathematics, computer sciences, English, as well as forming of the communicational skills and mastering of professional disciplines.

Project-based learning
Starting from September 1st of 2018, project-based learning was implemented at SUSU. The customers in most of the projects are the region’s companies and business entities, as well as international companies like Emerson, SMS Group, or Siemens. As of today, 33 projects are launched with the total of 200 students involved. These being Master’s and Bachelor’s students of the of the Centre of Elite Training. These projects are being fulfilled in all 10 schools and institutes.

Polylingual environment
Over the three years a polylingual environment was created at the university using the method of Cambridge University Press. More than 3000 students, academics and administrative staff members took English language training based on this method.

Distance education
In 2017, SUSU became the first one in Russia to release Bachelor’s degree holders in Construction who fully obtained their education within the distance training programme. All in all, 13 Bachelor’s and Master’s distance education programmes are being fulfilled at the university with their total number of students exceeding 3000 people. To improve the quality of training, virtual laboratories were added to 4 programmes in September of 2018.

Massive Online Open Courses
SUSU is actively developing training via Massive Online Open Courses (MOOC). At present, 7 NMOOCs (on alternative energy and learning Russian) are created at the university and are located on federal internet platforms Lektornik and Pushtinik. The total number of attendees exceeds 5000 people.

Blended learning
SUSU is consistently developing the LMS technologies of education. Today one third of the staff members use the LMS system on a regular basis, they upload new materials, constantly update information, and test their knowledge. In 2018, 6 blended-learning-format courses on social sciences and humanities were opened, which are already now training around 1000 students.

INTERNATIONAL ACTIVITY

Since the first days of SUSU’s joining Project 5-100 the university has been improving its standing in the national and international rankings. In 2017, SUSU became listed in the TOP 10 of the classical universities, according to the Ranking of Demand for Universities of the Russian Federation as compiled by the Russian Federation Ministry of Education and Science, and as per the Social Navigator Project by MIARussia Today.

In 2018, South Ural State University was listed in the prestigious ranking of the world’s top universities by Quacquarelli Symonds (QS) British consulting company.

Also, for the first time SUSU was listed in the RUR Ranking of the world’s best engineering universities, natural sciences and social sciences universities. In QS BRICS ranking, SUSU climbed from place 136 up to 112 over the year of 2018.

To prepare foreign citizens to enrolling with SUSU and for the adaptation of international students, a Sociocultural Adaptation Centre was created at the university. Here students are provided with an opportunity to learn spoken Russian, get introduced to the Russian culture and traditions, and find friends among students from other countries.
Today, students of more than a hundred nationalities from 52 world’s countries are studying at the major Russian university.

The university, in the frameworks of the strategy on entering the world’s educational space, is performing the task of vast cultural interaction and mutual exchange between Eastern and Western nations.

SUSU sets a goal to be one of the leading universities of the largest continent on Earth – the Eurasia continent. According to the objectives of Project 5-100, the university aspires to strengthening its positions as a scientific-and-research, educational and innovative centre among the world’s universities, which would allow it to make significant theoretical and practical contribution to innovative development and global competitiveness of Russia in Eurasia and around the world.

**Gryphon – EUROPE**

A symbol of velocity, strength, bravery, interdisciplinary scientific knowledge of the world.

**Lion – ASIA**

A symbol of wisdom, justice, patronage, kindness, and enlightenment.

---

SCIENTIFIC AND RESEARCH ACTIVITY

A strong vector of the university’s development under Project 5-100 is its scientific and research activity. More than 40 research-and-education centres and laboratories are functioning at SUSU, including 8 international research laboratories headed by the leading foreign scientists.

The university is demonstrating a general tendency towards notable increase in the number of publications in international highly rated editions.

An important indicator in the assessment of the university’s scientific activity is the growing number of citations.

As of today, the Web of Science search platform has indexed over 1749 SUSU publications over the recent 3 years (2016–2018), what equals 1.05 units per one member of the academic staff. A similar indicator in Scopus database over the period of 2016–2018 amounts to more than 2099 articles.

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REPUTATION AND IMAGE ACTIVITY

**Upgrade of the SUSU web-site**

The web-site’s content and format were re-oriented for the external audience in compliance with the marketing strategy of the university. According to Webometrics Ranking of World Universities, published late in January of 2018, SUSU improved its standing in the world ranking by 34 positions, having climbed from place 2089 up to place 2055, as compared to the previous ranking edition, SUSU occupies the 24th place among the universities of Russia.

**University rebranding**

In 2017 the university underwent complete rebranding as a multinational and multicultural university unifying Europe and Asia. A new logo and a unified brand book were adopted.

**University’s brand platform**

Today, SUSU is a SMART university uniting Europe and Asia. The university is located in the heart of the Southern Urals, at the intersection of two parts of the world – Europe and Asia, and in the very place where the Great Silk Way, which connected the Western European countries with China, run in the ancient times. At the modern stage of development it was namely SUSU that became the foundation of positive social and economical changes in the region: development of powerful industry, preservation of unique nature, creation of a cross-nation cultural and ethnical environment facilitating new discoveries and international collaboration.

Today the tendency to developing new connections between countries of different civilizations and social and economic systems of Europe and Asia is the leading trend of internal and foreign policy of Russia.

These key circumstances became the basis of the new corporate brand mark of the university. The new logo preserves continuity of the best university’s traditions, and at the same time it reflects the new development path of SUSU – the multinational, multicultural university situated at the intersection of Europe and Asia.

**The university’s main building**
SUSU, A SMART UNIVERSITY OF TRANSFORMATIONS

SUSU IN INTERNATIONAL AND NATIONAL RANKING

Currently, there is a general trend of assessing the leading universities through ranking. The methods of building the rankings, both national and international ones, vary. Each organisation, when compiling a ranking, chooses the priority fields of a university’s activities, and elaborates the calculation methods by assigning the efficiency indicators to an organisation.

INTERNATIONAL RANKINGS

QS WUR Ranking (2019)*

*The title of QS rankings includes the year next to the year of issue. For example, QS WUR 2019 ranking gets published in 2018. This way the ranking agency indicates the cycle of publishing all its rankings (beginning in 2018 and ending in 2019).

QS-BRICS Ranking
Assesses universities from BRICS countries

QS-EECA Ranking
Assesses universities from the Emerging Europe and Central Asia

In 2018 South Ural State University was for the first time listed in this ranking, which is considered to be among the most influential ones. Every year over 4 thousand universities from around the world are assessed in this survey. As a result, a ranking of 1000 top universities is compiled, as well as rankings in certain disciplines and regions.

INTERNATIONAL RANKINGS

RankPro Ranking
around the world: 573 in 2017, 414 in 2018

UniRank Ranking
around the world: 1393 in 2017, 1284 in 2018

NATIONAL RANKINGS

RAEX University Rank
English-language web-sites ranking of Russian universities

Interfax Ranking

RUR Ranking in Natural Sciences (2018)
Copper League: TOP 500

RUR Ranking in Technical Sciences (2018)
Global League:

RUR Ranking in Social Sciences (2018)
Global League:
GOALS AND TASKS OF THE COUNCIL

The International Scientific Council was established at SUSU to coordinate science and research in accordance with the best world practices within Project 5-100.

Establishment of the Council is one of the most important initiatives under the fulfilment of the university Road Map program.

Michael Train, President of Emerson corporation, acts as the Council Chairman.

The Council members are the world’s leading scientists with rich research experience in supercomputing, aerospace engineering, chemistry, nanomaterials, biomedicine, optics, and quantum informatics.

COUNCIL MEETINGS

The first meeting of the International Scientific Council was held at SUSU in October of 2016. In the course of three days the members of the International Expert Council visited the university research laboratories and centres, learned about the material and technical resources, and met the university staff. The foreign scientists gave an expert assessment of the university scientific projects listed among the activities being fulfilled within the Road Map under Project 5-100. Also, the Council members delivered open lectures. In 2017, two more meetings of the International Scientific Council were held.

In March of 2017, at the Council’s meeting held in the format of a teleconference, the leadership of South Ural State University discussed the results of the university activity over 2016 under Project 5-100 with the Council members.

Among the participants of the online meeting were Dr. Jaewan Kim, Dr. Panayotis A. Koutensis, Dr. Thomas Ludwig, Dr. Ashokkumar Muthupandian, President of Emerson company Edward L. Monser, and representatives of PwC international consulting company.

The participants of the online meeting approved the trajectory of the university’s development and made suggestions on further improvement of the efficiency of the university’s work.

At the third meeting of the Council, which was held in June of 2017, Chelyabinsk was visited by such scientists as: President of Emerson company Edward L. Monser (till 01.10.2018), Acting President of KIAS University in Seoul Dr. Jaewan Kim, whose research interest lies in quantum informatics; Dr. Ron de Kloe, Professor of Leiden University and Royal Netherlands Academy of Arts and Sciences, who studies human vulnerability to stress-related disorders and is known for his discoveries in the field of studying the effects of stress on brain; and who is also a specialist in organic chemistry and editor of Molecules and ARKIVOC journals; Dr. Panayotis Andreas Koutensis of the University of Cyprus, who is a physicist and chemist specializing in sonochemistry and who has greatly contributed into producing the materials for food and dairy industry; Dr. Ashokkumar Muthupandian of the University of Melbourne, a physicist and optics specialist, and Professor Maria Josefa Yzuel of the University of Barcelona participated in the meeting via teleconference.

Also, the Council members delivered open lectures for students and seminars for the university staff. The President of Emerson corporation devoted his speech to the Fourth Industrial Revolution and the Industrial Internet of Things; Dr. Panayotis A. Koutensis – to the promising fields of chemistry development; Dr. Ron de Kloe – shared on the psychoneuroendocrinology of stress; Dr. Ashokkumar Muthupandian – on the basics and methods of ultrasound treatment in the technologies of producing food and functional materials.

Within the three days the members of the International Scientific Council were studying the details of the process of fulfilling big research projects at SUSU, discussing the possible ways of being listed in the QS general and disciplines rankings, and were giving comprehensive recommendations on further positioning of the university.
The Supervisory Council is a collegial university management body, which was created at South Ural State University in accordance with Federal Law No.174-FZ “On Autonomous Institutions” as of 03.11.2006 and with the SUSU Charter.

The Supervisory Council includes considering of the issues related to the strategy of the university development, university’s financial and economic activity, property management, sharing, and to many other aspects of the university life and activity.

At the first meeting of the SUSU Supervisory Council, which was held on December 9th of 2016, its Chairman was elected – Victor Khristenko, President of the Business Council of the Eurasian Economic Union; SUSU Rector Aleksandr Shestakov presented the strategy of the university development till the year of 2020. In 2017, three more meetings of the SUSU Supervisory Council were held.

On January 30th of 2017, the following positive decisions were made: The Regulations on the Supervisory Council’s functioning was approved, a positive conclusion was given by the Council on the Draft Plan of the financial and economic activity of FSBEU HE “SUSU (NRU)” for 2017 and the planned period of 2018-2019, and a decision was made on opening a current account in PAO Sberbank of Russia.

On June 13th of 2017, at a scheduled fourth meeting, amendments were introduced into the university’s Plan of the financial and economic activity for 2017; the SUSU’s Plan of the financial and economic activity for the planned period of 2018-2019 was approved; the 2016 annual accounting reports were approved, and the report on the results of the activity on the SUSU property use as of 2016 was approved.

A separate section on the agenda was devoted to the strategy of the university’s development for the coming years. The details of the relevant trends in the university development were discussed at the working meeting with Rector Aleksandr Shestakov, and later – within the frameworks of the session on strategic planning, which closed the business agenda of the Council.

In 2018, SUSU held 8 meetings of the Supervisory Council in the framework of voting in person and absentee voting.

On March 21st of 2018, in the course of the meeting of the Supervisory Council’s members the issues on amending the SUSU’s Plan of the financial and economic activity for 2018 and the planned period of 2019-2020 were considered.

The next scheduled meeting of the SUSU Supervisory Council was held on June 15, 2018 in Moscow. The Council’s members approved a big transaction on management of the money assets – a federal budget subsidy for capital investments into the capital construction facilities of the Russian Federation state property within the frameworks of the activities on Making up for the Deficit of the Accommodation Places in Dormitories for International Students under the Russian Federation government program on Education Development.

On October 17th of 2018, the issues were considered on reporting by the university on the fulfillment of the plan of activities within the 5-100 Competitiveness Enhancement Program; on choosing the credit organisations, in which the university could open bank accounts, and more.

On December 6th of 2018, new members of the Supervisory Council participated in the meeting, including: Director of the Department for Coordinating the Activity of Higher Education Organisations at the Russian Federation Ministry of Science and Higher Education Ekaterina Babelyuk; Deputy Minister of Science and Higher Education of the Russian Federation Sergei Kuzmin; and Deputy Minister of Industry and Trade of the Russian Federation Vasily Osmakov.

Victor Khristenko
President of the Business Council of the Eurasian Economic Union

Areniy Brykin
Deputy General Director of AJ Rusalikaya Elektronika (Russian Electronics)

Alia Vuchkovich
Executive Director of Paralympic and Sports Policy of Roscosmos State Space Corporation

German Vystkin
President of SUSU, Director of Sciences (Chemistry), Professor, Corresponding Member of RAS

Vladimir Gutev
First Deputy Chairman of the Russian Engineering Union

Ekaterina Babelyuk
Director of the Department for Coordinating the Activity of Higher Education Organisations at the Russian Federation Ministry of Science and Higher Education

Natalya Kadycheva
Deputy Head of the Interregional Territorial Department of the Federal Agency for State Property Management for the Chelyabinsk and Kurgan Regions

Sergei Kuzmin
Deputy Minister of Science and Higher Education of the Russian Federation

Oleg Sienko
First Vice President of Russian Copper Company

Vasily Osmakov
Deputy Minister of Industry and Trade of the Russian Federation

Alexandr Chumakov
General Director of the International Press Club. Chumakov PR & Consulting
For the first time in Russia, a unique international scientific conference, 2018 Global Smart Industry Conference, was held at South Ural State University November 13th through November 15th of 2018. Among the participants were prominent scientists from more than 10 countries of the world: from the USA to China.
GLOBAL SMART INDUSTRY CONFERENCE

GOALS AND TASKS OF THE CONFERENCE

Digital industry determines the trend in the intellectualization of production processes, including the use of cyber-physical systems, implementation and operation of smart factories, use of the methods of machine learning and Big Data mining for the purposes of optimization of technological processes, achieving of the new quality of products and improving the efficiency of production. The research studies and developments aiming at solving such tasks of industry are becoming of paramount importance in the course of the transformation underway.

The 2016 Global Smart Industry Conference (GloSIC’2016) was organized in order to discuss the achievements of the world’s leading universities and research-and-development centres in development of innovative models, methods and technologies for the digital industry and the experience of their implementation in big transnational and domestic industrial companies. An important task of the conference was to determine the prospects for the development of Smart Industry technologies, integration of industrial companies, scientific organizations and authorities to create promising technologies of digital industry.

The conference topics covered the following main fields in digital industry:  
- Condition monitoring and control for intelligent manufacturing;  
- Industrial robotics;  
- Components of and sensors;  
- Wireless sensor and actuator networks;  
- Digital Twins technologies;  
- Additive manufacturing technologies;  
- Big Data, machine learning and artificial intelligence for Industry 4.0 management;  
- Human-machine interaction in industrial systems;  
- Security and privacy protection in industrial networks;  
- Virtual and augmented realities for Industry 4.0; and more.

Plenary speakers:

- **Michael Train**, President of Emerson corporation, USA
- **Andrei I. Rudskoy**, Doctor of Sciences (Engineering), Full Professor, Academician of the Russian Academy of Sciences, Rector of Peter the Great St. Petersburg Polytechnic University
- **Aleksandr Shestakov**, Doctor of Sciences (Engineering), Full Professor, Rector of South Ural State University, Russia
- **Andrey Ronzhin**, Doctor of Sciences (Engineering), Full Professor, Director of St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences, Russia
- **Peter Zornio**, Chief Technology Officer, Emerson corporation, USA
- **Philippe Bertrand**, Professor of National Engineering School of Saint-Etienne, France
- **Igor Movchan**, Professor of National Engineering School of Saint-Etienne, France
- **Andrei Tchernykh**, Full Professor of Centre for Scientific Research and Higher Education at Ensenada, Mexico
- **Goran Putnik**, Full Professor, University of Minho, Braga, Portugal
- **Shen Yin**, Professor of Harbin Institute of Technology, China
- **Okay Kaynak**, Professor of University of Science and Technology Beijing, China, and Bogazici University, Turkey
- **Fei Tao**, Professor of Beihang University, Beijing, China
- **Manus Henry**, Professor of University of Oxford, United Kingdom
- **Alessandro Beghi**, Professor of University of Padova, Italy
- **Jonathan Cullen**, Professor of Cambridge University, United Kingdom
- **Konrad Swirski**, Professor of Warsaw University of Technology, Poland

The conference was supported by:  
- Russian Foundation for Basic Research;  
- Emerson corporation;  
- South Ural State University, Chelyabinsk, Russia;  
- IEEE Russia Siberia Section;  
- South Ural IEEE Chapter.

CONFERENCE PARTICIPANTS AND PARTNERS

ABSTRACTS OF THE PRESENTATIONS BY THE PRINCIPAL SPEAKERS

SECURITY EVERYWHERE: SECURITY ECOSYSTEM IN THE DIGITAL TRANSFORMATION AGE

Andrei Tchernykh  
Centre for Scientific Research and Higher Education at Ensenada, Baja California, Mexico

Many fields, such as “smart” industry, “smart” healthcare, “smart” oil-and-gas industry, “smart” cities, etc., are being integrated into the ecosystem of the Internet of Everything (IoE). This platform combines smart sensors, cloud computing and networks. It is becoming the growth driver for the digital economy. Nevertheless, there exist vulnerabilities in this platform, which can be made use of, as well as attractive targets for possible threats, which can bring high risk to confidentiality, integrity and accessibility related to loss of information, closure of access for a long period of time, information leakage, conspiracy, etc.

Security must be everywhere: it must be built into the smart network infrastructure, smart sensors, industrial processes, oil and gas fields, data storage, transport, and control.

Within this presentation, the methods and algorithms were discussed for supporting the expectations and requirements of the IoE security in the context of unknown risks, which are difficult or impossible to predict, and which cannot be controlled proactively. The analysis was performed on the requirements to cybersecurity, the threats to security and reliability, the risks and attacks, security violations, data storage security, etc.

The detailed algorithms of ensuring reliability, accessibility, confidentiality and security of cloud data storages were presented. As an example, characteristics were given to the aspects of cyber security in the oil-and-gas field throughout the whole process cycle: production, collection, separation, terminals operation, processing, transportation, distribution, etc.

The dynamics of the characteristics and flexibility of IoE bring significant uncertainty to the different levels of computations, communication and data storage. One of the tasks includes the smoothing over of the uncertainty with regard to technical failures, violations to data security, etc.
GLOBAL SMART INDUSTRY
CONFERENCE

Also, the mechanisms were described for the regulated and adaptive security, reliability and redundancy, which are necessary for working with different preferences of users, different workloads, states of the system, cloud computing platforms, etc.

The following issues were as well considered: problems of planning the computational tasks for different scenarios of cloud infrastructures; problems of the resources optimization in case of uncertainty, which vary from the processing of the heterogeneity of the resources, dynamic behavior of the execution context, as well as the uncertainties related to security, cloud storages, containerized clouds, and the Internet of Things.

EDUCATION 3.0 AND SOCIAL
NETWORK-BASED EDUCATION
Goran Pulnik
Doctor of Sciences, Professor,
Systems Engineering and Operational Research at Centro ALGORITMI research unit, University of Minho, Portugal

One of the main priorities of the Europe 2020 strategy’s agenda is the rational growth, meaning that the economy of Europe should be based on knowledge and innovations at the levels, which require changes in the quality of education, improving the education systems and making them more efficient. This lecture presents the emerging paradigms of education, such as Education 3.0 and Social Network-based Education (SNE), which many authors consider to be the drivers of the changes necessary in education. Education 3.0 and SNE are based on several arising topics, such as chaos and complexity management in organizations, training organizations, and complex networks theory. Moreover, the speaker presented a concept of Learning Factory (LF) as an instrument for efficient synchronization of education and industry, especially for a wide range of modern businesses, as well as for production. The conceptual framework of Education 3.0 implementation was also based on several fields, including the interconnection architecture, management, technologies and methodology of teaching, compiling of curricula, and space and time.

Finally, the presentation provided a model of education based on social networks within the Education 3.0 paradigm, which is being fulfilled at University of Minho for 6 years now as part of an integrated Master’s programme on Industrial Engineering and Management.

DIGITAL TRANSFORMATION
Öknyay Kaynak
UNESCO Department of Mechatronics,
Bogazici University, Turkey

The presentation describes the deep technological changes that have happened around us within the recent twenty years, as supported by the new achievements both in software and hardware. In the past years, in an attempt to change the whole format of the industrial automation, these developments were fulfilled, especially in Germany, under the name of Industry 4.0. The main distinctive feature of Industry 4.0 is the integration of the virtual world and the physical one through the Internet of Things (IoT). Such engineering systems are called Cyber Physical Systems. These are based in and depend on a seamless integration of the computational algorithms and physical components. The digital transformation is what more fully describes what is going on around us. The presentation provides a discussion of the integration of artificial intelligence with the digital transformation in the form of “smart” production.

REINFORCEMENT LEARNING
AI-LED MONITORING AND CONTROL
OF INDUSTRIAL CYBER PHYSICAL SYSTEM
Shen Yin,
Professor of the School of Aeronautics, Harbin Institute of Technology, China

The focus of research in the era of Industry 4.0. As compared to the tasks on monitoring and control in traditional sectors, such systems cause big problems with consideration to integration of virtual cyber environment and physical devices. Thus, to solve these tasks, a reliable monitor and a reliable controller of the changes in the process parameters are required. The presentation gave a description of a systematic system of learning with the use of the approaches based on data functioning on the reinforcement learning methods. To analyse the stability.

FROM DIGITAL TWIN
TO DIGITAL TWIN SHOP-FLOOR
Fei Tao
School of Automation Science and Electrical Engineering, Beijing University, China

The presentation covered the existing scientific research on industry applications of digital twins (DT). Next, a five-dimensional DT model was given based on the practical requirements of “smart” production. The concept, composition, operational mechanism and key technologies of a digital twin shop-floor (DTS) were described. For the fulfillment of a DT-based cyber-physical synthesis, the four key aspects of the theory and technology of digital twins were considered, including the physical aspects, aspects of models, aspects of data and aspects of services. In the end of the presentation, the available relevant practical research by Beijing University were briefly introduced.

COLLABORATIVE ROBOTIZED
AND SOCIO-CYBERPHYSICAL
SYSTEMS
Andrei Rozchin
St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences, Saint Petersburg, Russia

The absence of the methods of consistent interaction and integration of physical, energy, computational, information and other resources of the socio-cyberphysical systems does not currently allow to achieve the emergent effect when solving the targeted tasks, which may involve several heterogeneous robots of various basing, stationary and in-built cyber physical devices, as well as amateur users and professional operators. The problems of energy efficiency, computational capacity, limitations of sensor, propulsive, manipulative and other in-built systems of the separately functioning robots and cyber physical services may be solved by combining the resources.

The work considered the methods and scenarios of the collaborative activity of heterogeneous robotic and socio-cyberphysical systems allowing to improve the interoperability of information and physical resources, and as based on the space-time structuring, to integrate them into complex high-level systems, which provide safe solutions for the national economy tasks of the digital society.
GLOBAL SMART INDUSTRY CONFERENCE

CONFERENCE RESULTS

The crucial result of the 2018 Global Smart Industry Forum was the agreement reached by the university with the Russian Federation Ministry of Digital Development, Communications and Mass Media on creating and developing in our country of a state system of digital industry supporting based on the fulfilled SUSU projects.

An important event was the opening of a new digital laboratory, Emerson Competence Centre, featuring the equipment which allows to improve the educational process in the field of automation technologies.

The Competence Centre equipment is a platform for training and research in the field of Industrial Internet of Things and digital transformation of enterprises.

In the course of the conference an industrial Exhibition opened in the SUSU’s main building, which was organized with the participation of the Government of the Chelyabinsk Region. The leading businesses of South Ural presented their exhibits on Industrial Internet of Things and industrial automation. Deputy Governor of the Chelyabinsk Region Ruslan Gattarov and Rector of South Ural State University Aleksandr Shestakov took part in the ceremony of the exhibition opening.

During the second day of the international conference the speakers shared on the advanced achievements in digital transformation of production, on the developments of the world’s leading universities and research-and-development centres in the field of Industry 4.0, as well as on the practices of implementing innovations at big transnational and national industrial companies. After the industrial session the world’s leading specialists in digital technologies took part in a round table and sections.

The third day of the 2018 Global Smart Industry scientific forum began with the ceremony of opening of Samsung Internet of Things Academy Laboratory at the SUSU School of Electronic Engineering and Computer Science. Deputy Minister of Information Technologies and Communications of the Chelyabinsk Region Vasily Kokoryukin, Rector of SUSU Aleksandr Shestakov and the leading specialist of Samsung Company Tatiana Volkova, who presented the high-technology possibilities of the laboratory to the students and guests and told about the peculiarities of this educational course, took part in the opening ceremony.

During the third day of the global scientific forum 9 sections were held with the discussions of the possibilities of the digital industry development. More than 50 scientific reports were presented. The topics of the sections included: New Educational Technologies for Industry 4.0; Security and Privacy Protection in Industrial Networks; Management; Basic Research for Industry 4.0.

Digital Twin Technologies; Cloud and High-Performance Computing for Smart Factory; Condition Monitoring and Control for Intelligent Manufacturing; Big Data, Machine Learning and Artificial Intelligence for Industry 4.0; Industrial Robotics; and Wireless Sensor and Actuator Networks.

The conference scientific presentations provided forecasts on the development of digital industry in the world. Most generally accepted were the following statements:

⇒ in the near future the production efficiency will completely depend on digital twins, managing the manufacture on the whole;
⇒ serious results will be achieved in digital industry along with the development of sensor networks, which will be used not just in the manufacture, but the other spheres as well;
⇒ the key fields of digitalization are being actively developed, and the results of the international scientific forum once again proved that the world is ready to cross the threshold into the new epoch called Industry 4.0.
The scientific and innovative activity of SUSU is developing with consideration to the trends of the Fourth Industrial Revolution and complying with the basic provisions of Project 5-100 Road Map.
HEADING TOWARDS DIGITALIZATION: SCIENTIFIC AND INNOVATIVE ACTIVITY

SMART INDUSTRY STRATEGIC ACADEMIC UNIT

The scientific and educational activity of SUSU within the Smart Industry Strategic Academic Unit (SAU) is based on the following key competitive advantages:

- **Experience in fulfilling of big projects in the priority research fields**
  The scope of the performed works related to the research fields of the Smart Industry in the priority industrial sectors of Big Ural amounted to 1.05 bln. roubles in 2014-2016. The stock of big orders is in the key fields of the Smart Industry amounts to 875 mln. roubles for 2018-2020.
- **Collaboration with the Russian Federation Ministry of Digital Development, Communications and Mass Media**
  In 2019, SUSU presented projects of the university’s priority development in the field of Digital Industry. Jointly with Magnitogorsk Iron & Steel Works an application is being prepared on creating a leading research centre for solving the tasks of two cross-cutting digital technologies under the national project on the Digital Economy of the Russian Federation: “robotics components and sensory aspects”; and “new production technologies”.

Developed contacts with industry
One of the key partners is the top metallurgical company, Magnitogorsk Iron & Steel Works; a world’s leader in industrial automation, Emerson corporation; one of the world’s leading companies in the field of metallurgical mechanical engineering, SMS Group; as well as a big motor vehicle enterprise, KAMAZ.

Educational programmes aiming at solving the tasks of businesses
Over 1700 students are taking training under the educational programmes in the fields related to various aspects of the Smart Industry and in collaboration with the industrial partners, such as Emerson, USA; Endress+Hauser, Switzerland; Samsung, South Korea; and Kaspersky Laboratory, Russian Federation.

FIELD EDUCATIONAL PROGRAMMES WITHIN THE SMART INDUSTRY SAU

More than 1700 students are studying in the fields of the Smart Industry, including 1446 Bachelor’s students and 257 Master’s students. The number of students from foreign countries studying under these educational programmes is increasing year after year:

- **Master’s programme (in English)**
  Development of Database Management Systems

- **Master’s programmes (in Russian)**
  Fundamental Computer Science and Computational Equipment
  Information and Communications Technologies and Electronic Means
  Instrumentation Engineering (internal educational standard, jointly with Emerson corporation)
  Control in Engineering Systems
  Bachelor’s and Specialist programmes (in Russian)
  Fundamental Computer Science and Computational Equipment
  Information Security at Industrial Enterprises
  Information and Communications Technologies and Electronic Means
  Instrumentation Engineering (internal educational standard, jointly with Emerson corporation)
  Control in Engineering Systems

Partners in fulfilling of the educational programmes:
- SMS Group, Germany
- Kaspersky Laboratory, Russia
- Samsung, Korea
- National Engineering School of Saint-Etienne, Saint-Etienne, France
- Emerson, USA
- Magnitogorsk Iron & Steel Works, Russia; and others

FIELDS OF RESEARCH-AND-DEVELOPMENT ENGINEERING PROJECTS

In 2016–2018, the total scope of the research-and-development works performed by SUSU over the three years for the clients in the priority sectors of industry exceeded 2.2 bln. roubles.

Field 1: Digital Twins and Model-Proactive Management
Project 1. Engineering the Systems of the Processes Model-Proactive Management
Project 2. Methods of Machine Learning and Very Big Data Mining for Solving of Industrial Tasks

Field 2: Development of Technologies for Parallel Processing of Very Big Amounts of Data, Using Column Representation and Information Compression in Cluster Computation Systems with Manycore Accelerators

Field 3: Sensors for the Industrial Internet of Things
Project 3. Development of Smart Sensors and Methods of Controlling the Systems’ Eigentests

SCIENTIFIC AND EDUCATIONAL ACTIVITY OF THE SUSU SUBDIVISIONS
FULFILLING THE SMART INDUSTRY SAU

- Digital Twins and Model-Proactive Management
  - Department of Automation and Control
  - Laboratory for Problem-Oriented Cloud Computing Environments (headed by Andrei Tchernykh, CICEE Research Centre)

- Methods of Machine Learning and Very Big Data Mining for Solving of Industrial Tasks
  - Department of System Programming
  - Department of Computational Mathematics and High Performance Computing
  - Supercomputer Simulation Laboratory (including the Supercomputer Centre)

- Sensor Systems and the Industrial Internet of Things
  - Emerson Plantweb Laboratory
  - Endress+Hauser Laboratory
  - Department of Informational and Measuring Technology

- Information Protection in Industrial Systems
  - Information Security Research and Education Centre of Kaspersky Laboratory
  - Department of Information Security

INFRASTRUCTURE SUPPORT OF THE SMART INDUSTRY SAU

- Supercomputer computational resources of the Supercomputer Simulation Laboratory
- Emerson Plantweb Laboratory
- Computer-aided Process Control System of Endress+Hauser Laboratory
- Personal virtual computer
HEADING TOWARDS DIGITALIZATION: SCIENTIFIC AND INNOVATIVE ACTIVITY

TOP OF SUSU SCIENTISTS WITH HIGH HIRSCH INDEX

The citation index is the adopted-in-science-world indicator of “importance” of works by a scientist, which is measured as per the number of references to the scientist’s publications in the reviewed scientific periodicals. The fact that a research-and-education organization has scientists with high Hirsch index is proof of high efficiency and productivity of the organization’s activity in general.

Dynamics of the SUSU academic staff members with the Hirsch index higher than 10

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<td>2017</td>
<td>18</td>
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<tr>
<td>2018</td>
<td>28</td>
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Viktor V. Atuchin

Condensed matter physics. Complex characterization of the structure and properties of crystalline materials.

Artem E. Masunov

Development and improvement of the efficiency of optically-active materials based on the multiscale simulation of properties, targeted design and modification of molecular and crystalline structures, using the strategy “Expanded Structural Model – Substance – Improves Material Properties”.

Liudmila I. Isaenko


Sergei V. Trukhanov

Preparative chemistry of solids, complex transition metals compounds, structural analysis, physics of magnetism, colossal magnetoresistance, multiferroics.

Igor I. Potemkin


Oleg A. Rakitin

Organic chemistry, sulphur-nitrogen-containing heterocycles, photovoltaics of the 3rd generation, organic semiconductors, materials for photonics and spintronics.

Aleksei V. Trukhanov

Magnetic and magnetotransport properties, materials for spintronics, multiferroics, low-dimensional magnetism, multiple-component oxide systems.

Valeriy V. Maslennikov


Lidia S. Konstantinova

Organic chemistry, sulphur-nitrogen-containing heterocycles, photovoltaics of the 3rd generation, organic semiconductors, materials for photonics and spintronics.

Maksim A. Grigoryev

Electric drives and multilevel semiconductor converters with improved mass and dimensions parameters for the facilities of metallurgy and oil-and-gas complex. Improving the reliability and stable operation of generators and relay automation systems at electric power plants and substations.

Evgenia B. Manukhina

Molecular mechanisms of stress. Non-drug (non-medicatied) mobilization of a body’s protective systems at the cellular and molecular levels.
The efficient scientific activity of SUSU is ensured by the close integration of the departments, research-and-development institutes, research-and-development laboratories, research-and-education centres, and the Research and Innovation Services of the university.


Financial Planning Office oversees the organization of scientific activity of the university subdivisions and branches by coordinating their interaction, renders practical assistance to the university subdivisions on signing contracts with businesses on performing research-and-development works.

Main functions of the Research Development Office include the initialization, promotion and organization of the fulfillment of big innovative projects for industrial enterprises.

Patent Office ensures high technical level, patentability and the patent freedom-to-operate of the project-designing and project-engineering works being performed at the university. Also, among the Patent Office’s main tasks is ensuring legal protection of the university-obtained results of intellectual activity in the Russian Federation and abroad. A new field of the Patent Office’s work is performing of the patent analytics for the university’s scientists and scientific teams.

Innovative Management Office deals with creating of small innovative enterprises, in which the university acts as one of the founders.

Information Management and Analytics Office works within the frameworks of creating a big-scale science-and-information field, expanding the university’s information contacts with the global information space as based on forming of the internal information environment.

SUSU collaborates with Russian and foreign universities, transnational corporations, Russian industrial enterprises, government authorities, participates in the programmes of innovative development of state corporations, as well as fulfils partnership within various technological platforms.

Mechanical Engineering Research Institute

The Mechanical Engineering Research Institute performs a wide range of research tasks in the priority fields of development of science, engineering and equipment in the energy and resources-saving technologies, mechanical engineering and metallurgy.

Main fields of work:

- providing various units, devices, high-technology prototypes required for scientific research,
- technical support in the course of performing scientific research and inquiry,
- providing equipment for the completion of doctorial and candidate theses.

The Mechanical Engineering Research Institute comprises:

- Experimental Mechanics Laboratory;
- Composite Materials Laboratory;
- Laboratory of Electronic Control System Design & Engineering;
- Mechanical Engineering Laboratory;
- Physical Simulation of Thermomechanical Processing Laboratory;
- Powder Metallurgy Resource Centre;
- Computer Engineering Centre.

Uctech-Profi Educational Equipment Manufacturer

Uctech-Profi Educational Equipment Manufacturer (Educational Technology & Equipment Research and Production Institute) deals with engineering and manufacture of educational equipment and visual aids for vocational educational institutions and training centres of enterprises, keeps expanding the products line, improves the quality of the products and increases the production capacity. The priority field is training and retraining specialists for them to acquire new competences and become capable of professional mobility in the context of growing competition.

The Institute provides equipment for more than 40 SUSU centres and laboratories, as well as for laboratories and classrooms of over 2 thousand universities, technical secondary schools, lyceums, vocational educational institutions, and retraining centres at industrial enterprises in Russia and abroad.

The Institute is an acknowledged leader among the Russian manufacturers of educational equipment. The product line includes more than 4000 different items of stands, training equipment and simulators, segmented models, and interactive and visual aids. The originality and scientific and methodological novelty of these developments have been confirmed by 73 patents, inventor’s certificates and software registration certificates, and the products comply with all the quality requirements.

Aerospace Engineering Research and Education Centre

- Elaboration of knowledge-intensive solutions in the aerospace and defence-industry sectors.
- Implementation of devices and technologies into industry.
- Products certification, and more.

Energy-efficient and Resource-efficient Technologies of Diesel Engine Manufacturing Research and Education Centre for Armoured Vehicles and Engineering Machines

- Performing research-and-development and design engineering works in the field of engine-transmission units and armoured vehicles chess, engineering and transport machines.
- Confirming the compliance of internal combustion engines, transportation vehicles, and of combustibles and lubricants with the requirements of the regulatory technical documentation, and more.

Nanotechnology Research and Education Centre

- Development of the methods of synthesis of nanocomposite catalysts for various chemical transformations.
- Designing of adsorption nanomaterials for cleaning water off radioactive elements, and more.

Sports Science Research Centre

- Assessing and monitoring of physical efficiency and functional state.
- Simulating adaptive states of a human being exposed to extreme conditions of the environment.
- Development of methods and devices for diagnostics, correction of biomechanics and recovery of the efficiency of a human being, and more.

Medical and Psychological Clinic Research and Educational Centre

- Quality training of professional medical psychologists through implementing the advanced methods of practice-oriented education for students and attendees of the university studying under the educational programmes in Clinical Psychology, and more.

Eurasian Studies Research and Education Centre

- Creation of a modern base of material and technical resources for performing educational, educational research, research-and-development, project and design engineering works in the fields of history, archaeology and ethnology, protection of historical and cultural monuments (sites of historical and cultural heritage), and more.
LEADING LABORATORIES OF DIGITAL INDUSTRY

EMERSON PLANTWEB LABORATORY
This is an educational-research laboratory intended for improving the level of knowledge and experience of the SUSU staff members and students using modern technologies and means of automation, as well as for practical testing of the solutions in the field of engineering different computer-aided process control systems and their elements. In 2018, a new SUSU Emerson Laboratory was opened, featuring equipment allowing to improve the educational process in the field of automation technologies. Most of the technologies by Emerson company are available at this laboratory.

The laboratory equipment is used in teaching the key specialty-related courses to students in the Instrumentation Engineering programme, which were developed jointly with Emerson company.

The SmartPipe scientific student project is being fulfilled, the key task of which is recording sensor readings for further statistical processing of the measurement results, as per the order by PG Metran company.

ENDRESS+HAUSER LABORATORY
At the Department of Automation and Control of the SUSU School of Electronic Engineering and Computer Science, a Laboratory of Automation and Control of Technological Processes has been functioning since 2016, within the joint project with the world’s leading manufacturer of industrial automation and control-and-measuring instruments, a Swiss company Endress+Hauser.

This laboratory helps training Bachelor’s students, Master’s students and postgraduates in Control and Informatics in Engineering Systems; Informatics and Computational Equipment.

The laboratory equipment is used to perform works under the following key specialty-related disciplines:

- Automated Information Control Systems;
- Modern Problems of the Control Theory;
- SCADA Systems.

SIEMENS LABORATORY OF DIGITAL ENGINEERING TECHNOLOGIES
In 2017, a unique Siemens Laboratory of Digital Engineering Technologies opened at the SUSU Computer Engineering Centre. The laboratory trains engineers in the field of managing the manufacture and life cycle of products. Along with SUSU academics, the teachers include engineers and top managers of SIEMENS PLM Software. The main competitive advantage of the laboratory is the computer simulation of processes, and replacement of a product’s physical prototype with its virtual version – digital mockup.

Projects fulfilled over 2016–2018:

- Mathematical research in the field of determining the remaining lifetime of the main units and equipment of the specimens of military automotive vehicles; creation of a high-technology manufacture of a new generation of energy-efficient transmissions for trucks and buses by PAD KAMAZ;
- development of design documentation for the automatic tool changer magazine for CNC machines of FSUE FZ Mayak;

GEOSTATIONARY TECHNOLOGIES RESEARCH AND DEVELOPMENT CENTRE
The goal of the Geoinformation Systems Research and Education Centre is performing the scientific and applied research in the field of geoinformation systems (GIS), as well as supporting the scientific, educational and economic activity of SUSU.

8 projects fulfilled over 2016-2018, including:

- development, implementation and support of the regional geoinformation system Geoportal of the Chelyabinsk Region;
- development and implementation of a subsystem of online monitoring over the movements of the agricultural machinery;
- development of a software product WEB GIS for Android and iOS platforms, performing of research-and-development and design-engineering works at 16 agricultural enterprises and three municipal districts in the Chelyabinsk Region.

INFORMATION SECURITY RESEARCH AND EDUCATION CENTRE OF KASPERSKY LABORATORY
Information Security Research and Education Centre (jointly with Kaspersky Laboratory) was established in 2017 for the purpose of fulfilling joint scientific and educational projects in the field of cyber security. The centre offers a project-based learning approach to education and the fulfilment of interdisciplinary projects on information security of computer-aided process control systems. The Information Security Technologies and Data Protection Laboratory functioning at the centre commands 25 professional-level work stations with the installed specialized software for performing of training classes in the disciplines taught at the Department of Information Security within the main educational programmes.

5 fulfilled projects over 2016–2016, including:

- interaction with Federal Service for Technical and Export Control;
- participation in the meetings of the coordination and methodological councils on the countermeasures against foreign technical intelligence services and on technical information protection, and of the council on information and communications technologies of the enterprises of the military-industrial complex of the Ural Federal District.

COMPUTER-AIDED DRUG DESIGN LABORATORY
The Computer-Aided Drug Design Laboratory is a world-class laboratory. It was established on July 1, 2016 within project С-100. The laboratory is developing the methods and software for analysing and predicting the biological activity of compounds. It performs complex theoretical and computer-aided studies of new medicaments. 10 fulfilled projects over 2016–2016, including:

- participation in works under the grant on "Peptide Templates for Biominaleralization of Titanium Oxide", by the Russian Foundation for Basic Research; the grant on "New Materials for Photonics and Spintronics Based on Chalcogen Heterocycles", by the Russian Foundation for Basic Research;
- 2 governmental tasks: Quantum Chemical Approaches to Analysing the Electronic Structure of the Complexes of Antituberculous Remedies with Bistargets; and 3D/4D QSAR Study of the Anti-tumour and Antiviral Activity of Medications.

SUPERCOMPUTER SIMULATION LABORATORY
Three supercomputers are installed at the laboratory, including the innovative energy-efficient Tornado SUSU supercomputer with 29184 processor cores and liquid cooling system. The SSL supercomputers are in the thick of the university’s scientific life and allow to perform most complex computations for the calculations in the fields of engineering, natural sciences, human sciences and IT. The SSL equipment was used for the fulfillment of works under 52 grants and 26 economy contracts.

Projects fulfilled over 2016–2018:

- prediction of blank part stocking in the process of steel tempering by using the artificial neural networks (customer – SMS Group GmbH, Germany);
- designing of new polymer composite materials with controlled non-linearity of mechanical behaviour and development of the methods of using those for designing the elements of turbofan engines (grant by the Russian Science Foundation);
- rendering of computer graphics and special effects for such motion pictures as The Icebreaker, Flight Crew, A Warrior’s Tail (also known as Saw’s: Heart of the Warrior), and Final Fantasy by Sony Pictures.

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MOLECULAR ELECTRONICS LABORATORY

Headed by: Fedor PODGORNOV, Associate Professor at the Department of Physical Electronics, Associate Professor at the Department of Optoinformatics, Candidate of Sciences (Physics and Mathematics)

The laboratory was created in order to perform research and development of components and devices based on mesophase materials with high spatial symmetry. This laboratory allows to initiate studies in the field of developing environmentally-friendly flexible solar cells and molecular components of electronic devices. The laboratory scientists conduct research in the fields of mesophase materials, optoelectronics (displays, spatial-temporal light modulators), electrokinetic motion of micro- and nanomaterials in liquid crystals, solar cells, and electrical methods of analysing organic materials.

Results of the work performed in the laboratory:
- the mechanism of the influence of nanoparticles on the time of electrooptic switching ferroelectric liquid crystals. This effect allows to design the new generation of spatial-temporal modulators of electromagnetic radiation;
- the physical nature of the interaction of metal nanoparticles and chiral liquid crystals was revealed;
- the effect of nonlinear electrophoretic motion of dielectric microparticles in nematic liquid crystals was discovered. This effect might be used for selective separation of micro- and nanoparticles, and for assembly of nanostructures.

NEUROHEMATOLOGY LABORATORY

Headed by: Elyahu DREMEKOV, Prof., PhD, Director of the Institute of Molecular Physiology and Genetics of the Slovak Academy of Sciences, Bratislava

Vadim TSIELIKMAN, Doctor of Sciences (Biology), Professor

The Neurohematology Laboratory was established at South Ural State University in November of 2016 within Project 5-100 in order to develop such a breakthrough field as studying the molecular mechanisms of chronic stress. The laboratory opening was preceded by long years of work by the South Ural scientists on studying the molecular mechanisms of stress.

The laboratory's work results:
- ability of liver microsomal enzymes to regulate activity of serotonergic neurons was discovered for the first time;
- new experimental PTSD model was developed, in which anxiety and depressive disorders are correlated with adrenal insufficiency, and depression of microsomal liver oxidation;
- mechanism of resistance to drug treatment in PTSD patients due to damages in liver microsomal enzymes was uncovered for the first time;
- new method of correcting PTSD was experimentally developed, that focuses on activation of liver microsomal enzymes by hypoxic training.

LABORATORY OF MECHANICS, LASER PROCESSES AND DIGITAL PRODUCTION TECHNOLOGIES

Headed by: Philippe BERTRAND, Doctor of Sciences (Engineering), Professor of National Engineering School of Saint-Etienne (ENISE), France

Marina SAMODUROVA, Candidate of Sciences (Engineering), Associate Professor of the Department of Machines and Processes of Pressure Metal Working at the SUSU Institute of Engineering and Technology

The laboratory was established in 2016 within Project 5-100 and the fulfillment of the program on enhancing the competitiveness (Road Map) of South Ural State University, and it is part of the SUSU Resource Centre of Special Metallurgy. For more than 5 years, the centre's scientific research has been addressing the studying of the processes related to the problems of creating multifunctional powder and gradient coatings, using the methods of laser cladding and detonation sputtering.

The laboratory's work results:
- 10 articles were published in journals indexed in Scopus, Web of Science databases;
- project with Chelyabinsk, Chelyabinsk, was fulfilled: Development of New Technology and Quenching for Tube Rolling Shop No. 1 project with AO Konar, Chelyabinsk, was fulfilled: Development of Technology of Strengthening the Sealing Faces of Split Rings for Pumping Equipment Using the Method of Laser Cladding;
- project with Russian Electric Motors, JSC, Transneft was fulfilled: Rendering Services on Developing and Implementing a Group of Technological Processes for the Technological Complex of Laser Cladding and Hardening; strengthening of the shaft journals of the rotors of electric engines for oil pumps.

LABORATORY FOR MIGRATION STUDIES

Headed by: Jeff SAHADEO, Professor of Carleton University, Canada

Olga NIKONOVA, Doctor of Sciences (History), Associate Professor

The International Laboratory for Migration Studies was established as a subdivision fulfilling the university indicators within Project 5-100. The laboratory mostly aims at institutionalization of the new promising field in the region and its integration into academic programmes of the university. The laboratory is the first specialized research-and-development institution, which studies migration in historical retrospective, using innovative interdisciplinary methods and finding correlations with the modern social-cultural and political context.

The laboratory's work results:
- 5 articles were published in journals indexed in Scopus, Web of Science databases;
- participation in writing a many-author monograph Conflict Management After Empire in Eurasia: Beyond the Liberal Peace, Ed. Catherine Owen, Shaitbek Juraev and Nicholas Megoran;
- performing of Government Task No. 33.5484.2017/64 by the Russian Federation Ministry of Education and Science in the field of scientific research: Borderzone of Cultural Worlds (South Ural Region from the Ancient Times to the Modern Age) (2017–2019);
- fulfillment of the project on Russian Revolution, Migration and Hygiene: Prospects and Problems of the Soviet Cultural History of Odesurs (I.V. Narsky, Swiss National Foundation).

LABORATORY OF MULTISCALE MODELLING OF POLYFUNCTIONAL COMPOUNDS

Headed by: Artem MASLINOV, PhD, Professor of University of Central Florida, USA

Ekaterina BARTASHEVICH, Doctor of Sciences (Chemistry), Associate Professor of the Department of Theoretical and Applied Chemistry

The International Laboratory of Multiscale Modelling of Polyfunctional Compounds was formed at the SUSU Faculty of Chemistry within the program on enhancing the university competitiveness. The laboratory aims at ensuring the interdisciplinary basic research on the intersections of chemistry, crystallography and digital technologies, as well as at supporting international collaboration with the world's leading scientists.

The laboratory's work results:
- 14 articles were published in journals indexed in Scopus, Web of Science databases;
- performing of Government Task No. 4.1157.2017/6.6 on the Science of the Future multiscale modelling of the structure and studying of the influence of the noncovalent interaction type on the conducting, elastic and catalytic properties of materials;
- computer modelling of the structure and studying the properties of organic crystalline lattices with nonlinear optical activity;
- forward-looking scientific development and application of the methodology on the adaptation of the evolutionary algorithms to the tasks of engineering of organic crystals with useful properties.
SELF-VALIDATING SENSORS, SYSTEMS, AND ADVANCED INSTRUMENTATION LABORATORY

Edited by:
Manus P. HENRY, Doctor, Professor, Director of the Technology Centre of University of Oxford, United Kingdom
Alekandr SHESTAKOV, Doctor of Sciences (Engineering), Professor

The Self-Validating Sensors, Systems, and Advanced Instrumentation Laboratory was established in 2016 within Project 5-100 for the purpose of studying the theoretical basics of engineering smart instrumentation and producing their prototypes.

The laboratory's work results:
- algorithms for operation of DU 15 and DU 50 flow meters in two-phase medium were suggested, with the flow measurement error not exceeding 3% in case of up to 10% of the gas fraction;
- possibility of simultaneous validation of the quality of thermocouple installation and its metrological control without the need for disassembly, as based on the principle of controlled exposure;
- design was developed and prototypes were produced of a non-contact three-dimensional sensor of the acceleration of rotating elements, which will allow for new possibilities in performing diagnostics of the condition of electric engines, drives, and other elements of actuators, and more;
- design for a strain-gage pressure transducer was suggested with the condition self-validation based on the method of controlled excitation; and also, laboratory models allowing to test the theoretical results were created. The transducer design was successfully patented;
- over the 3 years of working, 32 research papers were published, with 16 thereof in Scopus-indexed journals.

LABORATORY FOR PROBLEM-ORIENTED CLOUD COMPUTING ENVIRONMENTS

Headed by:
Andrei TCHERNYKH, Professor of the Centre for Scientific Research and Higher Education at Ensenada, Mexico
Gleb RADCHENKO, Director of the SUSU School of Electronic Engineering and Computer Science, Candidate of Sciences (Physics and Mathematics), Associate Professor

The International Laboratory for Problem-Oriented Cloud Computing Environments opened in 2016 and headed by Andrei Tchernykh, Professor of the Centre for Scientific Research and Higher Education at Ensenada, Mexico, performs breakthrough research in the field of distributed computing and cloud technologies to meet the challenges of Industry 4.0 and Big Data.

The laboratory's work results:
- over the period of 2017–2018 15 articles were published on Scopus-indexed editions, including 3 papers in TOP 10% journals;
- laboratory work is supported by grant 18-07-01224 by the Russian Foundation for Basic Research Development of Models, Methods and Algorithms of Planning the Containerized Computing Resources While Using Streaming Applications within a Concept of a Digital Enterprise.

SYNTHESIS AND ANALYSIS OF FOOD INGREDIENTS LABORATORY

Headed by:
Shirish SONAWANE, Doctor, Professor of National Institute of Technology, Warangal, India
Irina POTOROKO, Doctor of Sciences (Engineering), Professor

The Synthesis and Analysis of Food Ingredients Laboratory was opened in 2016.

The laboratory's work results:
- 7 articles were published in journals indexed in Scopus, Web of Science databases;
- fulfilling of project on Research on Molecular Mechanisms of Adapogenic Activity of Sambucus ebulus and Lonicera caerulea L. Medical Plants;
- fulfilling of project on Development of Nanocontainers for Efficient Delivery of Bioactive Substances, with the Use of the Sonochemistry Approach;
- grant by the Russian Foundation for Basic Research was obtained for joint Russian-Indian scientific projects on Ultrasound-assisted Encapsulation of Bioactive Compounds to Be Placed in the Food Matrix.

LABORATORY OF FUNCTIONAL MATERIALS

The laboratory was opened in December 2018. Within the frameworks of the scientific cooperation with Helmholtz-Zentrum Dresden-Rossendorf and Darmstadt University of Technology, Germany, the SUSU researchers are working on improving safety and reliability of natural gas transportation.
One of the tasks of strategic initiative No. 6 according to the plan of actions under the fulfillment of the university’s competitiveness enhancement program, is the creation of small innovative enterprises, in which the university acts as one of the founders.

Based on the assessment of the university’s innovative projects with the highest commercialization potential, 70 small innovative enterprises were created with the participation of South Ural State University, with 49 thereof successfully functioning today. The innovative infrastructure of the university and small innovative enterprises provided 202 permanent jobs. The total number of students, postgraduates and university staff involved in the work of the economy societies amounted to 332 people.

The majority of the enterprises deal with innovations in the fields of computer technologies, education, mechanical engineering, renewable energy sector and automation, ecology, geoinformation technologies, and even medical equipment.

Small innovative enterprises, which were established with SUSU acting as their nominal capital shareholder, are the key element in the final stage of the innovative process.

The main goal for the creation of the small innovative enterprises was to ensure the innovative leadership of SUSU in the region, facilitate the entrepreneurship in high-technology sectors for the sustainable development of the Chelyabinsk Region and the Big Ural region.

Successful small innovative enterprises provide solutions for a wide range of tasks for the development of the economy, social infrastructure of the region and of our country in general.

» StandUp Innovations small innovative enterprise materializes the best technologies and developments, such as: Interactive Sandbox; Interactive Climbing Wall; and Play and Progress complex, which are intended for the improvement of education and rearing of children. These innovations do not have analogues anywhere in Russia or abroad.

» Innovative developments by Uctech-Profi Educational Equipment Manufacturer include a welding simulator TSV-02 and a simulator with the technology of virtual reality for the Oil and Gas field. Also, among its products are high-technology prototypes of educational equipment: a training-and-production five-dimensions machine tool allowing to process parts of complex shapes, which has no analogues in Russia; and emulators (more than 120 prototypes). These include: emulators “Mining Machines”, “Jet Engine PD-90”, “Rocket Liquid-Fuel Engine RD-180”, “Operator of Hot Pipe-rolling Mill”, and other interactive visual aids (more than 130 kits), and more.

» Uctech-Profi occupies key positions in Russia in this field.

» Grid-engineering LLC deals with 3-D films rendering. This company participated in creation of computer graphics for such projects as Kingslave: Final Fantasy XV by Sony Pictures, Flight Crew, Salyut 7, Attraction, The Age of Pioneers, and others.

» Development in the field of control and automation of technological processes at enterprises of various industries is the domain of Inprom-avtomatika LLC.

» Design Group Ural Finishing Equipment Engineering LLC managed to approach the international market in China: the company’s products feature in the Chinese Technopark.

» The 2018 winner of the START program, the Turbine Manufacture Technologies, is developing a vortex injector burner for microturbines.

» UralGIS LLC demonstrated its capacities in the field of monitoring and geoinformation technologies, rendering its services to agricultural and forestry sectors, and mining industry in terms of studying the urban infrastructure.

» UralPolitekhDrupp is working in the field of engineering and designing of quadcopters. Their UAVs are intended for being located in a certain number over MKAD (Moscow Ring Highway) to regulate the Moscow traffic.

The proof of high demand for the products by the university’s small innovative enterprises on the market is the fast-paced dynamics of the sales volume.
All fields of international collaboration are being actively developed at the university: the field of scientific research is becoming more active, the geography of international collaboration is being expanded, and the number of international joint projects is growing.

**Currently, 282 collaboration agreements are being fulfilled, which were signed between the university and partner organizations in the field of scientific activity, while 180 of those agreements were concluded with foreign companies and universities. In 2016, the similar indicator equalled 245 agreements, and in 2017 – 254 agreements.**

Major world-class laboratories were opened at SUSU: Information Security Research and Education Centre of Kaspersky Laboratory; Laboratory of Additive Technologies, Mechanics, Laser Processes and Digital Production Technologies jointly with SMS Group corporation, and Siemens Laboratory at the SUSU Computer Engineering Centre.

In collaboration with leading foreign scientists from the United Kingdom, Germany, India, Canada, Mexico, USA, France, and Slovakia, eight international research laboratories are functioning at the university. The work of these laboratories resulted in publishing and indexing of over 50 papers in the world's leading journals (Top 1, Top 10 as per SNIP) included in Scopus and Web of Science databases.

At the same time, one of the priority tasks of the university's development is the strengthening of relationships with the leading Russian industrial companies and searching for new Russian partners.

SUSU is actively working on the projects on creating high-technology production, within the frameworks of fulfilling Government Resolution No. 218. The following projects were performed.

Creation of high-technology production of the new generation of energy efficient transmissions for trucks and buses. The customer is PAO KAMAZ, and the priority fields are: energy efficiency, energy saving, and nuclear power engineering. The development and production organization is being performed for promising driving axles (axle case, gear box case, wheel hub assembly, tooth gear with optimized parameters, driving gear and follower gear hub, two-speed hypoid-planetary gear box, hypoid gear box, automatic differential lock) with high consumer oriented characteristics complying with the requirements of the current legislation and long-term international requirements.

Engineering of a stageless differential steering mechanism with a follow-up control system for the new generation of off-road and road-building machines. The customer is OOO PK Khodovye Sistemy, and the priority fields are: transport and aerospace systems.

Every year work is being performed within the frameworks of the Federal Targeted Program on Research and Development in the Priority Fields of the Science and Technology Sector of Russia for 2014-2020, including work on such projects as:

- Development of domestic mass Coriolis flowmeter for the oil and gas industry with the function of measuring the capacity of multiphase flows. The project partner is OOO ElMetro Group. Engineering of the first Russian mass Coriolis flowmeters, allowing to measure volume and mass parameters of complex gas-liquid mixtures. Creating modern structural metallic materials, which are resistant to hydrogen sulfide corrosion, and using them to design and produce shut-off valves for oil and gas producing fields, for the purpose of reducing the accidents rate. The project partners are: OOO NPP Innovasi i Technologii (Innovations and Technologies Research and Production Enterprise), and OOO Zuzino-Uralakaya Litiinaya Kompaniya (South Ural Foundry Company).

In 2017, support was granted to the project on Modelling the Contact and Hydrodynamic Parameters of Precision Coupling of the Sprayer of Fuel-injection Nozzle of a Diesel Engine for Improving the Reliability and Performance Characteristics. This project partners are: Russian Federation Ministry of Education and Science, Institute of Internal Combustion Engines at Technical University of Munich, Munich, Germany, and German Academic Exchange Service (DAAD).

The project results may be used when engineering and producing the industrial prototypes of sprayers of fuel-injection nozzles, which would ensure efficient performance of fuel feed at high injection pressure (of up to 300 Mpa), as well as can be used in the training process in higher education institutions specializing in training Bachelor’s and Master’s students in Power Engineering industry when teaching the specifics and principles of functioning of the engine nozzle sprayers, and the methods of improving and analyzing them.

In 2018, SUSU launched the fulfillment of the project on the Fundamental Basics of Natural Gas Liquefaction Using Magnetic Cooling. Within the frameworks of the Russian Science Foundation’s contest on Performing Fundamental Scientific Research by International Scientific Teams (jointly with Helmholtz-Zentrum Dresden-Rossendorf), Helmholtz-Zentrum, Dresden-Rossendorf will act as the partner organization.

In 2018, an application was supported for the participation in the contest of projects on fundamental scientific research, being held jointly with the Russian Foundation for Basic Research and the Indian Government Department of Science and Technology. The project on Ultrasonic Encapsulatio of Biologically Active Compounds to Be Placed in Food Matrix was announced as the winner. It is headed by I.Yu. Potoroko, and the partner organization is National Institute of Technology, India.

The project on Establishment and Development of a Network of (no less than 8) Pushkin Institute Centres in the PRC on the Basis of Organisations Performing Education in Russian Language (under the Russian Federation governmental program on Education Development). The project aims at forming and developing the Pushkin Institute partner network with the purpose of promoting the Russian language in the world educational space, forming of a positive image of Russia abroad, and improving its international weight.

At the present stage, 9 centres were opened in educational organisations of the People's Republic of China, and a website of the Pushkin Institute network was created. The focus is made on the technical component of Industry 4.0, digital transformations in the field of teaching Russian for specialized needs, and that will allow SUSU to more efficiently promote Russian language abroad.
There is a general tendency in the university towards notable increase in the number of publications in international highly rated scientific editions; and an important indicator in the assessment of the university’s scientific activity is the growing number and the quality of citations.

**SCIENTIFIC PUBLICATIONS OF THE ACADEMIC STAFF**

<table>
<thead>
<tr>
<th>SCOPUS TOP 25</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCOPUS</td>
<td>70</td>
<td>127</td>
<td>162</td>
</tr>
<tr>
<td>Web of Science</td>
<td>28</td>
<td>62</td>
<td>94</td>
</tr>
</tbody>
</table>

**NUMBER OF PUBLICATIONS PER ONE MEMBER OF THE ACADEMIC STAFF** (total in over 3 years)

<table>
<thead>
<tr>
<th>SCOPUS</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.69</td>
<td>1.17</td>
<td>1.88</td>
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</table>

<table>
<thead>
<tr>
<th>Web of Science</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.39</td>
<td>0.8</td>
<td>1.17</td>
<td></td>
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</table>

The analysis of the university’s publication activity shows that the adopted policy on stimulation of the academics to publishing more papers in the highly rated journals is bringing good results.

Among the most important publications by the university’s academics we may mention Ancient Hepatitis B Viruses from the Bronze Age to the Middle Ages published in one of the most distinguished journals in the academic environment, Nature (SNIP = 8.524), in May of 2018. Andrey Epimakhov, Doctor of Sciences (History) and head researcher of the Eurasian Studies Research and Education Centre acted as the co-author on behalf of SUSU. The article came as a result of a big-scale project, among the participants of which were scientists from University of Cambridge, University of Copenhagen, and a number of scientific centres in Sweden, Denmark, Russia, Kazakhstan, and other countries.

One other public activity accomplishment is the fact of the SUSU’s international science journal Supercomputing Frontiers and Innovations being listed in the top 25 of Scopus database as per SNIP (1.071); the journal’s production editor is the Informatization Professor, Doctor of Sciences (Physics and Mathematics), Professor L.B. Sokolinsky.

**INDICATORS OF CITATION**

<table>
<thead>
<tr>
<th>THE SCIENTIFIC ARTICLES</th>
<th>(total)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCOPUS</td>
<td>5088</td>
</tr>
<tr>
<td>Web of Science</td>
<td>2905</td>
</tr>
<tr>
<td>Total number of citations</td>
<td>3,42</td>
</tr>
<tr>
<td>Average citation indicator as per 1 academic staff member</td>
<td>1,95</td>
</tr>
</tbody>
</table>

*as of December 2018
At present, over 20 scientific journals are being issued at the university, both printed and online. These editions mostly aim at promoting modern scientific research studies. The journals describe the scientific achievements and practical innovations by the researchers in the important problems of various fields and sectors of fundamental and applied science.

Bulletin of South Ural State University is the key edition of the university, a scientific journal established in 2001. Starting from 2016, the following 16 journal series are being issued:

- Computational Mathematics and Software Engineering;
- Computer Technologies, Automatic Control & Radioelectronics;
- Linguistics;
- Mathematical Modelling, Programming & Computer Software;
- Mechanical Engineering Industry;
- Metallurgy;
- Education. Educational Sciences;
- Food and Biotechnologies;
- Law;
- Psychology;
- Social Sciences and the Humanities;
- Construction Engineering and Architecture;
- Chemistry;
- Economics and Management;
- Power Engineering.

All these series are registered with the Federal Service for Supervision of Communications, Information Technology, and Mass Media, and are included into Abstract Journal and Databases of VINITI (All-Russian Institute of Scientific and Technical Information). Data on the journals are annually published in Ulrich's Periodicals Directory (an international reference system on periodicals and serial publications).

All the issues are uploaded to the electronic scientific library platform eLIBRARY.RU.

The series on Mathematical Modelling, Programming & Computer Software is indexed in the 3rd quartile of SCOPUS international database of Elsevier publishing house. The journal is also included into the Emerging Sources Citation Index (ESCI), which is a new database being part of the Web of Science Core Collection.

In a separate database of the Web of Science Core Collection, the Russian Science Citation Index, 773 Russian scientific journals are located. This list includes 2 SUSU Bulletin's journals: Power Engineering, and Mathematics. Mechanics. Physics.


Certain articles of the series on Food and Biotechnologies are described in the Agricultural Research Information System (AGRIS) international abstracts database.

The series on Psychology is included into the European Reference Index for the Humanities and the Social Sciences.

SUSU Bulletin is a many-time laureate of the regional and international university editions contest is in the Periodicals category. Also, SUSU publishes such scientific journals as: Human. Sport. Medicine (known as series on Education, Healthcare, Physical Culture of the SUSU Bulletin, till 2016); Bulletin of the Ural Federal District. Information Security; Issues of Law; journals published in English, including Journal of Computational and Engineering Mathematics; Supercomputing Frontiers and Innovations; a geopolitical journal titled Political Vector-PRO; and online journals, including Architecture, Town-planning, and Design; and Language. Culture. Communication.

19 of the university journals are included into the List of the Leading Peer-reviewed Scientific Journals and Editions, in which the Main Scientific Results of the Dissertations Shall Be Published for Obtaining a Doctoral Degree or a Degree of a Candidate of Sciences.

Supercomputing Frontiers and Innovations journal is indexed in the 2nd quartile of the Scopus international database. Human. Sport. Medicine journal is included into the Emerging Sources Citation Index in the Web of Science platform, and also into the Scopus database.

Journal of Computational and Engineering Mathematics is included into the American Mathematical Society MathSciNet Mathematical Reviews (an international mathematical abstract database), as well as into Zentralblatt Math database, and is located on the MatNet.RU portal.
One of the university's key tasks under Project 5-100 is the training of highly qualified specialists in the fields of the production technologies of the future, Big Data, and cyber physical systems.
One of the priority fields of development of South Ural State University under Project 5-100 is the creation of modern digital educational environment. Starting from 2017, works have been actively carried out at SUSU on creating a Smart Education Strategic Academic Unit (SAU), which implies new approach to education.

The Smart Education SAU aims at transforming SUSU into a university, where students of different levels of professional and educational background could be offered a wide range of quality educational services based on modern technologies of teaching.

The Smart Education SAU implies the creation of an open educational model focusing on individual development of each student and providing the best possible opportunities to SUSU graduates. The SAU will make a significant contribution into the promotion of the university in the QS and THE international rankings through improving its standing in the academic community.

Within the frameworks of the SAU implementation, new in-demand software products are being created, the use of distance education and blended learning in the basic training is being developed, collaboration with the industry is being strengthened, and the use of data-driven is being expanded (controlling the process of training and implementing the methods of artificial intelligence and data mining in the field of electronic pedagogy).

The Smart Education SAU ensures:
- development and support of laboratories;
- attraction of young members of academic staff;
- attraction of progressively-thinking Russian and foreign scientists;
- creation of a system of grant support for the academic staff members and students;
- creation of stimulation of the publication activity and including the university’s journals into the Scopus and Web of Science databases.

As a result of the Smart Education SAU functioning, SUSU is consistently restructuring its educational programmes, improving the efficiency of attracting students and postgraduates, and implementing problem-oriented and project-based approaches. New educational programmes are being created jointly with Russian and foreign partners.

The participation in Project 5-100 aims at creating modern digital educational environment, as one of the priority tasks of development. The university pays huge attention to implementing innovative education technologies, which imply the use of student-centred and competency-based approaches in the process of student training.

Advantages of new technologies:
- increasing the role and percentage of individual work;
- aiming at developing the creative potential of a person;
- individualization and differentiation of the process of studying;
- facilitating the efficient self-control and self-assessment of the results of studying;
- providing possibility of distance education and making the latter more variable;
- SUSU is in command of a wide range of educational technologies used in the process of training.

The distance higher education is offered at SUSU in 10 fields of studying under Bachelor’s programmes: Economics; Management; Jurisprudence; State and Municipal Administration; Pedagogical Education; Construction; Electrical Power Industry and Electrical Engineering; Design and Technological Support of Mechanical Engineering Production; Informatics and Computational Equipment and Metallurgy.

Distance education in Master’s programmes is offered for the following fields: Economics; Jurisprudence; and State and Municipal Administration.

It is important to note that in 2017 SUSU became the first one in Russia to release Bachelor’s degree holders in Construction who obtained their education within the distance training programme.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of registered users (thous.)</th>
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<tbody>
<tr>
<td>2016</td>
<td>21</td>
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<tr>
<td>2017</td>
<td>30</td>
</tr>
<tr>
<td>2018</td>
<td>35.2</td>
</tr>
</tbody>
</table>
NEW EDUCATION TECHNOLOGIES

System of e-learning

The Institute of Open and Distance Education is fulfilling a program of distance training of students within the e-learning system using state-of-the-art information Internet multimedia technologies. The main peculiarity of online training is that students, individually and interactively, are working with the educational materials, which include video lectures, presentations, audio files, and methodological recommendations, and after that they complete tasks on certain topics, and take level and final testing. An e-learning student can set his/her own rate of working through the educational materials, choose convenient time of studying, and decide which part of the materials to study first and which later.

The e-learning technologies and means make it possible:

- hold training in various formats, using synchronous, asynchronous and blended learning;
- use different methods of communication between the e-learning participants;
- use modern information and communications means of training (simulators, tests, simulations, simulation modeling, etc.);
- provide the required access to systematized electronic libraries;
- organize team work of the distance learning attendees.

A key aspect of organization of the e-learning training is the organization of active interaction between an attendee and the training system, and all the participants of the process.

The e-learning technologies give a chance to obtain the required education from home.

The distance education geography covers the USA, Cyprus, Turkey, Qatar, Mongolia, Kazakhstan, Tajikistan, Azerbaijan, Uzbekistan, as well as the Republic of Bashkortostan, Moscow and the Moscow Region, and other regions of Russia.

An important element of the e-learning organization is a systematized topic-related electronic library, which contains the materials required for e-learning, as well as materials needed for the e-learning users.

It is significant that e-learning helps make higher education accessible to people with special needs.

Massive Online Open (free-of-charge) Courses (MOOC)

A widely spread educational innovation are Massive Online Open (free-of-charge) Courses (MOOC), which allow to demonstrate the advantages and high level of the Russian national education system to an unlimited number of attendees of different levels of training and from different countries around the world.

From 2016 through 2018, 7 massive online open (free-of-charge) courses were created at the university on the platforms of the Lektorium educational project, and Pushkin Institute (pushkininstitute.ru), as well as on the SUSU’s MOOC platform (mooc.susu.ru).

Massive Online Open (free-of-charge) Courses (MOOC):

- Renewable Energy Sources;
- Phonetics Correction Course for Arabic Native Speakers;
- Introductory Phonetics Course of Russian as a Foreign Language for Arabic Native Speakers;
- Introductory Phonetics Course of Russian as a Foreign Language for Chinese Native Speakers;
- Using Time Management in Project Activity;
- Economics of an Enterprise.

Extensive work is being performed at the university on forming the own MOOC laboratory with technological equipment, software and on hiring highly qualified staff. MOOC have already become an integral part of the university’s educational activity, having given the academics a chance to try themselves as authors of modern courses and online teachers training an immensely wide audience of attendees.

Electronic SUSU educational portal

Today, the SUSU distance education portal offers over 2000 different courses for school pupils, students, postgraduates, teachers and government employees.

To make studying more convenient, SUSU created an Electronic SUSU educational portal, were all the university’s training programmes are posted. This helps students recap the studies materials at any time and be in touch with their teachers. In the process of such studying, one may consult or get advice from teachers, get a distance assessment by an expert, create a distributed community of users taking the same virtual training.

To help students succeed in their training, the portal provides theoretical material, algorithms of problem solving, hints that could be used in case of difficulties, practice tests, and reference materials. Students are provided with an opportunity to personally attend their teachers’ lectures directly from home, or watch the recorded lectures later. This is how one of the distance education’s main principles is being fulfilled: studying at one’s individual pace and rhythm.

Advantages of distance education:

- higher efficiency of professional training;
- simultaneous training in several fields;
- parallel studies in a Russian and a foreign university;
- students do not depend on a university’s geography;
- combining studies and work;
- higher education made accessible for such social groups as people with special needs, women on maternity leave, military personnel and their families; as well as for people on long-term business trips, etc.;
- studying as per one’s individual schedule in the period between sessions; possibility to directly use the obtained knowledge in practice.

New projects on developing the distance education

- New Training Technologies portal, created for teachers;
- Festival of Online Education;
- Development of Customized Courses, a professional retraining program which has no analogues anywhere in Russia;
- online courses on Information Technologies; Protection against Asteroids; Didactic Complex on Chemistry. Classes of Inorganic Compounds; Psychology of Traumatic Stress.

<table>
<thead>
<tr>
<th>Development of distance education at SUSU</th>
<th>Development of distance education at SUSU</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>2017</td>
</tr>
<tr>
<td>221</td>
<td>380</td>
</tr>
<tr>
<td>304</td>
<td>430</td>
</tr>
</tbody>
</table>

Number of online lectures | Number of courses on the distance education portal | Number of people taking the e-learning training | Number of people who have obtained higher education in the format of distance training
PROJECT-BASED EDUCATION

Among the projects' customers are SUSE's international and Russian partners: such industrial enterprises as Emerson, Magnitogorsk Iron & Steel Works, SMS Group, European Journalism Training Association (EJTA), as well as the region's ministries and administrations, and others. In a number of cases the university itself acts as a customer. Ultimately, every project aims at obtaining a certain product: a technology, matrix, model, software, etc.

To fulfill the project-based education, a new approach to activity organization and to the method of interaction between a project's participants is used. A special Digital Cloud of Projects web-platform has been developed, which serves as a bank of the projects just ordered, in progress, and those that are completed.

The web-platform can:
- provide interface for viewing of projects, and provide the opportunity to apply for the participation in projects;
- monitor the fulfillment of a project and interact with an external customer;
- allow a project supervisor to choose a project, search for the executors, etc.

As a result of this project, an innovative educational module is created and modern tools for fact-checking and verification of information, an open Internet platform is a stable European Eurofact-checking portal for checking of facts.

PROJECTS OF THE SUSU SCHOOLS AND INSTITUTES

INSTITUTE OF ARCHITECTURE AND CONSTRUCTION
» Ecological Settlement
» Scaffolding Platform for Stone-masons in Frame House Building
» Studying the Durability of Concrete in Reinforced Concrete Structures in Case of Cyclic Impacts
» Complex Development of the Household Infrastructure Systems of Municipalities
In the process of working on the project on Studying the Durability of Concrete in Reinforced Concrete Structures in Case of Cyclic Impacts, students will be studying the properties of the source raw materials, developing new concrete mixtures, testing strength properties of concrete before and after cyclic impacts. As a result, the developed technology will be implemented at the enterprises of the construction industry.

SCHOOL OF MEDICAL BIOLOGY
» Advanced Grain Processing
» Development of Efficient Technology for Grain Disinfection (Agrobiotechnology)
Students are performing the following tasks: determining principles of minimising the risks of accumulation of mycotoxins in grain mass of various crops, determining the algorithm of impact that ultrasonic effect impacts on the main ingredients of grain, introducing disinfection technology under conditions of grain storage in elevator, and more.

SCHOOL OF ECONOMICS AND MANAGEMENT
» Smart City
The project aims at developing practice-oriented models and methods for reduction of expenses for energy resources and enhancement of power engineering efficiency of national industry under conditions of digital economy.

SCHOOL OF ELECTRONIC ENGINEERING AND COMPUTER SCIENCE
» Smart Production (joint project of the School of Electronic Engineering and Computer Science and the Institute of Engineering and Technology)
» Cloud Platforms
» Smart System for Analysing Inception Patterns of the Russian Language
» Developing Outer Look of an Onboard Control System (OCC) of a Space Vehicle (SV) for a Flight to Asteroid
» Automatic Pressure Control System for Magnitogorsk Iron & Steel Works
» Designing of Smart Temperature Sensors
The project on Developing Outer Look of an Onboard Control System (OCC) of a Space Vehicle (SV) for a Flight to Asteroid aims at determining what an onboard control system of a space vehicle performing autonomous rendezvous and landing on an asteroid should look like.

INSTITUTE OF LINGUISTICS AND INTERNATIONAL COMMUNICATIONS
» Integration
» Development of the Concept of SCO Youth Forum
This is an interdisciplinary project. It was initiated by the Ministry of Economic Development of the Chelyabinsk Region, the International Cooperation Agency, the SCO and BRICS Summits Preparations Directorate, and others.

INSTITUTE OF SOCIAL SCIENCES AND HUMANITIES
» Eufactcheck
» Ecological Situation in the Region (joint project of the Institute of Social Sciences and Humanities and the Institute of Engineering and Technology)
» Virtual Museum of South Ural Writers
» Public and Digital History
» Digital Psychometric Twin of a Professional
» Virtual Museum of Artist Vasily Neyasov
The EuFactcheck International Journalism Project is a joint collaboration of Journalism Schools (Jachpol) during the 2019 elections in the European Parliament. EuFactcheck includes 20 members of the European Journalism Training Association: Thomas More University, Belgium; Haaga-Helia University, Finland; Institute of Journalism at Paris-Dauphine University, France; Aristotle University, Greece; Pompeu Fabra University, Spain; Linnaeus University, Sweden; and others.

As a result of this project, an innovative educational module is created and modern tools for fact-checking and verification of information, an open Internet platform is a stable European EuFact-checking portal for checking of facts.
PROJECT-BASED EDUCATION

INSTITUTE OF SPORT, TOURISM AND SERVICE
» «Olympic»
» Sustainable Development of Tourism in the Region
» Theoretical and Technological Justification of the Goals and Directions of Modernisation of the Infrastructures of the Mass-Scale Physical Education and Sports of the Highest Achievements
» Interconnection of the Results of the GTO (Ready for Labour and Defence) Performance and the Level of Health of Schoolchildren and Students
» Development of Methods of Using Seeds of Cereals and Oilseeds for the Production of Food Products
» The project on Sustainable Development of Tourism in the Region is being fulfilled within the cooperation with Geographical Institute Jovan Cvijić of the Serbian Academy of Sciences and Arts

INSTITUTE OF ENGINEERING AND TECHNOLOGY
» Smart Production (joint project of the School of Electronic Engineering and Computer Science and the Institute of Engineering and Technology)
» Milling and Additive Machine Tool
» Smart Transportation
» Protection against Asteroids
» Ecological Situation in the Region (joint project of the Institute of Social Sciences and Humanities and the Institute of Engineering and Technology)
» Power-efficient Combustion Engines
» Electric Race Car
» Robotic Automation of Technological Processes (by branches)
» Additive Technologies
» Smart Electric Drive with the Industrial Internet of Things and Augmented Reality, and more.
In the course of working on their projects, students of the Institute of Engineering and Technology learn to solve such tasks as producing of prototypes of parts, developing a smart system for controlling of traffic flows, improving the energy efficiency and environment-friendliness of the process of chromium plating of parts, designing technological structures and developing technological processes of coating using the methods of laser cladding and detonation spraying and much more.

INSTITUTE OF LAW
» Legal Regulation of Artificial Intelligence
» Model of Safeguards for Professional Rights of Attorneys
The project will result in elaboration of methodical recommendations on the Behaviour of Attorneys in the Context of Obstruction to Advocacy Activity.

HEADING TOWARDS DIGITALIZATION: EDUCATIONAL ACTIVITY

ELITE EDUCATION

The system of elite education at SUSU is one of the crucial components of Project 5-100. This is a constantly developing system, which keeps improving and adapting to working with students on the basis of the current needs of the national and international labour markets.
The elite education at SUSU mostly aims at forming such knowledge and skills in students, which will allow them to successfully build their careers in the chosen field once they graduate. The system of elite education began functioning at SUSU in September of 2016 as one of the activities under Project 5-100. In February of 2017, a SUSU Centre of Elite Education was created as one of the university's structural subdivisions.
Students carry out project-based work, mostly fulfilling orders from enterprises, and participate in solving real practical tasks. They are trained as unique specialists, who can formulate an innovation task and provide solution for it, who can conduct a complex of activities (production, project-related, research, and entrepreneurial activities) aiming at engineering, manufacturing and operating science-intensive products.

Specifics of the elite education:
» students of the elite programme groups are offered improved fundamental training;
» elite students of the senior years are mastering special disciplines adapted to their future jobs;
» as an option, students of elite groups may choose to attend lectures on economics or psychology disciplines;
» in the course of the whole period of studies classes are held on Foreign Language in Professional Field of Activity;
» students constantly keep in touch with their future employers.
The enterprises and businesses, which are interested in hiring the graduates of the SUSU elite programmes, set forth the topics for the projects and come up with the engineering tasks.
At present, more than 300 students are being trained in the 19 elite groups of both types. In the course of the last three years SUSU implemented 20 elite training programmes in engineering sciences and humanities, developed jointly with employers specially for talented students.
POLYILINGUAL ENVIRONMENT AND ENHANCED LINGUISTIC TRAINING

Presently, there are students from 52 countries studying at SUSU. In 2016, leadership of the university decided to change not only the content but the principle of teaching English. In accordance with the main goal of Project 5-100’s roadmap towards SUSU’s achievement of leading positions in international scientific and educational activity, the level of students’ knowledge of the language should be no less than B1+. In this regard, a multi-level model of continuous linguistic training for students of non-linguistic majors has been elaborated and implemented. This model is based on international standards and is being gradually implemented at SUSU.

Students have a chance to learn English during 7 semesters. Those, who vindicated the high level of English language knowledge at the final exam in the fourth semester, get the right to prepare and pass IELTS exam free of charge and receive an international certificate.

The learning process
After an entry test, students get divided into groups according to their level of language knowledge, which gets determined by the Common European Framework of Reference (CEFR), which provides maximally comfortable conditions for successful learning. At the end of each semester, students pass tests using materials of international format (KET, PET, FCE) which allow adequately determining the extent to which their level of language knowledge has changed.

For that purpose, the most recent study materials and the most advanced productive technologies (web 3.0) are used. Students use study manuals of publishing houses that are acknowledged leaders in the sphere of linguistic training, such as Cambridge University Press and Oxford University Press.

For each level, teachers have elaborated parallel courses and uploaded them to the platform of SUSU’s IODE. No matter the time and place, students not only complete assignments provided by the curriculum, but also improve their knowledge independently: they watch movies, visit educational websites, and read electronic books.

Special attention is paid to project activity which not only plays an important role in development of linguistic competencies of students but also encourages creative abilities, develops interest to the future profession, and helps recognizing the role of a foreign language in a future professional’s self-fulfillment.

Advanced linguistic training for SUSU staff
Academic, administrative and educational support staff also takes part in intensive linguistic training. The programme of advanced linguistic training called “Lingva” is targeted at teaching English language to perspective Master’s degree students, postgraduates and academics.

Moreover, all international students and foreign visitors of the university can easily navigate the university’s buildings due to pointers and subdivision name plates in English. Employees of dormitories, HR services, the library and SUSU’s House of Health have completed special intensive English language courses as well as trainings on intercultural communication and working in a polylingual environment.

Among global objectives of the programme is development of active cooperation between Russian scientists and their colleagues from abroad in both the scientific sphere (inclusion in global collaborations) and the academic environment (delivering lectures in universities around the world as invited lecturers, development of joint academic double degree programmes).

Every year, there are 15 groups overall consisting of 200 attendees studying on the Lingva programme. The system developed on the basis of blended learning technology provides gradual mastering of English language at 6 levels in the format of interactive classes as well as individual lessons in the format of online courses. Starting from B1+ level, along with general English courses, trainees of the programme sequentially learn the following professionally-oriented courses:

- English language for research presentations;
- English language for conference speeches;
- English language for professional communication in academic environment;
- English language for negotiations;
- English language for delivering lectures.

Results of the training get evaluated in accordance with the Common European Framework of Reference (CEFR). Within the programme, special courses intended for training for IELTS and EMI (English as a Medium of Instruction) international certification have been elaborated.

Polylingual environment of the university in 2016–2018

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>IODE Board certification</td>
<td>10</td>
<td>40</td>
<td>85</td>
</tr>
<tr>
<td>The number of administrative staff who passed IELTS certification for the level no lower than 5.5 (overall)</td>
<td>106</td>
<td>189</td>
<td>236</td>
</tr>
<tr>
<td>The number of students who take part in the project: elite training zone (overall)</td>
<td>911</td>
<td>1677</td>
<td>2583</td>
</tr>
</tbody>
</table>
In 2018 the university fundamentally restructured its system of interacting with highly motivated school pupils (potential high-scorers at the exams). For the purpose of attracting talented enrollees with high Unified State Examination (EGE) scores to the university, a number of new ambitious projects were launched at SUSS in 2018, including:

» Design and Engineering Bureau for School Pupils, created at the Institute of Engineering and Technology and at the School of Electronic Engineering and Computer Science;

» System of occupational guidance tests for school pupils;

» Quantumorium Technology Park for children, and more.

The Design and Engineering Bureau for School Pupils, organized at the Institute of Engineering and Technology and at the School of Electronic Engineering and Computer Science, creates all the conditions required for attracting and supporting project-based activity of talented and highly studies-motivated school pupils and potential enrollees.

As a result of the Step into the Future program for school pupils (holding of the international scientific forum Step into the Future – Sozvezdye NTMM (Step into the Future – Constellation of Scientific and Technical Creativity of Youth Contest)), the schoolchildren working on different inventions interact with the SUSS’s Uctech-Profi Educational Equipment Manufacturer, where they keep on developing their models under the guidance of the enterprise employees.

A fundamentally new plan of actions was developed on raising the grade point average of the EGE examination by attracting high-scoring enrollees

» Rebranding the educational programmes and determining the top Master’s programmes;

» Modernization of the point-rating system of student performance;

» Organization of the work of SUSS’s summer (“autumn”, “winter”, and “spring”) schools;

» Works on modernization of the institute of mentoring and creation of an institute of tutoring;

» Works on modernization of a student’s electronic portfolio;

» Works on optimization of the location of the structural divisions of the schools and institutes, and more.

Also, a plan of actions on occupational guidance was developed, which comprises:

» organization of study circles for school pupils of Chelyabinsk at the university schools and institutes on a regular weekly basis (work of creativity classes, engineering school, etc.);

» principles of a system-based working with sports and arts schools for children in Chelyabinsk;

» organization of holding master classes (advanced training courses) for school teachers of Chelyabinsk on a regular basis;

» organization of work of the EGE training centre;

» analysing the performed work and making suggestions on improving the organization of pre-university training;

» development of the courses of enrollees in the programmes of Architecture and Design of Architectural Environment;

» development and fulfilment of the plan of actions on occupational guidance for the Admissions Campaign school children, including:

- organization of the Open House days;

- organization of work with the victors and prize-winners of Zvezda (Star) Multidisciplinary Engineering Olympiad; Step into the Future contest; Intellectuals of the 21st Century contest; Odyssey of the Mind contest; Chelyabinsk RoboFest robotics festival, and other competitions;

- organization of traveling interactive exhibitions and other events on attracting the high-scoring enrollees from the cities of Magnitogorsk, Miass, Satka, Asha, Chebarkul, Kasl, and Kyshtym;

- organization of A Hundred Roads, and One is Yours’ project (meetings of students with senior school pupils of their former schools);

- organization of meetings between the university schools and institutes representatives and school pupils and their parents, covering all the schools in Chelyabinsk which have the 11th grades;

- organization of the Employers’ Fair, involving government corporations and major employers, industrial unions and associations, and more.
Development of strong international relations is one of the most important tasks within Project 5-100. Nowadays, SUSU implements double degree programmes and academic mobility programmes, and creates international laboratories in which ambitious international projects come into reality.
Participation in double degree programmes gives a chance to obtain two degrees for the period of studying on one Bachelor’s or Master’s degree programme.

There are 13 Master’s double degree programmes being implemented at South Ural State University. The leading programme is considered the Master’s degree programme in Management launched by SUSU’s Institute of Linguistics and International Communications together with Clark University (USA). Training of Masters within this programme is carried out in several majors:
» In the USA: Master in IT Sphere, Master in the Sphere of Professional Communications.

Upon completion of the study, Masters acquire skills in administering contemporary systems of database management, creation of methods and mechanisms for information protection, application of mechanisms of electronic business and electronic commerce, as well as project management in Hi-tech sphere.

For those working in foreign and joint companies, such a degree gives an extra possibility for career growth. Over the time of the programme’s existence, there are more than 150 alumni who have obtained two degrees, in Russian and American universities.

Another strategic partner of SUSU in the sphere of double degree programmes is Lappeenranta University of Technology (Finland), in which SUSU students can study such majors as Fundamental Computer Science and Information Technology, and Electrical Engineering and Electric Power Industry.

Moreover, in 2016, several double degree programmes for Master’s students have been created under the aegis of Project 5-100 with leading higher education institutions of Kazakhstan, which have been financed as SCO universities:
» Ecology and Natural Resource Management in L.N. Gumilyov Eurasian National University;
» Thermal Power Industry and Thermal Engineering;
» Technosphere Safety;
» Ecology and Natural Resource Management, and Computer Science in cooperation with Al-Farabi Kazakh National University.

It is only that students from Kazakhstan come to SUSU in order to obtain a Russian degree; students of South Ural State University become alumni of Kazakh higher education institutions as well.

Starting from 2017, three double degree programmes have been implementing with Beijing:
» Thermal Engineering and Thermal Power Industry, and Electrical Engineering and Electric Power Industry in North China Electric Power University.

This programme is popular among Chinese students, and annually attracts residents of the Chinese capital to the Southern Ural.
» Automation of Chemical Processes in Petroleum and Gas Industry in China University of Petroleum (Beijing).

The latter programme implemented with China University of Petroleum unites two spheres of training and offers students a chance to obtain degrees in two different majors: Chemical Technology (in China) and Automation of Production Processes and Manufactures (in Russia).

Unique nature of the programme is also in the fact that Master’s degree students have a chance to work in laboratories of both universities and get familiar with original equipment of such companies as Emerson, CNPC and CINOPEC.

The number of students who have completed double degree programmes

<table>
<thead>
<tr>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>48</td>
<td>74</td>
</tr>
</tbody>
</table>
ACADEMIC MOBILITY PROGRAMMES

South Ural State University gives a chance for students, researchers and academics to get high-quality educational and scientific training in largest universities of Europe.

The university implements programmes of incoming and outgoing academic mobility with China, European countries, as well as with Latin America and near-abroad countries.

Upon completion of an exchange programme, student gets a certificate specifying the name of subjects as well as the number of points and ECTS credits (the common European system for accounting workload of students who are studying on an educational programme or a course).

Students learn special disciplines as well as language and culture of the hosting university’s country.

Inherent advantages of academic mobility are enhancement of students’ motivation and their position at the labour market; enhancement of the university’s educational efficiency and competitiveness; integration into the global educational space.

Student exchange is one of the points in Memorandum on Mutual Understanding signed by SUSU and partner universities.

Academic mobility programmes are implemented within international academic projects. One of such projects is the Network University of Shanghai Cooperation Organization (SCO University). South Ural State University is a basis university in four spheres of training: Ecology, Economics, Power Engineering, and Information Technologies. Starting from 2015, more than 40 students from Kyrgyzstan, Tajikistan, Kazakhstan and China have completed SCO University’s Master’s degree programmes at South Ural State University.

Starting from 2016, SUSU students have been actively participating in academic mobility programmes implemented with Kazakhstan.

CHINA

Academic mobility programmes have been actively developing with China as well: by 2018, more than 280 students from Russia have got a chance to master a part of their educational programme in the PRC; more than 230 students from China visited SUSU in the frameworks of studying on such programmes as: Foreign Studies; Linguistics; Mechatronics and Robot Engineering; Electrical Engineering and Electric Power Industry; Thermal Engineering and Thermal Power Industry; Chemistry; Ecology and Natural Resource Management; Economics; Finance and Credit; Management; Architecture; Civil Engineering; Metallurgy; Technosphere Safety; Mechanical Engineering, etc.

Every year, no less than 20 SUSU students take part in academic mobility programmes implemented with Heihe University (China).

In 2017, China University of Petroleum, North China Electric Power University and Beijing University of Technology became SUSU’s new partner universities.

China University of Petroleum is one of Chinese national universities subject to the Ministry of Education of the PRC as well as to four petroleum companies: CNPC, SINOPEC, CNOOC and CHEMCHINA.

Together with China University of Petroleum, SUSU implements academic mobility programmes in the following majors:

- Energy- and Resource-Saving Processes in Chemical Technology, Petroleum Chemistry and Biotechnology;
- Chemical Technology;
- Mechatronics.

SUSU has been actively developing cooperation with North China Electric Power University in such spheres as Thermal Power Industry and Thermal Engineering, and Electric Power Industry and Electrical Engineering.

SUSU has also been implementing academic mobility programmes with:

- Huazhong University of Science and
INTERNATIONAL ACTIVITY

ACADEMIC MOBILITY PROGRAMMES

Technology within programmes in the sphere of Metallurgy and Materials Science, and Electric Power Industry;
» Shenyang Institute of Technology in the sphere of Food Technology and Management;
» Harbin Institute of Technology.

Total number of Russian students who take annual part in academic mobility programmes implemented with China is 150 people. At that, the number of students from China studying at SUSU is 200 people per year.

EUROPEAN COUNTRIES

Partnership relations on academic mobility programmes between SUSU and European countries are implemented within the project called Erasmus Mundus, the state programme of international student mobility supported by intergovernmental grants (in 2018, they were Czech Republic, Slovakia, Slovenia, Denmark, Hungary), as well as within bilateral contracts signed between SUSU and such universities as:
» Brno University of Technology (Czech Republic);
» Czech Technical University in Prague (Czech Republic);
» University of Verona (Italy);
» National Engineering School of Saint-Etienne (ENISE, France).

LATIN AMERICA

Development of academic mobility programmes in Latin American countries is a new direction for SUSU. In 2017, SUSU and Saint Thomas University (Colombia) with active participation of RGSU started implementing academic mobility programme for Bachelor’s degree students majoring in International Relations. In 2018, some steps have been taken to extend cooperation with Latin American countries; in particular, agreements were signed with universities of Mexico, Cuba and Argentina.

DUAL-MENTORSHIP POSTGRADUATE PROGRAMMES

Starting from 2016, SUSU has been implementing postgraduate programmes based on the model of dual mentorship.
At such a format of research, a young scientist gets engaged in the research process under the guidance of two academic supervisors or research advisors from universities of different countries at once. For example, postgraduates of SUSU have a unique chance to get a Candidate’s degree in Russia and a PhD abroad.

In 2016, SUSU and the National Centre of Legislation under the President of the Republic of Tajikistan concluded the first agreement in the sphere of postgraduates’ training by the dual mentorship model. Based on this agreement, dual-mentorship postgraduate programmes have been launched in the following majors: Constitutional Law, Criminal Law, Criminal Procedure, Municipal Law, and Criminal Law and Criminology, Criminal Executive Law.

In 2017, programmes have been launched for the following majors: Criminal Procedure; Civil Law, Family Law; International Private Law; Entrepreneurial Law.

Also in 2017, SUSU and Kostanay Social Technical University named after Academician Zulkharnay Aldamzhar (Republic of Kazakhstan) signed a contract on postgraduates’ training by the dual mentorship model. Steps have been taken to launch programmes for the following majors: Constitutional Law, Constitutional Legal Procedure, Municipal Legal Procedure, Criminal Law and Criminology, Criminal Executive Law.

In 2018, an agreement on postgraduates’ training by the dual mentorship model was signed between SUSU and the Graduate School of Saint-Etienne (France). Programmes are implemented in the following spheres: Engineering Mechanics, Metallurgy and Materials Science; Metal Science and Thermal Treatment of Metals and Alloys, Metal Forming.

In 2018, agreements on implementation of joint (dual) postgraduate studies were signed with universities of European and Asian countries: Finland, Spain, Barcelona, France and China.
Language schools and vocational schools are short-term study programmes organized by the university for the summer period. SUSU organizes summer schools in European and Asian countries.

**GERMANY**
SUSU students have a chance to learn German language at Freiberg Mining Academy. Likewise, students from Germany learn Russian language at SUSU.

**CZECH REPUBLIC**
Students attending summer school on journalism in Prague are taught by employees of leading European television and radio stations, as well as by instructors from Charles University, University of New York in Prague, etc. Also, there is an educational project intended for internships of students majoring in Journalism, Public Relations, Political Science, and International Relations. Instructors are employees of Russian editorial board of Radio Prague, and of Metropol private TV channel in Prague.

**SPAIN**
Summer courses in Spain offer intensive learning and combination of language courses with other auxiliary classes: Spanish culture, history, arts, literature, gastronomy and business. The team of instructors consists of lecturers from higher education institutions of Spain, who has a lot of experience in teaching international students.

**CHINA**
Students of SUSU learn Chinese language by taking part in summer schools organized by Shanghai International Studies University and Harbin Institute of Technology.

**SUSU’S SUMMER SCHOOL OF RUSSIAN LANGUAGE**
SUSU offers language schools and vocational schools for students from Europe as well as Asian and Arab countries. Students from China University of Petroleum, Shenyang University of Technology, and UNITEN Malaysian National University of Power Engineering study in such spheres as Information Protection Methods and Automation of Production Processes.

**SUSU’S SUMMER SCHOOL OF RUSSIAN LANGUAGE**
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Sociocultural Adaptation Centre has been established in 2016 as part of a big project intended for provision of a comfortable stay of international students in Project 5-100. One of the main activities of the Centre is organizing a voluntary movement intended to support international students.

Volunteers provide social, domestic, and academic assistance to international students. There are trainings on international communication which are regularly organized for volunteers by the Centre. During these trainings, experienced tutors teach volunteers the main principles of intercultural communication as well as fundamentals of conflict-free communication in a multicultural environment.

Similar classes are held for university employees interacting with international students; there are trainings in intercultural communication, intensive English language courses for professional communication with international students intended for administrative staff of the dormitories, libraries and student HR offices.

In 2017, a Conversation Club for informal friendly meetings of Russian native speakers and international students was opened at the Sociocultural Adaptation Centre together with the Department of Russian as a Foreign Language. Sociocultural Adaptation Centre regularly organizes roundtable discussions regarding the issues of international students’ study. Such discussions are held featuring lecturers, administrative staff and leadership of the university, as well as international students themselves. As a result of this work, a system of incoming control, testing the level of Russian language knowledge that international students have when entering the university, has been created, and requirements for methods of instruction used by a lecturer during classes held for a mixed audience (for students possessing different levels of Russian language knowledge) have been formed.
ASSOCIATION OF INTERNATIONAL STUDENTS

There are about 2000 international students from 52 countries of the world studying at South Ural State University in various spheres and majors. In order to make our guests’ stay in Russia more comfortable and interesting, our university has established the Association of International Students.

In accordance with the objectives of Project 5-100, the university aspires to be in the centre of development of new social and economic interrelations between Eastern and Western countries, strengthens its positions at the international arena, contributes to a vast cultural interaction and creation of a multinational environment.

The main purpose of the Association is providing assistance to international students in adaptation and solving issues regarding their study, accommodation and leisure, as well as introducing them with specificities of Russian culture.

AIS is acting as organizer of a number of national holidays, including Nowruz, Chinese Spring Festival, the Day of Eurasian and African Culture, etc. In 2016, the most massive of such events was the Arab Culture Day, which was held in the frameworks of Vmeste (Together) International Festival and featured such honourable guests as Ambassador Extraordinary and Plenipotentiary of the Republic of Sudan to the Russian Federation, Nadir Youssif Elhayeb Babiker, and Advisor of the Ambassador of the Arab Republic of Egypt, Osana El-Sayed Mahmoud Elserei. In 2017, the honourable guest was Ambassador Extraordinary and Plenipotentiary of the Republic of Iraq in Russia, His Excellency Haidar Mansour Hadi.

In 2018, the team of AIS students took the 2nd place in the category “The best system of working with international students and international student partnership.”

In 2018, the team of Arab students for the first time took part in the 8th Annual City Tournament in Mini-Football among National Youth Teams and took the 2nd place. In Yekaterinburg, international students of SUSU accomplished good results at All-Russian Sports Olympiad among International Students of Russian Higher Education Institutions: the team of SUSU took the 3rd place in rock climbing and tennis.

Students take active part in cooking festivals and social events as well as in informational, scientific and educational meetings and roundtable discussions.

Also in 2018, Association of International Alumni has been established at the university. Its purposes are:

- establishment and maintenance of alumni’s connection with the university;
- exchange experience and information which would contribute to implementation of professional and creative potential of the Association’s members;
- sharing information about current activity of the university.

In May of 2018, the student organization expanded the range of its interest and became the South Ural Association of International Students.

The number of events held by the Association of International Students

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>13</td>
<td>17</td>
<td>23</td>
</tr>
</tbody>
</table>
INTERNATIONAL ACTIVITY

EVENTS FEATURING FOREIGN REPRESENTATIVES

Within the process of internationalization, the university regularly holds massive cultural and social events featuring representatives of partner educational and industrial organizations, ministries, embassies, consulates, centres and associations.

Being a participant of Project 5-100, SUSU carries out international activity in order to enhance its international competitiveness. This programme is targeted at improvement of the quality of higher education system as well as on improvement of the university’s positions in global academic rankings. Internationalization processes taking place in educational, scientific and cultural spheres of SUSU’s activity allow corresponding to global tendencies of development and make a significant contribution to global education and science.

SUSU is among higher education institutions which are developing a target model of Russian higher education institutions’ activity aimed at export of education up to 2025. The goal of the project is development of export potential of Russian system of education and increase the number of foreign citizens studying in Russian educational institutions of higher education in full-time mode of study. An example of the university’s activity in this direction is its participation in training of specialists for recovery of Syria. The university is included in examination boards of Rossotrudnichestvo in different countries, administering examinations of international university applicants who are getting enrolled to higher education institutions by quotas.

SUSU is a venue for holding massive international events. In 2017, South Ural State University hosted the Forum of Rectors of Russian and Kazakhstan Universities.

Special attention at the Forum was focused on official signing of contracts on cooperation. Negotiations regarding academic mobility programmes were held with new partner universities. More than 40 international contracts have been signed within the Forum, including 12 contracts concluded with SUSU.

The university pays a lot of attention to issues regarding communication between representatives of different countries. International students from China, Sri Lanka, Mongolia, Kyrgyzstan, Latin America and other countries readily participate in the university’s activities and organize memorable events in order to introduce their schoolmates to specificities of their native culture. Students are united by the Association of International Students of SUSU.

The Association acts as organizer of a number of national holidays. It also holds scientific and educational meetings, roundtable discussions and debates, and implements social and recreational programmes. Such events give students a chance to introduce the audience to their native culture as well as widen the horizons of Russian students and instructors, and create an intercultural environment at the university.

2016 through 2018, SUSU hosted more than 200 delegations of higher education institutions and business communities from 25 countries around the world. Also, SUSU organized 37 receptions of foreign delegations.

Among participants of these events were representatives of China, USA, Great Britain, Germany, France, Italy, Mexico, Cuba, Netherlands, Norway, Israel, Egypt, Sudan, Iran, Romania, Czech Republic, Tajikistan, Kazakhstan and Ukraine.
EVENTS FEATURING FOREIGN REPRESENTATIVES

2016

» A visit by Deputy Director for Academic Affairs at the National Engineering School of Saint Etienne (ENISE, France), Philippe Bertrand (France);

» Discussing the prospects of bilateral cooperation with William Francis Fisher, the Dean of International Programmes at Clark University (Worcester, Massachusetts, USA), and Amy Cecelia Daly Gardner, Deputy Dean of International Programmes at Clark University;

» A visit by delegation from Yellow River Institute of Hydraulic Research;

» International Conference featuring delegation from the University of South Bohemia (Czech Republic), including Head of the Department of Education, Deputy Dean at the Faculty of Education, Miroslav Prochazka, and Vice-Rector for International Relations, Radka Závodská;

» Degree awarding ceremony for MBA School graduates featuring Deputy Ambassador of the British Embassy in Moscow, Martin Fergus Harris, and the British Consul-General in Yekaterinburg, Martin David Fenner;

» A workshop for SUSU administrative staff held by Consultant of QS Ranking Agency, Shadi Hijazi (Great Britain);

» Workshops for SUSU administrative staff held by Professor at the National Institute of Technology in Warangal, Shirish Sonawane (India);

» Seminars and lectures for students of the School of Economics and Management held by Professor at the Ensenada Center for Scientific Research and Higher Education (CICESE Research Centre), Andrei Chernykh (Mexico).

2017

» A visit by the Director of the RSSU Russian-Ibero-American International Center, Berenice Najera Cervantes (Mexico), and the Rector of the University of Guantanamo, Alberto Turro Brief (Cuba);

» A visit by specialist in the sphere of green engineering from the Gensler Company, Kirsten Tede Ritchie (USA), and the US Consul General for Political and Economic Affairs, Michael Ritchie;

» Discussion of elaboration of short-term exchange programmes for postgraduate students majoring in Metallurgy, Food Technology and Biotechnology and Engineering with President of the University of Zanjan (Islamic Republic of Iran), Seyed Mohsen Najafian;

» Participation of Oxford University Professor Manus Patrick Henry (Great Britain) in a Conference entitled “Measurement: States and Prospects of Development”;

» A visit by Director General of SMS Metallurgical Service LLC and Regional Vice-President of SMS Group (for Russia and the CIS countries), David Roger Jeffrey (Great Britain), Deputy Director for Operational Activity of SMS Metallurgical Service LLC, Ian Michael Joiner (Great Britain), Consul General of the Federal Republic of Germany in Yekaterinburg, Stefan Friedrich Keil (Germany), and President and Director General of SMS group Inc. (USA), Pino Tese;

» Master classes by such choreographers as Erika Maria Siligoni (Italy), Rocco Alberto Ieraclitano (Italy), Eugene Kulakovskiy (Ukraine), Kristian Vindenes (Norway), and Adi Salant (Israel) in the frameworks of Mootore Dance Festival;

» A visit by delegation from Nazarbayev University (Kazakhstan);

» A visit by the PRC Consul for Education, Zhao Yan, Attaché Zhang Yanhui and Deputy Consul of the PRC, Wang Jun;

» Workshop on strategic audit of the university featuring consultants of QS Ranking Agency, Jacques de Champchesnel and David Reggio (Great Britain);

» Workshop on strategic audit of the university featuring consultants of THE Ranking Agency: Strategic Solutions Director, Michael Charles Caruana, and Senior Analyst, Nichola Jane Horsman (Great Britain).

2018

» A workshop by the University of Cambridge for SUSU students and administrative staff regarding assessment of English language knowledge (IELTS);

» Participation of President of the European Journalism Training Association, Nico Drok (Netherlands), and Professor of Heilongjiang University of Science and Technology, Philosophy Doctor, Academician of the Eurasian Academy of Television and Radio, Song Yaowu (China) in the International Forum called “Communication Leader of the 21st Century”;

» Presentation of a programme for joint Russian-German Summer School of Language and Culture held at Freiberg Mining Academy and SUSU;

» A visit by delegation from Tajikistan. The delegation included: Advisor of the RIPKRO Rector, Zeboniso Fayzullaev, Director of the RIPKRO Branch Institute in the city of Khuind of the Sogdijsk region, Muhamad Ismatdinov, Director of the RIPKRO Branch Institute in the city of Dushanbe, Mahmoddislam Kurbonov, Director of the RIPKRO Branch Institute in the city of Kulyab, Jamshed Namozov, and Director of the RIPKRO Branch Institute in the city of Bokhtar of the Khatlon region, Muhammad Sharipov;

» Lectures for SUSU students and postgraduates held by Oxford University Professor Manus Patrick Henry;

» Participation in a joint project conducted by SMS group specialists Johan Voksen and Thorsten Ove Bender (Germany).

The number of events featuring foreign representatives

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
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</thead>
<tbody>
<tr>
<td>2016</td>
<td>34</td>
</tr>
<tr>
<td>2017</td>
<td>37</td>
</tr>
<tr>
<td>2018</td>
<td>60</td>
</tr>
</tbody>
</table>
Thorough selection of human resources and vocational enhancement of academic staff, which puts the university’s plan to get included to the international educational space into reality, considerably increase the university’s potential in fulfilment of its research and educational activity.
SUSU actively supports young academic staff and students by issuing grants for research projects. The university’s Research and Innovation Services provide support for young academic staff and students by arranging internships in leading R&D organizations of the university.

**2016**

In order to enhance SUSU young academic staff’s publishing activity in the world’s leading journals, a number of research project contests were carried out in 2016, namely:

- **Support for Young Science – 2016** for academic staff
- **Scientific Perspective – 2016** for postgraduates

First part of subsidies for research granted to winners of the contests amounted 260,000 roubles and 100,000 roubles for academic staff and postgraduates correspondingly. In December of 2017, according to the contest conditions, the winners published their articles in leading journals, indexed in Scopus/WoS databases (postgraduates) and in Scopus/WoS TOP 25% (academic staff). The winners who fulfilled conditions of the contest received the second part of financial support in the same amount.

**2017**

In 2017, a decision was made to hold repeated contests for the university’s academic staff and postgraduates with similar conditions of participation called “The Beginning of Big Science – 2017” and “Scientific Potential – 2017”. Only those of SUSU academic staff members, who had no less than two articles on the project topic, published in peer-reviewed Russian or foreign journals indexed in Web of Science, Core Collection or Scopus databases, could take part in the contests.

Winners of the contests in 2017 received the first part of financial support in the amount similar to the last year’s subsidies.

Moreover, another significant event was a contest of research projects among students called “Forward to Discoveries – 2017”, the main purpose of which is to get students involved into research activity.

By the decision of the University Senior Management of Project 5-100, 20 research projects of students were announced the winners and received a scholarship support in the amount of 50,000 roubles for implementation of research projects in such areas as: Engineering; Human Sciences, Social Sciences and Liberal Arts; Big Data and Data Mining; and Natural Sciences and Mathematics.

**2018**

In 2018, three reporting campaigns were organized for the scholarship support contest among students called “Forward to Discoveries – 2017”, contest for postgraduates entitled “Scientific Potential – 2017” and the contest among academic staff called “The Beginning of Big Science – 2017”.

The second part of financial support for the “Forward to Discoveries – 2017” contest was granted to 15 out of 20 winners of the first round. 7 postgraduates were granted personal SUSU scholarship by the results of the “Scientific Potential – 2017” contest. Participants published 6 articles indexed in Web of Science high-ranked journals, and 5 articles have been published in journals indexed in Scopus.

The second part of financial support in the form of a lump-sum payment in the amount of 200 thousand roubles was granted to 6 young academic staff members of the university by results of “The Beginning of Big Science – 2017” contest. Contestants published 15 articles in journals included in Scopus database, 7 of which made it to the Top-25 journals by SNIP.

**Financing of research at SUSU over 2016–2018 (in thousand roubles)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>1,833</td>
</tr>
<tr>
<td>2017</td>
<td>2,270</td>
</tr>
<tr>
<td>2018</td>
<td>3,000</td>
</tr>
</tbody>
</table>
Lectures by Foreign Scientists

Over the 2016–2018 academic years, more than 150 lectures by world-level scientists from USA, Great Britain, Australia, Bulgaria, India, Slovakia and Netherlands were held at SUSU. All Institutes, Schools and Departments of the University took active part in organization and conducting of master classes and lectures featuring foreign scientists.

2016

In 2016, more than 20 lectures were delivered by foreign scientists for students of SUSU Schools and Institutes. The most important ones were the following:

- A lecture by Deputy Director for Academic Affairs at the National Engineering School of Saint-Etienne (ENISE, France), Philippe Bertrand (France).
- Lectures by delegates from the University of South Bohemia (Czech Republic), namely the Head of the Department of Education, Deputy Dean at the Faculty of Education, Miroslav Prochazka, and Vice-Rector for International Relations, Radka Závodská, in the frameworks of their participation in an International Conference at SUSU.
- Lectures by ambassador of the British Embassy in Moscow, Martin Fergus Harris, and by British Consul-General in Yekaterinburg, Martin David Fenner, held for MBA School students.
- Workshops for SUSU administrative staff and lectures held for students by Professor from the National Institute of Technology in Warangal, Shirish Sonawane (India).
- Workshops and lectures held for HSEM students by Professor from the Ensiniada Center for Scientific Research and Higher Education (CICESE Research Center), Andrei Chernykh (Mexico).

2017

In 2017, foreign scientists visited SUSU to deliver lectures in the following areas: computer sciences and programming, natural and precise sciences, engineering sciences, medicine- and biology-related sciences, social sciences and humanities, as well as linguistics, construction- and computer-related sciences.

- Former President of Emerson Company, Edward Monser, held a lecture and a master class on the topic of leadership, as well as on establishment and management of an international corporation;
- Director of a Centre for Technology at Oxford University, Doctor Manus Patrick Henry delivered a lecture on the topic: "Signal Processing Technologies for a New Generation of Intelligent Sensors and Measuring Systems" for SUSU students;
- Professor Manus Patrick Henry together with Hristo Radev and Roald Taimanov held master classes for SUSU students and administrative staff;
- Lectures for SUSU students held by Professor Ashokkumar Muthupandian (Australia), Professor Ron de Kloet (Netherlands), Professor Panayiotis Koutentis (Cyprus), and Professor Jaewan Kim (Korea);
- Lectures held in the frameworks of the Software Engineering International School held at SUSU by Franck Leprevost, Vice-President of the University of Luxembourg;
- A series of lectures on the topic “Extended structural model – substance – enhanced properties of the material”, held by Professor from the University of Central Florida, Artem Masunov;
- Franck Leprevost, Professor, and world-class specialist in the sphere of cryptology, held a series of lectures about encrypting;
- Professor from Mexico, Andrei Chernykh, held a workshop regarding a currently topical issue of Energy Efficient Computing;
- Professor of the University of Innsbruck (Austria), Radu Prodan, held an open lecture entitled "Modeling and optimizations of applications using distributed calculation systems”;
- A course of lectures held by Julio Licinio (Australia), supervisor of the SUSU Laboratory of Neurohepatology, Experience of Professor Julio Licinio is actively studied and frequently applied by SUSU scientists;
- Lectures, master classes and workshops held at SUSU by scientists-historians Dakota Irvin (USA), Rosibel Roman (USA), and Professor from Sofia University (Bulgaria), Orlin Stefanov;
- President of the European Journalism Training Association (EJTA), Professor Nico Drok (Netherlands), held a number of lectures on problems of contemporary mass media for SUSU students.

2018

- Oxford University Professor Manus Patrick Henry delivered lectures for SUSU students and postgraduates;
- SMS group specialists Johan Voksen and Thorsten Ove Bender (Germany) worked on a joint project at the SUSU Laboratory of Mechanics, Laser Processes and Digital Production Technologies;
- Director of the Institute of European Languages and Cultures, PhD, Professor Li Yining and assistant of the Director of the Institute of European Languages and Cultures, Dean of the Faculty of Russian Language, PhD, Associate Professor Wan Wencian (China) delivered a number of lectures for SUSU students within the International Scientific Conference entitled “Interaction of Languages and Cultures”;
- Professor of interactive design at the University of Design Schwäbisch Gmünd, Benedikt Gross (Germany) held a lecture and a workshop for SUSU students;
- A lecture by the American Planning Association member, Jeffrey Soul, held for SUSU students;
- President of SMS Group Holding, Pino Tese, read SUSU students a lecture regarding equipment and technologies connected with metallurgical rolling production;
- A course of lectures on Strategies of Construction Management, delivered for SUSU students by Professor from Serbia, Zoran Delec;
- President of the European Journalism Training Association, Nico Drok (Netherlands) and Professor of Heiqlongjiang University of Science and Technology, Philosophy Doctor, Academician of the Eurasian Academy of Television and Radio, Song Yaowu (China), held a series of lectures and master classes for SUSU students.

The number of lectures held by foreign scientists in 2016, 2017 and 2018.

- 2016 r.
- 2017 r.
- 2018 r.
The goals of postgraduate studies within Project 5-100 are: attracting talented graduates who have experience of research activity, as well as alumni from other universities, international students included; implementing the system of postgraduates' participation in financed research projects and development works; providing integration of academic mobility programmes for postgraduates; institutionalization of postgraduate programmes by the dual mentorship model.

Presently, training is being performed in educational programmes of higher education, the programmes for training of academic staff within postgraduate studies in 26 areas and more than 80 specialties (majors), studying on which are about 600 postgraduates, more than 100 of whom are foreign citizens coming from Iraq, China, Yemen, USA, Sri Lanka, Algeria, Ecuador, Kazakhstan, Tajikistan, Mongolia, Bulgaria, Estonia, Latvia, Afghanistan and Syria.

Attraction of talented students to the university's postgraduate studies is carried out systematically.

In order to select the most prospective and talented graduates for enrolment to postgraduate studies, Provisions on Admissions Tests on a Special Discipline have been developed. The tests are intended to reveal the experience of research activity of those applying for postgraduate studies as well as the presence of publications in editions issued by Scopus, WOS, State Commission for Academic Degrees and Titles, etc., the presence of patents, computer software, honorary credentials and certificates received at the events whose level is no lower than regional.

Dual-mentorship postgraduate programmes are being implemented, which gives a chance to obtain a degree of a Candidate of Sciences or a PhD, and extend one's empirical base of research due to access to research platforms abroad.

Agreements on training of top-level qualification specialists have been signed with the following industrial enterprises: ChTPZ PJSC, Volzsky Pipe Plant OJSC, UralGIS LLC, Eva Mobil LLC, Vash Buhgafet LLC, Arikas-Rus LLC, UPTK LLC, Apmor-Story LLC, TMK NTTs LLC, Energy Institute of Tajikistan, and West Kazakhstan Agrarian-Technical University named after Zhangir Khan Non-profit JSC.

Within event 3.2.2. of the roadmap, a number of programmes for perspective and talented postgraduates are being implemented at the university. These programmes are called "Scientific Potential" and "Grant Support of Internships for Students".

The Scientific Potential contest is held in order to provide financial support for completing research projects and enhance publication activity of SUSU postgraduates in the world's leading journals.

Postgraduate and Doctoral departments of SUSU have passed a dynamic way of development and played the main role in establishment and development of scientific schools and research directions not only at the university but also in other higher education institutions and academic institutes of the country. Research cadre who have competed their postgraduate or doctoral studies at SUSU made an essential contribution to development of Russian science, manufacture and military-industrial complex.
Within three years South Ural State University, which is taking part in Project 5-100, has been creating its own network of centres in China in order to promote Russian language abroad and enhance the quality of training of Chinese citizens before their study in Russia.
OBJECTIVES OF SUSU'S PUSHKIN INSTITUTE CENTRE

Pushkin Institute Research, Education and Coordination Centre was established at the university in 2014 upon an order of the Ministry of Education and Science of the Russian Federation.

A lot of attention in the Centre's activity is paid to innovative technologies used for promotion of Russian language among foreign citizens.

» The most important objective of the Pushkin Institute Centre is forming a network of the research, education and coordination centre for promotion of Russian language and education in Russian.

» Besides, among the objectives of the Pushkin Institute Centre is organizing and holding vocational enhancement courses for Russian language instructors as well as for instructors who are teaching in Russian abroad.

In the frameworks of the Centre's activity, a series of events are held in order to identify the best educational experiences, strengthen international cooperation in the sphere of teaching Russian as a foreign language, and enhance the prestige of an instructor of Russian as a foreign language on the education market.

» Another objective of the Pushkin Institute Centre is elaboration and development of educational resources for distance learning in Russian language with elements of virtual reality and game formats for foreign citizens.

» In the frameworks of the Centre's activity, a robotized dialogue system has been developed. This system includes:
  1) a program of operation of a virtual office with the system for speech sample processing;
  2) massive open online courses;
  3) software for functioning of an anthropomorphic robot.

This complex is targeted at native Chinese and Arab language speakers. A phonetics complex for international students is being created by teams of employees from the Department of Russian as a Foreign Language and the Department of International Relations and Regional Studies of the Institute of Linguistics and International Communications, as well as instructors of the Institute of Open and Distance Education, Departments of Information Measuring Equipment of the School of Electrical Engineering and Computer Science. Developed products get tested in partner universities of the People's Republic of China.

Over the time of project implementation, a database called "Speech Samples", which contains 39 thousand audio files, has been created, and 4 state registration certificates have been obtained.

» An important direction of the Centre's activity is participation in arranging and holding Olympiads and other creativity contests testing the knowledge of Russian language and culture, including the ones using online technologies.

Also, the Pushkin Institute Centre takes active participation in arrangement and holding of educational events and promotional actions: Days of Russian language and Russian education, international forums and exchanges, exhibitions and congresses.

» in 2016, instructors of the SUSU Pushkin Institute Centre for the first time organized a special venue for participation of foreign citizens in the Total Dictation. An interest to this event was expressed not only by foreign citizens of our city, but also by international students from partner universities.

In 2015, the Pushkin Institute Centre of SUSU joined the Institute of International Education, presently the Institute of Linguistics and International Communications. Head of the Pushkin Institute Research, Education and Coordination Centre is a Candidate of Sciences (Philology), ladviga Berezovskaya.

Nowadays, partnership network of the Pushkin Institute Centre includes:

» Beijing Union University;
» Xuchang University;
» Zhengzhou University of Aeronautics;
» Shenyang Institute of Technology;
» Tianjin Foreign Studies University;
» Beijing Language and Culture University;
» Zhejiang University of Foreign Languages;
» China University of Petroleum;
» North China Electric Power University.
2017
Projects ordered by the Ministry of Education and Science of the Russian Federation
A project entitled “Development of a robotized dialogue system for Russian language learning by various target audience with its following application in the current system of electronic support of Russian language learning and distance education in Russian” has been implemented upon an Agreement No.09.Y70.25.0165 dated December 7 of 2016 (2016–2017) in the frameworks of the Russian Language Federal target programme for 2016–2020 (together with other SUSU departments).
Arrangement and holding of events
In March of 2018, a master class on Formation of Communicative Competence among Chinese Attendees during Russian Language Classes was held in Heihe University.
Total Dictation international action for international participants
The event took place on April 14 of 2018 featuring more than 190 international participants, including 25 representatives of a partner university (Heihe University).
Start and admissions for supplementary education programmes

2018
Projects ordered by the Ministry of Education and Science of the Russian Federation
A project entitled “Establishment and development of a network (no less than 8) of Pushkin Institute Centres in the PRC on the basis of organizations performing education in Russian language” has been implemented within an event called “Subsidies for implementation of activities targeted at full-fledged functioning and development of Russian language” of the main event entitled “Development of open education in Russian language and Russian language teaching” (together with other SUSU departments).
Arrangement and holding of events
It is planned to hold a master class for instructors of Russian as a foreign language, a contest of pedagogical skills, and vocational enhancement courses held on the basis of participant organizations of the partnership network. It is also planned to organize an international Olympiad, a contest of projects, and a photo contest among international students of participant organizations of the partnership network.

WORK RESULTS

Over the period of 2016–2018, within implementation of event entitled “Subsidies for financing and development of Russian language”, some considerable results have been achieved.

2016
Projects ordered by the Ministry of Education and Science of the Russian Federation
A project entitled “Development of a robotized dialogue system for Russian language learning by various target audience with its following application in the current system of electronic support of Russian language learning and distance education in Russian” has been implemented upon an Agreement No.09.Y70.25.0165 dated December 7 of 2016 (2016–2017) in the frameworks of the Russian Language Federal target programme for 2016–2020 (together with other SUSU departments).
Arrangement and holding of events
An International Science-to-Practice Conference entitled "Dialog of Eurasian Cultures" was held in Chelyabinsk on September 23rd through 25th of 2016.
Total Dictation international action for international participants
The event took place on April 16 of 2016 featuring more than 80 participants.
Start and admissions for supplementary education programmes
6 attendees of a programme entitled "Theory and Practice of Teaching Russian as a Foreign Language".
Participation in international conferences and forums
1) Intergency programme entitled "Russian language and instruction in Russian in the system of international positioning of Russia" (October 4–28 of 2016) held by Pushkin State Russian Language Institute (Moscow).
2) International forum and seminar called "Russian Seasons: Days of Russian science and culture" (December 12–17 of 2016) held by Immanuel Kant Baltic Federal University (Kaliningrad).

2017
Projects ordered by the Ministry of Education and Science of the Russian Federation
A project entitled “Development of a robotized dialogue system for Russian language learning by various target audience with its following application in the current system of electronic support of Russian language learning and distance education in Russian” has been implemented upon an Agreement No.09.Y70.25.0165 dated December 7 of 2016 (2016–2017) in the frameworks of the Russian Language Federal target programme for 2016–2020 (together with other SUSU departments).
Negotiations regarding establishment of the Centres
Negotiations have been carried out with Tianjin Foreign Studies University (China).

2018
Projects ordered by the Ministry of Education and Science of the Russian Federation
A project entitled “Establishment and development of a network (no less than 8) of Pushkin Institute Centres in the PRC on the basis of organizations performing education in Russian language” has been implemented within an event called “Subsidies for implementation of activities targeted at full-fledged functioning and development of Russian language” of the main event entitled “Development of open education in Russian language and Russian language teaching” (together with other SUSU departments).
Negotiations regarding establishment of the Centres
Centres have been established in Tianjin

PROSPECTS OF DEVELOPMENT

Projects ordered by the Ministry of Education and Science of the Russian Federation
Participation in the project entitled “Establishment and development of a network of less than 8 of Pushkin Institute Centres in the PRC on the basis of organizations performing education in Russian language” has been implemented within an event called “Subsidies for implementation of activities targeted at full-fledged functioning and development of Russian language” of the main event entitled “Development of open education in Russian language and Russian language teaching” (together with other SUSU departments).
Negotiations regarding establishment of the Centres
It is planned to carry out negotiations with 18 partner higher education institutions and establish a network of new Centres.
Arrangement and holding of events
It is planned to hold a master class for instructors of Russian as a foreign language, a contest of pedagogical skills, and vocational enhancement courses held on the basis of participant organizations of the partnership network. It is also planned to organize an international Olympiad, a contest of projects, and a photo contest among international students of participant organizations of the partnership network.
Transmedia as a method of storytelling and distribution of information through various media platforms with the use of digitalization tools favours for efficient promotion of the university’s brand in the regional, federal and international media space, as well as for enhancement of its recognition and for improvement of the university’s positions in rankings.
In 2017, according to the order of the Rector of SUSU, A.L. Shlestakov, Marketing and Strategic Communications Department has been established at the university. According to Project 5-100, activity of this Department is targeted at formation of the university's image as an educational, research and innovative centre. Head of the Department is Doctor of Science (Philology), Professor at the department of internet and Mass Communication, L.K. Lobodenko.

**Press Office**

The purpose of Press Office’s activity is operative and fundamental for most important accomplishments and events at SUSU, explaining specificity of the university’s activity, distribution of official texts of the Rector’s announcements and messages.

The most important events of the university’s activity get published on such websites as 74.ru, www.toi1.ru, www.cstable.ru, as well as broadcasted via TV on STS Chelyabinsk, Oblastnaya Televidenie State Enterprise of the Chelyabinsk Region, Southern Ural GTRK, and such radio stations as Business FM, Vuznyi Ural, Olmpir, they also get published in such journals as Delovaya Rossia (Business Russia), TSR, Tekhnadzor, etc.

Every year, more than 15,000 informational material regarding the university’s activity get published in mass media.

### Digital Communications Office

The main purpose of the Digital Communications Office’s activity is promotion of SUSU’s educational, research and innovative activity in the global Internet space.

Over 2017–2018 academic year, administrative staff of the Office prepared and published more than 2,400 informational and analytical materials in Russian and English for the official website of SUSU.

In order to draw attention of the audience to the most topical issues, administrative staff of the Office creates multimedia loreads. For example, 6 loreads have been created over 2017–2018, among them are the following: “PS–KTR–EECS: jubilee of the School of Electrical Engineering and Computer Science”, “60 Sunny Years: SUSU’s Nevyakhino Sports and Recreation Complex is to Celebrate its Anniversary”, “Our campus: live and study at SUSU comfortably”, etc.

Special role in the Office’s activity belongs to work targeted at development of concepts for websites and landingpages for departments and important projects at SUSU. A lot of attention is paid to promotion of the university in social networks, such as VKontakte, Facebook and Instagram.

### Marketing Department

Marketing Department carries out research in the sphere of education, science and innovations. In 2017–2018, in the framework of implementation of events intended by Project 5-100’s roadmap, specialists of the Department carried out a number of research using questionnaire and survey methods featuring more than 6,000 people and regarding the issue of perception of SUSU’s Image. The research was intended to reveal the target audience’s opinions. Analysis of the best branding practices of leading universities of Russia, Europe, Asia and North America (more than 200 higher education institutions), which have high ranks in national and international rankings (RAEX (Expert RA) Universities Rankings, National University Ranking (by Interfax), QS–WUR, THE, etc.), was carried out. The conducted analysis of the internal and external environment of the university allowed developing a brand platform which became the basis for development of a new logo and brand book. Work is being done to form a common informational navigation system of the university in two languages (Russian and English) in accordance with the brand book’s requirements.

### Strategic Communications Department

Activity of the Strategic Communications Department is targeted at enhancement of the university’s reputation, and formation of its positive reputation in the international scientific and educational space.

In 2017–2018, within the active work targeted at promotion of SUSU in foreign mass media, more than 400 articles in foreign languages regarding research and educational activity of the university have been published by specialists of the Department at Internet portals of USA, Great Britain, Ireland, Germany, Spain, Latin America, India, China, Near East, Vietnam, Taiwan, Bangladesh, Kazakhstan, etc. Special attention in the Department’s activity within establishment of SUSU’s strategic communications is paid to creation of multipe image-making editions which comprehensively present various spheres of the university’s activity. In 2017–2018, the following editions have been issued in Russian and English: “SMART-University uniting Europe and Asia”, “Annual Report – 2017: in 2 parts”, a photo book entitled “SUSU – A Bridge between the Present and the Future”, a handbook entitled “Guidelines for International Students”, etc.

### Production-and-Training Centre of Advertising Technology

The Centre completes tasks for development of the university’s advertisement development system which guarantees high quality in designing mockups and producing various forms of advertising: printed and souvernir products intended to promote educational services, research products and inventions of the university. Every year, the Centre carries out design of mockups, replication and production of printed and souvernir items for more than 100 key events of the university held at various levels. Total yearly production volume of the Centre amounts more than 200 thousand items of various printed and souvernir products.

### Science and Technology of the Southern Ural Exhibition Centre

Concept of the university’s exhibition activity includes arrangement of exhibitions at the university as well as participation of SUSU in major national and international exhibitions.

The Centre regularly organizes exhibitions of scientific and technological achievements within the Day of Russian Science celebration, and more. Within profession-oriented work carried out for university applicants, the Centre and the Faculty of Pre-university Training hold presentations of educational programmes implemented by SUSU’s schools and institutes, entitled “Study and Be the First One”.

The Centre provides assistance in participation of the university in major international exhibitions such as: VUZPROMEXPO National Multi-Industry Forum and Exhibition (Moscow), INNOPROM International Industrial Trade Fair (Yekaterinburg).
promotion of the university under conditions of transmedia

TO THE ALMA MATER ANNIVERSARY

in December 2018, South Ural State University celebrated its 75th anniversary. in the course if a celebratory week within the period of December 10th through 14th, various departments of the university carried out a number of events that reflected the eventful history of the university, its scientific schools, and sport and cultural traditions. every day at 10 p.m., Chelyabinsk residents and city visitors could observe a celebratory flash mob; the light in the university’s windows formed number 75.

Day One. Culture, Arts, Sports

celebration in honour of the university started with a photo exhibition called “SUSU: A Bridge between the Present and the Future” based on the text of SUSU’s anthem. exhibited photos displayed stages of historical development of the university from CMEI to SUSU, its research and innovative activity, study process, outstanding scientists, and social, cultural, and sport activity of former and current students.

a big contribution to arrangement of the exposition as well as to commemoration of the past and the present of the university was made by Museum and Education Complex of South Ural State University and by the Marketing and Strategic Communications Department. the university’s history is reflected in a startup called “Digital History of SUSU” which was presented on that day. Digital History of SUSU is a special platform at the university’s website. it presents historical documents and archive photos and videos, many of which have never been available for public use before.

on the same day, a presentation of an album on the occasion of the 15th jubilee since establishment of the Arts Hall and the collection of contemporary artworks by the SUSU Art Museum was held. another celebratory exhibition entitled “From Design Students to the University” was dedicated to the topic of pictorial art.

in honour of all international students studying at the university, Extracurricular Activities, Department together with International Office created an art object: large 3D letters forming the word SUSU with pattern depicting 52 national flags.

an important event in a number of celebratory events was a hockey match of Traktor Stars versus Polytechnic Stars, team of coaches of the Polytechnic Hockey Club features SUSU’s alumnus, Chairman of the Chelyabinsk City Duma, Stanislav Moscharov.

among celebratory events of this day, an important role belonged to a student event – the Mister Campus contest finale.

day two. achievements of Schools and Institutes

December 11 was a significant day for the Institute of Engineering and Technology. That day was the day of the opening ceremony of the memorial plate in honour of A.T. Potekhin, a Professor who contributed a lot to the development of Chelyabinsk Polytechnic Institute.

School of Economics and Management held a test drive of an enterprise of lean production processes, and SUSU’s Institute of Linguistics and International Communications organized a language festical called LILC International Fest.

School of Electrical Engineering and Computer Science held an Open Scientific Seminar entitled “EECS: Education and Science for Industry 4.0.”

On the occasion of the university’s anniversary, Institute of Natural Sciences and Mathematics presented scientific schools that have formed at various Faculties of the INSM over many years of the university’s existence.

this day, the Forum of winners of Zvezda (Star), Multidisciplinary Engineering Olympiad, which actually takes place at SUSU, took place on the main stage of the university.

At the end of day two of the celebratory week, leadership of the university held celebratory meetings with veterans and pedagogical dynasties of SUSU.

day three. Science and Innovations

On December 12, the Rector of SUSU opened an exhibition of scientific and engineering achievements entitled “From CMEI to the University: Global Changes and Digital Transformations.”

Guests of the exhibition saw the latest inventions of SUSU scientists that have been developed in the region: the apparatus of informational microwave therapy, simulator with virtual reality technology for the study of oil extraction, transparent concrete, 3D printer of temporary building structures, forensic devices used in forensic science, Vanya the Robot, and many more.

a unique exhibition of Functional Materials has been opened at SUSU. assigned Head of the Laboratory is Sergey Taskaev.

February 20th was celebrated as “Science and Innovations at SUSU” was broadcasted on air of SUSU-TV Television and Radio Company. SUSU-TV Television and Radio Company created a cycle of television programs depicting research activity of the university. these movies acted as a basis for the telephone.

suspension of a coin with the word “SUSU” held an excursion exhibition entitled “Optimism to Cloud: History of the University Publishing.” photo gallery called “SUSU Leaders-2018” was opened at the SUSU Scientific Library.

Presentation of a project entitled “History of the Southern Urals. From the Ancient Time till the End of the 20th Century” was held at SUSU. Authors of the project are Director of the Eurasian Studies Research and Education Centre, Aleksandr Tarlov, leading research fellow of the REC, Sergey Botalov, and Dean of the Faculty of History, Professor Igor Sibiryakov.

day four. international activity

Continuation of the university’s rebranding started in 2017 was the ceremony of opening I Love SUSU brand studio, where students, university staff and guests can buy souvenirs starting from office supplies to electronics depicting the university’s logo.

On this celebratory day, presentation of SUSU’s Pushkin Institute Partnership Network, which has established centres for Russian language promotion in 9 cities of China, was held.

In the frameworks of celebrating the university’s anniversary, second stage of Laboratory of Mechanics, Laser Processes and Digital Production Technologies was opened by Executive Vice-President of Engineering Service Department of SMS group Holding Company, Pino Teo.

Publication and presentation of a book entitled “The 75th Anniversary of SUSU Golden Pages” took place. the book describes the university’s history, its major milestones, the most important accomplishments and contemporary situation, as well as outstanding alumni who took part in the presentation as honourable guests.

An International Inter-University Project entitled “Multi-Purpose Journalism: Project-based Learning Experience” was presented at SUSU. this is a unique study manual elaborated under editorship of the Dean of the Faculty of Journalism, Lidmiula Sherstikina.

Within the frameworks of Eurasia in the Asian Times presentation of the studies by SUSU archaeologists and foreign scientists held at Pushkin Hall, results of joint projects of the university’s staff and their colleagues from Hungary, Germany, Sweden, and the USA were demonstrated.

On this day, official reception of international delegations by the rector of SUSU was held. representatives of 10 partner universities from China, Bulgaria, Tajikistan, Kazakhstan, Great Britain and South Korea offered their greetings at the meeting.

Upon initiative of SUSU’s international Office and Association of International Students of Southern Urals, Association of International Alumni has been established.

day five. Happy Anniversary, Alma Mater!

The final day of the anniversary celebration was dedicated to official greetings offered to the university’s representatives of authorities, educational spheres and business communities.

celebratory event on the occasion of the 75th anniversary of South Ural State University was concluded by a digital multimedia show, after which guests could taste an extraordinary jubilee cake. Beautiful fireworks signified a memorable ending of the celebration.
THE TECHNOPOLOIS NEWSPAPER

On its pages, the Newspaper describes eventful student life, inventions of SUSU scientists, plans for innovative development of the university as well as its leading role and authority in higher education community and in educational space. Special attention is paid to participation of the university in Project 5-100, intended to enhance competitiveness of leading Russian universities among the world’s leading research and education centres, and promote, among all, an increase of research potential at SUSU, as well as strengthen its competitive positions at the global market of educational services.

More than once the Technopolis Newspaper and its authors became the winners and laureates of corporate, city, regional and all-Russian contests and international mass media festivals.

PRODUCTION PHOTO STUDIO LABORATORY

In the context of strategic initiatives provided by the roadmap of Project 5-100, determined as the main goals of the Photo Laboratory activities were: production of necessary photo materials for advertising and PR projects in order to form the university’s image for its promotion in the international educational space; arrangement of photo shoots at the university and preparation of quality photo material intended for university applicant admissions campaigns; and improvement of educational process in such majors as Journalism and Advertisement and Public Relations.

Production Photo Studio is equipped with all necessary technical facilities: the Laboratory has several light sources, applicable for both photo and video shooting. At photographers’ disposal are 4 types of background, various modifiers for total control over the light distribution, and 2 powerful computers for photo editing.

Nowadays, activity of the Production Photo Studio is directly connected with production of photo resources for a digital information university.

360-DEGREE MULTIMEDIA NEWSROOM

360-Degree Multimedia Newsroom is a modern world-level digital media complex which allowed uniting multi-component informational medium of the university in a homogenous digital format; it also presented digital possibilities for processing of complex multi-varying information; ensured secure and long-term storage of big volumes of media materials; and created advanced engineering-and-technology conditions for training of universal media specialists of the 21st century.

Media Complex is equipped with brand-new digital equipment based on TV journalism complexes, Sennheiser radio and microphone systems, modern photo facilities and special software.

At All-Russian contest called “The best media centre of Russian higher education institutions in 2017”, a multimedia longread entitled “Russian Language and instruction in Russian”, prepared by students at the media platform of SUSU’s Newsroom, was placed the first and received a Winners’ certificate.

A powerful tool of the university’s communication with its external and inner target audience is university mass media.

SUSU-TV TELEVISION AND RADIO COMPANY

In order to cover strategic initiatives of Project 5-100’s roadmap targeted at enhancement of competitiveness among the world’s leading research and educational centres, the Television and Radio Company prepared more than 500 news videos, more than 150 interviews with leading world-level scientists, about 100 image-making movies and short videos describing the activity at research and education centres, leading departments and international laboratories of SUSU.

In 2016, SUSU-TV Television and Radio Company became the winner of TEFI TV Contest and received a special prize of the Russian Television Academy Foundation, the Student TEFI for making a contribution into development of professional education in the sphere of television.

SUSU RADIO STATION

In order to produce audio materials to fulfill tasks within Project 5-100, special student editorial offices have been created at the radio studio. Over three years, they produced more than 300 material items.

From October of 2017 till January of 2018, SUSU Radio became a participant of the grant entitled “Development of a robotized dialogue system for Russian language learning by various target audience with its following application in the current system of electronic support of Russian language learning and distance education in Russian”. Together with instructors of the Department of Russian as a Foreign Language, SUSU Radio Studio recorded more than 35 000 audio materials for voice identification performed by neural networks of the computer-aided program.

**Total number of media materials under conditions of transmedia over 2016-2018 (thousands of items)**

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>42,3</td>
<td>45,7</td>
<td>54</td>
</tr>
</tbody>
</table>

**The number of videos by SUSU-TV Television and Radio Company**

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>650</td>
<td>720</td>
<td>805</td>
</tr>
</tbody>
</table>
According to event plan of the university’s roadmap, an important part in development of the value of education and upbringing is holistic development of students as well as their socialization. The university contributes to this due to its eventful extracurricular activity.

*the number of attendees who completed their training at the Young Leader School over 3 years (from 2016 to 2018)
The main purpose of SUSU’s Extracurricular Activities Department is forming a personality of the university’s student/alumnus, who is characterized by humanitarian way of thinking, high level of civic consciousness, orientation at professional success, creative determination, intelligence, active social position, communicability, and commitment to the university spirit and its traditions.

The system of extracurricular and educational activity at South Ural State University includes the following elements and directions:

- Civic and patriotic education;
- Spiritual and moral education;
- Vocational-oriented work (arrangement of part-time employment, assistance in seasonal employment);
- Massive cultural and creative activity of students (a system of creative associations, castings, contests, festivals, exhibitions, etc.);
- Sport and recreational activity, propaganda and implementation of physical education and healthy lifestyle;
- Psychological counselling and preventive work (adaptation of freshman students, young family problems, prevention of delinquent behaviour, drug habit and HIV infection);

Forms of encouragement for accomplishments in curricular and extracurricular activity of students (certificates, bounties, name scholarships, titles, etc.).

The system of extracurricular and educational process at the university includes the following public institutions: Extracurricular and Educational Activity Council, Association of Deputy Directors of Schools and Institutes for Extracurricular and Educational Activity, Association of Study Group Mentors, Structural subdivisions specializing in extracurricular and educational activity, and student self-government bodies.

Extracurricular Activities Department supervises work of student self-government bodies, which allows systemically support students’ initiatives regarding implementation of projects and events. Structure of the United Student Council consists of two general forms: student councils and student associations. Student councils exist in every School and Institute, within which they organize operation of student self-government.

Student Associations
- Mass Culture Committee;

The number of international, national and regional contests, festivals and forums

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of projects and events</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>428</td>
</tr>
<tr>
<td>2017</td>
<td>520</td>
</tr>
<tr>
<td>2018</td>
<td>609</td>
</tr>
</tbody>
</table>

*The number of participants
EXTRACURRICULAR ACTIVITY

YOUNG LEADER SCHOOL

Young Leader School is one of important projects of South Ural State University. This is a complex of unique training courses which brought together active students of the university in their aspiration to become leaders of their time and change their life for the better.

The Young Leader School project (YLS) is targeted at forming personal and professional skills necessary for organizational, political and social activity. For students, introductory course of the YLS becomes the first stage where they learn about the university’s structure, about its traditions and events held at SUSU, and about spheres where they can use the experience of organizational activity; they also learn which skills get developed due to public work.

Communicability, the art of public speaking, the ability to efficiently work in a team and achieve one’s goals – all of these things are studied by attendees of the Young Leader School.

Starting from 2013, a festival called “Successful SUSU” has been held within the project. In the festival, achievements of students, who aspire for self-fulfilment, self-improvement and uncover of one's abilities, get demonstrated within the main directions of the university’s extracurricular activity: Science, Art, Sport, and Student Self-Government.

Overall, 10 thousand students competed their training at the Young Leader School. Those who graduated from the YLS are ones of the most competitive potential employees at the modern labour market.

The number of attendees

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>912</td>
<td>860</td>
<td>957</td>
</tr>
</tbody>
</table>

VOLUNTEER CENTRE

The main sphere of the Centre’s activity is social, cultural, sport and event-related volunteering.

The main goals of the Volunteer Centre:
- Socialization of students;
- Involvement into extracurricular activities;
- Formation of an active life position;
- Development of volunteer movement.

At the moment, the Centre includes 300 people, and every new event attracts new members.

Over the last three years, volunteers of SUSU actively participated in arrangement of city events, such as Student Spring festival, Clean Games festival, Total Dictation, etc.

Several times a year, within a movement called “Help the Veteran”, volunteers of SUSU clean up apartments of veterans. Gratuitous help to the older generation is one of prioritized directions in activity of the Volunteer Centre.

Also, Volunteer Centre is one of organizers of the Immortal Regiment march, which has become the main tradition when celebrating the Day of Victory in the Great Patriotic War. In 2018, 250 volunteers of South Ural State University took part in arrangement and coordination of the march.

An important sphere of the Centre’s operation is sport-related volunteering and participation in international-level events. For example, in 2017 SUSU students became volunteers at the 14th Russia-Kazakhstan Interegional Cooperation Forum featuring the Presidents of the two countries, Vladimir Putin and Nursultan Nazarbayev. In 2018, volunteers of South Ural State University took part in arrangement of FIFA World Cup 2018.

The number of volunteers who took part in various events

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>863</td>
<td>1000</td>
<td>1300</td>
</tr>
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</table>
COMMUNICATION LEADER OF THE 21ST CENTURY
INTERNATIONAL FORUM

EXTRACURRICULAR ACTIVITY

Image-making events are an efficient tool of forming and promoting the university’s reputation. One of such events is the annual International Scientific and Educational Forum called “Communication Leader of the 21st Century”. In accordance with the university’s mission within Project 5-100, the goal of the Forum is to create and apply scientific knowledge and to perform training of a new generation of leaders, who are capable of solving global problems regarding sustainable development.

2016

On March 26, the first International Scientific and Educational Forum called “Communication Leader of the 21st Century” has successfully concluded at the Faculty of Journalism. Within 4 days of the Forum, SUSU welcomed more than 600 talented schoolchildren and students from France, Venezuela, Italy, Laos, Poland, Ukraine, Kazakhstan, and from more than 70 Russian cities from Abakan till Yakutsk.

Event programme covered literally all spheres of contemporary spheres of communication: Journalism, Advertising and PR, and Philology.

In her report, Dean of the Faculty of Journalism at MSU and President of the National Association of Mass Media Researchers (NAMMI), Elena Vartanova talked about who is the communication leader and how to become one. Other renowned media specialists presented their reports at the Forum as well.

There were international science-to-practice conferences, master classes, philology-related games, and a poetry meeting featuring such poets as Konstantin Rubinsky, Yanis Grants, Arsen Mirzaev, Natalia Sannikova, Nikolay Godina and Yuri Orilsky, held within the Philology section.

In the sphere of Advertising and Public Relations, the Department of Mass Communication held a roundtable discussion entitled “Specialist in new media promotion: regional market requirement”. 

2017

Within the Forum held on March 21-26, South Ural State University hosted more than a thousand talented schoolchildren and students from all over the country, as well as near and far-abroad countries. Participants of the Forum represented more than 100 educational institutions of Poland, Kazakhstan, Belarus, Ukraine and the largest regions of Russia.

Among the key events of the Forum were the International Festival-Contest of Student and School Media called “Media Planet”, International Congress entitled “Public Relations and Advertising: Theory and Practice”, International Roundtable discussion of Literature of the 20-21st Centuries: Philosophy of Creativity, and more.

Participants of the Forum participants met the leading media specialists of the country, took part in contests on journalism, advertising and PR, visited professional master classes, and delivered reports at science-to-practice conferences. An important specificity of the Forum was the fact that it featured Nico Drok, the President of the European Journalism Training Association (EJTA, Belgium). South Ural State University, together with leading European centres of journalism training, has been its institutional member since 2016.

2018

The 3rd Communication Leader of the 21st Century International Scientific and Educational Forum held under the slogan “Uniting Europe and Asia” and featuring the European Journalism Training Association (Belgium), Northeast Petroleum University (China), and Eurasian Academy of Television and Radio (Russia) took place at SUSU on March 26 through 30. Participants of the Forum were schoolchildren and students representing almost 100 educational institutions from all around Russia, from Saint-Petersburg till Vladivostok, as well as from China, Iraq, Kazakhstan, Belarus and other countries.

More than twenty master classes by practicing specialists in the sphere of journalism, philology, philosophy, psychology, sociology, political science and advertising and PR were held for participants of the Youth Forum. Among them was a master class by the President of the European Journalism Training Association, Nico Drok, held on the topic “What a journalist in 21st century should know and be able to do”, and “Joint Movie Projects of Russia and China” featuring screening of a movie entitled “Under the Walls of Moscow” held by the President of the Eurasian Academy of Television and Radio, Valery Ruzin, and Professor from Northeast Petroleum University, Song Yaowu.

Philological assembly, Philology-related games, science-to-practice conference and a roundtable discussion entitled “Literature of the 21-21st Centuries: Searching for a Style” were held on the final days of the Forum.

Participants of the Communication Leader of the 21st Century Forum

<table>
<thead>
<tr>
<th>Russian cities</th>
<th>600</th>
<th>1000</th>
<th>1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
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<td></td>
<td></td>
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<tr>
<td>2018</td>
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</table>

10 partner countries over 2016-2018
(China, France, Venezuela, Italy, Laos, Poland, Ukraine, Kazakhstan, Iraq, Belarus)
CREATIVE ACTIVITY

Recreation Centre of SUSU is a structural subdivision of the university consisting of 25 creative teams in such spheres as music, dancing, theatre, original genre, and literature.

The Centre organizes and holds massive cultural events, supervises student creative groups, and performs guiding work. Under supervision of talented and highly qualified instructors, choreographers, directors and international-class coaches, students of all years of study carry out creative activity and take part in events that have become signature events of the university: the ceremony of degree awarding, Tatyana’s Day (Students’ Day), March 8th, Spring at SUSU, matriculation ceremony, the university’s anniversary, etc.

Forms of students’ participation in creative activity:

- trips to large-scale creative contests and festivals;
- arrangement of intra-university creativity festivals;
- producing props and costumes for new performances;
- search for new forms of massive culture events;
- implementation of innovative creative ideas of young directors.

The university provides all necessary conditions for development and implementation of students’ creative potential. The Centre has an Activity Hall including three rehearsal rooms, choreography studio and wardrobe department, as well as rehearsal hall, the Mannequin theatre studio room and garden room.

Every year, the Centre organizes more than 200 concerts, costumed celebrations and theme-related events.

Choreography is especially popular among SUSU students. Today’s representative of folk dance is the Uralskoe Rodzioye; ballroom dance is represented by the Ballroom Dancing Group, and contemporary dance is taught at L-Classic Classical Dance Studio. The most popular and numerous teams are the Deep Vision Dance Theatre and the Crazy Family Dance Crew.

The university has many singing teams as well: the Male-voice Choir of the Automobile and Tractor Engineering Faculty, Primavera mixed-voice choir, Ladies Band Pop Studio, Folk-ten Folk Song Ensemble, and the Art Song Club. Directors of music teams are a laureate of the Russian Federation, A.A. Abdurakhmanov, who is the supervisor of SUSU’s Chamber orchestra; laureate of the Russian Federation, S.V. Ivanova; Director of the Folk Instrument orchestra, P.M. Denyakin, and renowned Chelyabinsk’s musician and composer, Jazz orchestra Director, G.P. Anokhin.

The Mannequin Theatre Studio received multiple awards at international theatre festivals; its former members work in leading theatres of Russia and near-abroad countries. Parnassus Poetry Club, Studio of Declaration Art, Valkiria Fashion Theatre, Body & Soul vocal and instrumental ensemble, and Gattaka historical dance studio are representatives of the powerful creative potential of the university.

All the teams are multifold laureates of international, national and regional festivals and contests.

Upon graduation from the university, members of the creative teams keep attending their studios and it is frequently that they become directors and mentors. Some of them start an independent artistic career. Therefore, SUSU students not only get high-quality higher education but also successfully fulfill their creative ambitions.

CREATIVE ACTIVITY:

KEY EVENTS

2016

- SUSU’s L-Classic Dance Group took part in Dance Generation International championship on choreography (held in Sochi) and got awarded with the title as a 2nd-degreelaureate;
- SUSU’s Primavera academic choir took the third prize of Blagovest open contest among student choirs of engineering higher education institutions.

2017

- Deep Vision Dance Theatre became prize-winner at the 25th Festival called Russian Students’ Spring (Tula) and took part in a gala-show in the Kremlin (Moscow);
- Male-voice Choir of the Automobile and Tractor Engineering Faculty got the title of a laureate at the 11th International Festival of Student and Academic Choirs called “Vesnushka-2016” held in Yaroslavl. By the Decree of the Ministry of Culture of the Chelyabinsk region, the Male-voice Choir of the Automobile and Tractor Engineering Faculty was assigned the title of a National choir;
- Administrative staff of South Ural State University got included in the regional organizing committee of the World Festival of Youth and Students held in Sochi.
- Upon results of the 28th International Festival called KVN—2017 (Sochi), SUSU Ladies’ Team KVN team made it to KVN’s premier league.

2018

- SUSU became the venue for a big-scale dance project, the contemporary choreography Meteorite Dance Festival. The project united such countries as Italy, France, China, Germany, Norway, Israel, Great Britain, Poland, USA, Netherlands, Ukraine, and Russia. Deep Vision Dance Theatre of the SUSU Recreation Centre acted as the organizers of the international dance project;
- Director of SUSU’s Jazz Band and author of the music for the university’s anthem, Georgy Anokhin was awarded with the Golden Treble Clef for a special contribution to development of music in the Southern Urals and in Russia.

The number of events and projects

<table>
<thead>
<tr>
<th>Year</th>
<th>Events</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>310</td>
<td>414</td>
</tr>
<tr>
<td>2017</td>
<td>498</td>
<td>414</td>
</tr>
<tr>
<td>2018</td>
<td>310</td>
<td>498</td>
</tr>
</tbody>
</table>
Today, SUSU has unique sports facilities and a sport and recreation complex, there are various student associations working at the university, whose activity is targeted at improvement of students’ skills in various sports, as well as at popularization of active leisure and propaganda of healthy lifestyle in the student environment.

**Education and Sports Facilities of SUSU**

Student Sports Complex of SUSU is an acknowledged world-level sports centre. Educational and training processes are provided by highly qualified specialists of the Institute of Sport, Tourism and Service: Doctors and Candidates of sciences, merit workers of physical education of the Russian Federation, high achievers of physical education and sports, merit coaches and Masters of sport of Russia.

As of today, there are more than 25 sports being implemented at SUSU: track and field, ski races, orienteering, kick boxing, boxing, power lifting, volleyball, basketball, badminton, etc. Education and sports facilities of SUSU are among the best in Russia.

The unique complex of sports facilities includes:

- Student Sports Complex (Olympic-standard swimming pool, indoor stadium, tennis courts, group workout gym, individual workout gym, medical centre, etc.);
- Palace of Sports (specialized gyms for exercising boxing, power lifting, volleyball, basketball, wrestling, table tennis, fitness, aerobics, and a workout room);
- Olimpia Sports Centre (fitness gym and workout room).

Sports competitions of the city, regional and national level are held regularly on the basis of the Student Sports Centre.

**Specialized activities available for various population categories:**

- Olympic Children’s Sports Club;
- programs on choreography, rhythms, capoeira;
- complex recreational program with the use of children’s exercise devices;
- Mama I Malyshe (Mother and Child) program for children aged 1 to 3;
- group for special children’s development.

**SPORTS ACTIVITY: KEY EVENTS**

**2016**

- SUSU alumnus Vasily Melnikov as part of student team of the Russian Federation took two bronze medals at the World Speed Skating Championship in Italy.
- SUSU alumnus Kirill Denisov as part of National Team Russia took the gold medal at the Grand Slam international judo tournament in Tokyo.

**2017**

- SUSU student Anton Bulayev took the gold in team competitions on compound archery at the World University/State in Taibe (China).
- 15 students of SUSU’s ISTS became winners and prize holders at the UFD Track and Field Championship.

**2018**

- SUSU alumnus Anna Nechaevskaya took the bronze at Winter Olympics - 2018 in PyeongChang. The athlete was awarded with a second-class medal of the Order of Merit for the Motherland.
- The Ministry of Sports of the Russian Federation granted SUSU the right to carry out assessment of completing a set of tasks of the All-Russian Physical Education and Sports Complex called “Ready for Labour and Defence” (GTO). The university is included in the federal register of test centres.
- A professional 10-meter-high climbing wall has been installed at the university’s Student Sports Complex with passes of various difficulty levels.
- SUSU student K. Natilskaya became the winner at European Powerlifting Championship among juniors in the city of Zarnosco (Poland).
- SUSU students N. Vasilyev, A. Kuchukov, G. Yulisky, and M. Antoshkin became champions of the Student Hockey World Cup (Slovakia). The international tournament featured three largest teams of student hockey leagues of USA, Europe and Russia.

The number of sports events:

- 2016: 120
- 2017: 136
- 2018: 167
MODERN INFRASTRUCTURE OF THE UNIVERSITY

*Comfortable dormitories for students and staff members at the SUSU campus.

Three years of SUSU’s active participation in Project 5-100 allowed transforming the university’s infrastructure, implementing a set of tasks targeted at modernization of academic buildings, and providing SUSU students with necessary conditions for a safe and interesting life.
MAINTENANCE DEPARTMENT

Maintenance Department provides maintenance and development of the university’s infrastructure, arranges activities targeted at maintenance of buildings and rooms’ operation and supplies them with energy resources, develops university by constructing new facilities, carries out recreational optimization of rooms and buildings.

Maintenance Department includes 10 services, such as:
- Maintenance of academic buildings;
- Energy management;
- Campus management;
- Department for control and operation of property complex;
- Repair and construction site;
- Overhaul management board with a construction site;
- Garage;
- Sports-and-Recreation Complex;
- Department for labour protection and ecology.

Due to the university’s participation in Project 5-100, the Maintenance Department has elaborated and completed tasks on placement and equipage of all laboratories and facilities in order to put the equipment into operation.

Rearrangement of rooms and communications has been carried out for the following laboratories and centres:
- Supercomputer Simulation Laboratory with constant power supply for continuous computation;
- Power Engineering Centre with three sources for real energy generation;
- Composite Materials Laboratory;
- Mechanical Engineering Centre;
- Laboratories based on Horiba equipment;
- Laboratory of Mechanics, Laser Processes and Digital Production Technologies, etc.

INFRASTRUCTURE OF STUDENT CAMPUS

South Ural State University provides Russian and international students with all conditions necessary for comfortable life in a dormitory during their study. They are provided with all the necessary for an interesting and eventful life.

Campus infrastructure includes:
- 11 dormitories;
- Medical Centre;
- Student Hospital;
- Sports Complex;
- Swimming pool;
- Studenteshkoy Café;
- Hairdressing salon, etc.

Student campus of SUSU is a complex of dormitories intended for 4600 students. Presently, there are students from 37 countries living in the dormitories.

The university is surrounded by a vast forest and park zone. There is a pine forest behind the Kurchatov memorial, in which students can take a break from the city bustle; there is a small square in front of the main building, and behind the building is the Gagarin Park of Culture and Leisure with outdoors cinema theatre, workout zone, a pond, small cafes, places for renting bikes or paddle boats, skating arena, roller-skate track, and more. Several meters away from the Park is the Central Stadium. Location of the campus, due to its closeness to the nature, gives students a chance to exercise sports and meet friends outdoors.

11 dormitories for students and staff members
4600 residents
37 countries of the world
Construction of a new dormitory
Construction of a new advanced dormitory intended for 1500 residents has started in 2018. It will consist of two sections of corridor- and condominium types with all amenities, kitchens and furniture. The dormitory will be put into operation in May of 2020 and will receive international students and correspondents who will arrive to the South-Ural capital for SCO and BRICS summits. The new building will correspond with the level of a three-star hotel.

Functions of student campus administration
The main goal of student campus administration is to create suitable residential and psychological conditions for leisure and self-education. For the purpose of the university’s internationalization and formation of bilingual environment, intensive English language courses for the university staff has been launched at SUSU in 2017. First participants of the programme were dormitory staff. Suitable residential conditions for students are provided by a team of 196 people.

The dormitories provide conditions for preparation for classes: there are equipped study rooms, access to the university’s computer network and access to the Internet. Students can use study materials on resource portals of Departments, Institutes and Schools; they also have access to the website of the Scientific library and to a catalogue of electronic resources.

Student campus has a complex of measures providing security and warranting protection to residents in case of emergency situations.

Among prioritized directions of security provision in the dormitories is implementation of a set of measures on fire protection. The dormitories are equipped with various technical devices which are fundamental for the security system.

All dormitory levels are equipped with video surveillance cameras. For international students, the safety manual and all internal regulations are translated into English, Arab, Chinese and French languages.

Financing for maintenance of dormitories is provided annually. There are comfortable and safe conditions created for residence of students.

Special attention is paid to cultural, leisure and sports activity at SUSU’s student campus.

Nowadays, dormitories are equipped with workout rooms for exercising weight lifting and shaping. The Ural Hawk Sport Club, which is among top-10 of the best student sports club of Russia, has been established on the basis of student campus. Moreover, competitions are held between dormitories in 15 sports: football, volleyball, basketball, orienteering, badminton, tennis, chess, etc. One of the traditional massive sport events is the International Sports Festival. Participants of the Festival are teams consisting of students from different countries living in the student campus.

Another traditional events are:
- contest for The Best Room on Campus;
- Culinary Fight contest;
- Miss Campus contest;
- Mister Campus contest;
- movie evenings and guitar song evenings;
- Master classes for freshman students.

In the beginning of an academic year, the big student committee arranges the Ropes Course in order to introduce freshman students to life at the dormitory. Contests of Miss Campus and Mister Campus are held annually, being preceded by intensive preparation and auditions. An own dance studio has been operating in the campus for many years; the campus also has its representative KVN team called “Hostel”.

Each dormitory has a Student Council which quickly solves all domestic issues.

The Student Campus duly appreciates the conscientious work of members of Student Councils of all nine dormitories. The dormitories are equipped with study rooms, gyms for powerlifting, shaping and recreational gymnastics; there are also leisure zones where students can spend their free time, watch movies or TV programs.

Special attention is paid to patriotic education, volunteer movement and support of various initiatives and projects.
Three years of participation in Project 5-100 (2016 – 2018) is a special stage of the university’s development, in the result of which SUSU has transformed into a multidisciplinary, multicultural higher education institution; the university improved its positions in international rankings, launched new programmes in English, opened new laboratories, got acknowledged by the international academic society, and duly celebrated its 75th anniversary in 2018.
KEY EVENTS OF SUSU IN 2016-2018

SUSU’S 75th ANNIVERSARY: PHOTO GALLERY
KEY EVENTS OF SUSU IN 2016-2018

KEY EVENTS OF SUSU

2016

FEBRUARY
» SUSU graduate Ruslan Vaulin was among participants of an international collaboration created on the basis of LIGO observatory (USA), which discovered gravitational waves. Scientists for the first time observed space-time oscillations produced by the gravitational waves that reached the Earth from the depth of the Universe. This became a scientific discovery of the global importance.

MARCH
» In order to teach students disciplines connected with industrial automation and process control, a new Endress + Hauser International Science Laboratory was established at SUSU. Partner of the university, the Swiss Company called Endress + Hauser, is one of the world’s leading manufacturer of industrial automation and measuring and control equipment.

APRIL
» The top award in the sphere of television, the special prize of the Academy of Russian Television called "Student TEFI" was awarded to the Dean of the Faculty of Journalism, Liudmila Shesterkina, for establishment of SUSU-TV university’s television and radio company, and for a contribution to development of the Journalism training system.

JUNE
» SUSU won the contest for state support of pilot projects on establishment and development of engineering centres and established the new Computer Engineering Centre.

JULY
» Delegation of South Ural State University took part in INNOPROM-2016 International Exhibition. Within the Exhibition, an agreement on cooperation was signed between South Ural State University and Siemens PLM Software Company. The agreement intended for establishment at SUSU a Competency Centre based on PLM technologies and an Academic Laboratory for teaching contemporary technologies and solutions on the basis of software by Siemens.

» Students and postgraduates of SUSU took part in the 6th International Youth Industry Forum called “Engineers of the Future – 2016”. Organizers of the event were the Russian Engineering Union together with the government of the Udmurt Republic under support of RosTech State Corporation.

SEPTEMBER
» Within implementation of Project 5-100 at South Ural State University, the Academic Writing Office was established in order to develop skills of publication activity and professional communication of SUSU’s research and academic staff.

OCTOBER
» The first official meeting of SUSU’s International Scientific Council, which included 11 world’s leading scientists with a lot of working experience in the sphere of fundamental and computer sciences, engineering and medicine, was held. During the first meeting of the International Scientific Council, its members had chosen eight appointees for the positions as heads of innovation laboratories.

NOVEMBER
» SUSU’s Institute of Linguistics and International Communications launched a supplementary professional education programme called “Theory and Practice of Teaching Russian as a Foreign Language”.

DECEMBER
» The first meeting of the Supervisory board took place at SUSU. Establishment of the Board was predetermined by the change in organizational form of the university from state-funded to a state autonomous institution. Viktor Khristenko, the President of the Business Council of the Eurasian Economic Union, was unanimously elected as the Chairman of the Board.

South Ural State University took part in VI2PROMEXPO-2016, the annual national multi-industry forum and exhibition. In the frameworks of the exhibition, the most important event for SUSU was signing an agreement on cooperation with Roscosmos State Corporation.
2017

MARCH

» Kaspersky Lab’s Research and Education Centre (REC) of Information Security was established at SUSU. The REC was created at SUSU’s School of Electrical Engineering and Computer Science. The partnership between South Ural State University and Kaspersky Lab JSC provides for organizing counteraction to occurring threats for information security, protection of national interests of the Russian Federation in the information sphere, working on joint research projects, and training of highly qualified specialists in this sphere.

» SUSU for the first time entered the TOP-600 universities according to RankPro 2016/2017 Worldwide Professional University Rankings.

APRIL

» Graduates and students of SUSU’s School of Electrical Engineering and Computer Science successfully presented their innovative developments in various spheres of national economy—agriculture, healthcare, industry and transport—in Skolkovo Foundation. Among them were projects regarding the use of geographic information systems and distance exploration of the ground for monitoring of agricultural objects, ECG-recording T-shirts, innovative pavilions for waiting of public transport, and technology for recycling wastes of copper industry.

» The Rector of SUSU Aleksandr Shestakov and the President of Emerson Company, Edward Monser, made a business trip to the University of Oxford (Great Britain) where they had a meeting with Oxford professors Manus Henry, Ron Roy and Lionel Tarassenko. The meeting resulted in discussion of variants of trilateral cooperation and joint projects between SUSU and Emerson Company in the sphere of engineering.

JUNE

» A robot named Vanya was created at SUSU to help international students learn Russian language. In his work, he can actively interact with students and display his presentations on the monitor. The software was developed by the Department of Informational and Measuring Technology of the School of Electrical Engineering and Computer Science, and the methodology and content were developed by the Institute of Linguistics and International Communications.

» The RSK Tornado SUSU supercomputer participated in the creation of the first Russian aircraft, MS-21.

AUGUST

» Leading research fellows of the SUSU Laboratory for Computer Simulation of Medications, Doctor of Sciences (Chemistry) Mariya Grishina and Candidate of Sciences (Chemistry) Vladimir Potemkin participated in the Drug Discovery and Therapy World Congress (Boston, USA). Presented there was software developed at SUSU which has a wide range of action: from modelling the chemical structure of medications to modelling formulas of molecules and determining their characteristics.

SEPTEMBER

» Presentation of the SUSU Centre of Computer Engineering was held, within the framework of which Science-to-Practice Conference called “Modern Digital Technologies in Industry 4.0: Trends and Challenges” was held. Establishment of the Laboratory for Digital Engineering Technologies within the Centre of Computer Engineering became possible due to the close collaboration with Siemens Company.

OCTOBER

» The 2nd international Science-to-Practice Conference called “Measurement: Status and Prospects of Development” was held at South Ural State University. The most prominent scientists in the field of metrology from Great Britain, Bulgaria, Ukraine, Kazakhstan and more than 20 regions of Russia took part in this big-scale scientific forum. Participants of the Conference discussed the prospects of development of metrological activities in our country and around the world; agreed on fulfilling an approved policy on metrology in various countries and continuing along the course of approximation of the principles of performing metrological activities in Russia to the analogous principles of international organizations and industrially developed countries.

» Ceremonious opening of the Laboratory of Mechanics, Laser Processes and Digital Production Technologies was held in Chelyabinsk. The Laboratory was established featuring SMS group Company, the world’s leading company in metallurgical equipment production.

NOVEMBER

» The Forum of Rectors of Russian and Kazakhstan Universities was held at SUSU. A joint resolution and 40 agreements on cooperation in the sphere of science and education were signed.

» SUSU started implementing an innovative project called “Industrial Cloud Platform” targeted at researching possibilities for creation of a system of digital twins of production processes. The second project of SUSU and MMK, which uses Big Data information analysis methods, deals with development of a computer vision system which analyses condition of produced goods and reveals possible defects by using the mechanisms of artificial neural networks.

DECEMBER

» December 15, on the day of South Ural State University establishment, opening of the Laboratory for Massive Open Online Courses (MOOC) was held. The Laboratory is equipped with hardware and software and has highly-trained cadre working there. The Laboratory gives academics a possibility to try themselves as authors of modern courses and as online tutors working for an infinitively large audience.
KEY EVENTS OF SUSU 2016-2018

KEY EVENTS OF SUSU

2018

JANUARY
» Opening of the Laboratory of Composite Materials took place at SUSU. The Laboratory is part of the Mechanical Engineering Research and Development Centre. Its scientists carry out research of composite materials and create prototype models for largest enterprises of Russia.

FEBRUARY
» On the Day of Russian Science, a number of events dedicated to scientific accomplishments of the university’s scientists, researchers and inventors took place at South Ural State University. The 10th Scientific Conference of Postgraduates and Doctoral Students; an exhibition of unique R&D inventions; presentations of research by young scientists; and an intellectual contest called “SUSU Scientific Fights”.

» Scientists from South Ural State University conducted a workshop on geoinformatics at the University of Guantanamo (Cuba) and discussed the role of geographic technologies in managing land resources and the possibility to create a geoinformational observatory with their Cuban colleagues.

MARCH
» President of the European Journalism Training Association (EJTA, Belgium) Nico Drok once again took part in the International Scientific and Educational Forum called “Communication Leader of the 21st Century” held at SUSU.

APRIL
» A conference called “Kaspersky Security Day” was held at South Ural State University. The experts delivered reports on contemporary cyber threats and the issues of information security provision for automated process control systems, demonstrated consequences of attacks on the automated process control systems, and showed possibilities of Kaspersky Lab products for preventing the attacks.

MAY
» The annual Prom-Engineering International Scientific and Technical Conference dedicated to modern achievements in industrial engineering was held at three venues simultaneously: SUSU (Chelyabinsk), MPI (Moscow), and SRSPU (Novocherkassk). Participants of the Conference were scientists from 79 Russian cities and 14 countries, including Germany, Spain, Canada, China, USA, etc.

» The First Specialized Conference entitled “Modern Technologies of Quality Control. Non-destructive Inspection and Mechanical Testing” was held at South Ural State University. Representatives of industrial enterprises of the region and SUSU representatives delivered reports on the issues related to ultrasonic, liquid penetrant, and magnetic-particle inspection, as well as demonstrated the operation of portable equipment and the most recent inventions in the sphere of quality control.

JULY
» SUSU traditionally took part in INNOPROM–2018 annual international industrial exhibition in Yekaterinburg. The exhibition brings together the main industry sectors: industrial automation, metalworking, additive technologies, technologies for the power generation sector, mechanical engineering and production of components for the mechanical engineering sector.

SEPTEMBER
» Delegation of South Ural State University took part in the 28th International Scientific Symposium called “Metrology and Metrology Assurance – 2018” held in the city of Sozopol (Bulgaria). Rector of SUSU, Aleksandr Shestakov, delivered a report and took active participation in scientific discussions. The Department of Philosophy was represented by Head of the Department, Candidate of Sciences (Philosophy), Associate Professor Elena Grednovskaya and Professor of the Department, Doctor of Sciences (Philosophy), Vladimír Gladyshev.

OCTOBER
» International Science-to-Practice Conference on Materials Science and Metallurgical Technologies was held at SUSU. Laureate of Alferov’s Foundation and of the National Academy of Sciences of Belarus, Candidate of Sciences (Physics and Mathematics), senior research fellow of Nanotechnology REC, Alexey Trukhanov acted as one of the key speakers at the Conference. In the frameworks of Project 5-100 competitiveness enhancement programme, he was recruited to SUSU for the position of a postdoctoral researcher.

NOVEMBER
» A unique International Global Smart Industry Conference (GloSIC’2018) participated by more than 800 specialists in the sphere of advanced technology implementation was held at SUSU. For this event, specialists from USA, China, France, Germany, Poland, Mexico, Portugal, Great Britain and Italy, as well as executives of large industrial enterprises of the Chelyabinsk region arrived to Chelyabinsk. At the digital forum at SUSU, participants discussed the latest achievements in the sphere of development of innovative models, methods and technologies for the digital industry, as well as the experience of their implementation at large transnational and domestic industrial companies.

DECEMBER
» SUSU celebrated its 75th anniversary. Celebratory programme was very eventful; it reflected the rich history of the university as well as its cultural and sport traditions. Within five days, events describing accomplishments of the university’s Schools and Institutes as well as science, innovations, multi-aspect international activity, creativity and sports were held. The series of celebratory events concluded with a fireworks at the university square.