



# 2016

## Breakthroughs and Best Practices



National University of  
Science and Technology





# Breakthroughs and Best Practices



National University of  
Science and Technology





# The Rector's Welcome Address

NUST MISIS is one of Russia's most dynamically developing scientific and educational centers which attracts bright students, leading scientists and talented professors. The University pays special attention to integration of science, education and innovations, as well as to the development of creative environment allowing to maximally develop abilities of each student.

In 2016, thanks to implementation of integrated strategy development, NUST MISIS demonstrated impressive results in all fields of its activities: R&D, educational and extracurricular. Several large-scale research projects have been launched at the University, impressive quantitative and qualitative growth in a number of scientific publications have been recorded. The University completed several extensive infrastructure projects: creation of new state-of-the art research laboratories, completion of the Center of Industrial Prototyping of High Complexity construction and restoration of NUST MISIS Commune House. In conjunction with business partners and leading world universities, NUST MISIS developed and launched new joint academic programs, including international. Thanks to operating professional programs designed to attract talented school-leavers, various competitions winners NUST MISIS held the most successful admission campaign which allowed us to enter TOP-5 technological universities in Russia on Admission quality monitoring. In 2016 extracurricular activities of NUST MISIS students in different fields were awarded with prestigious awards on the federal level.

NUST MISIS successful development led to improvement of the University's positions in the world education rankings. In 2016, among the Russian universities, NUST MISIS showed the highest growth rate in QS World University Rankings rising by 100 positions.

NUST MISIS has ambitious goals and great challenges, and I believe we can cope with them properly. NUST MISIS has everything to become one of the best technological universities in Russia and in the world: right strategy, highly professional staff, talented students, world-class infrastructure and tight relations with our business partners.

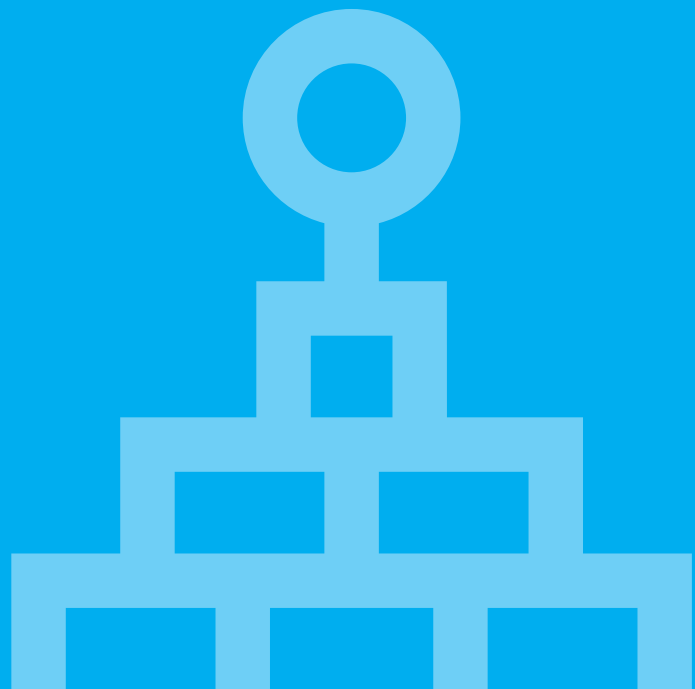
**Chernikova A.**

Rector of NUST MISIS

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# Information about NUST MISIS



# NUST MISIS Today

6

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**4**

branches

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**9**

colleges

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**1**

business school

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**4 000**

employees

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**1 000**

doctors and candidates  
of sciences

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**17 000**

students

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**3 300**

international students

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**69**

countries of the world

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**1**

center of collective use

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**3**

world-class engineering  
centers

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**29**

advanced  
laboratories

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# Colleges of NUST MISIS

**COLLEGE OF IT  
& AUTOMATED  
CONTROL  
SYSTEMS**



**COLLEGE OF  
ECONOMIC &  
INDUSTRIAL  
MANAGEMENT**



**COLLEGE OF  
MINING**



**COLLEGE OF  
ENVIRONMEN-  
TALLY SOUND  
TECHNOLOGIES &  
ENGINEERING**



**COLLEGE  
OF NEW  
MATERIALS &  
NANOTECH-  
NOLOGY**



**COLLEGE OF  
INFORMATION  
BUSINESS  
SYSTEMS**



**COLLEGE  
OF LIFELONG  
LEARNING**



**COLLEGE  
OF BASIC  
PROFESSIONAL  
STUDIES**



**COLLEGE  
OF QUALITY  
OF HIGHER  
EDUCATION**



# History of NUST MISIS

8

**2017**

NUST MSIS entered the QS World University Rankings by Subject and took 31<sup>st</sup> position in Engineering - Mineral & Mining

**2016**

NUST MSIS showed the highest growth rate among Russian universities in QS World and Regional Rankings

**2015**

NUST MISIS first entered the THE World University Rankings and ranked 19<sup>th</sup> in the THE World's Best Small Universities Ranking

**2008**

National University of Science and Technology MISIS – NUST MISIS

**2013**

NUST MISIS became a winner of Russian Academic Excellence Project 5-100

**2014**

NUST MISIS and MSMU amalgamation; the University entered the QS World University Rankings

**1962**

Moscow Institute of Steel and Alloys – MISIS

**1930**

Moscow Institute of Steel – MIS

**1918**

Moscow Academy of Mines – MAM



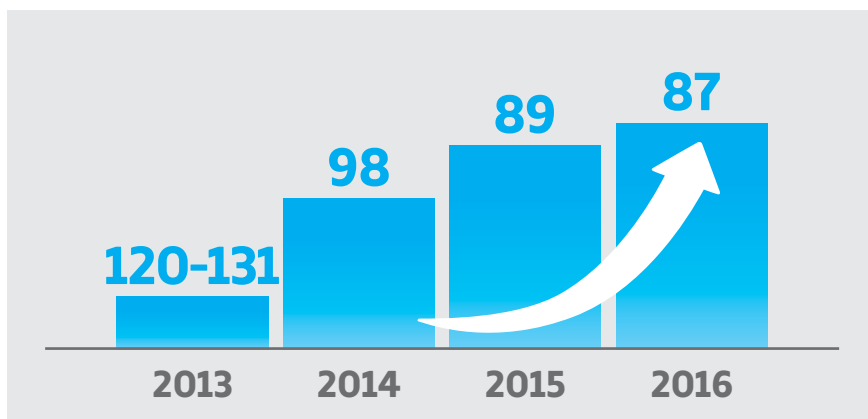


# 100

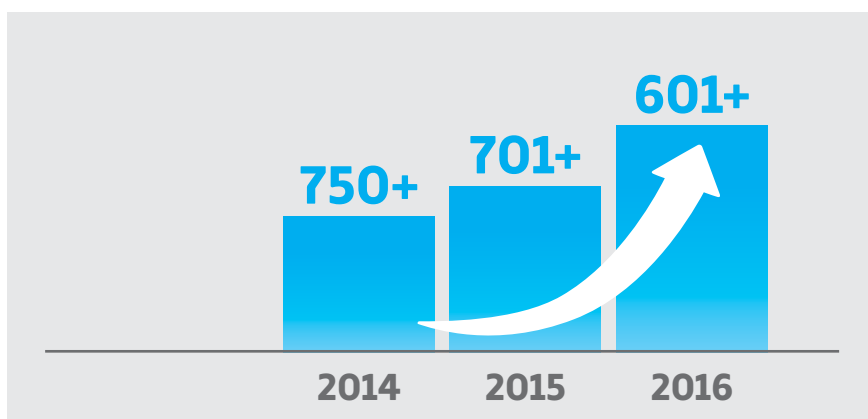
**In 2018 NUST MISIS  
celebrates 100  
anniversary of Moscow  
Academy of Mines**

# QS University Rankings

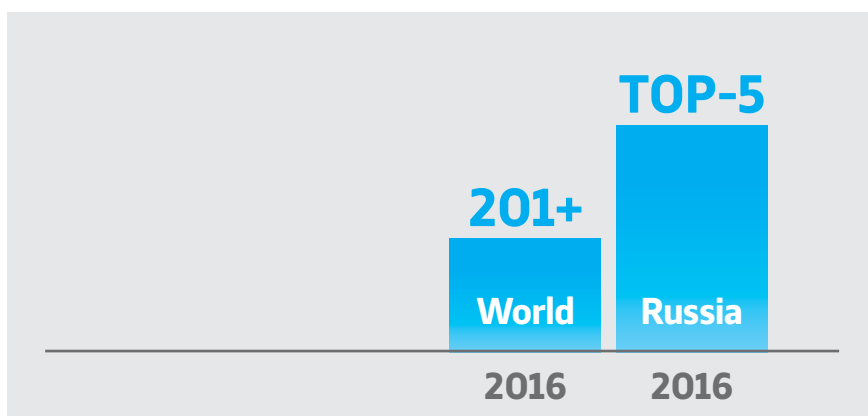
10



87 QS: BRICS



601–650 QS World University Rankings



201+ QS Graduate Employability Rankings



87

**NUST MISIS takes  
the 87<sup>th</sup> position  
in QS University  
Rankings: BRICS**



# THE Rankings, U.S. News Best Global Universities



12

**801+**

Worldwide

**19**

World's Best Small  
Universities Ranking,  
2015



**283**

TOP-300  
U.S. News Best  
Global  
Universities-2017

# Education



# Admission Campaign

# 2016

## Admission quality monitoring

14

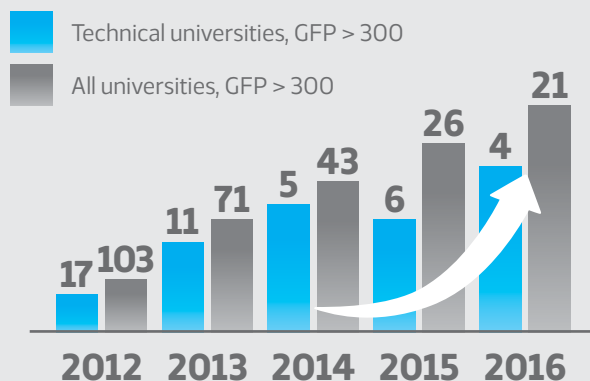
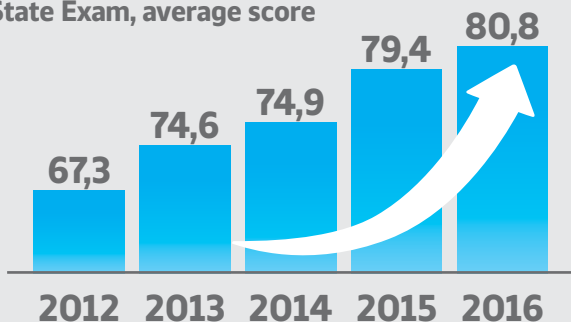
**NUST MISIS's 2016 admission campaign became the best of the last 5 years**

313 bachelor's degree students took part in the international "Research projects contest" to enter NUST MISIS master's degree programs without exams.

## 50

**admission competition reached 50 applications per one place funded by government**

**The growth of the Unified State Exam, average score**



**Arkady Dvorkovich**

Deputy Prime Minister of the Russian Federation

"NUST MISIS is one of the leaders of engineering education in Russia. The University trains excellent specialists for the country's future. I highly support NUST MISIS".

# Student Office

In 2016 a new organization called the Student Office was established. Its primary target is the development of the information infrastructure of student services, including «one window» online service.



# 4 500

documents have  
been issued in  
4 months

Students can request necessary information and documents, monitor their academic performance on different disciplines, check the schedule, do homework and use research libraries and analytical database.

The service has simplified and accelerated the process of interaction between students and University administration. In 4 months more than 4 500 documents have been issued. Proceeding period is just one day.



# Education

16



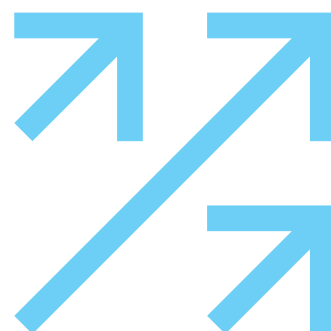
**x2**

**admission to  
master's degree  
programs increased  
almost two times**

Every year the University creates new educational programs in Russian and English languages. Recruitment for master's and PhD programs has doubled in past years.

NUST MISIS was awarded the Russian Federation Government Prize for the Centers for Technological Support of Education – the networking system of continuous education.

In June 2016 the first graduation of master's degree students from NUST MISIS's Advanced Metallic Materials for Engineering and Quantum Physics programs took place.







**MISIS**  
National University of  
Science and Technology

9

**full-time English-  
medium master's  
programs  
in NUST MISIS**

# Three English-medium Summer Schools

# 100

To attract future full-time students to master's degree programs NUST MISIS organized three English-medium Summer Schools on materials science, quantum technologies and thermodynamics.

18



**Summer School  
“Materials and  
Technologies”**

**Summer School  
2016**

organized jointly with Russian  
Quantum Center

**APDIC WRRS  
Summer School**

**More than 100  
international students  
and scientists from all  
over the world**

# School-leavers Attraction

# 182 000

## Moscow

## Russian Federation

## World

<b>SCHOOL COMPETITIONS</b> "MISIS Lights the Stars", Programming competition, "The Future of Russia", etc.	<b>SCIENCE FESTIVAL</b>	<b>SCHOOL COMPETITIONS</b> "Star", Interuniversity Math competition, Online Physics Competition, etc.	<b>INTERNATIONAL EXHIBITIONS</b> NAFA, the U.S.; APAIE, Australia; EAIE, Great Britain; etc
<b>DISTANCE-LEARNING ENGINEERING SCHOOL</b>	<b>OPEN-DOORS DAY</b>	<b>DISTANCE-LEARNING ENGINEERING SCHOOL</b>	<b>COMPETITION "IT'S TIME TO STUDY IN RUSSIA"</b>
<b>ONE DAY UNIVERSITY</b>	<b>PREPARATORY DEPARTMENT</b>	<b>UNIVERSITY PRESENTATIONS AT SCHOOLS</b>	<b>DISTANCE-LEARNING ENGINEERING SCHOOL</b>
<b>UNIVERSITY SATURDAYS</b>	<b>FABLAB</b>	<b>EXCURSIONS AND MASTER CLASSES</b>	
<b>ENGINEERING CLASSES</b>	<b>SUMMER SCHOOL IN SOKOLNIKI</b>	<b>UNIVERSITY SITE AT GEOLOGICAL MUSEUM</b>	
<b>CHILDREN'S UNIVERSITY</b>			

19

In 2016 NUST MISIS held the events devoted to school-leavers attraction. 150 000 high school students from Russia and 32 000 students from different countries visited them.

Just for a year, 35 schools have joined the project "Engineering class in Moscow school".





# Online Courses

# 14

**14 online courses have been developed and launched on the Open Education National Platform**

In 2016 NUST MISIS developed and launched 14 online courses on the Open Education National Platform in core areas of the University disciplines: physical chemistry, materials science, engineering and others.

21

**NUST MISIS has the largest number, after Lomonosov Moscow State University, of natural sciences online courses on educational platforms.**

## 42 000

**students of online courses on openedu.ru**

In 2016 the number of students for NUST MISIS online courses on openedu.ru exceeded 40 000.

## 3<sup>rd</sup>

**among the most popular courses**

The Time-management course took 3<sup>rd</sup> place among the most popular courses on the OENP.

## 2

**online courses in English**

2 online courses in English developed for the EdX.



# EdCrunch

One of the most important events of 2016 was EdCrunch – Europe’s largest conference in the field of new educational technologies and methodologies, which was held with the active support of Russia’s Ministry of Education & Science. 2016’s key topic was “Blended learning: traditions and the future”.

22



**More than 4 000  
participants attended  
the conference and  
15 000 people took  
part online**





#EDCRUNCH

ПАНЕЛЬНАЯ ДИСКУССИЯ

Мнения школьников о  
смешанном обучении: что и  
как мы изучаем, чтобы нам  
интересно учиться?

250

experts from  
40 countries  
and 70 Russian  
regions delivering  
speeches



# Creative Environment

# 4.0

## University 4.0

24

NUST MISIS implements the "University 4.0" model, that includes not only education, science and innovation, but also creative environment.

NUST MISIS's strategy involves creation of a wide range of possibilities for students – for personal growth, self-education, entrepreneurial skills development.



Dmitry Medvedev, Arkady Dvorkovich, Anatoly Chubais, Mikhail Fridman, Ruben Vardanyan and others delivered lectures through the "Technology of success" project.





30+

student  
organizations



# Continuing Education

## International School of Business and Technologies

26

In 2016 NUST MISIS became the first among Russia's technological universities to open a business school. ISBT has high-quality, practice-oriented MBA, EMBA and DBA programs, and short-term professional development programs. The synthesis of NUST MISIS engineering competences and the School's educational methodology allows the University to hold professional training courses for business community representatives.



### Specialized MBA program “Management of Industrial Enterprise”

On October 24<sup>th</sup>, 2016 the MBA program “Management of Industrial Enterprise” started with the aim to enhance the professional and managerial skills of OMK’s executives.



# Science



# Publication Activity

# 51%

## Growth of publication activity

28

From 2015 to 2016 the number of publications per faculty increased by 51%, and the citation index per faculty by 84%.

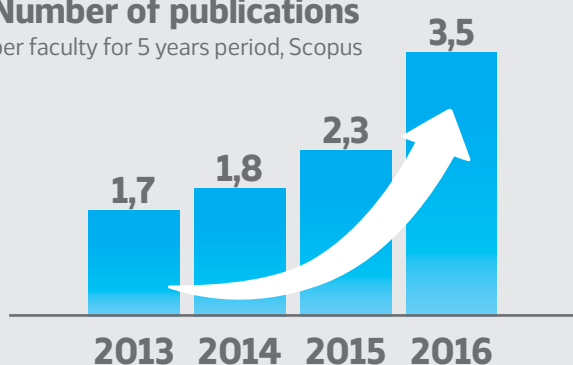
Among the universities-participants of the Project 5-100, NUST MISIS is the first by the number of publications in the engineering & materials science field in journals in the first quartile of the SNIP.

## 1 place

by the number of publications in journals in the first quartile of the SNIP

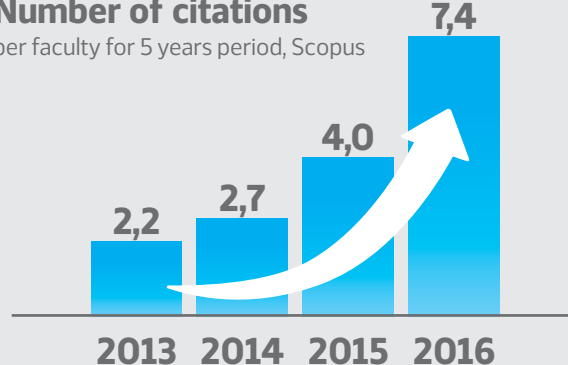
### Number of publications

per faculty for 5 years period, Scopus



### Number of citations

per faculty for 5 years period, Scopus



**Harry Bhadeshia**

Professor, member  
of NUST MISIS ISAC,  
University of Cambridge

“Throughout my cooperation with NUST MISIS I have been observing significant achievements of my Russian colleagues both in educational and research activities. The number of publications in leading international journals, such as Nature, Nature Physics, Nature Communication, has significantly increased”.

# Publications in Highly-cited Journals

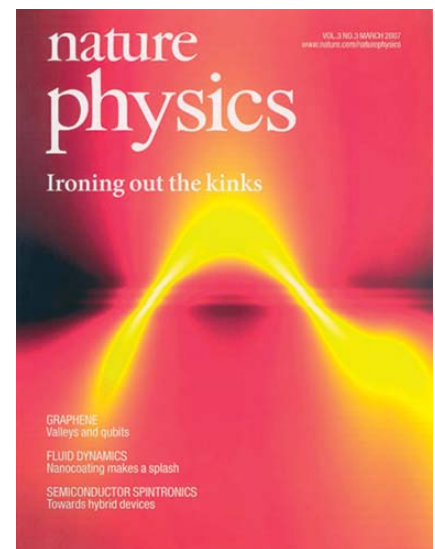
# TOP



**Nature Materials**



**Science**



**Nature Physics**

In 2016 NUST MISIS scientists published articles in the most prestigious journals included in the TOP-1% of the SNIP. Articles were published in such journals as Science (Morozov S.V.), Nature Physics (Eremin I.M., Vasilyev A.N.), Nature Materials (Efetov K.B.), International Materials Reviews (Levashov E.A., Mukasyan A.S., Rogachev A.S., Shtansky D.V.), and other highly-cited journals.

**NUST MISIS  
scientists published  
articles in the most  
prestigious journals**





70

Over 70  
NUST MISIS  
researchers have  
an h-index of  
over 20

# Leading Scientists

Professor Dmitri Golberg, head of the NUST MISIS Laboratory of Inorganic Nanomaterials, and professor Sergey Morozov, head of the NUST MISIS Laboratory of Functional Low-Dimensional Structures, have entered the list of the Most Highly Cited Researchers-2016, published by Thomson Reuters.



**Professor Dmitri Golberg**

Head of the Laboratory of Inorganic Nanomaterials



**Professor Sergey Morozov**

Head of the Laboratory of Functional Low-Dimensional Structures

## 21

young academic  
staff members have  
international  
PhD degree



**Jan van Ruitenbeek**

Professor, member of  
NUST MISIS ISAC,  
Leiden University

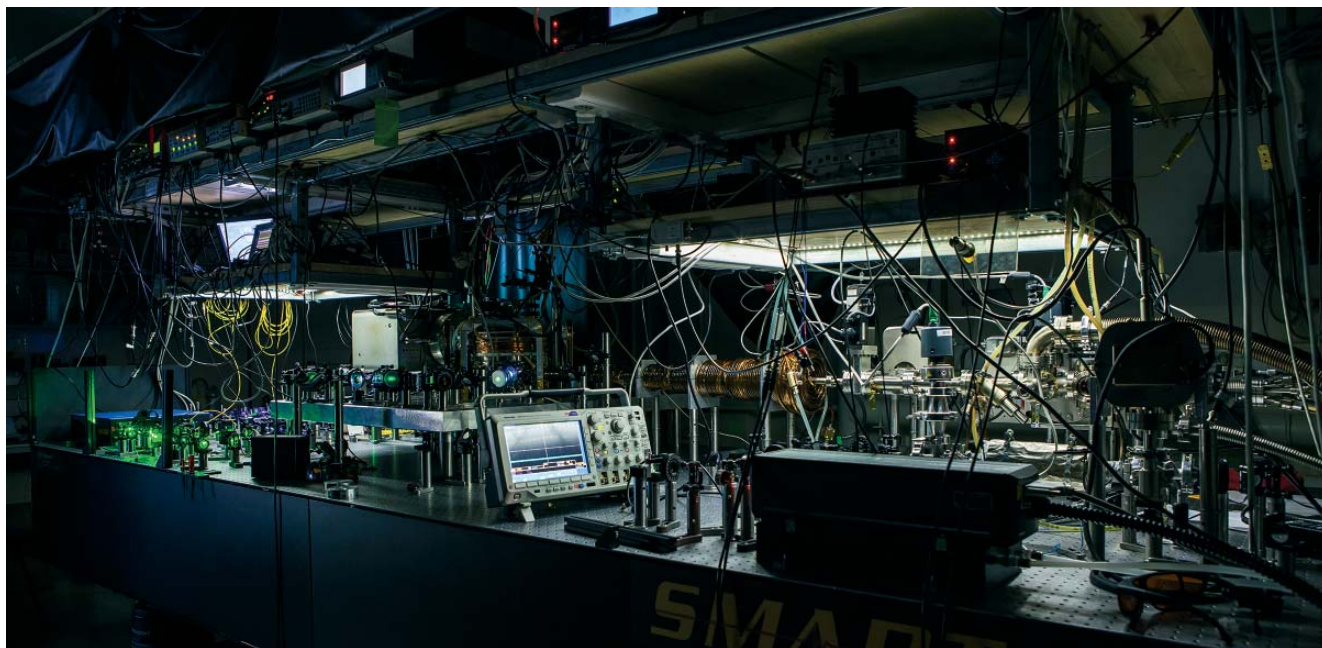
“I am very impressed with NUST MISIS’s dynamics of development. I think my university should learn the ways NUST MISIS makes decisions and implements ambitions plans”.



# NUST MISIS Quantum Center

# RQC

32



## 10

**R&D laboratories**

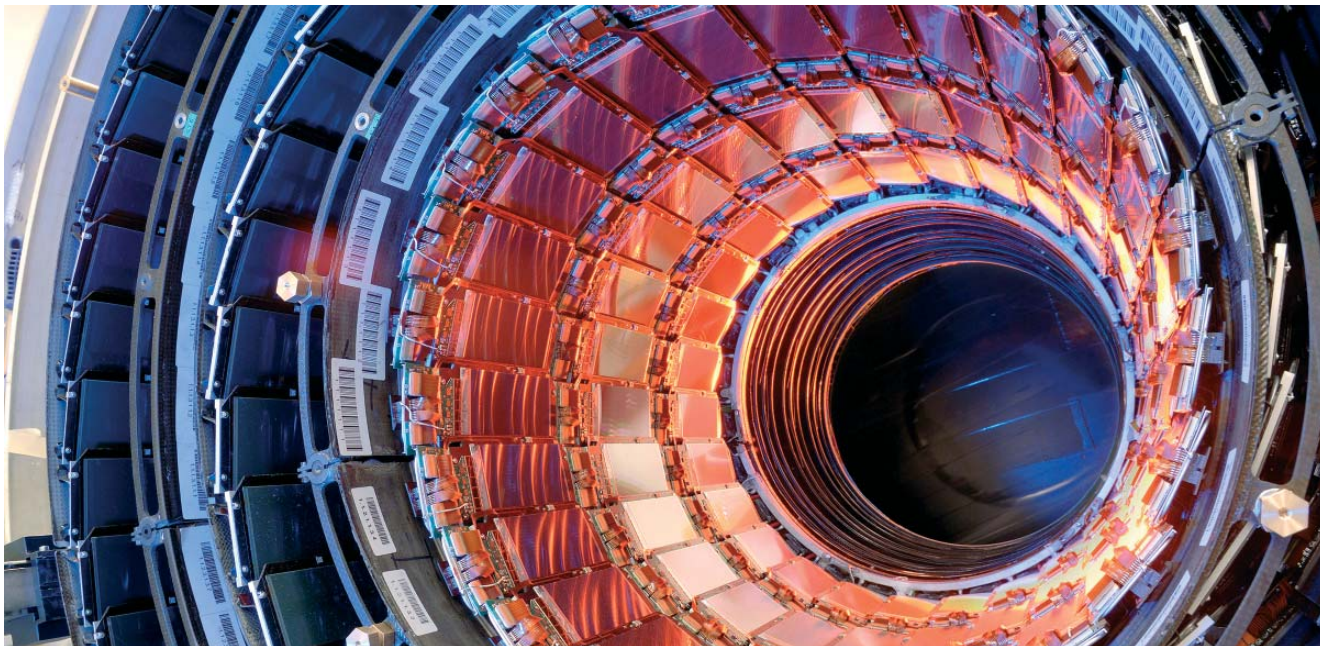
### **Creation of the NUST MISIS Quantum Center**

In September 2016 NUST MISIS and the Russian Quantum center (RQC) created the NUST MISIS Quantum Center, joint science and educational project which includes 10 R&D laboratories.

The combined potential allows the NUST MISIS Quantum Center to compete for the leading position among world-recognized research centers specializing on these issues.

# Cooperation with MegaScience Projects

# SHIP



33

## Cooperation with MegaScience projects

In October 2016 a group of NUST MISIS engineers started the design of the decay vessel's camera, the most massive part of the SHiP's (Search for Hidden Particles) new experimental apparatus at CERN, the European Organization for Nuclear Research (Geneva, Switzerland).

41 scientific organizations from 16 countries are engaged in the project. In 2015 NUST MISIS joined the SHiP project as an expert in the field of superconducting magnets and various kinds of steel and alloys to use in the construction of SHiP, as well as one of the major participants designing and implementing the engineering part of the project.

# 41

scientific  
organizations from  
16 countries are  
engaged in the  
project



# Government Awards

# RUSSIA

34



## Russian Federation's Government Award

In November 2016 a group of scientists from the NUST MISIS R&D Center "Acoustooptics" received the Russian Federation's Government Award 2016 for young scientists in the field of science and technology for the development of a setup of acousto-optical control for a powerful laser fusion device of a new generation.

## Moscow Government Award

In February 2016 NUST MISIS's young scientist Vyacheslav Bazhenov received the Moscow Government Award for the development of a new technology for producing molded titanium alloy components by casting them in a graphite mold made by milling. The technology will be used in the Russian aircraft industry.

## NUST MISIS PhD students won three gold medals at the all-Russian contest "Scientific and Technical Creativity of Youth"



# Innovations and Know-hows

## NUST MISIS achievements at international exhibitions

### Archimedes-2016 (Moscow)

3 gold



### Inventions Geneva (Switzerland)

2 gold



1 bronze



### INST-2016 (Taiwan)

2 gold



### iENA-2016 (Germany)

1 gold



1 silver



### SIIF-2016 (South Korea)

2 gold



2 silver



1 bronze



### China Association of Inventions

Big gold medal



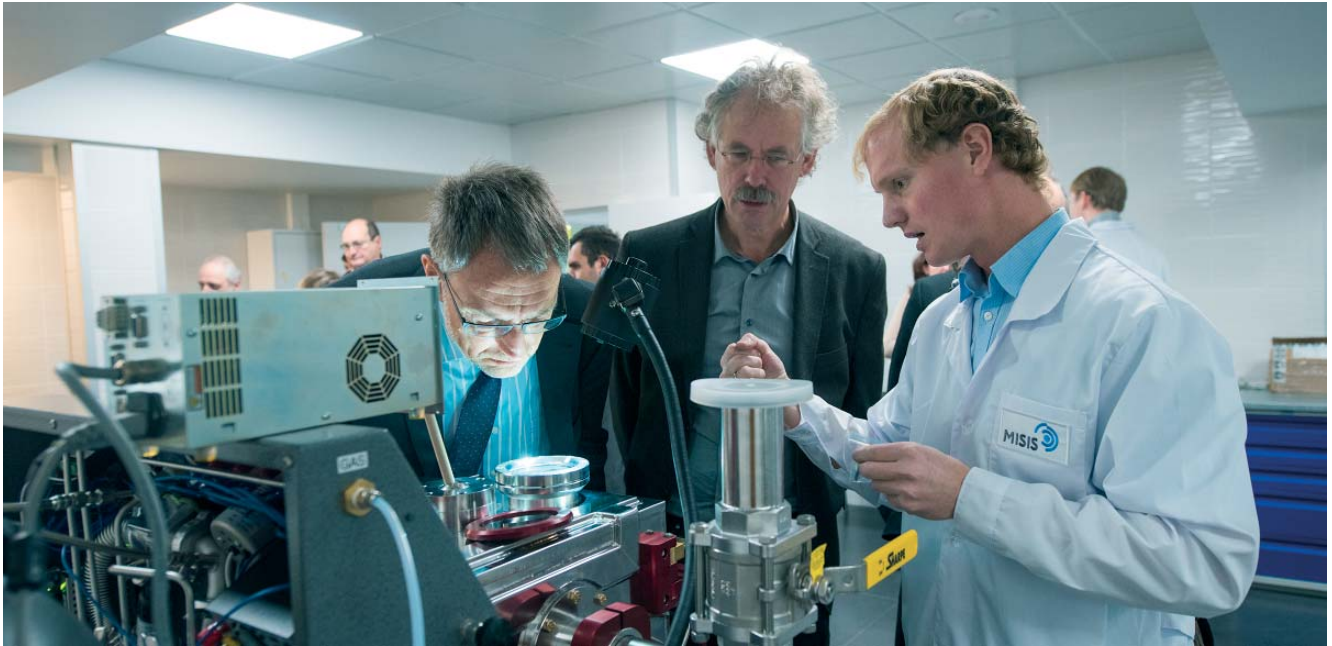
**6** innovations of NUST MISIS  
scientists are among the  
“100 best inventions of Russia”



# International Scientific Advisory Council

# ISAC

36



NUST MISIS's International Scientific Advisory Council (ISAC), comprised of world-leading scientists from the UK, Germany, the USA, Israel, Canada, Russia, Sweden and the Netherlands – continued its active work in 2016.

**The 2016 ISAC meetings key topics – strategic academic units (StrAUs) and NUST MISIS educational activities**



# Infrastructure







# Center for Industrial Prototyping of High Complexity

In 2016 the construction of NUST MISIS's Center for Industrial Prototyping of High Complexity was completed. The Center, unique for Russia, will become a high-tech digital lab for the development of innovative products. The size of output varies from one micron to 20 meters.



**The construction of NUST MISIS's Center for Industrial Prototyping of High Complexity was completed**

39

The center's equipment and machine-tools can measure, develop, generate, and build sophisticated functional digital systems for multiple sectors.



**Vladimir Pirozhkov**

Director of the Center for Industrial Prototyping of High Complexity

“Our center will provide scientists with a kind of a “magic wand”. The multi-industrial facility which is the first of its kind and hasn’t existed before, will give an opportunity to create almost any object that comes to mind – from biobot to spaceship”.



# Commune House

40



**In 2016 the NUST MISIS Commune House became the best student residence hall complex in Russia according to the all-Russian contest “Moscow restoration – 2016”**

A large-scale project of the Commune House reconstruction started in 2009 and was finally completed in May 2016, when the complex's third campus was put into official service. After the reconstruction the Commune House,

a historical and architectural monument of the constructivism era, became modern and comfortable student residence hall complex for 600 NUST MISIS students.



**In 2016 NUST MISIS  
Commune House was  
recognized the best  
student residence hall  
complex in all-Russian  
competition**



# New Laboratories

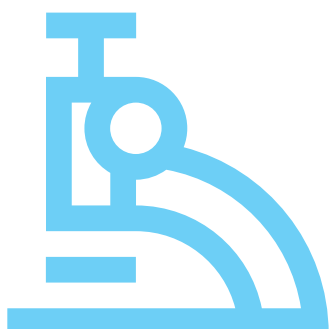
42



**Laboratory for  
Hybrid Additive  
Technologies was  
launched in 2016**

## **Creation and construction of new laboratories**

In 2016 the Laboratory for Hybrid Additive Technologies led by professor Igor Smurov from the National Engineering School of Saint-Etienne (France) was launched. Previously opened at NUST MISIS R&D laboratories (4 in 2015 and 3 in 2014) continued their work in 2016.





# Extracurricular Activities



# Student Organizations

## Joint Student Council

44

**University Council**

**Residence Hall  
Complex Council**

**Trade Union**

**Scientific Society**

**Student Business  
Club**

**Industrial Design  
Club**

**KVN**

**Sports Clubs**

**Tour Club**

**Dance, Theatre and  
Vocal Studios**

**English Club**

**MISIS Media**

**International  
Friendship Club**

**Volunteer Club**

# International Youth Association



45

**In May 2016 NUST MISIS held the first Russian-Latin Student Forum supported by the Russian Ministry of Foreign Affairs and the National Committee of Assistance & Economic Cooperation with Latin American Countries**

**In May 2016 NUST MISIS established the African Student Union**

**In April 2016 the International Congress of Students Associations was organized under the patronage of Russia's Ministry of Education and Science.**



# KVN Movement

**KVN – “Club of the Funny and Inventive People”**

46



According to the results of the XXVII KVN International Festival “KiViN-2017”, held in Sochi, the “MISIS-GUU” team entered the best 20 teams of the International KVN Union.





20

**“MISIS-GUU” team  
entered the list  
of best 20 teams  
of the International  
KVN Union**



# Sports Achievements

# SPORT

48



## Gold

**medal in Rio  
Olympics**

Two NUST MISIS students and two alumni helped represent the Russian national team at the 2016 Rio Olympics. NUST MISIS alumni Evgeny Tishchenko won the Olympics first gold medal in boxing.

## Gold

**medal at swimming  
championship  
in Canada**

Rozaliya Nasretdinova, a 3<sup>rd</sup> year student at the NUST MISIS College of Mining, became a World champion in swimming in Windsor, Canada.

## 8

**medals at the 5<sup>th</sup>  
All-Russian Summer  
Universiade**

9 NUST MISIS boxers participated in the final of the 5<sup>th</sup> All-Russian Summer Universiade, collecting 8 medals.



# Program “New Level 2.0”



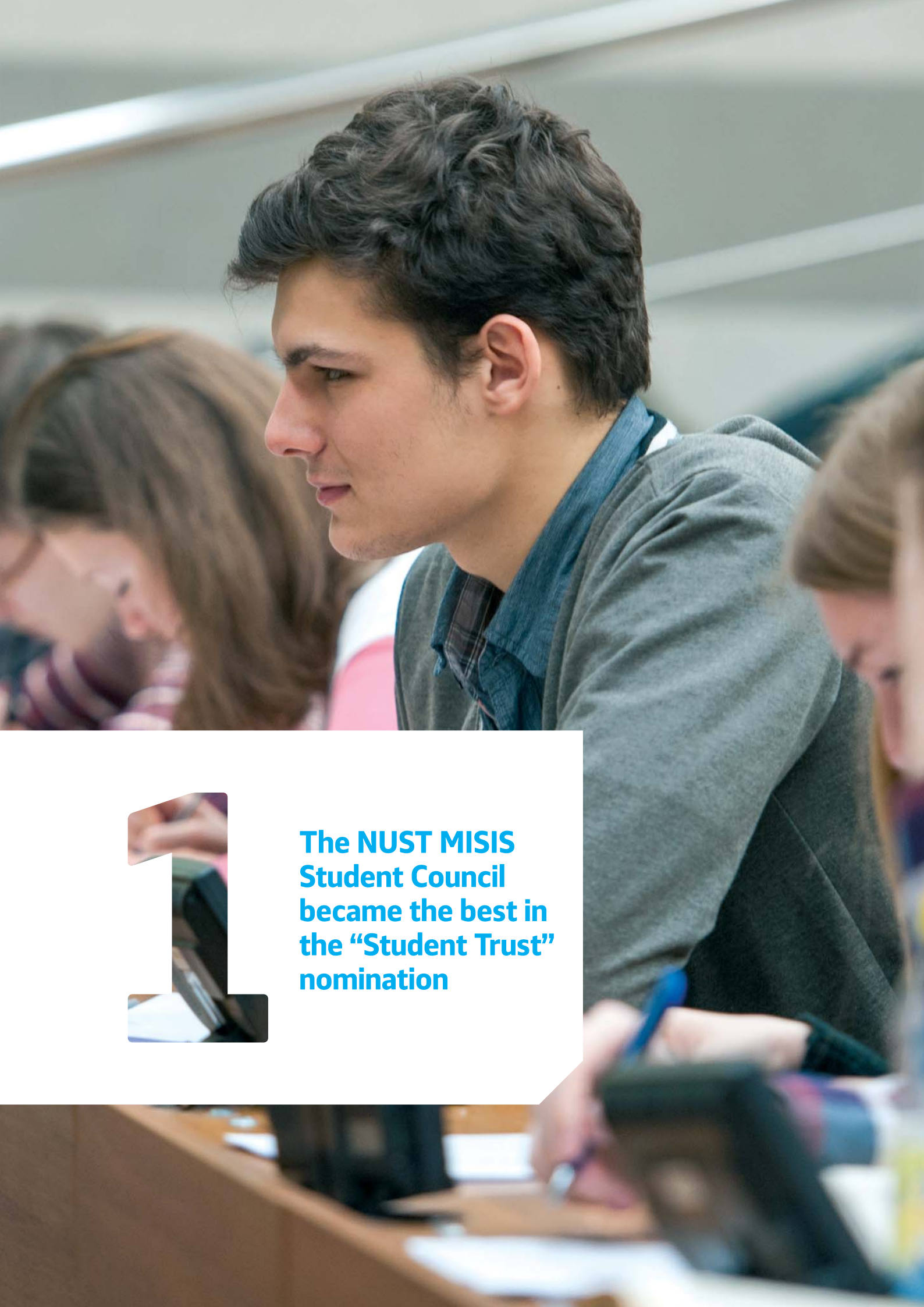
49

**NUST MISIS student mass media received awards in “The Best TV” and “The Best Editor” categories of the student mass-media competition “Crystal Arrow-2016”**

## **Leaders for student self-administration**

The program trains leaders in student self-administration, as well as tutors and professional guides.

Master classes on the basics of modern communications and public speaking practice, teamwork and corporate culture trainings are regularly held at NUST MISIS.



1

**The NUST MISIS  
Student Council  
became the best in  
the “Student Trust”  
nomination**

# Student Self-administration

## All-Russian contest in the field of student self-administration

In May 2016 NUST MISIS became a prizewinner of the all-Russian contest in the field of student self-administration development in three categories – “Rector of the Year”, “The Best Tutoring System of Education Institution” and “The Best Student Scientific Society”.

**2016**

**Rector  
of the Year**

**2016**

**The Best Tutoring  
System of Education  
Institution**

**2016**

**The Best Student  
Scientific Society**

51

## Russian Student Council Rankings

In December 2016 the NUST MISIS Student Council became the best among the leading universities in Russia in the “Student trust” nomination in the first Student Council Rankings, as well as entered the TOP-5 in the “Financial Support” category and the TOP-10 in “The Development of Student Self-administration” and “Openness and Transparency” categories.

**TOP-5**

**Financial Support**

**TOP-10**

**The Development  
of Student  
Self-administration**

**TOP-10**

**Openness and  
Transparency**



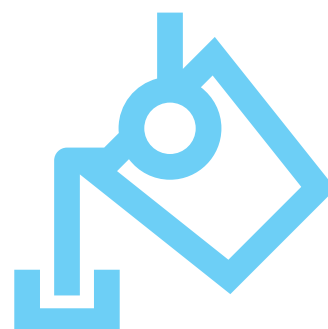
# Volunteer Movement

52



Hundreds of NUST MISIS students are involved in volunteer movements and large-scale all-Russian projects: visits to orphanages and correctional residential care homes, work with veterans, visits to cities of military glory, and work with high-school students.

Most of the volunteer projects are implemented jointly with the University's business partners. "Ginger expo" and "Christmas garland" are held at the Cancer Center named after N.N. Blokhin jointly with OMK, and the patronage for the children's social-rehabilitation center in Kolomna – with EVRAZ.



# Endowment Fund



# Endowment Fund

54



**x2**

**endowment fund  
doubled from  
68 million rubles to  
128,3 million rubles**

In 2016 NUST MISIS's endowment fund showed the highest rate of growth among the endowments of Russian universities. The University nearly doubled its endowment from 68 million rubles to 128,3 million rubles.

It was announced at the IV International Forum of Universities held by RAEX Ranking Agency, where the University was awarded with the diploma for "Efficient Communications with Alumnus".



# Cooperation with Business



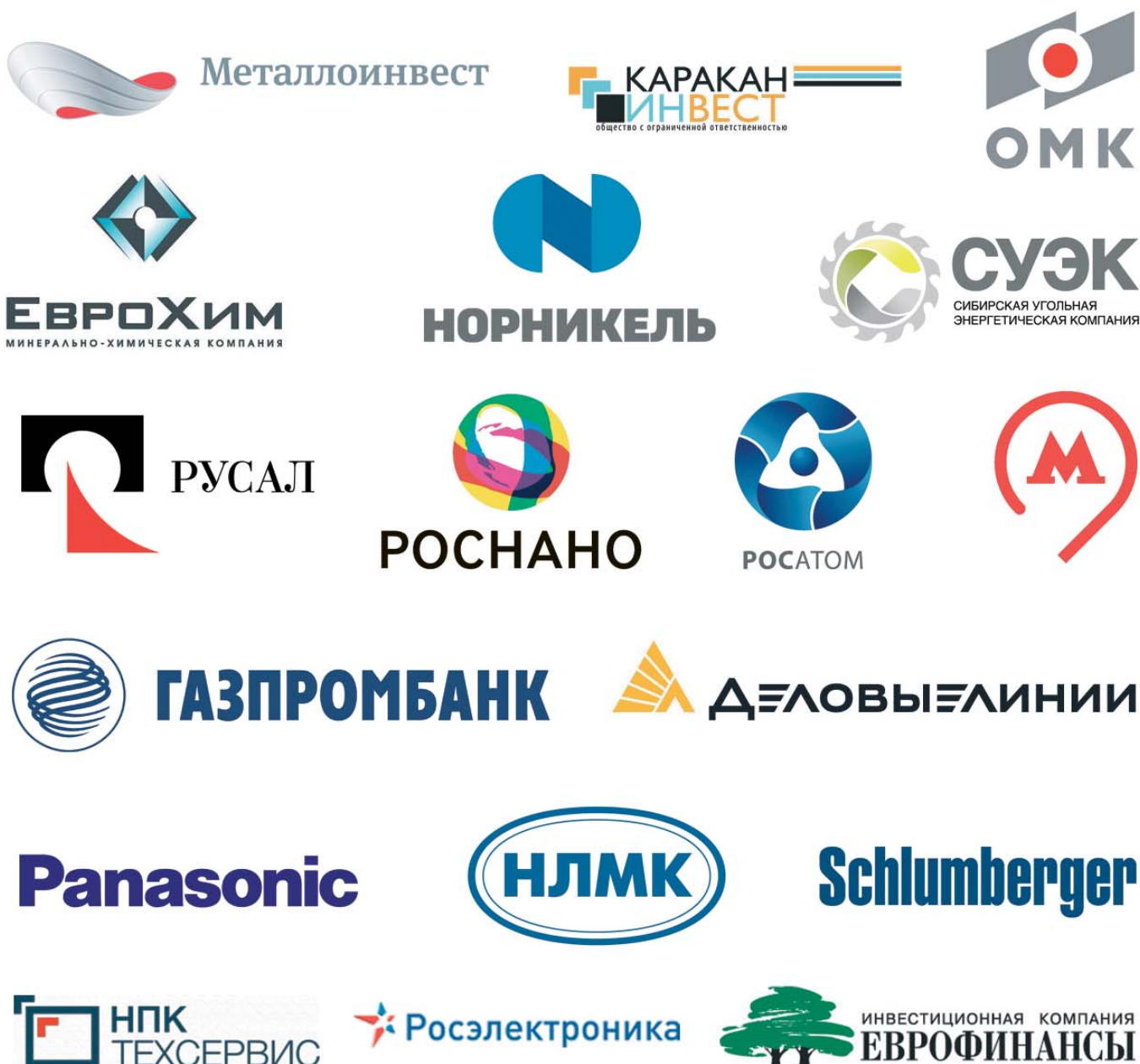
# Business Partners

# 1500

NUST MISIS has more than 1 500 business partners. Over 1 200 of them provide students with internships and practical works. University business partners are the leading Russian and international companies, state bodies.

According to the University's statistics, students' placements and internships are followed by employment in 80-90% cases.

56







# Career Events

58



## Career days

Every week the University holds career meetings with business partners. During the events students have a chance to get information about current job opportunities, communicate with successful business community representatives, participate in master classes and be selected for internship programs.

## Case-championships

The University holds three types of championships: specialized company championships (Air Liquid, Evraz, EuroChem, etc), industry based championships (in the fields of mining and metallurgy), and the all-Russian case championship CUP MISIS CASE, which attracted more than 1 000 participants from 56 Russian universities.





# 100

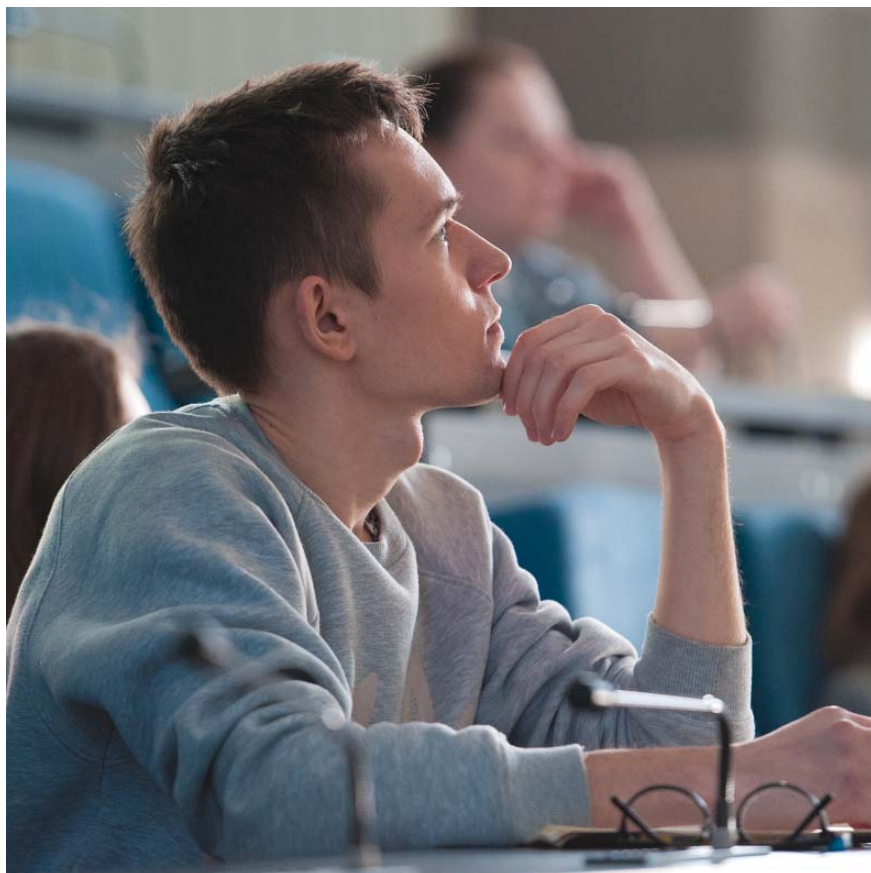
**NUST MISIS  
organizes around  
100 career events  
for 5 000 students  
annually**



# Scholarship Programs

NUST MISIS offers more than 50 unique grant and scholarship programs with a total amount of 22 mln rubles. The largest scholarship programs are implemented jointly with key partners: Metalloinvest, OMK, SUEK, IBS, TMK, Giredmet, Rigaku, Norilsk Nickel, Rosatom, TVEL, etc.

60



# 50

**unique grant  
and scholarship  
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