



POLYTECH

Peter the Great
St. Petersburg Polytechnic
University



POLYTECH

INTERNATIONAL OUTLOOK



Dear partners and colleagues!
Dear friends!

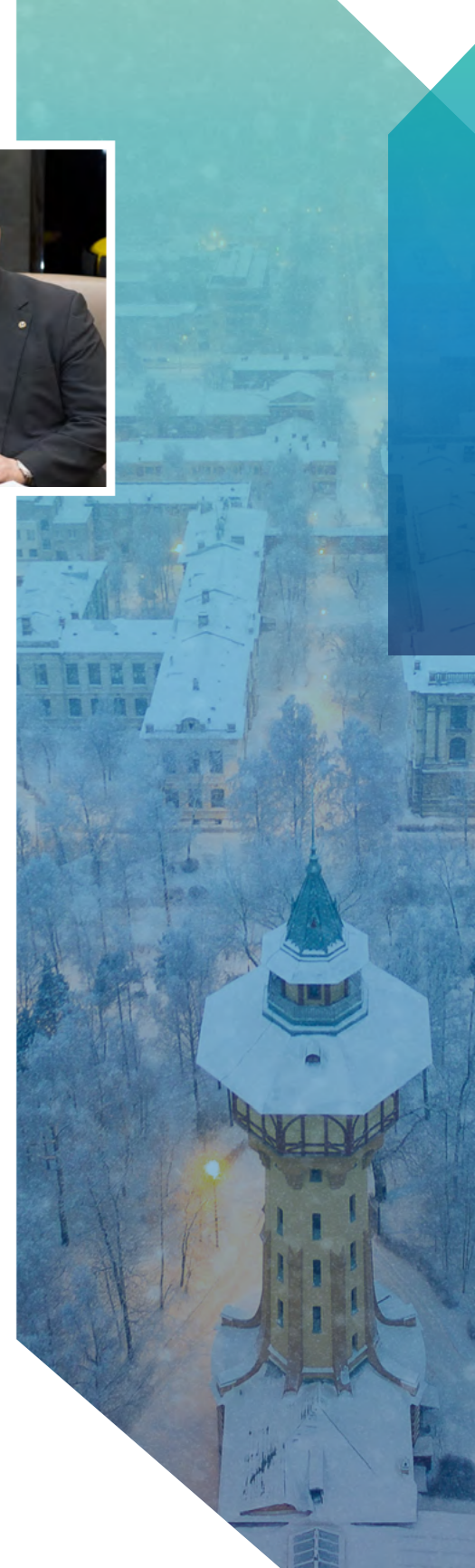
For more than 120 years, Peter the Great St. Petersburg Polytechnic University has been one of the leading universities in Russia. Over the years, within the walls of our university worked scientists who have forever left their mark on world science. And today, Polytechnic University is proud to continue the traditions established by the outstanding researchers, to develop and strengthen our scientific, technological and educational potential. We are part of the global world, being in contact with more than 400 foreign partners, including the world's leading universities and companies.

The rapid development of advanced areas of science, technology, education, and active interaction with foreign partners has given a synergetic effect, the key results of which you can see on the pages of this booklet, where we presented the best achievements of the Polytechnic in recent decades. You will find out about joint research and breakthrough discoveries, scientific and educational centers and laboratories; educational programs, grants, and competitions; about large-scale international exhibitions, conferences, and forums.

Perhaps, the most important thing is that we would not have achieved such results if we had been implementing our activities only in Russia. That is why we are developing our international activities and so highly appreciate the support of our foreign partners, many of whom have already become our friends. And we are always ready for reciprocal actions and steps towards working together for the benefit of world science, education, and technology.

Dear friends, I sincerely wish you all new discoveries, success, and inspiration. Our doors are always open for you: welcome to Polytechnic University!

Andrei Rudskoi
SPbPU Rector



ABOUT UNIVERSITY

POLYTECHNIC UNIVERSITY

was founded in **1899**



Sergey Yu. Vitte –

the Prime Minister of Russia (1903-1906), initiated the idea of setting up Polytechnic Institutes in St. Petersburg, Warsaw, Kiev.

Grand opening of the Polytechnic Institute took place on **OCTOBER 01, 1902**

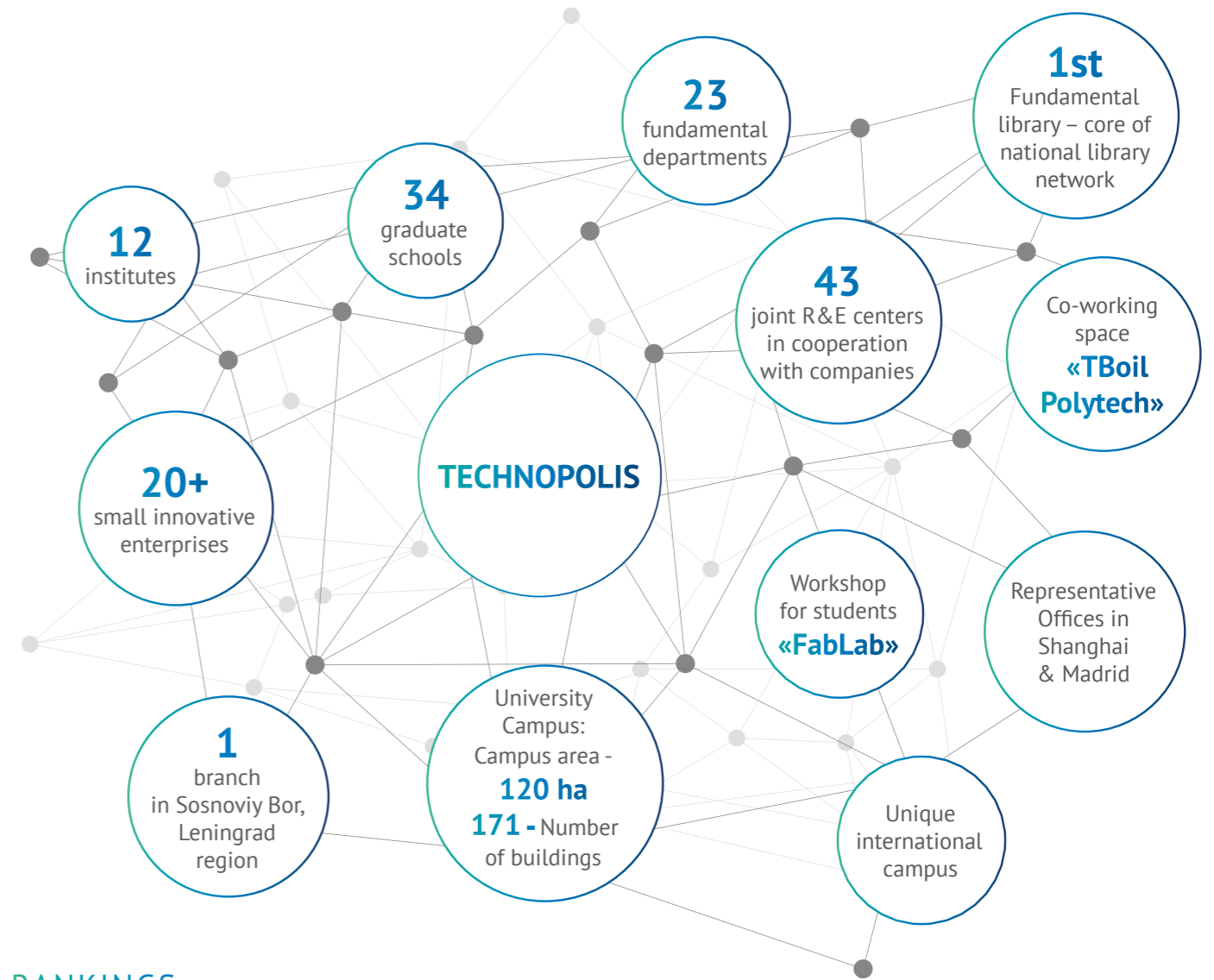
1956
Nicolay N. Semenov
Chemistry

1978
Pyotr L. Kapitsa
Physics

2000
Zhores I. Alferov
Physics



STRUCTURAL UNITS



RANKINGS

THE WORLD UNIVERSITY RANKINGS 2021
301-350

THE UNIVERSITY IMPACT RANKINGS 2020 TOP 50
37

THE WORLD UNIVERSITY RANKINGS 2020 TOP 90
87

THE WORLD UNIVERSITY RANKINGS 2021 TOP 125
Physical Sciences

THE WORLD UNIVERSITY RANKINGS 2021 TOP 150
Engineering Sciences

THE WORLD UNIVERSITY RANKINGS 2021 TOP 175
Computer Science

THE WORLD UNIVERSITY RANKINGS 2021 TOP 250
Education

THE WORLD UNIVERSITY RANKINGS 2021 TOP 300
Business and Economics

THE WORLD UNIVERSITY RANKINGS 2021 TOP 500
Life Sciences

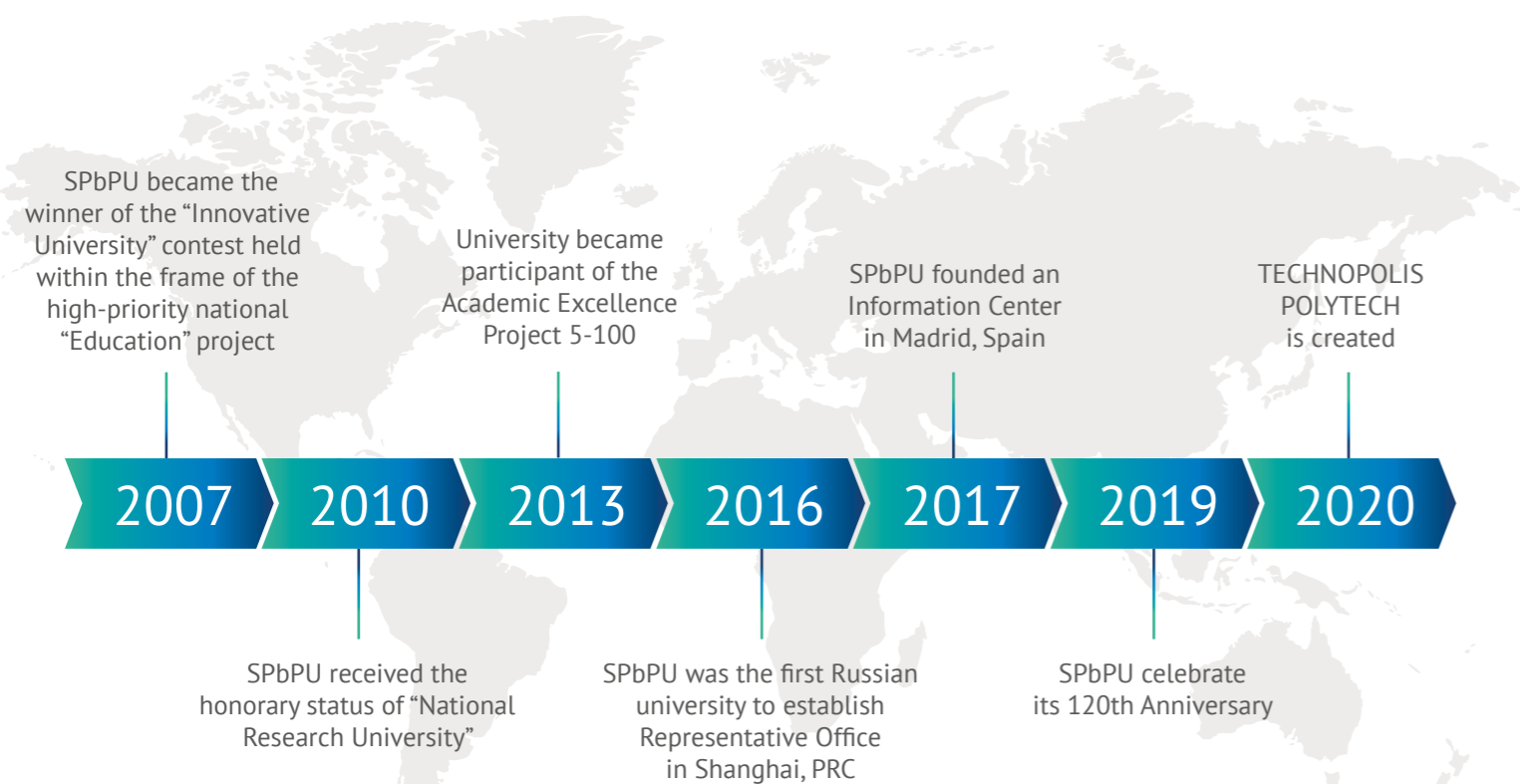
QS WORLD UNIVERSITY RANKINGS 2021
TOP 500

QS WORLD UNIVERSITY RANKINGS 2020
TOP 250
ENGINEERING - MECHANICAL, AERONAUTICAL, & MANUFACTURING

QS WORLD UNIVERSITY RANKINGS 2020
TOP 300
PHYSICS & ASTRONOMY

QS WORLD UNIVERSITY RANKINGS 2020
TOP 200
ENGINEERING - CIVIL STRUCTURAL

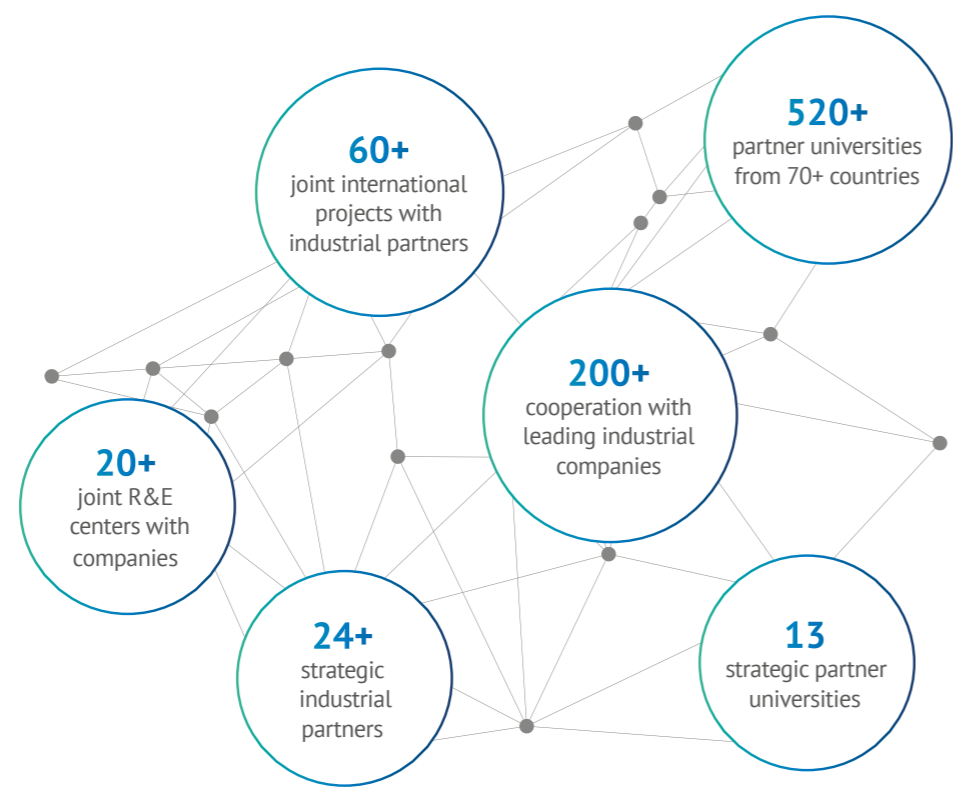
QS WORLD UNIVERSITY RANKINGS 2020
TOP 350
COMPUTER SCIENCE & INFORMATION SYSTEMS



UNIVERSITY GLOBAL PARTNERS

UNIQUE Worldwide international partnership network

2 University Representative Offices in Europe and Asia



KEY PARTNERS



COOPERATION WITH FOREIGN COMPANIES



COOPERATION WITH RUSSIAN COMPANIES

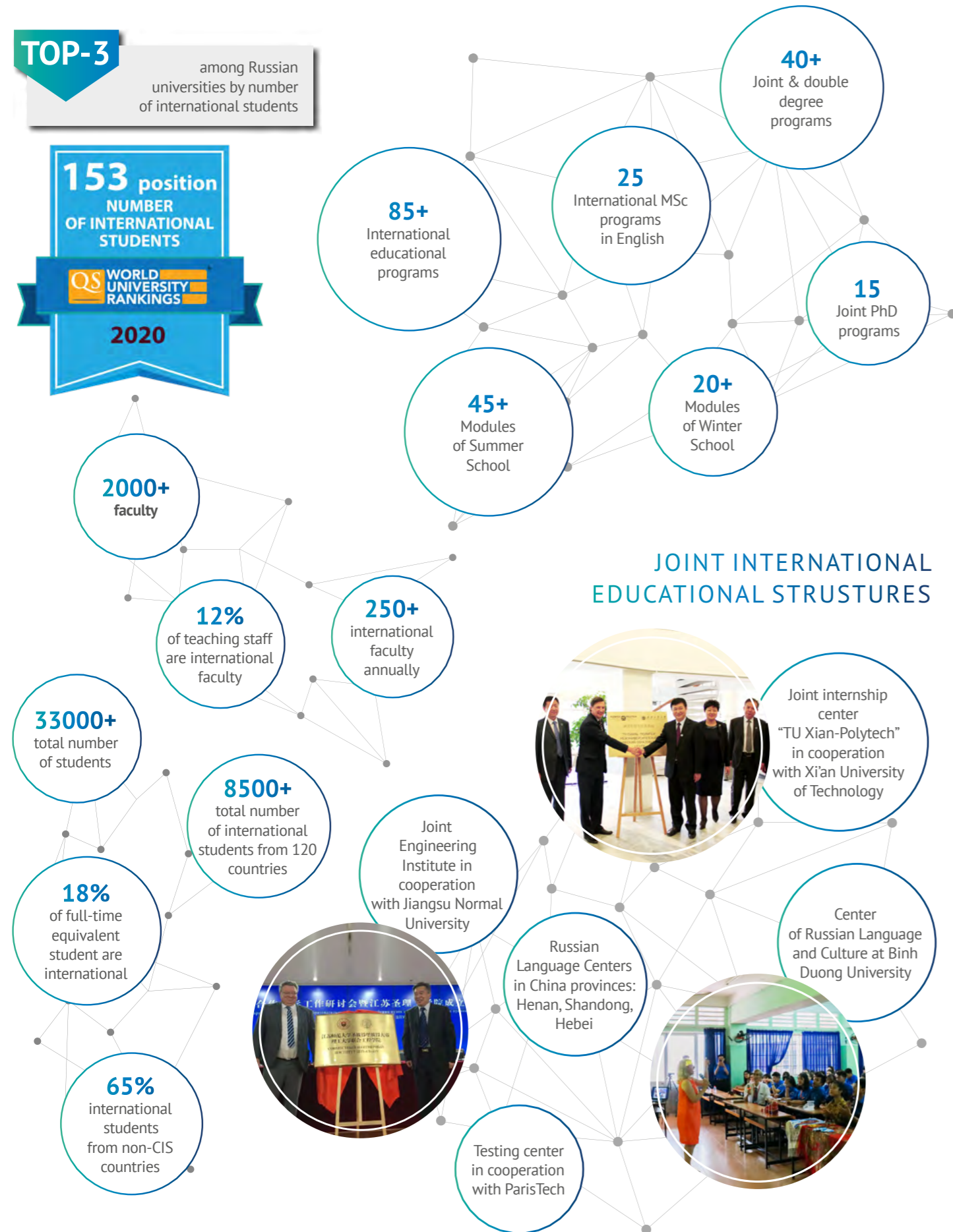


PARTNER UNIVERSITIES



INTERNATIONALISATION

INTERNATIONAL FACTS & FIGURES



INTERNATIONAL STRATEGIC PRIORITIES

- 1 Aiming to be one of the world leading technical Universities
- 2 Worldwide unique international partnership network with leading universities, research institutions and companies
- 3 Targeted promotion strategy on the European, Asian and Ibero-American market through the network of representative offices and joint structures
- 4 Comprehensive internationalization: educational programs, number of international faculty, foreign students, international-friendly campus
- 5 Organization of unique international events in collaboration with world academic & industrial leaders

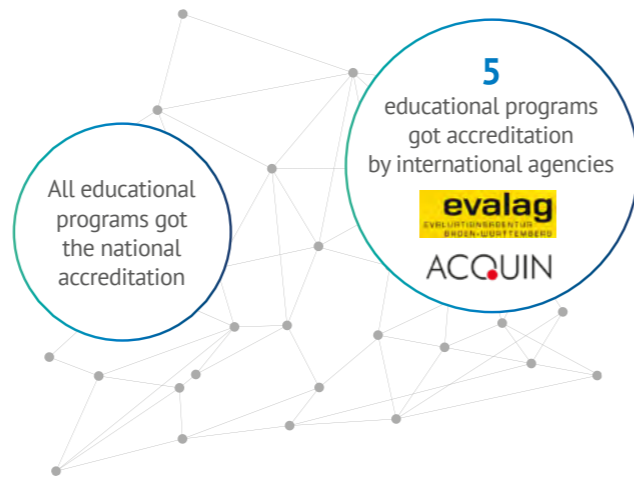
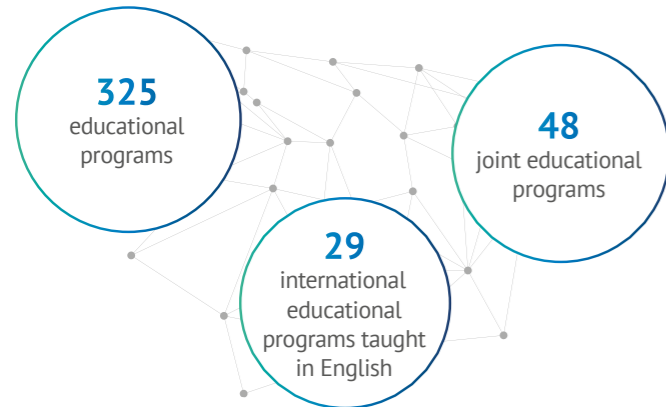


KEY INTERNATIONAL ASSOCIATIONS

- AU: International Association of Universities
- Association of Sino-Russian Technical Universities
- Belt & Road Science and Innovation Network
- World Class World Cities University Network
- T.I.M.E. Association
- Association of Russian-Indian Universities
- BRICS Network University
- Hewlett-Packard OpenView University Association

BEST PRACTICES IN EDUCATION

ANNUAL MONITORING AND UPDATING OF EDUCATIONAL PROGRAMS PORTFOLIO



STRATEGY FOR ATTRACTING PROSPECTIVE STUDENTS:

- Cooperation with centers for gifted children
- Cooperation with leading high schools of Russia
- Olympiads & contests
- Early career guidance
- Project activities & online courses
- Expert activities
- Exhibitions & social platform
- System of Engineering Schools for high school students of grades 9 and 10 (engineering leagues, Summer Schools, Polytechnic Challenge Festival)

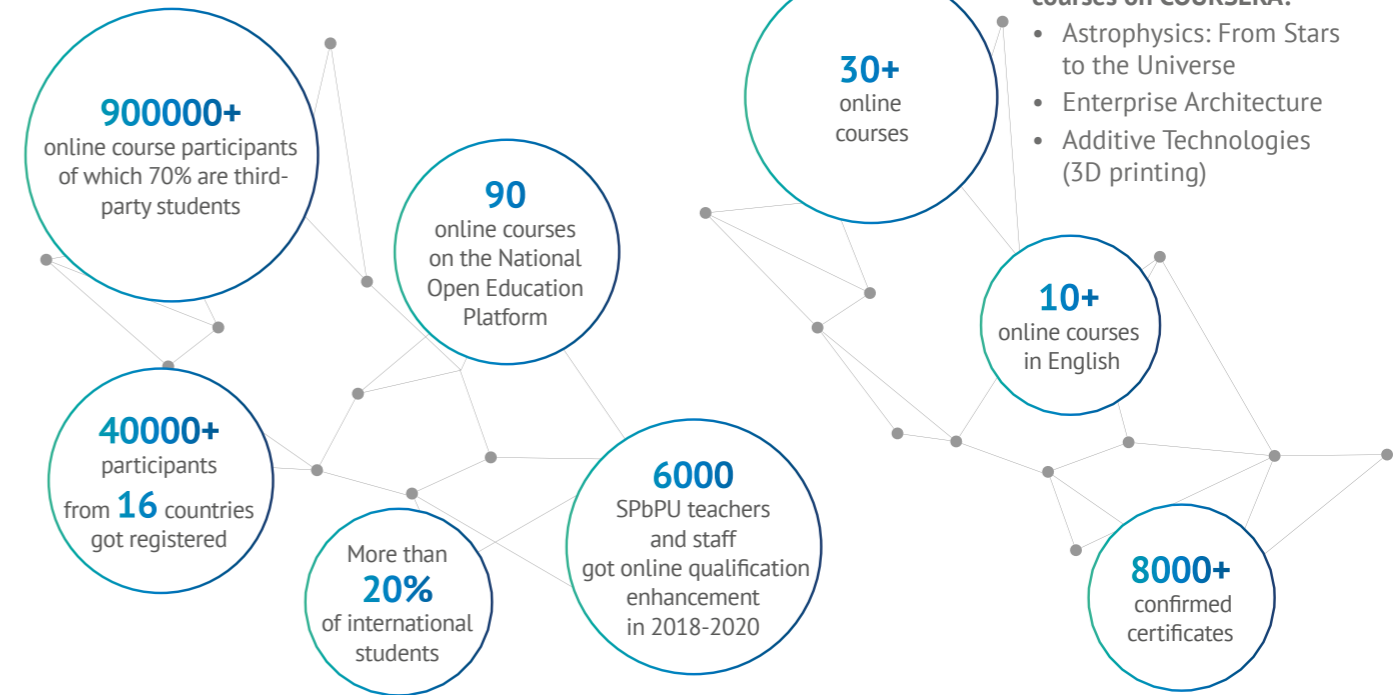
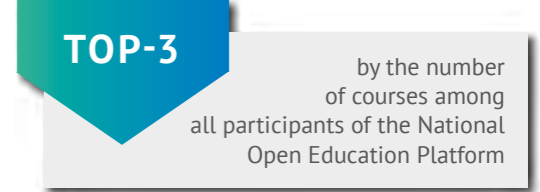
Winners of major Russian Olympiads for Russian and foreign citizens study at SPbPU.



SPbPU, Rosatom State Corporation and Akkuyu Nuclear JSC are working together on a large-scale Russian-Turkish project of Akkuyu NPP. Students from Turkey study nuclear energy at SPbPU and take practical training at the Leningrad Nuclear Power Plant.

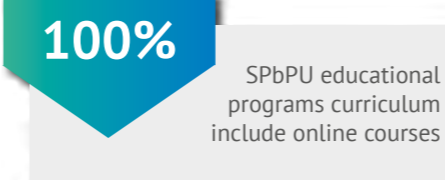


ONLINE EDUCATION

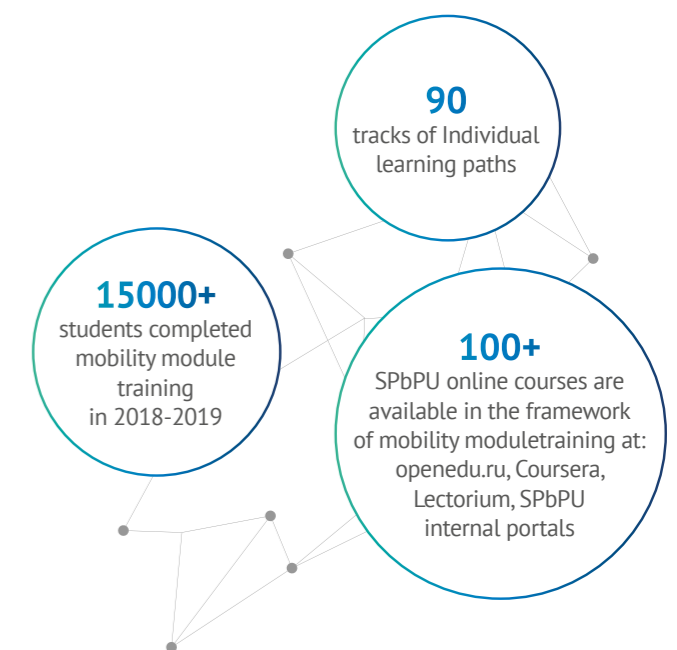


The most popular SPbPU courses on COURSERA:

- Astrophysics: From Stars to the Universe
- Enterprise Architecture
- Additive Technologies (3D printing)



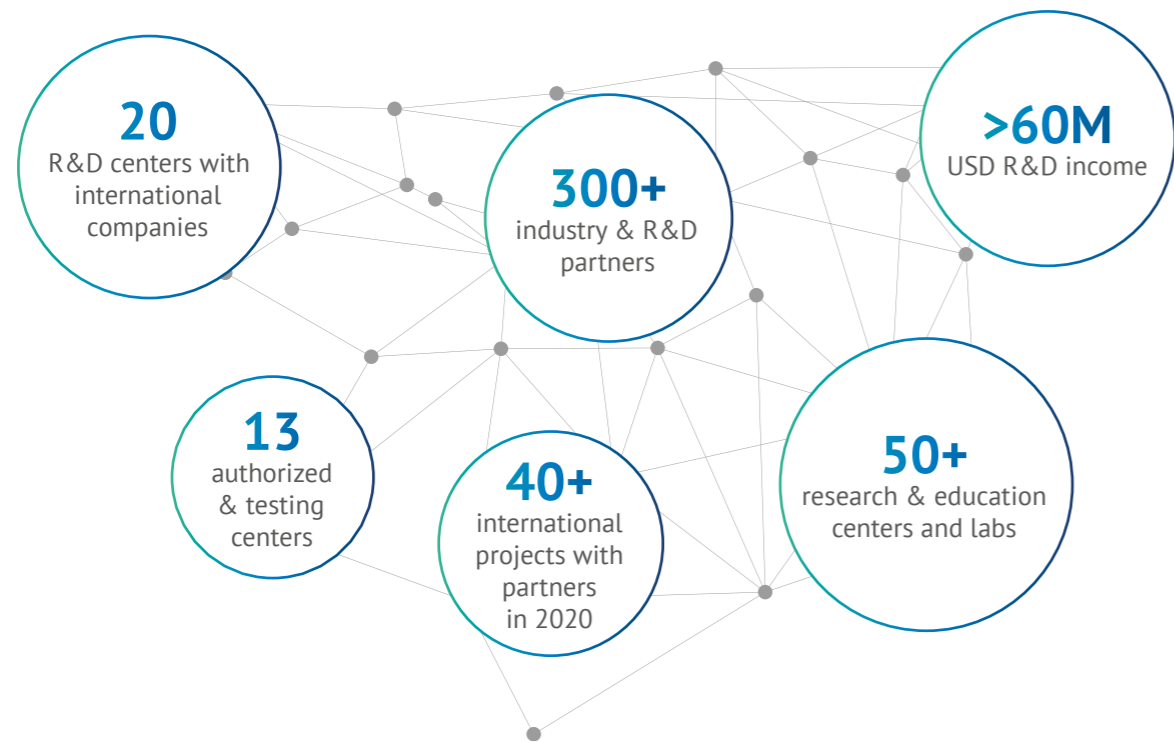
MOBILITY MODULE: INDIVIDUAL LEARNING PATHS



KEY EDUCATIONAL TECHNOLOGIES INTRODUCTION:

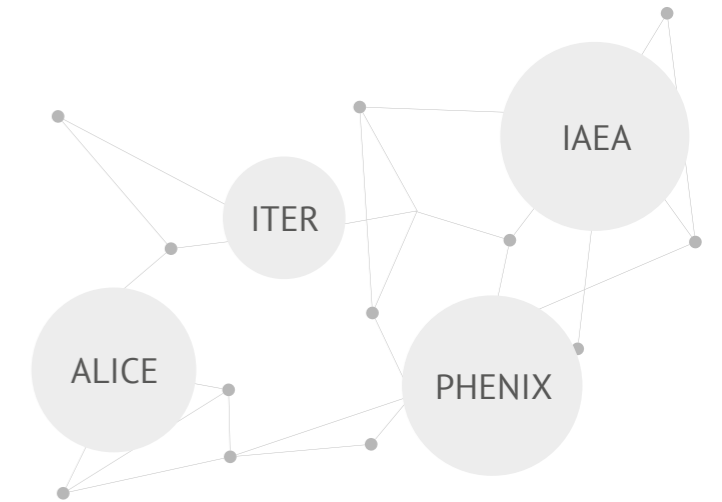
- **Project activities:** blended learning methodology – course “Basics of project activities”
- **Online education:** open online courses are included in the curriculum of all SPbPU educational programs
- **Individual learning paths**
- **Joint educational programs**

RESEARCH



MEGA SCIENCE. GLOBAL RESEARCH PROJECTS

SPbPU scientists are involved with the major experiments



#1 sole Russian University – the official Airbus software supplier

KEY RESEARCH ASSOCIATIONS AND SCIENTIFIC NETWORKS:

- International network for professional education and research in process & project management (PMUni)
- European Consortium for Mathematics in Industry (ECMI)
- European Science and Education Fellowship (ESEF)
- International Association of Universities and Colleges of Art, Design and Media (CUMULUS)
- The European Fusion Education Network (FuseNet)
- Russian-Speaking Academic Science Association (RASA)
- Institute of Electrical and Electronics Engineers (IEEE)



SCIENCE. WORLD-CLASS TECHNOLOGIES

<p>OIL RECOVERY</p> <p>full employment of resources and increase in performance of oil and gas extraction</p> <p>design processes acceleration due to creation of digital models of civil engineering objects</p> <p>CIVIL ENGINEERING</p>	<p>NUCLEAR PHYSICS</p> <p>use of thermonuclear energy on an industrial scale</p> <p>to develop the domestic component base of special purpose glasses, to replace the expensive analogues, to create a series of final devices and devices for tasks in the field of biosensors, micro-gas sensors, optical tomographs for the diamond processing industry</p> <p>OPTICS & OPTICAL DEVELOPMENT</p>	<p>MECHANICAL ENGINEERING</p> <p>4-fold increase of the Arctic sledge load-carrying capacity - transportation of large-size cargo weighing up to 60 tons for the distance of 1500 km</p> <p>providing a complete cycle from design to manufacture of engine parts</p> <p>ENGINE CONSTRUCTION</p>	<p>AUTOMOBILE INDUSTRY</p> <p>development of environmentally friendly public transport in the Russian Federation</p> <p>cost reduction via friction stir welding technology and lighter structures</p> <p>ensuring the speed of material connection while maintaining quality</p> <p>NEW MATERIALS AND TECHNOLOGIES</p>	<p>SHIPBUILDING</p> <p>a carbon plastic catamaran design and manufacture with high speed and seaworthiness and operational efficiency for passenger, tourist and cargo transportation</p> <p>high accuracy and uninterrupted positioning of objects in the absence of navigation systems</p> <p>TELE-COMMUNICATIONS</p>
--	--	--	---	---



DEVELOPMENT TECHNOPOPOLIS

JOINT R&D STRUCTURES



International R&D Center Siemens-Polytech «Industrial Artificial Intelligence»

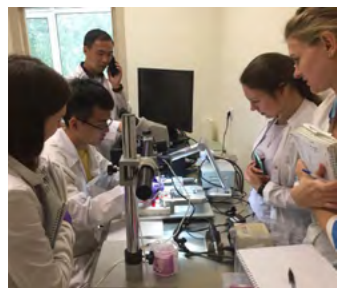


Joint Education and R&D Center of Industrial Robotics Kawasaki-Polytech

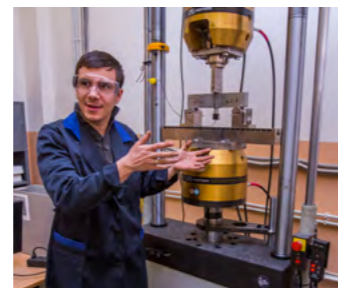
North-West Regional Intercollegiate Education and Research Centre SPbPU-FESTO «Synergy»



Laboratory of Aerospace and Electronic Engineering with Tsinghua University, China



Laboratory of Basic and Translational Neuroscience with Shanghai Jiao Tong University, China



International Research and Education Center «Weatherford – Polytechnic»

Gazpromneft – Polytech Scientific and Research Center



International Academic Center of Excellence «Polytechnic – SAP»



NATIONAL TECHNOLOGY INITIATIVE CENTER FOR ADVANCED MANUFACTURING TECHNOLOGIES



Russia's leading center of competence and largest consortium in the field of advanced manufacturing technologies

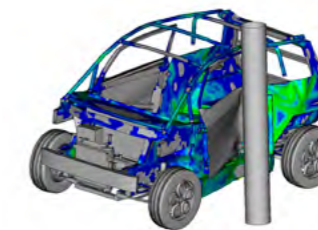


leader in the development of original technologies, structures, equipment and products based on advanced manufacturing technologies

TECHNOLOGIES OF NTI CENTER FOR AMT

- Digital Twins of products and mfg processes
- Digital design and simulation (DT)
- Computer-Aided Engineering (CAE)
- High Performance Computing (HPC)
- Computer-Aided Optimization (CAO)
- Computer-Aided Manufacturing (CAM)
- Computer-Aided Additive Manufacturing (CAAM)
- Product Data Management (PDM)
- Product Lifecycle Management (PLM)
- New materials (NM)
- Additive technologies (AT)
- Smart Manufacturing

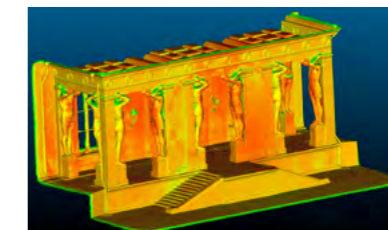
NTI CENTER FOR AMT PROJECTS



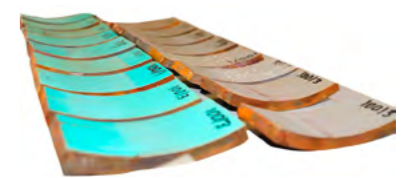
Smart Digital Twin of a Compact Urban Electric Car



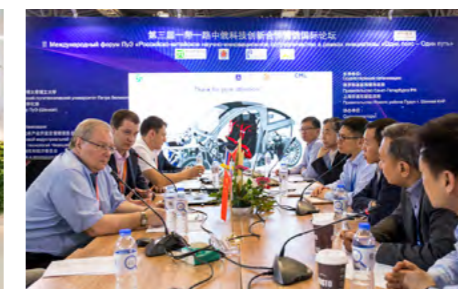
Level 1 Digital Twin of an Aircraft Engine



Building Information Modeling (BIM) Technologies for Cultural Heritage



Novel Materials for Oilfield Equipment



INTERNATIONAL PROJECTS WITH UNIVERSITY PARTNERS

with University partners

BILATERAL INTERNATIONAL RESEARCH PROJECTS

- “Development and implementation of innovative aquatic-based bio-refinery for microalgae *Chlorella sorokiniana* and duckweed *Lemna minor* (ABiRe)” with TUHH, Hamburg, Germany;
- “Development and characterization of novel materials for capacitor-based storage devices” with IIT Madras, India
- “Technologies and Toolset for Reliable Control of Production Areas of Internet of Things” with IIT Bombay, India
- Joint project of SPbPU and Leibniz University of Hanover on the production of ultrapure alloys

CROSS BORDER COOPERATION PROGRAM (CBC ENI) RUSSIA-SOUTH-EAST FINLAND

- “Energy-efficient systems based on renewable energy for Arctic conditions (EFREA)” with LUT University, Finland and Prometey Company, Russia
- “Lightweight hybrid wooden composite materials for sustainable construction technology (SUSTECH)” with LUT University
- “One Drop – new technologies for water cleaning” with LUT University
- “POETA Practice-oriented children education in the areas of Industry 4.0 based on a unified open educational hardware platform” with LUT University

BRICS FRAMEWORK RESEARCH PROGRAM

- “Research and development of algorithms and experimental samples of hardware-software system for increased accuracy seamless indoor/outdoor positioning” with IIT Rourkee, India and East China Normal University, China
- “Natural and artificial porous materials filled with liquid and solid dielectrics” with IIT Madras, India and University of Venda, South Africa

INTERREG PROGRAM FOR BALTIC SEA REGION

- “AREA21 Baltic Smart City Areas for the 21st Century” with Hafencity University, Hamburg, Germany and consortium
- “CAMS Platform for audit in energy” with Tartu Regional Energy Agency
- German Academic Exchange Service (DAAD) Program
- “Strategic partnership joint project of SPbPU and Leibniz Universität Hannover”



INTERNATIONAL ACTIVITIES

SPbPU INTERNATIONAL EVENTS:

- SPbPU International Polytechnic week
- 2nd Russian-Spanish Week of Language and Culture in cooperation with University of Cádiz
- International Forum Student Project Marathon in cooperation with Graz University of Technology
- POLYTECH DAYS in Europe and Asia
- St. Petersburg German Week
- Falling Walls Lab competition of young scholars in cooperation with the German Academic Exchange Service (DAAD) and the German Centre for Research and Innovation in Moscow (DWIH)

PARTICIPATION IN WORLD LEADING B2B EVENTS:

- NAFSA (National Association for Foreign Student Affairs)
- APAIE Annual Conference & Exhibition
- Annual EAIE Conference and Exhibition
- CEE (China Education Expo)



INTERNATIONAL CONFERENCES



Nature International Conference
"Achievements and Applications
of Plasma Physics"

International Conference
Cyber-Physical Systems and Control
(CPS&C'2019)

Scientific and Practical Conference
with International Participation
"SPbPU Science Week"

International Conference
"Corrosion in the Oil and Gas Industry"

Fifth International
Scientific Conference "Technological
Transformation: a New Role of People"

International Scientific Conference
"Modern materials and advanced
manufacturing technology"

International Scientific Conference
"Mathematical Methods
in Engineering and Technology – 32"

International
Summer School-Conference
"Advanced Problems in Mechanics"

Scientific and Practical Conference -
Digital Technologies and Innovative
Materials in Road and Bridge
Construction. Development Trends»
(DigTechIMC-2020)

Scientific Conference
Global Challenges of Digital
Transformation
of Markets-2020

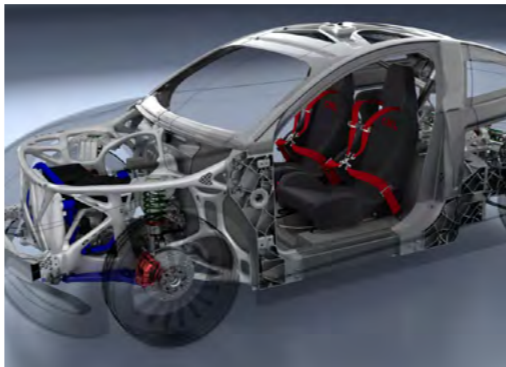
International Polytech-SOKENDAI
Conference on Plasma Physics and
Controlled Fusion

STUDENTS RESEARCH & ACTIVITIES

FORMULA STUDENT
(Formula SAE) – race car for Formula Student racing



The first Russian customized conceptual electric car
CML CAR



SATELLITE POLYTECH
development of the first student satellite of Polytechnic University



BRILLE SIMULATOR
for use by students of typhoid departments, educators who study braille, and late-onset blind people



SOLAR CAR –
first Russian solar unique solar-powered car



SOLAR PANEL BOAT
Unmanned control solar-powered boat



FABLAB
Center for scientific and technical creativity



SOLARDRONE
Solar powered catamaran



TEDXSPBP CONFERENCE
Provides a unique opportunity to bring out a unique idea to a wide audience



ARDUINO WATCH –
for teaching robotics and programming



SCIENCE SLAM POLYTECH
International project to popularize science



RECTOR CUP ENGINEERING COMPETITIONS
For developing students' technical abilities, creative thinking, unleash potential, acquire teamwork skills and broaden their horizons



POLYTECH RISE WEEKEND'19 FORUM
A platform for acquaintance of students, inventors, investors and large companies



«UMNIK» SCHOOL
For anyone who wants to prepare their project for participation in the UMNIK scientific and technical grant and "UMNIK-NTI"



FABPRO DIGITAL PRODUCTION EDUCATIONAL COURSE
To teach university students how to work with modern machines and other technological equipment



BIONIC HAND PROSTHESIS
Bionic prosthesis of the hand developed by SPbPU Students



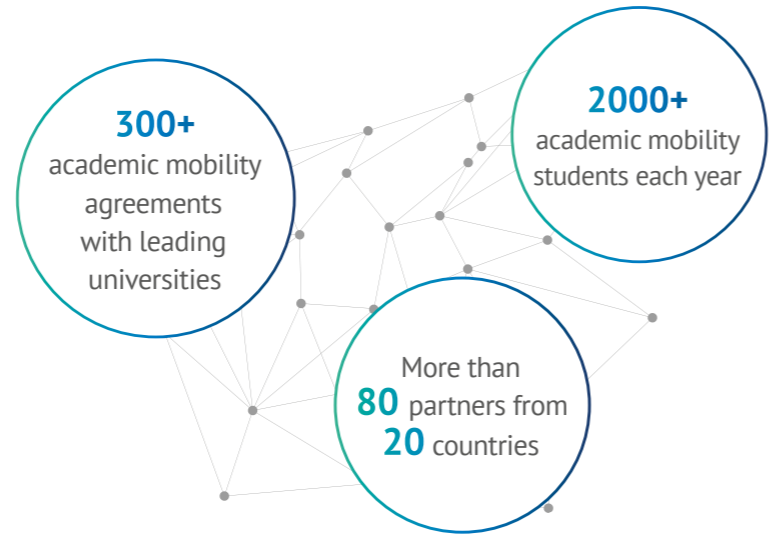
STUDENT TOURNAMENT OF THREE SCIENCES
Platform for the interaction of students, the business community and government authorities with the subsequent employment of talented participants



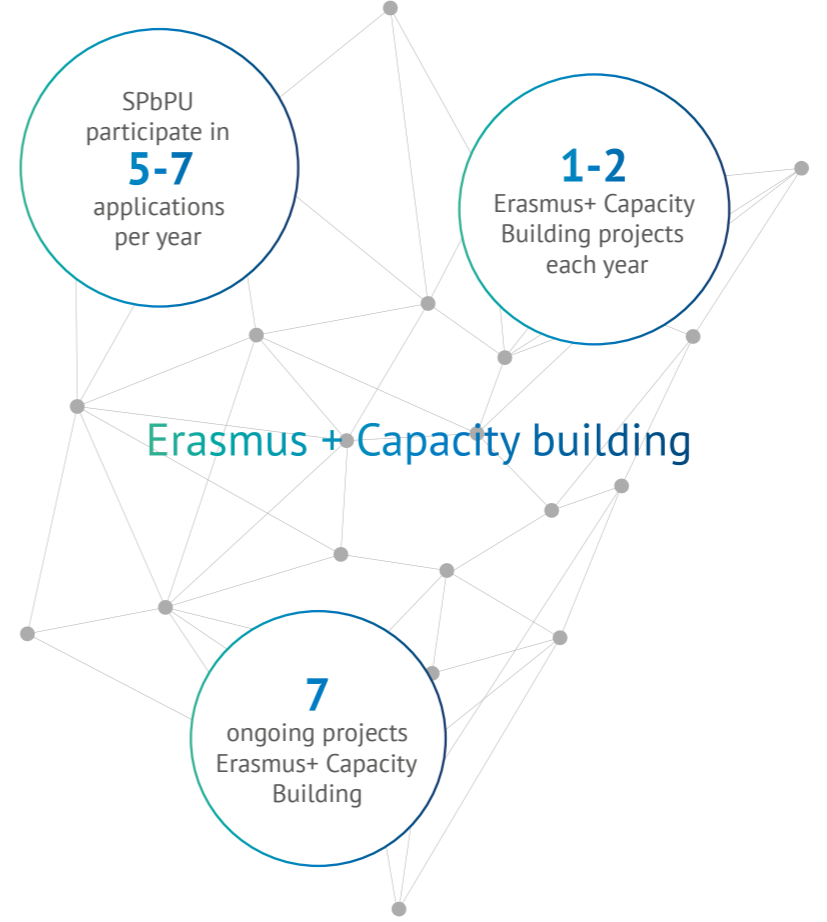
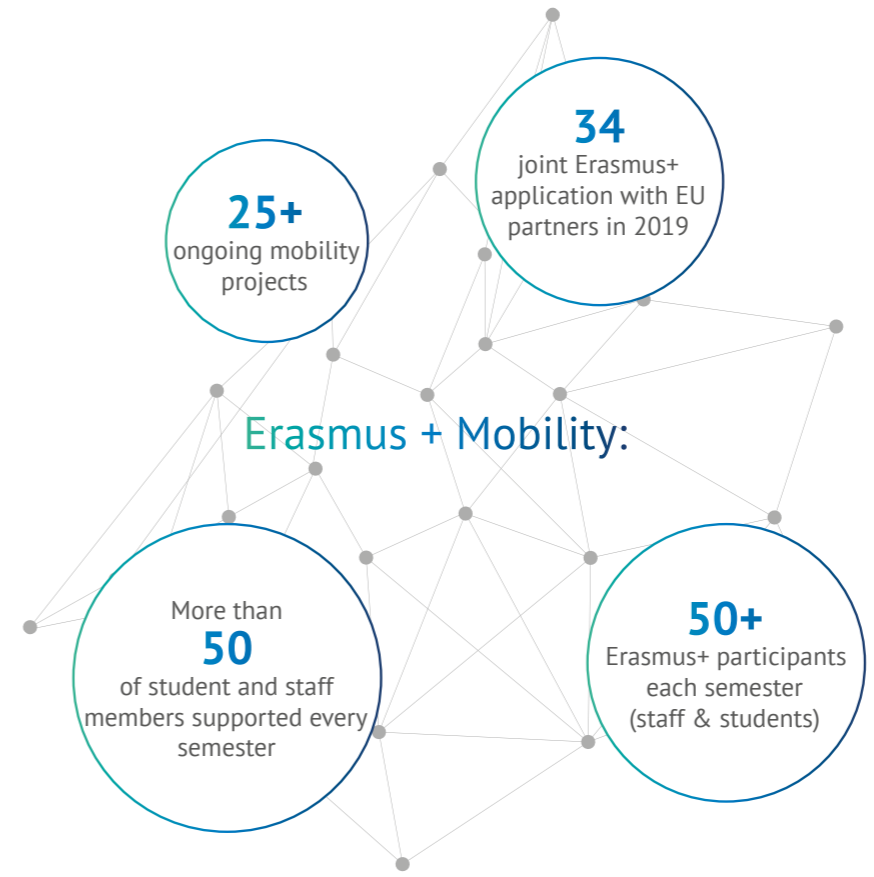
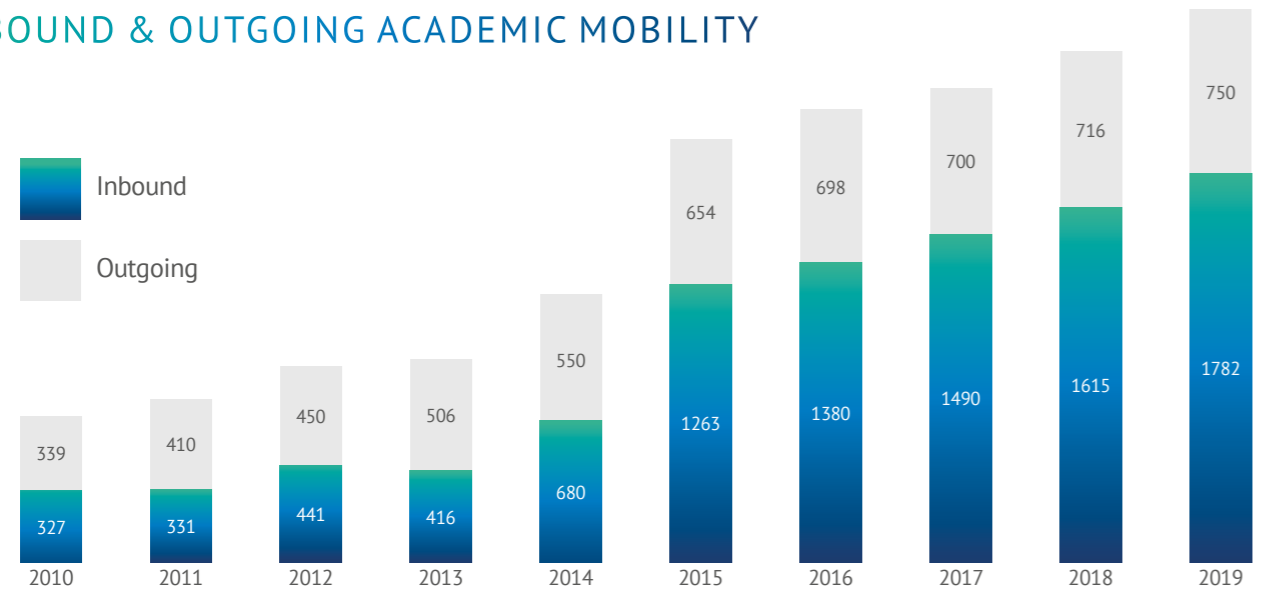
ACADEMIC MOBILITY

TOP-1
Among Russian universities
by number of projects
Erasmus+ Capacity Building

500,000 €
Annually attracted to support
academic mobility programs

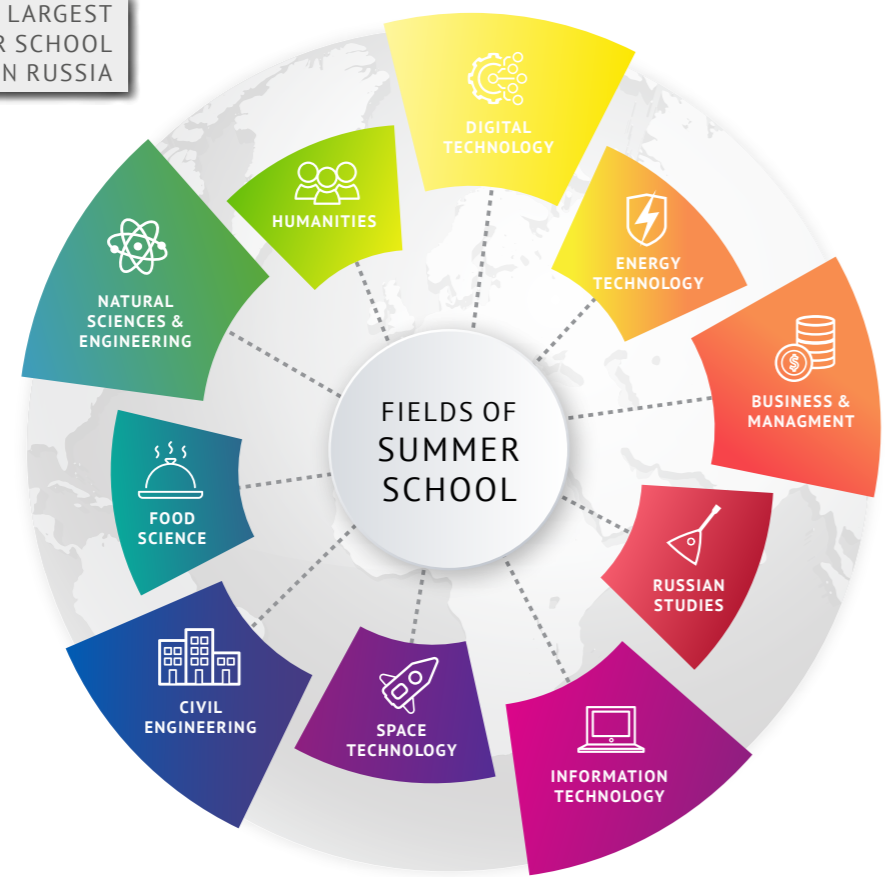


INBOUND & OUTGOING ACADEMIC MOBILITY



INTERNATIONAL POLYTECHNIC SUMMER SCHOOL

TOP-1 LARGEST
SUMMER SCHOOL
IN RUSSIA



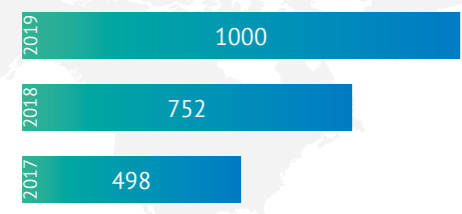
WHO
1000+ international students from
60+ countries

WHAT
45+ programs
with ECTS credits

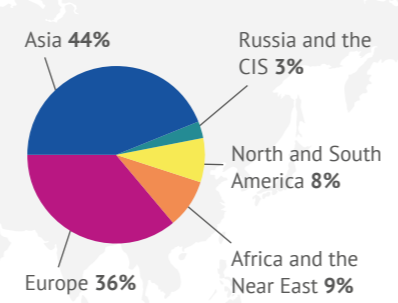
WHEN
June – September



INTERNATIONAL POLYTECHNIC SUMMER SCHOOL PARTICIPANTS



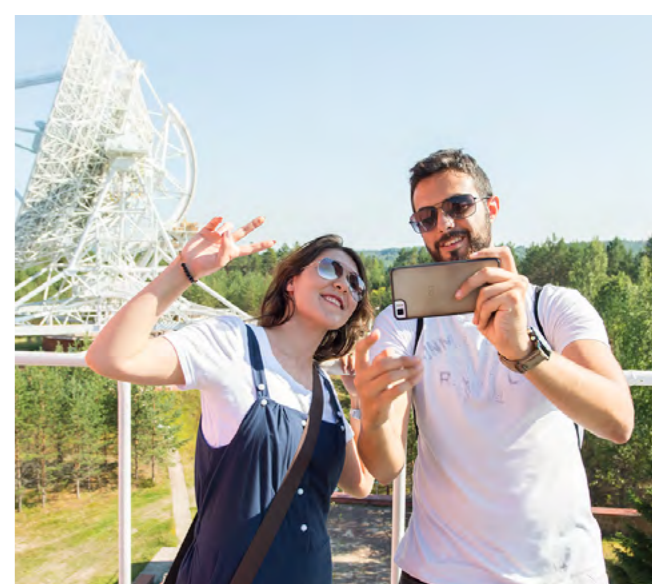
SUMMER SCHOOL 2019: DISTRIBUTION BY REGION

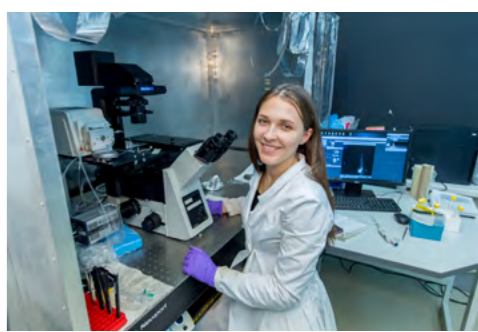


JOINT PROGRAMS WITH INTERNATIONAL PARTNERS

- Plasma Physics and Controlled Fusion - SOKENDAI
- Biomedical Engineering - Leibniz Universität Hannover

- Additive Manufacturing and Joining Technologies - Ecole Polytechnique
- Computer Modeling and Simulation for Engineers - National University of Distance Education





CONTACTS

ADDRESS

29 Polytechnicheskaya str.,
St. Petersburg, 195251, Russia

RECTOR'S OFFICE

Tel: +7 (812) 552-60-80

E-mail: adm@spbstu.ru

INTERNATIONAL OFFICE

Tel: +7 (812) 534-10-02

E-mail: intadm@spbstu.ru

[Https://english.spbstu.ru](https://english.spbstu.ru)

 [@spbstu.official](https://www.facebook.com/spbstu.official)

 [@spbpu.official](https://twitter.com/spbpu.official)

 [@polytech.eng](https://www.instagram.com/polytech.eng)

