VISION | MISSION | GOALS

MEPhI IS A LEADING NATIONAL UNIVERSITY
that develops elite specialists for careers in the nuclear industry, science-driven, IT, engineering and other hi-tech sectors in the Russian economy.

MEPhI MISSION
is to accumulate, generate, promote and apply scientific knowledge to address the global challenges of the twenty-first century, as well as to provide innovative transformations in Russia to develop the country's competitive position in the global energy and non-energy high-technology sectors.

MEPhI STRATEGY
is to be a global leader in education, science & innovation in nuclear science, radiation science, laser science, nano-science, biomedicine, information technology, and engineering. The university seeks to make a significant contribution to the innovation-driven growth and competitive position of the Russian economy.

MEPhI GOALS
is to shape trends in science, education and innovation in collaboration with its partners. The University engages in active partnerships with scientific organisations and companies and participates in a number of regional clusters, industry and research consortia, and professional associations. The University also extends and strengthens international partnerships with foreign universities and research organisations, focusing on the joint development and promotion of educational programs in new and breakthrough areas.
GLOBAL UNIVERSITY

STRATEGIC PRIORITIES OF THE MEPhI

GLOBAL POSITIONING
- Global University at the frontier of the R&E agenda at the national and global levels
- Internationalisation of science and education
- The attraction of internationally recognised faculty

SUSTAINABLE DEVELOPMENT
- University as a platform for the industrial and scientific cooperation
- MEPhi governance model blends best global universities and business practices

REGIONAL DEVELOPMENT
- Driver for the accessible high-quality education in the regions of presence
- Social impact for Regional development

NATIONAL LEADERSHIP
- Entering new educational markets and industrial R&D markets
- Development of new partnerships models and formats

MEPhI today is the all-Russian scientific and educational complex with branches in all regions of the SC Rosatom presence, our main partner and ally. The MEPhI brand is steadily associated with the highest quality education. Our university is distinguished by a special approach to education, combining fundamental physical and mathematical training with deep engineering knowledge, as well as the active students’ involvement in research process.

FORESIGHT SESSIONS WITH STRATEGIC PARTNERS

ALIGNED STRATEGY WITH THE STRATEGIC PARTNERS not only strengthens the leading position of MEPhI in the breakthrough scientific areas but also allows contributing significantly to the transformation of education and training of highly qualified specialists in the fields of science & technology that closely related to the latest development in the regions and the whole Russian economy.

NEW BUSINESSES

Strong cooperation with the SC Rosatom results in the diversification of strategic projects enabling new businesses in the areas of:

NUCLEAR ENERGY
- Mobile of low-mid powered nuclear power plants
- Decommissioning of nuclear and radiation-hazardous facilities
- New materials and technologies for advanced energy systems

NEW ENERGY SOURCES
- Energy storage systems
- Hydrogen power
- Controlled thermonuclear synthesis
- Wind power

NON-ENERGY SECTOR
- Digitalization and AI systems
- Additive technologies and new materials
- Advanced medicine & biotechnology
- Robotics

INSTRUMENTS FOR PRIORITIES REALISATION

266 participants, including:
203 representatives of the SC Rosatom, as well as:
64 representatives of enterprises and organizations
63 representatives of MEPhI
6 panel discussions
13 areas of development

OCTOBER 2019 | Foresight session with SC Rosatom
UNIVERSITY AS A PLATFORM

MEPhI is a platform of opportunities for employees, students, graduates, industry players, technological and R&D partners both in Russia and abroad. The platform system enables MEPhI to react swiftly to rapid and massive technological changes in industries high-tech.

The openness of the University as a platform is ensured through high quality, flexibility and speed of response to market changes.

At the same time, the platform enables the University to carry out its mission of accumulated knowledge promotion and discoveries at a whole new level through a variety of forms of engagement among all platform participants.
ENGAGING IN NATIONAL PROJECTS

NATIONAL PROJECTS

MEPhI contributes to the development of the Russian Federation by sharing its best practices and launching high social impact projects in the regions of presence, in accordance with Federal Projects approved in Russia in 2018 in the areas of “Human capital”, “Comfortable living environment” and “Economic growth”.

NATIONAL PROJECT "SCIENCE"

MEPhI among TOP 5 countries GLOBALLY number of articles in international databases

>20% of Russian and foreign leading scientists

x1,5 ARTICLES in Q1 | Q2 (WoS and Scopus)

MEPhI INVOLVEMENT IN NATIONAL PROJECT "SCIENCE"

RANK AMONG RUSSIAN UNIVERSITIES

1st RANK number of articles per faculty

5th RANK number of articles in Q1

5-6th RANK overall number of articles

WoS, Scopus

Number of articles in Q1 | Q2 WoS, 2014–2018

Faculty h-index, growth

5-year citations per faculty, WoS

International academic staff, share
MEPHI INVOLVEMENT IN NATIONAL PROJECT "EDUCATION"

RUSSIA among TOP 10 countries GLOBALLY number of universities in the TOP-500 in World University Rankings

>40% Rate of successful PhD thesis defense

x2 number of international students in Russia compared to 2017

MEPhi Dynamics 2013-2019

1 | 1 Int'l Subject ranking | Top-100

2019

12 | 2 Int'l Subject rankings | Top-100

93% of young faculty received support

42 yrs - High-level managers

31 yrs - HiPo & Brand Ambassadors

Number of young PhD students increased by 14.3%

Average age Human Capital

1 | 1 Int'l Subject ranking | Top-100

2013

International student at MEPhi. TOP-20 countries of origin. 1284 students

1 | Vietnam | 248
2 | Turkey | 192
3 | Kazakhstan | 157
4 | Kyrgyzstan | 90
5 | Jordan | 75
6 | Bangladesh | 68
7 | Uzbekistan | 63
8 | Zambia | 52
9 | Ukraine | 42
10 | Bolivia | 38
11 | Belarus | 38
12 | Tajikistan | 35
13 | Egypt | 33
14 | Armenia | 30
15 | Mongolia | 27
16 | Moldova | 26
17 | Algeria | 23
18 | India | 20
19 | Azerbaijan | 14
20 | Nigeria | 13
MEPhI INvolVEMENT IN NaTIONAL PROJECT "DIGITAL ECONOMy"

40% share of the population owning digital skills

5 centers of excellence for the development of «Digital university» models

120 k highly qualified IT-graduates at the market, annually

MEPhI TRANSITS TO DIGITAL UNIVERSITY

Digital Administration
- Deliver business efficiency through the use of technology and information management systems

Digital Teaching, Learning and Research
- Provide online support to education process and technology-enabled teaching and learning management to deliver best outcomes
- Accelerate research productivity and collaboration to increase revenues and enhance research excellence

Digital Campus & Communities
- Transform given environment to reduce costs, provide settings for teaching and learning and deliver the best experience

TRAINING IT SPECIALISTS FOR THE ECONOMY
MEPhI’S CONTRIBUTION

IT profiles at MEPhI
- Data processing/ testing, System administration
- Information and cybersecurity
- Data analysis. Mathematical and computer modeling

- 64 graduates annually
- 131

Active involvement in "thin client / Server"
- Implementation of Russian engineering software
- IT coworking places
- Use of "thin client / Server"
- Digital Skills Centre
- 7 seminars
- 2 hackathons
- 25 participants
- 108 hackathons
- 21 digital projects
- 23 services for staff

END-TO-END TECHNOLOGY COMPANIES

DIGITAL ENVIRONMENT

DIGITAL INFRASTRUCTURE

DIGITAL COMPETENCES

SMART CAMPUS

Digital teaching of educational and Management
developments through digital research

Development and implementation of online learning tools

Development of educational programs

One card on the Campus — a joint project

Implementation of Smart Access Systems in the lecture halls

Digital space development for business plan

The use of Simulators, VR-technologies, digital twins

Development and implementation of "Hackathons" on "end-to-end technologies"
FOSTERING INNOVATION IN EDUCATION & INTERNATIONAL NETWORKING

6 UNIQUE ADVANTAGES TO STUDY AT MEPhI

- Unique educational programs focused on the professions of the future and breakthrough research
- Learning partnerships with leading global corporations and research organisations from around the world
- Advanced and unique experimental facilities, laboratories and centres
- Internships for students in leading global research organisations and laboratories
- Participation in international research and innovation projects and Megascience experiments
- Modular, interdisciplinary and personalised learning paths
- Compliance of curricula with international standards in engineering education

MEPhI transforms education and diversifies core (fundamental) disciplines by developing personalised module-based educational programs, with strong fundamental (basic) training on Mathematics, IT, Physics, Biology, Chemistry and other Natural Sciences.

EDUCATION MODEL TRANSFORMATION DRIVERS:

Global level
- Competing with global universities
- Implementation and promotion of best practices

National level
- Market-driven demand (Industry | Government)

Regional level
- Meeting changing student and faculty expectations
- Improving the quality of education in the regions of presence

Life-long continuing education offering for schoolchildren, students and specialists
- Pre-university
- Olympiads
- HPE
- SVE
- Professional certification

Individual learning paths
- Enhanced education
- Elective courses
- Individual curricula

Environment for student development
- Residential & Recreational facilities
- Students associations and clubs
- Science Diplomacy Centre

Blended learning
- Distance learning centre
- On-line lectures and materials
- VR technologies
- Digital learning environment (LMS)

SPECIALISTS
- Engaging students in research and engineering activities
- WorldSkills Competencies Centre Learning factories
- Boiling points
- Business School
- Collaborative spaces
- Business accelerator

STUDENTS
- Soft skills
- Social sciences and humanities
- Advanced curriculum in English
- Postgraduates as mentors on student projects

SCHOLARS
FOSTERING INNOVATION IN EDUCATION & INTERNATIONAL NETWORKING

CHANGING EDUCATION PARADIGM

1st among Russian universities by the number of courses on the edX platforms

98 total number of on-line courses by the end of 2019

>300 000 registered students from 50 regions

MOOCs

DIRECT EXPORT OF EDUCATION BRANCH IN UZBEKISTAN

The opening ceremony of the first international branch campus of National Research Nuclear University MEPhI was held on the 3rd September 2019 in Tashkent. SC Rosatom’s CEO, Alexey Likhachev, mentioned in his speech that the opening of MEPhI’s campus in Tashkent is one of the most significant events of the year and has a fundamental importance for Uzbekistan.

TOP 5 CROSS-DISCIPLINARY AREAS

- SAFE ENERGY
- Q-TECHNOLOGY
- MEDICINE: CANCER TREATMENT
- CYBERSECURITY
- ROBOTICS AND AI

Admission

667 applications submitted

BSc Programs

4 academic bachelor’s programs

Admission Contests

6:1 applicants to open position

TOP 8 EDUCATION PROGRAMS

International students from 57 countries, among them 33 countries of interest of SC Rosatom Presence

Over 20 adjusting programs and events

340 international students completed internships at resource centres

24 direct export of education programs in 13 countries

International staff, share 1st among Project 5-100 universities

Nuclear Physics and Technology

Information Technology

Medical Physics

Business Informatics

Economics and Management

Kazakhstan

Uzbekistan

China

India

Malaysia

NUCLEAR ENERGY AND THERMOPHYSICS

NUCLEAR PHYSICS AND TECHNOLOGY

THERMAL POWER GENERATION AND HEAT POWER ENGINEERING

ELECTRICITY AND ELECTRICAL ENGINEERING
Over the last few years, MEPhI has substantially expanded its partnership network with leading international universities, laboratories and associations. Nuclear industry professionals in Rosatom’s partner countries are being trained as part of nuclear education export efforts. Today, students, postgraduates and faculty members from leading international research and education centres are doing their internships at MEPhI.
MEPhI IN MEGASCIENCE PROJECTS

LHC (Large Hadron Collider)
Search for new principles in physics, detection and identification of particles by transition radiation, exploration of multi-charged particles, study of the Higgs Boson characteristics, search and registration of quark-gluon plasma signals, analysis of strong interaction physics at extreme nuclear matter densities at the Large Hadron Collider.

RHIC (Relativistic Heavy Ions Collider, Brookhaven National Laboratory, USA)
The first machine in the world capable of colliding heavy ions to explore phenomena in nuclear physics, condensed matter physics, astrophysics, and cosmology.

NICA (Nuclear Ion Collider Facility, Russia)
The unique facility that enables investigation of the highly compressed baryonic matter phase diagram at the laboratory conditions. Highly compressed baryonic matter is only present in the celestial objects such as neutron stars and in the core of supernovas.

ELI (Extreme Light Infrastructure, Czech Republic)
International research center aspires to install and run the world’s most intense laser system, allowing investigation of the applied tasks for which laser radiation of ultra-high peak powers are used, fundamental studies in the fields of chemistry, biology, life science with an improved temporal and spatial resolution, overcoming the limitations of the picosecond barrier.

FAIR (Facility for Antiproton and Ion Research, Germany)
Experimental setup dedicated to research of the fundamental properties and structure of matter, quark-gluon plasma, and relativistic nuclear physics at the extreme conditions, comparable with the Big Bang state, Universe in the Lab.

PHELIX (Petawatt High-Energy Laser for Heavy Ion Experiments, Germany)
The facility provides unique opportunity to use highly intense laser radiation simultaneously with heavy ion beam in the fields of plasma physics, nuclear physics as well as interdisciplinary and natural sciences.

KEK (High Energy Accelerator Research Organization, Japan)
Particle accelerator for research activities in the areas of applied physics, biology and medicine. As well as the optimization of current security systems (e.g., at the customs, transport and cargo terminals and public places) by implementation of THz imaging technology.

BICA Society (Biologically Inspired Cognitive Architectures Society, USA)
Society with an aim to encourage and create conditions for the interdisciplinary study of biologically inspired cognitive architectures (BICA) ranging from AI, neurotechnology and machine learning to creation of digital assistant for the creative profession.

NEVOD (Neutrino Water Detector, MEPhI, Russia)
One-of-a-kind facility to study of energy spectrum, mass composition and interaction of cosmic rays, investigation of active processes in the heliosphere, the magnetosphere and the Earth’s atmosphere with the muon diagnostics methods.

ICECUBE (the Antarctic)
Study of muons and ultrahigh energy neutrinos generation processes to identify their origins.

ITER (International Thermonuclear Experimental Reactor, France)
Demonstration of the viability to use thermonuclear reactor and possibility to address physical and engineering problems of the new energy sources and technologies.

XFEL (European X-Ray Free-Electron Laser Facility, Germany)
The facility allows a broad range of the experiments in the fields of fundamental and applied sciences: novel materials, new stable energy sources, smart and eco-friendly (green) materials and technologies.

TAIGA (Tunka Advanced Instrument for cosmic ray physics and Gamma Astronomy, Russia)
-Addressing fundamental issues of gamma-astronomy and high energy cosmic ray physics
- Gamma radiation point sources tracking.
MOLECULE-SIZED MICROCHIP ELEMENTS

A group of MEPhI scientists is conducting predictive modeling of the properties of organic light-emitting diodes (OLED) to create molecular-sized microchip elements. They were able to model the changes in the agitated molecules of an organic semiconductor. They plan to present suggestions on modifying the molecules used in the emissive layers of OLED displays.

ACCIDENT TOLERANT FUEL: HOW TO INCREASE NUCLEAR REACTOR SAFETY

MEPhI scientists developed a protective chromium-containing coating for accident-tolerant nuclear reactor fuel element containers. They studied the composition, structure and thickness of the coatings using electron- and ion-microscopy. The researchers chose the optimal composition of coatings preventing the oxidation of the external surface of zirconium tubes at 1200 °C for 400 seconds.

PROSPECTS OF NANOTECHNOLOGY FOR CANCER TREATMENT

MEPhI scientists created a new type of contrast agent for MRIs based on nanoparticles of porous silicone that may be used both in diagnostics and therapy of oncological diseases. The use of silicone nanoparticles is one of the most promising methods for cancer nanotheranostics. These particles are not harmful and may be heated to 42 °C and higher using radio waves that locally destroy cancer cells.

EFFICIENT WHEELCHAIR CONTROL

MEPhI developed a decomposition method for a multi-channel control system based on extended BCI (brain–computer interface) that is designed to help users of robotised wheelchairs.

WHAT IS ARTIFICIAL INTELLIGENCE GOING TO BE FOR THE HUMANITY

An emotional artificial intelligence (AI) modeling is one of the hot topics for scientists at MEPhI. They are studying human emotions using an experimental platform based on virtual and mixed reality (monitoring eye movement), as well as electromyography and automated facial expression analysis. They are planning the improvement and empirical validation of social-emotional cognitive architecture (“eBICA”).

ULTRA-THIN LIGHT-ABSORBING FILMS

MEPhI scientists made ultra-thin multi-layered films that can be used in the electronics and power sectors in the future. To accomplish this, they singled out the conditions for the thermal-chemical synthesis of hetero-structures based on the transition metals’ dichalcogenide compounds MoS_2, WS_2, MoSe_2 and WSe_2. These films are capable of acting as photocatalysts, which makes the process of obtaining solar-fuel components, including hydrogen and oxygen, from water more effective without the use of expensive platinum-group metals.

COMPRESSION OF DIGITAL HOLOGRAMS WITH RATIOS OF 380

A method to compress holographic information by 380 times have been demonstrated at MEPhI. The new method enables the compression of holographic video from 1 TB to 1 GB, while retaining high quality in the reconstructed images. To this end, after the hologram is recorded, a spectrum analysis is held, the specific components are separated, and wavelet decomposition and wavelet processing are undertaken.
ADVANCING GLOBAL COLLABORATION
STRONGER TOGETHER

MEPhI INNOVATION PROJECTS

- **Safe energy**
  - New sources of energy
- **Cybersecurity of digital environments**
  - Emotional AI
- **Laser and information technologies**
  - Matter under extreme conditions
- **Integrated microwave photonics**
  - Electronics in aviation
- **Cancer treatment**
  - Nanoteranostics
  - New pharmaceuticals
- **Cognitive models for human-like AI. Emotional AI**
  - Detection of abnormal activity in user behavior for countering cyber threats
  - Suspicious activity to counter the cyber threats
  - User identification via behavioral biometrics
- **Microwave photonics for broad signal processing**
  - Distant Quantum gravimetry
  - Eco- and bio-monitoring of Earth and terrestrial atmosphere based on laser technology
- **Advanced technologies for integrated microwave photonics**
- **Multiparameter detection of tumor markers for early cancer diagnosis**
  - Nano-sensitizers
  - Nanotechnology in nuclear medicine

**NETWORK ALLIANCE CONSORTIUM**

**INNOVATION SCIENCE AND TECHNOLOGY CENTRE (ISTC)**

**LEARNING FACTORIES**

**DIGITAL TEST BEDS**

**R&D CENTRES LABORATORIES**

**ENERGIZE DEVELOPMENT**
ENGINEERING FUTURE WORLD SKILLS

WorldSkills is an international commercial movement. Since 2017 MEPhl is an active member of the WorldSkills. In addition to the participation in WorldSkills competitions professional skills are also developed in practice-oriented contests such as “Changellenge” and “Umnik”.

Mission
To raise the profile and recognition of skilled people and show how important skills are in achieving economic growth and personal success

Goal
To promote non-professional occupations and develop vocational education and training by harmonising best practices and professional standards in the world and organising and holding professional skills competitions in every country

WorldSkills Kazan 2019
- 2 gold
- 1 gold in main contest “Products made from polymeric materials”
- 3 silver
- 6 medals in the Future Skills competencies
- 1 bronze
- MEPhl's team competed in 22 nominations
- Total: 10 medals

AtomSkills Yekaterinburg 2019
- 4 bronze
- 2 silver
- 4 gold
- Numbers of medals won by MEPhl teams

PROFESSIONS OF THE FUTURE

<table>
<thead>
<tr>
<th>Level of automation in production</th>
<th>MAN</th>
<th>MACHINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2025</td>
<td>48</td>
<td>52</td>
</tr>
<tr>
<td>2022</td>
<td>58</td>
<td>42</td>
</tr>
<tr>
<td>2018</td>
<td>71</td>
<td>29</td>
</tr>
</tbody>
</table>

division of labor as a share of hours spent, %

Safe energy
- Microgeneration system developer
- Environmental system disaster prevention specialist
- Ecodesigner
- Zero waste manager
- Auditor of integrated safety and security in production

New materials
- Recycling specialist
- Biotechnological smart materials developer
- Metamaterial specialist
- Nanoindustry security specialist

IT
- Big Data analyst
- Blockchain developer
- Neurointerface designer
- Virtual hospital manager

VR|AR|AI
- Virtual navigators and digital advisors
- Architects of virtual reality
- Personal data curator
- Smart environment cybernetist
- Cyber researcher

Engineering
- Mechatronics engineer
- Self-driving car operating engineer
- Biomimetics engineer
- Composite materials specialist
- Life support systems engineer

Life science
- 3D tissue printing specialist
- Brain Neurostimulation Specialist
- Epigenetic counsellor
- Bioinformatics specialist
- Molecular nutritionist
- Medical robot operator
GETTING REAL: RESEARCH — EDUCATION — ACTIVITIES — LIFE

SCIENTIFIC AND EDUCATIONAL INFRASTRUCTURE

MEPhI's INFRASTRUCTURE

MEPhI
National Research Nuclear University MEPhI

MAIN CAMPUS
Modern scientific and laboratory complex | Office spaces

MEGASCIENCE FACILITIES
NEVOD (R&E centre) | MEPHIST-1 (Tokamak)

STrAU's FACILITIES AND LABORATORIES
Computing Clusters | 3D Printing Lab | VR-AR Labs

CLUBS AND ASSOCIATIONS
Educational and design Centres | Intellectual clubs

SPORTS FACILITIES
Infrastructure for an active lifestyle | Gym | Multipurpose hall

DORMITORIES
Smart lighting and heating

CO-WORKING
Communication spaces for students & faculty | Boiling points

MEPhI's SELF-GOVERNANCE
MEPhI Student Council
MEPhI Dormitory Council
MEPhI student construction brigades
MEPhI Student Media Centre
MEPhI Charity Centre
MEPhI Volunteer Centre

SPORTS
MEPhI Bowling Club
Sports history centre
Sambo Club
Rugby Club
Explosion hip hop team

CULTURE
MEPhI cultural project centre
Eight Creative Union
Quanto di Stelb vocal studio
MEPhI academic male choir
MEPhI's CARPE DIEM chamber choir
MEPhI visual arts centre
Vernost panoramic club
Poetry club
MEPhI rock laboratory

SCIENCE
MEPhI Student Research Society
centre of academic diplomacy
Case club
LOOKING BEYOND SELF

PRE-UNIVERSITY
Equipped with modern laboratories and computer classrooms. Key disciplines are taught by highly professional lyceum teachers and university professors with a strong focus on project-related activities. Research is undertaken at the departments and research and educational centres of the university.

SPORTS AT MEPhI
MEPhI is also going strong at sports such as sambo, fitness aerobics, rugby, badminton, sports tourism, cheerleading. In 2018-2019 MEPhI athletes participated in 30 All-Russian competitions. More than 50 MEPhI students are prizewinners of the All-Russian competitions in sambo, sports tourism, fitness, step aerobics, hip-hop. The men and women’s national teams of the rugby club, which history has more than 55 years, are regulars at the finals of the Championships of the Russian Federation and Moscow Cup Competitions. MEPhI student is also selected to represent Russia national rugby team at the European Championship 2019.

CHARITY
Charity festivals “From Heart to Heart” have been held annually since 2012.

CASE CLUB «PROEKTORIA»
3 joint Rosatom – MEPhI cases in:
- Energy technology
- Health technology
- Material Technology

500 students and 200 teachers attended professional orientation workshops

TEACHERS PROFESSIONAL DEVELOPMENT
>3 000 teachers

Olympiads
>30 000 Participants

ROSATOM SCHOOL
200 schools in 31 cities
>10 000 scholars of E-Courses and Online lectures
36 atom classes in 29 cities

OLYMPIADS
7 All-Russian Student Olympiads
214 2018
79 2014
The number of winners and nominees of Olympiads organized by the Russian Council of School Olympiads

4th RANK AMONG BEST IT - TECHNOLOGY ORIENTED SCHOOLS IN RUSSIA, 2019

>27 000 students in grades 5-11

NETWORK SCHOOL
from 57 Regions of the Russian Federation

>4 000 problem-oriented programs in cooperation with industry partners

SILVER STUDENTS
Continuing education courses for the additional professional program “CAD Engineering Design” are held for persons of pre-retirement age at SIPT MEPhI. This is an initiative of the Union Agency for the Development of Professional Communities and Workers “Young Professionals (WorldSkills)”.

38
39
OBJECTIVES:
- Creation of advanced R&D infrastructure
- Bring together regional and industry leaders
- Transferring ideas, knowledge, and technology to the economy
- Encouraging students to address technological challenges for business
- Conducting advanced research in the areas of expertise

R&D INFRASTRUCTURE
- 6 centres, including:
  - Centre for Development of Nuclear Medicine
  - Test Field for Small Nuclear Power Plants

«SMART» ENVIRONMENT
- Digital platforms for Science and Technology Projects
- "Smart City" and "Smart Home" Technologies for ISTC engineering systems

BUSINESS INFRASTRUCTURE
- B2B | B2C | B2G | including:
  - Business incubator
  - Conference centre

INNOVATION INFRASTRUCTURE
- "From idea to product" concept, including:
  - Centre for Industrial Design
  - Centre for Data Processing and Storage

CITY INFRASTRUCTURE
- City environment for life and work:
  - Campus of low-rise residential buildings
  - Service organizations

EDUCATION ENVIRONMENT
- 7 innovation enabling formats:
  - GxP School
  - Digital product accelerator

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MAKING A MARK: RANKINGS

NATIONAL RANKINGS

1. University performance monitoring Ranking (National education innovation support fund)

2. Demand for Russian Universities Ranking (engineering universities) (“Rossiya Segodnya” news agency)

2. Russian universities from students perspective

2. INTERFAX National University Ranking

3. Forbes Education Quality Ranking

3. MEPHi pre-university is at TOP-3 among school in Russia by the rate of successful enrolment to the best engineering, natural- or exact-science universities

3. RAEX Russian Universities Ranking (“EXPERT RA”)

4. RAEX Best Russian University in IT Ranking

4. Forbes Best Russian Universities Ranking

INTERNATIONAL RANKINGS

MEPhI is a leader among Project 5-100 universities by the year on year presence in TOP-100 subjects rankings — THE Physical Sciences | QS Physics & Astronomy

World University Rankings

<table>
<thead>
<tr>
<th>Rank</th>
<th>THE Physical Sciences</th>
<th>QS Physics &amp; Astronomy</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>401-500</td>
<td>329</td>
<td>147</td>
<td>MEPHi</td>
</tr>
<tr>
<td>601-700</td>
<td>157</td>
<td>419</td>
<td>MEPHi</td>
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<tr>
<td>801-900</td>
<td>52</td>
<td>76</td>
<td>MEPHi</td>
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Rankings by subject

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<th>Subject</th>
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<tr>
<td>Physical Sciences</td>
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<td>Computer Science</td>
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<td>Electrical &amp; Electronic Engineering</td>
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<td>Materials Science</td>
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<td>Computer Science &amp; Information Systems</td>
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<td>9</td>
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<tr>
<td>Physics</td>
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QUOTATION

INTERNATIONAL EXPERTS ABOUT MEPhI

SAMUEL CHAO CHUNG TING
Nobel Laureate in Physics, Massachusetts Institute of Technology, USA

This is my second visit to MEPhI. Scientists from MEPhI are very good. Earlier, they were involved in a very important international experiment called PAMELA and made a very important contribution. The AMS experiment is much more precise. We are very hopeful that we will be able to work with them.

PARKAS PRASAD
Distinguished Professor of Chemistry, Physics, Medicine and Electrical Engineering, the New York State University, USA

MEPhI is uniquely positioned, having different aspects of physics, nuclear technology and biomedicine, and can influence the development of biomedicine not only in Russia but all over the world.

FEDERICO ANTINORI
Head of ALICE Collaboration, Switzerland

MEPhI has made a great contribution to the development of the ALICE experiment. MEPhI graduates have had a role to play from early on, when the possibility of experimenting with heavy ions was only discussed at CERN. I would say that without them, ALICE would not exist as we see it now.

MARCO DURANTE
Director of the Biophysics Department of GST Helmholtz Centre for Heavy Ion Research, Germany

In my opinion, MEPhI is moving in the right direction in developing scientific research jointly with foreign counterparts. As I understand it, the university is seeking to become one of the most advanced universities in the global rankings. It is a very ambitious goal and the development of international collaboration should help achieve it.

ZHANGRU KU
Head of the International STAR Collaboration, USA

The cooperation between MEPhI and STAR has a long history that includes scientists as well as MEPhI’s students. Their work attitude and professionalism are well known.

ARQULLA ARJPOV
Prime Minister, Uzbekistan

For a Hi-tech project aimed at building the first nuclear power station in Uzbekistan, specialists with modern knowledge are needed. I am sure that the new branch will fully meet the demand for highly qualified engineering and technical skills at the level of international education standards and graduates will be able to solve the most important scientific, technological and operating challenges for the benefit of the nuclear power industry.

WILLIAM HARWOOD
Director-General, OECD Nuclear Energy Agency, Austria

I am pleased to be in one of the most well-known and leading Russian universities with a nuclear focus. MEPhI students have already left a very good impression – doctoral students were doing an internship with us and proved to be very efficient. The guys took part in ROSTOV 2 modelling and contributed to the development of NEA’s research and experimental center database. I am sure that our cooperation with MEPhI will be very beneficial and we will achieve outstanding results together.

ANTON FOJTÍK
Professor at the Technical University of Liberec, Czech Republic

MEPhI’s reputation in the academic community has improved in recent years. I would put the university into the 50-100 range already now, and this is a great achievement considering how many good universities are there in the world.
QUOTATION

EXPERTS
ABOUT MEPhI

ALEXEY LUNACHEV
Director General of Rosatom State Corporation

Each year, at least one-third of graduates from MEPhI and its branches come to work at our companies, whereas for nuclear professions this figure reaches 80 percent. We do not put any barrier between Rosatom and MEPhI. In this sense, we are one family not only in Russia, but in a wider international nuclear community as well. This unity gives us power.

YURI OGDANESVAN
Academician of the Russian Academy of Sciences, Scientific Leader of the Heavy Laboratory of Nuclear Reactions at the Joint Institute for Nuclear Research (Dubna)

I am thankful to MEPhI, which gave a lot to me both in the early years of my development when I was a student and later when I embarked on my independent career. Today, MEPhI pursues the same mission that was there when it was established. I am really pleased that people receiving a broad education here apply their knowledge, energy and capabilities for the benefit of their country.

NATALIA NIKSELOVA
President of JSC “TVEL” Fuel Company

TVEL Fuel Company has a long-time collaboration with MEPhI aimed for development of the industry-oriented science and technologies with focus, among others, on the advanced nuclear technologies. TVEL company values and encourage MEPhI’s development and transformation which accommodates implementation of the best practice and latest trends in formation of the scientific and engineering agenda as TVEL Fuel Company will always need highly qualified staff.

VLADIMIR SERGIENKO
Head of the Department of Radiouclide Diagnostics and Positron Emission Tomography, Federal State Budgetary Institution “Scientific Research Center for Cardiology”, Ministry of Health of the Russian Federation

Fundamental education at MEPhI is great. I was there during exams and experienced it first-hand. I see excellent opportunities for the development of nuclear medicine with the support of such world-class specialists as MEPhI graduates.

VLADIMIR LUBA
Director of the Federal Medical-Biological Agency of the Russian Federation (FMBA)
Academic and research and management staff of the MEPhI are working continuously to bring the quality of the education to the next level, adopts creativity as a search of meaning and closely cooperated with leading national research centers.

ARSENII ERYKYN
Director for External Communications of the JSC “Ruselectronics”, Doctor of Economics

MEPhI graduates are in high demand at enterprises of electronic industry both in Russia and abroad. Institute works at the intersection of fundamental and applied research. In addition to fundamental professional training, special attention is paid to economics and management, as it is not enough to develop a product, it is important to learn how to commercialise it and put it into production.

Mikhail Erenetz
Head of laboratory at the MPI of Chemistry, Germany

I graduated from MEPhI in 1973 and can admit that the University still shows the highest level of students training and scientific research. It can be proved by the unique experiment that we conducted in collaboration with European Synchrotron Research Facility (ESRF, Grenoble, France). The great expertise in synchrotron research gained at the LaPlas, MEPhI allows for better understanding of the very nature of high-temperature superconductivity. Issues addressed by the MEPhI approach the very frontier of world science.

Dmitry Smyslov
Vice President for HR and Education, Mail.Ru

The MEPhI students’ training is outstanding. They successfully master practical knowledge in our joint educational project TECHNOATOM. No surprise, that there is a healthy competition among our internal divisions for the best of them as they are invited as interns to our company.
STUDENTS ABOUT MEPhI

NASIRA NURZHANOVA
Institute of Nuclear Physics and Engineering

I have always wanted to have some technical profession that would be desired and needed by my homeland, Uzbekistan. Since MEPhI is a global leader in training specialists for the nuclear industry, it did not take me much time to decide where to apply to. It is not that easy to study at MEPhI, but it's worth it. The university is renowned for its highly qualified specialists and professors. I am proud that I learn from world-renowned scientists. I am sure that MEPhI diploma is a lucky ticket to the future.

KANAMAT EFENDIEV
Institute of Engineering Physics for Biomedicine

We might expect some breakthrough changes in approaches to disease diagnostics and treatment in the next five years. I believe that MEPhI’s Institute of Engineering physics for Biomedicine has all the capabilities needed to train specialists in biomedicine who would be in demand in the global labour market. What distinguishes the Institute are the laboratories that are doing research on the edge between physics, biology and chemistry. We are working on new, innovative approaches to cancer treatment.

VLADIMIR BOLDYREV
Institute of Nanoeengineering in Electronics, Spintronics and Photonics

Many people think that a master’s program is a summary of the bachelor’s course, but that is not so. The Master’s degree is the first step on the path to applied problems and interesting knowledge. Thanks to the experienced staff, a new approach to education and cooperation with companies such as “Ruselectronics”, JSC SPC “Elvis”, etc., NESPI is an excellent place for becoming a student as a true professional in his field.

DARIYA DAMILOVA
Institute of Nanoeengineering in Electronics, Spintronics and Photonics

Due to the NESPI up-to-date scientific agenda, prospective Master’s student can choose one of the promising scientific areas. These are organic electronics, physics of kinetic phenomena, physics of the radiation interaction, etc. Master’s students are engaged in research, participate in conferences, gain experience and learn to respond correctly to stressful situations. Among NESPI lecturers there are world-class scientists. Collaboration with such people helps to get in-depth knowledge.

ARTEM YULIBASHEV
Institute of Cyber Intelligence Systems

Studying at MEPhI allowed me to develop crucial skills such as evidence-based and analytical decision making under tight time schedule and teamwork. This also contributed to the victory at the DigitalSkills contest, there my ability to accomplish tasks in broad areas from data analytics to the integration to existing and/or development of new operational network was tested.

ANISIA KLIKENKO
Institute for Laser and Plasma Technologies

The Institute of Laser and Plasma Technologies has amazing capabilities: we can both engage in fundamental research and create new technologies. It is important that the institute has solid experimental capabilities. We have true professionals working at the labs who know how to work with students and like it and who involve students in solving real tasks by applying their theoretical and practical knowledge.

SHIKHNASR AMONGEDEV
Institute of Nuclear Physics and Engineering

I have chosen to study at MEPhI, because this university is a global leader in the nuclear industry, which is currently developing rapidly in Uzbekistan. My studies are very productive and interesting. All teachers are highly qualified and love what they do. After my studies are over, I would like to work at the state corporation, Uzatom, and develop my country. MEPhI’s diploma is highly appreciated all over the world and will definitely give me additional career opportunities.

DMITRIY POZDEY
Institute of Engineering Physics for Biomedicine

MEPhI is exactly the place that will help me to become an in-demand specialist. I understand that I am studying in one of the leading universities not only in our country but in the world as well. Great teachers with hands-on experience in their respective areas, modern equipment in laboratories where you can engage in world class research, all these things help a young specialist to develop needed skills and qualities.
MEPHI ORGANISED A WINTER SCHOOL FOR PARTICIPANTS OF THE “I AM A PRO” NATIONAL STUDENT CONTEST IN NUCLEAR PHYSICS AND TECHNOLOGY

The contest offers career bits for students, as they can be employed by market leaders and/or continue their education in leading Russian universities. Over three days, students and young specialists from different parts of Russia received an in-depth enrichment-packed programme from recognised experts, who described current nuclear power trends and developments and networked with the students.

MEPHI STRENGTHENS COOPERATION WITH BRICS UNIVERSITIES IN BIOENGINEERING

National Research Nuclear University MEPhI signed a tripartite agreement with three BRICS universities: the University of Cape Town, the Bremen University (Germany) and the University of Pretoria (South Africa). The agreement signed by MEPhI’s rector, Vladimir Visevski, will make it possible to develop joint projects in education and science, particularly in biotechnology. Representatives of MEPhI discussed with their counterparts from the University of Pretoria the progress of joint research for the nanoparticles for biomedical project, intended to develop new methods of oncological diseases treatment and talked about new developments in medical decision support systems.

MEPHI TAKES PART IN A NETWORK PROJECT ON PROMOTING ARTIFICIAL INTELLIGENCE

MEPhI joined a network project for AI promotion together with the University of Ulster, the agency for the Strategic Initiatives (ASRI) and a number of IT companies, including Nvidia, Ensino, Inforsys, Skyeager, Bigdata team and NL. The Charter on Educational Space (Digitalisation and Cooperation Agreement) was signed by MEPhI and the Association of Technology Communities (Kolchuga).

MEPHI & ROSATOM JOINT FORESIGHT SESSIONS

The webinar gathered representatives from universities in Russia and IC Rosatom management teams. New formats of personalising training for the development of the industry has been one of the topics, in particular the training of personnel for the nuclear power and development of new businesses.

ON 3RD SEPTEMBER, TASHEFAN SAW THE OPENING OF THE 1ST FOREIGN BRANCH CAMPUS OF NATIONAL RESEARCH NUCLEAR UNIVERSITY MEPhI “Opening of the first foreign branch campus of National Research Nuclear University MEPhI in Tashkent — one of the major events this year that has a special significance for Uzbekistan. We are proud, and we’re delighted at the same time that the opening had happened in Uzbekistan,” said Akmaral Kachenbaeva, Director General of IC Rosatom.

MEPHI IS AMONG THE WORLDWIDE LEADERS

MEPhI students win the National Student Olympiad in Physics. MEPhI hosted one of the stages of the National Student Olympiad among higher vocational education (NVOE) institutions. MEPhI student Ayur Galke won the National Student Olympiad in Physics, while another MEPhI student, Shamil Chashvili, won the international round. This year, the university will host five Olympiads from the IEEE BoE. IEEE members and mediators may enrol in V Midwest student programmes without exams, whereas the Olympiad prize holders are eligible for benefits.

YOUNG SCIENTISTS FROM MEPhI RECEIVED A MOSCOW GOVERNMENT AWARD

An official award ceremony for young scientists who made remarkable progress in research and new technology development was held in the Kremlin’s Hall.

WINNERS IN THE SMART GRID CATEGORY OF THE NATIONAL TECHNOLOGY INITIATIVE OLYMPIAD HOSTED BY MEPhI

MEPhI hosted the final round of the National Technology initiative Olympiad in the Smart Grid category. The NTL Olympiad is the first Russian team engineering competition for schools and students, which is held by the NTL initiative. The teams competed against each other; the winners were expected to solve the best problem and write the best management algorithm. Also, the participants were allowed to sell electricity to their competitors on other teams.

COOPERATION UNDER THE MEPhI STUDENT INTERNSHIP PROGRAMME AT THE DEO HAS BEEN CONFIRMED IN A MEMORANDUM

William D. Maguire, the Director General of the OECD Nuclear Energy Agency (NEA) and the rector of MEPhI signed a memorandum on cooperation for a student internship programme. The internship programme gives an opportunity to qualified candidates to improve their analytical and technical skills as well as gain experience working at an international organisation.
Des chercheurs russes ont découvert comment déceler des états précancéreux à l’aide de nanodiamants. Des chercheurs de l’Université nationale de recherche nucléaire MEPhI (Institut d’ingénierie physique de Moscou) ont étudié les propriétés optiques des nanodiamants issus de la détonation lors de leur interaction avec différentes biomacromolécules (molécules de biopolymères).

Un team di fisici dell’Università Nazionale di Ricerca MEPhI e dell’Istituto di Fisica del Generale A.M. Prokhorov hanno proposto un metodo per rilevare microcrepe e aree nascoste di accumulo di microflora patogena sulla superficie dei denti utilizzando un laser e nanoparticelle. La ricerca è stata pubblicata su Laser Physics Letters.


El nivel actual de desarrollo de las tecnologías permite dar vida a unas ideas que hasta hace poco parecían ciencia ficción y venidas de un futuro muy remoto. Gracias a los avances científicos, la humanidad está más cerca de poner en práctica las ideas del transhumanismo.