

Passport of TPU

125 Years of Glorious History.
Over **170 000** Engineers for Success
and Wealth of RUSSIA!

Full name –

Federal State Autonomous
Educational Institution for Higher
Education National Research
Tomsk Polytechnic University
(FSAEI HE NR TPU).

Established

in **1896** as Tomsk Technological
Institute (TTI) of practical engineers. Opened in
1900 as TTI by the Russian **Emperor Nikolas II**.



Category –

National Research University. The category was awarded in 2009.

5100

Winner of the competition on Competitiveness Enhancement of the Leading Russian Universities among Global Leading Research and Education Centers in 2013.



Acting rector –

Andrey A. Yakovlev



1,712

Academic staff members –

256

Doctors of Sciences

1

RF President Award winner

782

Candidates of Sciences

20

honored workers of science and technology

2

State Award winners

23

RF Government Award winners, including

6

members of the Russian Academy of Sciences

8

RF Government Award winners in the field of science and technology for young researchers



**Number of
Students –**

11,500+,

including

2,900+

international students from

50+

countries.

University Budget (2019) –

5,6 billion rubles

**Total area of university buildings
and facilities –**

↗ 329,000 square meters.

Location (legal and postal address):

634050, Tomsk, 30 Lenin Avenue, Russia.

Official website: tpu.ru

E-mail: tpu@tpu.ru

Achievements

In 2006 and 2016,
**TPU received the
RF Government
Award in the field
of quality.**

The Award was granted for the achievement of significant results in the field of product and service quality, as well as introduction of high-performance methods in quality management.



In **1997**,
by the Russian President
Decree Tomsk Polytechnic
University was included into
the State Register of the
most valuable objects
of the cultural heritage
in the Russian Federation.

TPU graduates make the gold pool of Russia:

Nikolai Kamov – engineer of unique Russian helicopters

Nikolai Nikitin – designer and architect of the Ostankino TV Tower

Dmitri Bondarev – designer of the first Soviet car Russobalt

Matvei Kapelyushnikov – inventor of the revolutionary turbodrill (a hydraulic bottom-hole drill for drilling wells)

Nikolai Urvantsev – discoverer of Norilsk ore deposits

Kanysh Satpaev – discoverer of the world largest copper deposit in Zhezkazgan, founder and the first President of the Kazakhstan Academy of Sciences

Oleg Alimov – inventor of a space drill that was used to retrieve lunar soil samples from the Earth's moon in Luna 24 mission

Rankings

TPU position



**World University
Rankings 2021**

801-1000

8th position in Russia

World University Rankings by Subject 2020

↗ Engineering and Technology

251-300

↗ Physical sciences

401-500



**QS World University
Rankings 2021**

401

World University Rankings by Subject 2020

↗ Engineering Petroleum

26



Global Ranking of Academic Subjects 2020

↗ Mechanical Engineering

51-75

↗ Energy Science
and Engineering

301-400

Forbes

**100 best
Russian
universities**

7th position

(1st position among HEIs in Siberia)



9th position

**Expert RA Rating
Agency**

TPU MISSION –

is to enhance competitiveness of the country by providing internationalization and integration of research, education and practical training in the processes of training engineering elite, generating new knowledge and innovative ideas, developing resource efficient technologies.


TPU campus has well-developed infrastructure

↗ **32**
university buildings

↗ **48**
land plots with a total area of
186,6 hectares

↗ **197,475**
square meters
for educational and laboratory
facilities

↗ **6,149**
places in **15** dormitories



↗ University Library
— containing over
2.6
million books

↗ Over
— **7,000**
computers and over
250 WiFi zones in
university buildings

↗ **11,612**
— square meters
of indoor sports facilities

↗ **550**
— places in university
sanatorium and
recreation centers

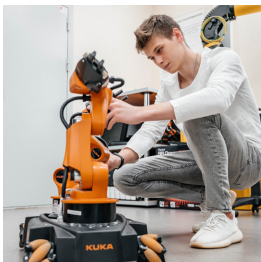
↗ over
— **1,000**
seats in university
canteens and cafes

↗ International Culture
— Centre

↗ Kindergarten
—

↗ Year-round sports
— facility

**School
of Core
Engineering
Education**



**6
Engineering
Schools**

**TPU
Lyceum**

**School
of Engineering
Entrepreneurship**



2 Research Schools



➤ A new university structure is established to ensure training of highly qualified engineers, researchers and technology entrepreneurs.

Reserve- Officer Training Department

The main objective of the **School of Core Engineering Education**

is developing basic universal and professional competences in engineers (the core bachelor training during 1-2 years of studies).

Advanced educational technologies, modern interactive resources, project-based learning and highly-qualified staff of the School provide development of wide area of thought, deep theoretical training in fundamental disciplines and flexible practical skills: teamwork, critical thinking, leadership skills, and ability to solve complex tasks. By the end of the training in the School of Core Engineering students can choose their further educational path more consciously, coordinate the selected training at the bachelor level, choose training at the master level, which can be applied, research, entrepreneurial, or combined.



School of Core Engineering Education

1-2 year of study

Divisions:

- Mathematics and Computer Sciences
- Natural Sciences
- Social Sciences and Humanities
- General Engineering
- Physical Education
- Foreign Languages
- Russian Language



Engineering Schools

There are **6** Engineering Schools with **11**

divisions and **3** research centers (RC), resulting from integration of previously existing departments.





School of Nuclear Science & Engineering

- Division for Nuclear-Fuel Cycle
- Division for Experimental Physics
- The Weinberg Research Center



School of Non-Destructive Testing & Security

- Division for Electronic Engineering
- Division for Control and Diagnostics



School of Computer Science & Robotics

- Division for Information Technology
- Division for Automation and Robotics



School of Energy & Power Engineering

- Division for Power and Electrical Engineering
- The Butakov Research Center



School of Earth Sciences & Engineering

- Division for Geology
- Division for Oil and Gas Engineering
- Division for Chemical Engineering



School of Advanced Manufacturing Technologies

- Division for Materials Science
- The Kizhner Research Center

Research schools

○ High Energy Physics

➤ integrated master and postgraduate programs

Engineering schools

○ Non-Destructive Testing & Security

○ Advanced Manufacturing Technologies

○ Earth Sciences & Engineering

○ Energy & Power Engineering

➤ engineering master programs

➤ applied postgraduate programs





School of Engineering Entrepreneurship

➤ master degree in entrepreneurship

➤ additional minor in entrepreneurship

Chemistry & Applied Biomedical Sciences





↗ fundamental
world-level research

-  researchers - PhD holders
-  publication activity
-  academic reputation
-  rankings by subject





Computer Science & Robotics

Nuclear Science & Engineering

↗ engineering
solutions

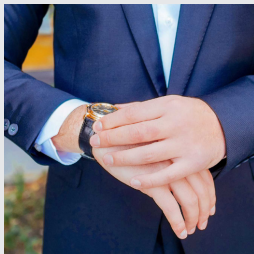
-  new-generation engineers
-  advanced technologies
-  R&D revenue
-  good reputation among
employers

↗ fostering
entrepreneurship

-  technostarters
-  income from business assets
-  income from enterprises
-  innovation environment

Research Schools provide new format of PhD training – integrated master and PhD programs, thus ensuring the defense of a thesis in time and participation of students in scientific projects.





School of Engineering Entrepreneurship

educates tech entrepreneurs within engineering master programs and trains future engineers and researchers for entrepreneurial activity within its extracurricular programs and courses, at the university and beyond. Besides, the School is integrated into the overall TPU innovative infrastructure to create a common knowledge-commercialization environment.

Today the University offers

-
- 29** Bachelor programs
 - 32** Master programs
 - 9** Diploma Specialist's programs
 - 19** Candidate's programs
 - 31** Doctoral courses

395

professional
development
programs

12

network
master
programs

41

professional
retraining
programs

>1,900

e-courses within in-class
and distance learning

6

network bachelor

programs and **1**
network specialist
program

240

Virtual simulators
within in-class and
distance learning

↗ There are
— **27.7** %
of international
students at TPU.

↗ In 2020, **133** TPU
students took internship (studied)
— in **17** foreign countries
under academic mobility
programs.

↗ **254** students from
— **19** foreign countries
studied at TPU.





There are over **90** agreements
for academic mobility programs with
foreign universities.



Research

➤ TPU is a leader in off-budget R&D activity and international contracts among universities and institutions of the Russian Ministry of Science and Higher Education.

In 2019, the total number of R&D projects

amounted to over **2** billion rubles; off-budget

funds made up over **1** billion rubles.

Publication activity - **1,917**
articles indexed in WoS and Scopus,
552 - in Q1 and Q2 journals

**TPU TAKES A LEADING POSITION AMONG
OTHER UNIVERSITIES OF THE RUSSIAN
MINISTRY OF SCIENCE AND HIGHER
EDUCATION ON THE AMOUNT OF ATTRACTED
FUNDS FOR YOUTH SCIENCE**

↑ 220 billion rubles are annually allocated

to youth science, where over **70%** comes from programs and grants.

Following the results of international, national and local competitions, TPU students annually receive

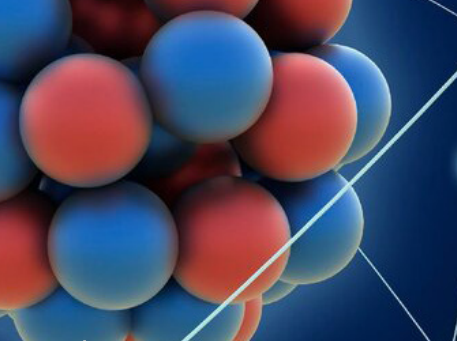
over **800** grants and scholarships for research projects and final qualification papers.



Tomsk Polytechnic University is among the top five universities in Russia as per the number of scholarships and grants of the President of the Russian Federation, as well as the number of RAS medals awarded to postgraduate students and young scholars.

Breakthrough research and engineering projects

- Magnetron spraying systems on metal vapors providing high sedimentation speed and quality of lightweight films
- Research within Land-Shelf-Atmosphere system in the Arctic
- 3D-printing in space
- Biomedical materials and articles with additive technologies, plasma and radiation modification methods
- Conception of high thermal gas-cooling thorium reactor installation
- Nuclear technologies for diagnosing and treating cancer diseases



- Technology of hydrogen formation from natural gas without hydrocarbon emission
- Import substituting technology for serial production of detectors for consumption, level, pressure difference, density and interface level
- Nanoceramics market for hi-tech industry
- Green chemistry – environmentally friendly technologies and materials for chemical engineering
- Industrial and municipal wastewater treatment and decontamination
- Transformation of solid fuel into eco-friendly gas

News. Events. Facts



➤ A case of TPU practices was included in the White Paper on the Role of Universities of Science and Technology in Innovation Ecosystems of the Conference of European Schools for Advanced Engineering Education and Research (CESAER).

CESAER

➤ TPU was assigned the status of the Huawei Authorized Information and Network Academy (Huawei is the world telecommunications giant).



➤ LAPP opened the research center for electrotechnical materials at TPU that became the first Competence Center in Russia (LAPP is one of the world's leaders in cable industry).





➤ TPU officially joined the UArctic cooperative network and became the first Russian university to run an overseas expedition jointly with RAS.



➤ The International Arctic Siberian Scientific Center (IASSC) was established at TPU within the Arctic Forum involving leading world Arctic researchers.

➤ TPU took the initiative as an integrator of TekhnetSibir, the interregional development program, to ensure synchronous activities of Siberian regions aimed to provide NTI market with goods and services and launch cutting-edge technologies

➤ The project “Packaged Technology for Transforming Solid High Energy Efficient Fuels with Low Emission of Green-House Gases” has been short-listed into National projects of the Ministry of Energy of the Russian Federation for introduction of innovative technologies and advanced materials in power engineering.

Research



↑ In 2019, **66**
TPU academic staff
and post-graduated
students defended
candidate or doctoral
theses.

↑ **42** TPU
employees are editorial
board members of
international and
Russian indexed
journals.

↑ **149** results
of intellectual activity
were registered,

including **75**

2
Russian and
foreign (EEC, USA)
patents.

6 license
agreements were
signed with industrial
partners.





↑ **6** TPU employees are members of organizing committees of international conferences.

↑ **29** scientific events were organized at TPU, including **22** international.

↑ TPU staff participated in **35** exhibitions, including **24** international. Over **40** awards, including **9** medals, were received.



➤ **TPU was one of the first universities in Russia to acknowledge technology entrepreneurship as a separate component of engineering education.**

- Integrator of priority markets and cross-cutting technologies.
- Center of interaction for researchers, engineers, business structures, development institutes, start-ups, academic institutions, government authorities, technology entrepreneurs and investors.
- Hub for R&D and technological tasks for leading companies.

Integrated system of complete innovative cycle

- 1.** School of Engineering Entrepreneurship:
 - Business Incubator – Test Ground of Engineering Entrepreneurship with a center of youth innovative creativity
 - Councils of industrial partners
 - Council of business partners
- 2.** Engineering centers within TPU engineering schools
- 3.** Pilot Production center
- 4.** Intellectual Property Office
- 5.** R&D Center
- 6.** Exhibition Center – Science and Education at TPU: Traditions and Innovations
- 7.** Innovative Zone of Small University Spin-offs (SUS)
- 8.** Scientific training center for Establishment and Technologies of Higher Professional Education
- 9.** MBA Programs Office within the Center for Continuing Education at Academic Affairs Division

TPU innovative zone includes

42 small university spin-offs (SUS), **40** of which were established under the Federal Law No. 217-FL; Foton company received financial support from the Foundation for Promotion of Small Enterprises in the Field of Science and Technology. The total SUS revenue in partnership with TPU amounts to approximately **240** million rubles.



Joint projects

- water treatment facilities within the Clean Water Initiative
- personal ECG machine based on nanoelectrodes technology
- mobile module complex for processing of furnace-waste materials
- charged particle accelerators and units
- hardware and software system to monitor and control a group of industrial robots
- prototype system for robotic ultrasonic control of ITER components (International Nuclear Fusion Reactor)

Internationalization of TPU research

Each year TPU signs over a hundred contracts and grants amounting to

0.5 billion rubles, which makes tpu one of the leaders among Russian Universities.



TPU has **18** international research and educational laboratories and centers under the supervision of leading Russian and international scientists (USA, Germany, Italy, Iceland, China, Armenia, Israel, etc.), including laboratories established following the RF Government Decree No. 220.

↗ **International Research Laboratory for Arctic Seas Carbon**

Supervisor: Prof. Igor Semiletov (USA)

↗ **International Research Laboratory for Development of Target Molecules Based on Framed Proteins for Diagnosing and Treating Cancer Formations: Theranostic Approach**

Supervisor: Prof. Vladimir Tolmachev (Uppsala University, Sweden)

↗ **International Research Laboratory for Technologies of Senior Citizens Well-Being Improvement**

Supervisor: Prof. Fabio Casati, PhD (Italy)

TPU mega-platforms



Research Nuclear Reactor

Science Park



Center for Science,
Technologies and
Education in the Field
of Defense and State
Security

Flight Control Center



Ecoenergy 4.0 Research Center

Center for Geological Training in Khakassia



Center for Additive Manufacturing Technologies

R&D Laboratory for Clean Water

TPU in CERN

TPU officially joined the biggest global initiative, i.e. the Large Hadron Collider being the world's largest and most powerful particle accelerator. Research is carried out in five CERN collaborations.

- Together with the **ALTAS** group, TPU researchers are involved in 2 main activities: distribution of tasks among a large number of computer centers around the world, ranging from such large centers as GRID-1 and GRID-2 to smaller grid systems of separate institutes and laboratories within the experiment; distribution of metadata.



As a part of NA64 and RD51 collaborations in CERN, TPU joined the **ATLAS** and CMS experiments, one of the most large-scale nuclear research.



Annually TPU young researchers have their long-term internships at the Large Hadron Collider within the **ATLAS** experiment and the LHCb project.

International recognition

TPU is the only Russian member of

16 prestigious international organizations, including Conference of European Schools for Advanced Engineering Education and Research (**CESAER**) and Consortium Linking Universities of Science and Technology for Education and Research (**CLUSTER**). In 2013, Tomsk Polytechnic University became the 30th regular member of the Association of Technical Universities of Russia and China (**ATURC**).



CESAER





НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ
ТОМСКИЙ ПОЛИТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ



Strategic partnership

TPU has over **1,100** cooperation contracts and strategic partnership agreements with the following companies and organizations:

460
universities and
research institutions

420
business structures

189
schools, lyceums and
educational centers

33
governmental
agencies

20
associations
and societies

**TPU is a
part of**

17 innovative
development programs (IDP)
of state corporations

Partner Companies

TPU develops partnerships with major corporations and companies, such as Gazprom, Rosatom, Roscosmos, Sibur Holding (Tomskneftekhim in Tomsk), Scientific and Production Association for Immunological Preparations "Microgen", System Operator of the United Power System, R-Pharm, ROSSETI FGC UES, Rosneft, Kaspersky Lab, Irkutsk Oil Company, Lenenergo, Mail.Ru Group, SIMENS AG (Germany), NISSAN Motor (Japan), National Nuclear Center of the Republic of Kazakhstan, VSK Insurance Company, Micron Corporation, Surgutneftegaz, Transneft, LLC GAZprom-Vostok, etc.



(and **6** IDP as a base university)

24 out of
36 technological
platforms

Strategic partnership

TPU is a base university of:

- Gazprom
- Rosatom
- Information Satellite Systems named after academic M. F. Reshetnev
- Microgen
- System Operator of the United Power System
- RAO Energy System of the East



РОСАТОМ



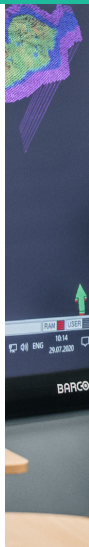
СИСТЕМНЫЙ ОПЕРАТОР
ЕДИНОЙ ЭНЕРГЕТИЧЕСКОЙ СИСТЕМЫ



ОАО «ИСС»



МИКРОГЕН



➤ TPU has its students' job placement system. More than 90% of young specialists are employed by industrial companies.

➤ Annually, the demand for TPU specialists and masters is **twice** as high as the number of graduates.



In 2010, the TPU **Endowment Foundation** was established – a non-profit trust fund intended to finance university educational, scientific and cultural projects. The first people who donated to this foundation (2010) were the RF President **Dmitry Medvedev**, political and public leaders of the country and the region.



TPU is the co-organizer and permanent operator of the All-Russian Forum of Young Researchers - U-NOVUS, which has been annually held in Tomsk since 2014.



The **4th Congress of Siberian Engineers** was held at TPU in 2018, where a program for the technological development of Siberia for the next four years was approved.



Cultural values of TPU are supported by multiple creative teams and associations:

- Bespokoinye Serdtsa (Restless Hearts) ensemble of TPU old-timers
- Dominanta student music association
- Diamant student sports dance club
- Ragtime jazz vocal studio
- Reflection pop vocal studio
- Club of opera and vocal music
- People's Artist of Russia Ludmila F. Travkina School of classical singing
- ART Concept photo studio
- Drama Club of TPU International Culture Center
- Musical Studio of TPU International Culture Center
- Folk dance ensemble

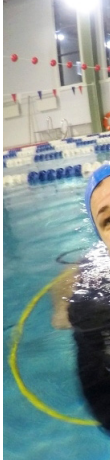


TPU is a partner institution and an official representative of the All-Russia St. **George's Ribbon Action.**



TPU student unions

- **Aida** climbing and caving club
- **Amazons** tourist club
- **Ariadne** climbing club
- **Siberian Lions** sports club
- **Orion** paragliding club
- **Afalina** diving club
- **Lifestyle** student organization
- **Otechestvo** (Fatherland) patriotic youth center, etc.





Culture and sports

Since 2012, a well-developed social infrastructure and complex approach to extra-curricular student activities has ensured TPU victories in the all-Russian competition of development programs for student associations.



**Sports
facilities:**




stadium




400


metre-long
athletic facility
of the Olympic
standard




on-campus
playgrounds, gyms
and other sporting
facilities




swimming pool




skiing lodge



football field covered
by artificial grass



rock climbing
simulator



two-km-long
roller-ski track

Public initiatives



Within Russian Student Teams

Within Russian building organization, TPU student construction brigade **"Kanikula"** participates in the construction of fuel and petrochemical refinery and other important objects of infrastructure.



Volunteer training center

Since 2010, the university has been the center of attraction of volunteers for the XXII Winter Olympic Games and the 2014 Winter Paralympics in Sochi, XIX World Festival of Youth and Students in 2017, FIFA World Cup in Russia and the Fire Relay of the XXIX World Winter Universiade in 2018.

Corporate media is a source of information for current university staff and students, an effective platform that promotes the university in regional, national and international scientific and educational fields.

➤ Bulletin of TPU:

The journal is included in the list of Higher Attestation Committee of the RF Ministry of Education and Science. It has been published for more than a century. Bulletin of Tomsk Polytechnic University. Geo Assets Engineering is indexed in Scopus and GeoRef databases.



**Journals
and press**

➤ Electronic journal
“**Vectors
of well-being:
economy
and society**»,
the editorial
board included 18
academicians of the
Russian Academy
of Sciences and 4
foreign scientists from
Germany, France,
Iceland and China.
The journal was first
published in 2011.

➤ Personnel Weekly
(**Za Kadry**)
is a large-circulation
12- page newspaper
issued every other
week. The number
of copies amounts to
1,500 issues. It has
been published since
1931.

➤ **Tomskiy
Politehnik:**

This journal of the TPU
Alumni Association
contains articles about
famous graduates,
significant dates and
events of the past and
the present. It has been
published for more than
15 years.

➤ Together with Elsevier
Publishing House TPU
releases **Resource-
Efficient
Technologies**,
an electronic scientific
journal in English.
Chief Editor of the
journal is Anatoly
Korkin, Professor of the
University of Arizona
(USA).

Contacts

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R&D Center

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TPU Museum Complex

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