

«Since its foundation the University has been the center of development of the advanced scientific and technical thought, training highly professional specialists for the strategically important spheres of the Russian economy, including nuclear industry. Within its walls serious research activities have been carried out and innovative solutions have been developed and implemented. Today same as all the past decades MEPhI is well known for its strong traditions, competent teaching staff, talented and enthusiastic students. That is why MEPhI's diploma is the evidence of one's profound knowledge and a guaranteed start in life».

// Vladimir V. Putin, President of the Russian Federation



MEPhI seeks to train the next generation of industry, government, academic, and civil society leaders; to generate research and knowledge that can help solve major global challenges; and to work in close collaboration with partners globally to improve our society

# IS ONE OF THE BEST NATIONAL UNIVERSITIES,

TRAINING THE ELITE EXPERTS FOR THE NUCLEAR SPHERE, IT AND OTHER HIGH-TECH SECTORS

VIDEO ABOUT MEPHI



THE UNIVERSITY IS A RECOGNIZED LEADER
AND HAS THE UNIQUE EXPERTISE AND
ADVANTAGES IN THE FOLLOWING
BREAKTHROUGH DIRECTIONS



nuclear research and engineering



laser, plasma and beam technologies



microwave-nanoelectronics



nanobiotechnologies



biomedicine and medical physics



information technology

TO SHAPE TRENDS IN SCIENCE OF TOMORROW, NEW RESEARCH AREAS, LINKED WITH AREAS OF MEPHI'S EXPERTISE, ARE IN FOCUS



**space** research and technologies



controlled thermonuclear fusion



materials for nuclear and space applications

MISSION

TO GENERATE, PROMOTE, USE
AND PRESERVE SCIENTIFIC KNOWLEDGE
AIMING TO ADDRESS GLOBAL
CHALLENGES OF THE XXI CENTURY

## INTERNATIONAL MEPH

MEPhI is a global university collaborating with a wide range of scientific and educational organizations, attracting international students from all over the world to the educational programs in the groundbreaking fields of science, technology and engineering

partner universities abroad

origin countries and territories

for international students

educational programs in Engineering with international accreditation by FEANI



nternational

Nuclear Competence Center







World Nuclear University (WNU)



Regional Network for Education and Training in Nuclear







Management Academy (INMA)

## FOR INTERNATIONAL STUDENTS INTERNATIONAL STUDENTS AT MEPHI / ADMISSION GEOGRAPHY **RWANDA** University of Rwanda

BOLIVIA

University of San Andres



Egyptian-Russian University

Ain Shams University

DIRECT EXPORT

Partners in **JOINT TRAINING PROGRAMS** for international students



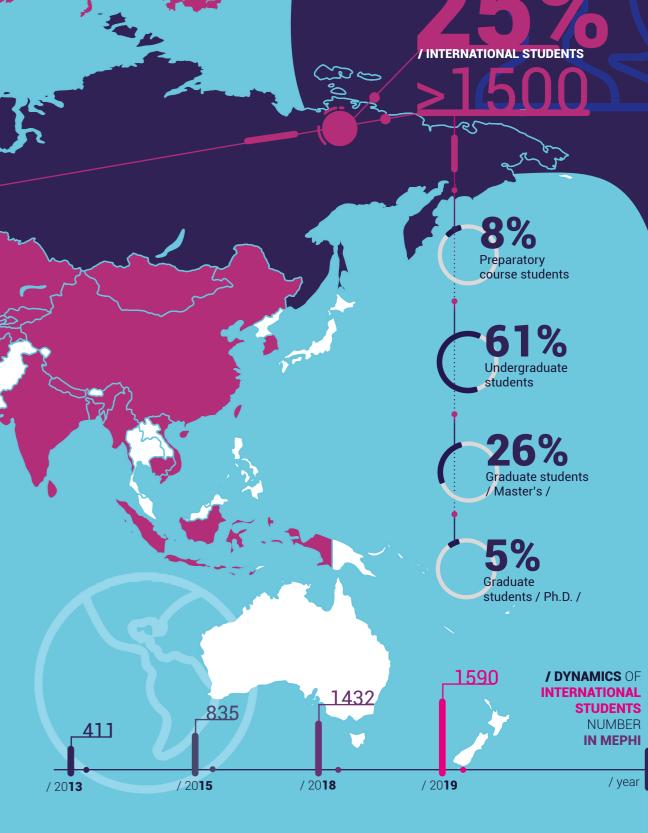
D. Serikbayev East Kazakhstan State Technical University

**ARMENIA** 

National Research

Nuclear University

National Polytechnic University of Armenia



**KAZAKHSTAN** 

## JOINT TRAINING PROGRAMS

## UNDERGRADUATE PROGRAMS

### **UNIVERSITY** OF SAN ANDRES. **BOLIVIA**

**Nuclear Technologies** 

### D. SERIKBAYEV EAST **KAZAKHSTAN STATE TECHNICAL UNIVERSITY. KAZAKHSTAN**

Innovative Methods of Uranium **Products Synthesis** 

### UNIVERSITY OF RWANDA. **RWANDA**

Nuclear Science and Technology

### **AIN SHAMS** UNIVERSITY, **EGYPT**

**Mechanical Power Engineering** / Nuclear Energy Specialisation /

### **EGYPTIAN-RUSSIAN** UNIVERSITY, **EGYPT**

**Nuclear Power Station Engineering** 

### **NATIONAL POLYTECHNIC** UNIVERSITY OF ARMENIA. **ARMENIA**

**Nuclear Power Engineering** Heat Power Engineering

## GRADUATE / MASTER's / PROGRAMS

### **HACETTEPE** UNIVERSITY, **TURKEY**

**Nuclear Engineering** 

### **ISTANBUL TECHNICAL** UNIVERSITY, **TURKEY**

**Energy Science and Technology** 

## STRUCTURE

## HIGHER ENGINEERING **SCHOOL**

**UZ**BEKISTAN

Nuclear physics and engineering, nuclear power engineering,

heat power engineering, electric power engineering

MEPHI BRANCH IN TASHKENT

Software engineering, system analysis and management, digital engineering

**INSTITUTE FOR NANOENGINEERING** IN ELECTRONICS. SPINTRONICS **AND PHOTONICS** 

**INSTITUTE OF NUCLEAR** 

Nuclear power and technology,

development of new materials, physics of fundamental interactions

**PHYSICS AND** 

**ENGINEERING** 

and particle physics

Specialized electronics and new physical principles-based electronics, functional nanoelectronics, quantum computer systems, integrated radio photonics, nanomaterials

**PHYSICOTECHNICAL** 

Development of cyberphysical

INTELLIGENT

SYSTEMS

### **INSTITUTE OF INTERNATIONAL INSTITUTE OF**

International relations, international cooperation in in science & technology and industry, advanced linguistic

RELATIONS

## **MOSCOW**

/ STUDENTS



### / Programs for international students

### **INSTITUTE OF FINANCIAL TECHNOLOGY AND ECONOMIC SECURITY**

Financial monitoring, information and economic security, economics, audit

### 13 13 · aPlas **INSTITUTE FOR LASER AND PLASMA TECHNOLOGIES**

Laser, plasma, beam, synchrotron, x-ray technologies

National Research Nuclear University

10 1

## **ISTITUTE FOR LASER**

**AND PLASMA TECHNOLOGIES** Composites, photonics materials, nanomaterials, photonics technologies

**OBNINSK** 

PHYSICS AND ENGINEERING

Operation of NPP, non-energy application of nuclear technology

## **INSTITUTE OF CYBER**

Applied mathematics, IT, cyber security, cryptography, artificial

### STITUTE OF CYBER INTELLIGENCE SYSTEMS **INTELLIGENCE SYSTEMS** Artificial intelligence

& machine learning, fuzzy systems and intelligence, neurotechnologies oft computing, higherformance computing, 'smart city" and "smart nome" technologies

PHYSICS FOR BIOMEDICINE General medicine, nuclear medicine, radiobiology, pharmacy

**FACULTY OF BUSINESS INFORMATICS** AND COMPLEX SYSTEMS MANAGEMENT

Business informatics, industrial management, management in nuclear sphere

## STITUTE OF SOCIAL

AND ECONOMIC SCIENCES

Economics, management, state and municipal management



**INSTITUTE OF ENGINEERING** PHYSICS FOR BIOMEDICINE

Innovative technologies for diagnostics and therapy of cancer, nuclear medicine and nanobiotechnologies, methods of computer nanomedicine



### UNDERGRADUAT **PROGRAMS**

 MOSCOW
 OBNINSK / English medium program / / Russian medium program /





### **INPhE**

- Radioecology and Safety of Human and Environment •
- Nuclear Physics and Cosmophysics •
- **Experimental Research** 
  - and Fundamental Interactions Modeling •
- Particle Physics and Cosmology •
- Radiation Technologies in Life Sciences •
- Physics of Fundamental Interactions •
- Physics of Extreme State of Matter •
- Physics and Thermal Physics of Nuclear Power Facilities •
- Innovative Nuclear Technologies •
- Radiation Safety



- Operation of Nuclear Power Plants
  - Nuclear Technologies
- Research Nuclear Reactors: Physics and Technologies
  - Nuclear Technologies

**NUCLEAR POWER ENGINEERING AND THERMAL PHYSICS** 

### **MATERIALS SCIENCE AND TECHNOLOGY**

**NUCLEAR** 

**PHYSICS AND** 

**TECHNOLOGIES** 

- Physics of Materials and Processes •
- Radiation Safety of Nuclear Power Plants • • Design and Operation of Nuclear Power Plants •
- Monitoring and Control Systems of Nuclear Power Plants

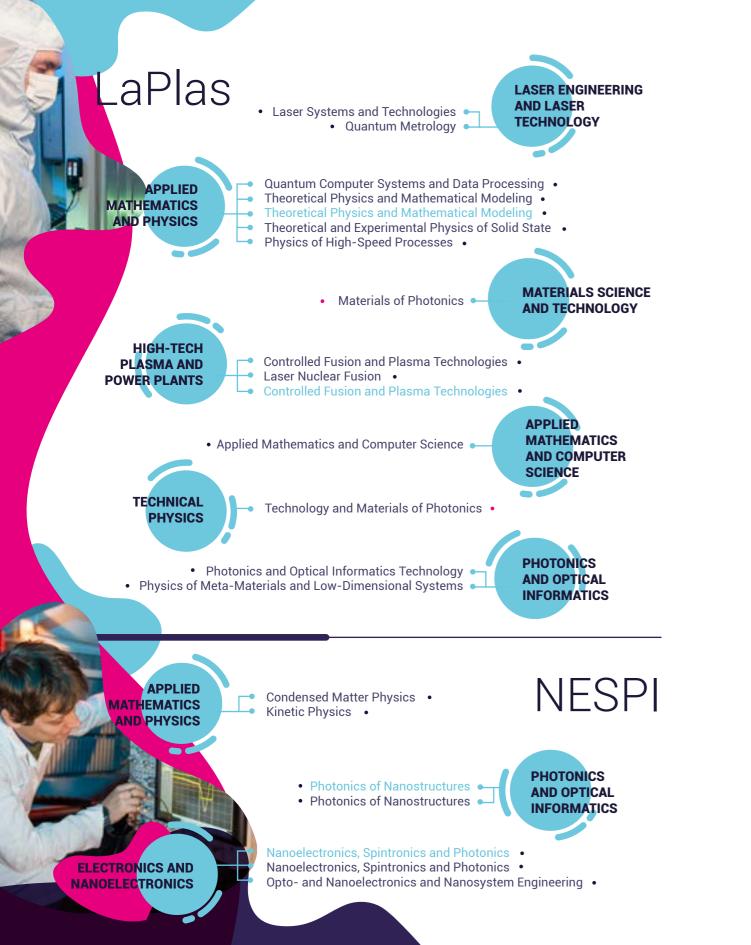
**NUCLEAR POWER** PLANTS: DESIGN, **OPERATION** AND **ENGINEERING** 

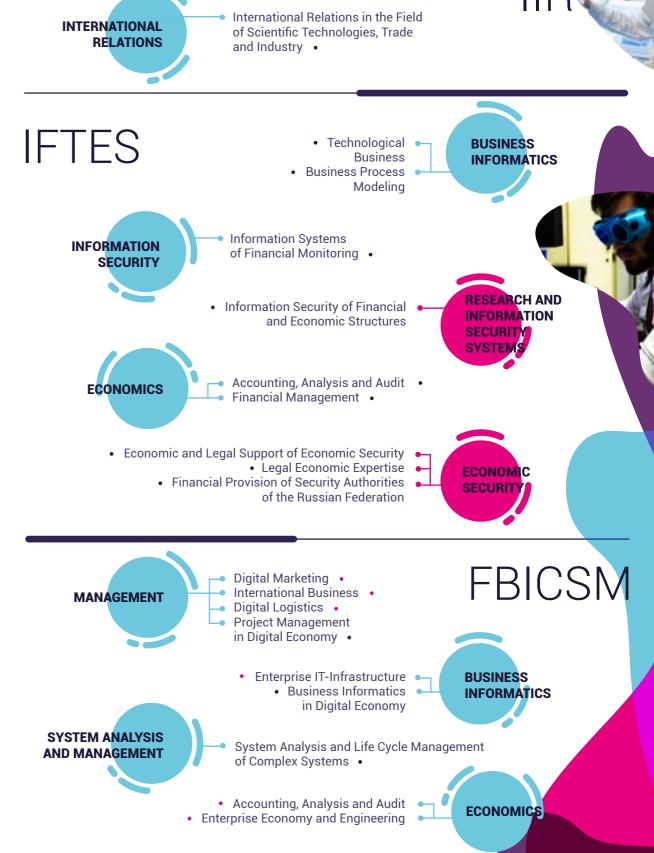
NUCLEAR **REACTORS AND MATERIALS** 

- Innovative Nuclear Reactors •
- Nuclear Reactors
- Instruments and Methods of Diagnostics and Quality Control

**INSTRUMENT ENGINEERING** 







### **GRADUATE / MASTER'S**

/ English medium program / / Russian medium program / MOSCOW • OBNINSK **INPhE**  Radioecology and Radiation Protection State Regulation in Safety of Atomic Energy Use • Automation Systems for Physical Installations and Their Elements • Experimental Nuclear Physics, Cosmophysics and Physics of Fundamental Interactions • **Experimental Methods of Nuclear** and Particle Physics • Nuclear Physics and Cosmophysics • Particle Physics and Cosmology • **NUCLEAR** New Generation Nuclear Power Technologies • **PHYSICS AND** Engineering Computer Modeling in Nuclear Industry • **TECHNOLOGIES**  Nuclear Engineering Innovative Nuclear Technologies Radioecology and Radiation Safety • Physics and Technologies of Nuclear Reactors • Materials for Nuclear Application • High Energy Physics and Astrophysics Prospective Nuclear Reactors and Power Facilities • Modern Technology of Light-Water Nuclear Reactors • **NUCLEAR POWER**  Operation of NPP and Power Facilities **ENGINEERING AND**  Nuclear Power Plants **THERMAL PHYSICS**  Nuclear Power Engineering MATERIALS SCIENCE Materials Design and Engineering Materials Design for Innovative Technologies AND TECHNOLOGY Non-Destructive Testing, Technical Diagnostics **INSTRUMENT** of Equipment and Computer Support **ENGINEERING** of NPP Operator

### PhysBio

- High-Tech Diagnostic Systems •-
- Biomedical Nanotechnologies
- Biomedical Nanotechnologies

BIOTECHNICAL SYSTEMS AND **TECHNOLOGY** 



**CHEMISTRY, PHYSICS AND MECHANICS** OF MATERIALS

Pharmaceutical and Radiopharmaceutical Materials Science •

Chemical Technology in Pharmacy

**CHEMICAL TECHNOLOGY** 

**APPLIED MATHEMATICS AND PHYSICS** 

Condensed Matter Physics • Kinetic Physics

NES

- Photonics of Nanostructures
- Photonics of Nanostructures

**PHOTONICS AND OPTICAL INFORMATICS** 

**ELECTRONICS AND NANOELECTRONICS** 

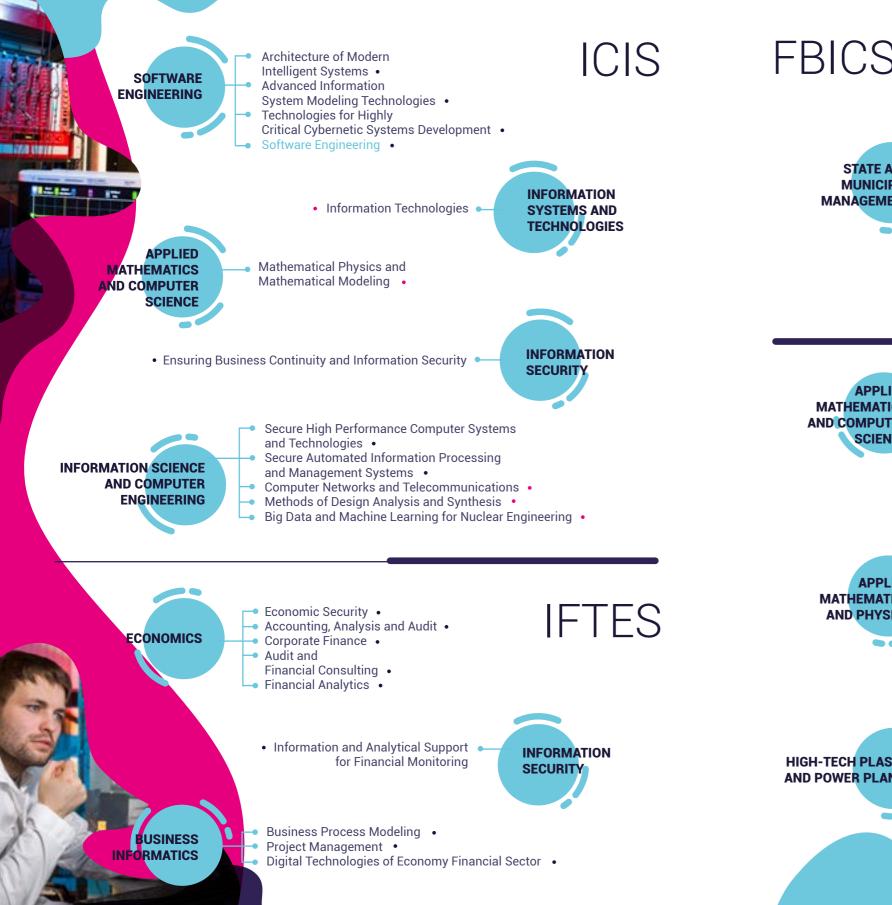
Nanoelectronics, Spintronics and Photonics •

Applied Micro- and Nanoelectronics



- International Relations in the Field of Scientific Technologies, Trade and Industry
- International Relations in the Field of Scientific Technologies, Trade and Industry

**INTERNATIONAL RELATIONS** 



### **FBICSM**

- Logistics Management Management in Nuclear Industry
  - Digital Management of High-Tech Business
  - Strategic and Innovation Management





Digital Technologies in State and Municipal Management •• State and Municipal Management in Smart Cities •

- Business Informatics in High-Tech Industries
  - Business Informatics in Digital Economy

**BUSINESS INFORMATICS** 



High-Performance Computing and Parallel Programming Technologies • Mathematical and Computer Methods in Scientific Research •

Photonics and Solid State Physics

**PHOTONICS AND OPTICAL INFORMATICS** 



- Problems of Theoretical Physics and Mathematical Modeling Quantum Computer Systems and Precision Measurements
- Charged Particle Accelerators for Mega Science Level Installations Supercomputer Technologies in Engineering and Physical Modeling
- Accelerators for Medicine
- Accelerators for Medicine •

Laser Systems and Technologies

LASER ENGINEERING AND LASER **TECHNOLOGY** 

**HIGH-TECH PLASMA AND POWER PLANTS** 

- Controlled Fusion and Plasma Technologies Controlled Fusion and Plasma Technologies
- High-Power Lasers and Laser Fusion •

• Composites and Materials of Photonics

**MATERIALS SCIENCE AND TECHNOLOGY** 



/ RESOURCE CENTERS

are the centers for practical training of the international students founded at MEPhI branches in collaboration with the university's partners in nuclear sphere - research institutions and industrial enterprises

## TRAINING IN MEPHI

MEPHI RESOURCE CENTERS FOR TRAINING OF THE INTERNATIONAL SPECIALISTS FOR NPPS AND CENTERS OF NUCLEAR SCIENCE AND TECHNOLOGY (CNST)



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VOLGODONSK

Volgodonsk Engineering Technical Institute
- MEPhl Branch

### / Specialization

· design and major operation modes of NPP units

### / Main fields of practical training

- Exploring NPP unit design on full-scale
- Operation of NPP unit on a full-scale simulator
   WWER-1000 fuel overload simulation
- Technology of production and quality control of the items and fitting nodes for NPP unit
  - Quality control of NPP unit equipment
    - Safety culture

/ ROSTOV NPP
/ «VOLGODONSKATOMENERGOREMONT»

/ «ATOMMASH»

- JSC «AEM-TECHNOLOGY» BRANCH / VOLGODONSK INDUSTRIAL CLUSTER OF ATOMIC MECHANICAL ENGINEERING / AEM RESEARCH INSTITUTE



/ Specialization - operation of WWER-based NPP

### / Main fields of practical training

- Operation of WWER power unit
- Management and technology of NPP equipment maintenance

### / PRACTICE FACILITY OF NOVOVORONEZH NPP

- JSC «ROSENERGOATOM» BRANCH
- / PRACTICE CENTER OF «NOVOVORONEZHATOMENERGOREMONT»
- / JSC «ROSENERGOATOM» BRANCH
- EXPERIMENTAL ENGINEERING CENTER ON NPP SHUTDOWN







VIDEO
Volgodonsk
resource center



- MEPhi Branch

### / Specialization

non-energy application of nuclear technologies, nuclear safety

### / Main fields of practical training

- Research on neutron-physic and termal-hydraulic features of nuclear units
- Radiation monitoring and control
- Irradiation of the products of animal and plant origin with the accelerated electron flow

### / IRT-2000 REACTOR

/ TRAINING LABORATORY « NPP SIMULATORS»

/ FUNCTIONAL SIMULATOR OF WWER REACTOR

/ RUSSIAN RESEARCH INSTITUTE OF RADIOLOGY AND AGROECOLOGY

/ KARPOV INSTITUTE OF PHYSICAL CHEMISTRY

/ SPC DOZA

/ MEDICAL RADIOLOGY RESEARCH CENTER NAMED AFTER A.F. TSYBA

- NATIONAL MEDICAL RADIOLOGY RESEARCH

**CENTER BRANCH** 

/ TECLEOR LLC





Scientific & Educational Centre NEVOD, is based on the unique experimental complex of physical systems and detectors that have no analogues in the world, which are designed to study the natural flux of particles on the surface of the Earth:

/ water Cherenkov detector / coordinate - tracking detector / moun hodoscopes

The Unique Scientific Facility «Experimental complex NEVOD» is the only in the world that allows conducting basic (particle physics and astrophysics) and applied (monitoring of the state of the atmosphere and magnetosphere of the Earth and of extra-terrestrial space) research based on the analysis of detected of natural fluxes of the particles at the Earth's surface over the entire range of zenith angles (from 0 to 180 degrees) and in the record range of energy (1-1010 GeV)







Academic center «Nanotechnologies» conducts R&D activities in the sphere of new materials and technologies in non-silic electronics

### / 6 RESEARCH AND ANALYTICAL LABORATORIES

1/ Molecular-beam epitaxy and nanolithography laboratory 2/ Semiconducting devices complex technology laboratory



### / MAJOR SPHERES OF RESEARCH

- · High-power fiber lasers · Laser processing technologies
- · Laser micro- and nanotechnologies · Laser technologies for medical applications

### PHYSICS OF ULTRA-INTENSE LASER RADIATION

Development of experimental laser facility MEPhI ELF for experimental research of extreme state of matter physics

### **PORTABLE SPHERICAL TOKAMAK «MEPHIST»**

- · Research in the field of controlled nuclear fusion
- International coopeartion in the framework of ITER project



/ PLASMA-SURFACE INTERACTIONS **AND PLASMA TECHNOLOGIES** / MODELING OF PHYSICAL PROCESSES IN EXTREME

**BIONANOPHOTONICS / NANOBIOENGINEERING / NANOTHERANOSTICS** 

/ HYBRID PHOTON NANOMATERIALS

**LIGHT FIELDS** 

/ BIOMOLECULAR TECHNOLOGIES

/ FUNCTIONAL ELECTROPHYSICAL DIAGNOSTICS

AND NON-DESTRUCTIVE TESTING

/ RADIATION METHODS OF DIAGNOSTICS AND RADIATION TECHNOLOGY

**USING ULTRA-INTENSE LASER RADIATION** 

/ QUANTUM METROLOGY / SILICON PHOTOMULTIPLIER

/ EXPERIMENTAL NUCLEAR PHYSICS

PHYSICAL PROCESS MODELING FOR SAFE OPERATION OF NUCLEAR POWER-UNIT

/ ADVANCED TECHNOLOGY OF NEW MATERIALS



### / BIOTECHNOLOGY CENTER

Biotechnology center was created in 2017 for conducting innovative research in biology, chemistry and

### / Center's laboratories

Eukaryote cell research laboratory • Confocal microscopy laboratory • Molecular biology laboratory • Real time quantitative PCR laboratory • Training PCR laboratory • Organic synthesis laboratory • Invertebrate biology laboratory



### / HIGH-PERFORMANCE COMPUTING **CENTER (HPC CENTER)**

HPC Center is designed for resource intensive and distributed computing for scientific, research and academic activities including studying modern HPC technologies.

### **FACILITIES**

- «University cluster» farm
- 96 cores 384 GB RAM net 1 Gbit/s peak perfomance 1.2 TFlops
- 160 cores 1.3 TB RAM 14.6 TB usable disk space net 10 Gbit/s
- peak perfomance 3.5 TFlops
- «Cherenkov» farm
- 288 cores 2.3 TB RAM 34 TB usable disk space
- net Infiniband FDR 56 Gbit/s peak perfomance 11 TFlops

### / VR-LABORATORY AND REVERSE **ENGINEERING LABORATORY**

The laboratories are designed for development of VR prototypes of complex engineering constructions including nuclear enegry facilities



Uranium-graphite assembly VR-twin



Simulation center is equiped with the trainers, manikins and other simulating devices modeling specialization. The classes are equiped utmost



## **PARTNERS**



























































JBC GLONABB

























LASSARO





Infrastructure



World University Impact Ranking: Industry, Innovations and



Graduate Employability Rankings 2019: Graduate **Employment Rate and Employer Student Connections** 



World University Ranking: Industry income



**KEK** / High Accelerator Research Organization, Japan



FAIR / Facility for Antiproton and Ion Research, Germany



**BICA Society** / Biologically Inspired Cognitive Architectur Society, USA



XFEL / European X-Ray Free-Electron Laser Facility, Germany

**ICECUBE** / South

Pole Neutrino

### MEGASCIENCE **PROJECTS**



ITER / International Thermonuclear Experimental Reactor,

France

PHELIX / Petawatt High-

Experiments, Germany

Energy Laser for Heavy Ion

NICA / Nuclotron-based Ion Collider facility, Russia



**ELI** / Extreme Light Infrastructure, Czech Republic



Observatory, Antarctic **CERN** / European Organization for

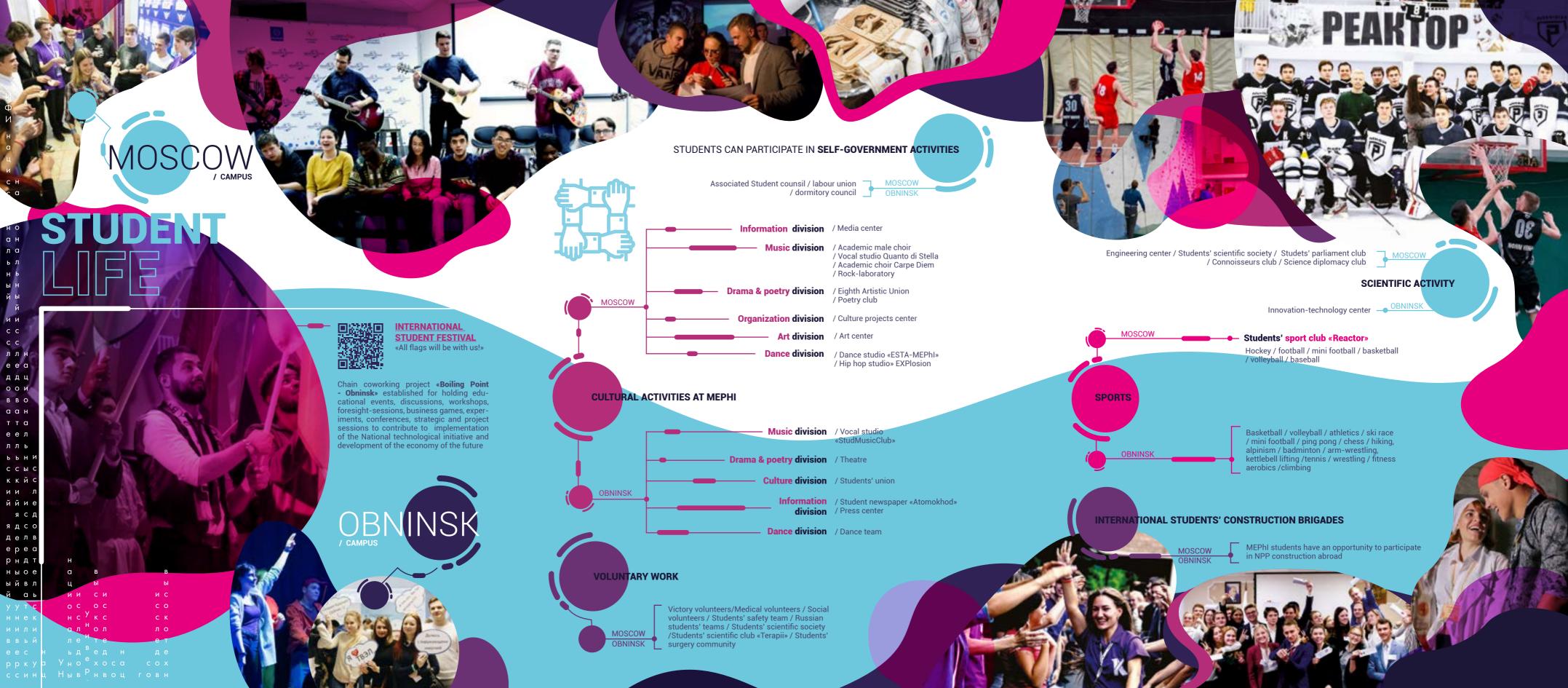


TAIGA / Tunka Advanced Instrument for Cosmic Ray Physics and Gamma Astronomy, Russia



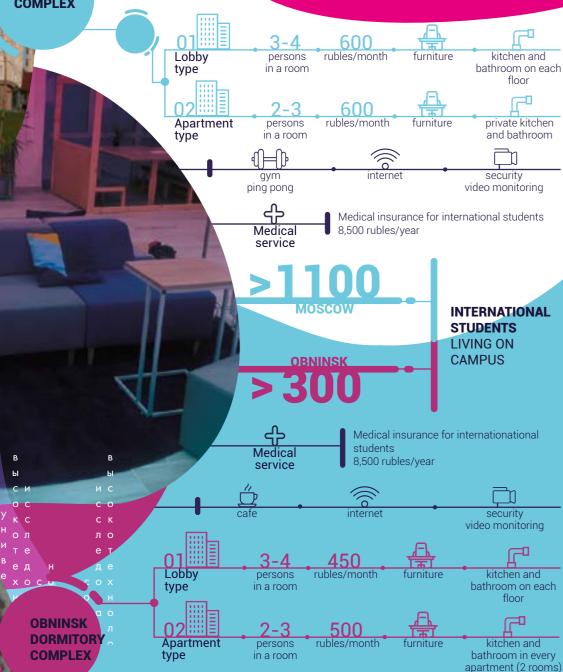
RHIC / Relativistic Heavy Ions Collider, Brookhaven National Laboratory, USA

Nuclear Research, Switzerland



## INTERNATIONAL

**MOSCOW DORMITORY** 





### **SUMMER SCHOOLS**



Young specialists • Young scientists • Students -Postgraduates •

### **GLOBAL NUCLEAR MEPHI FEST**

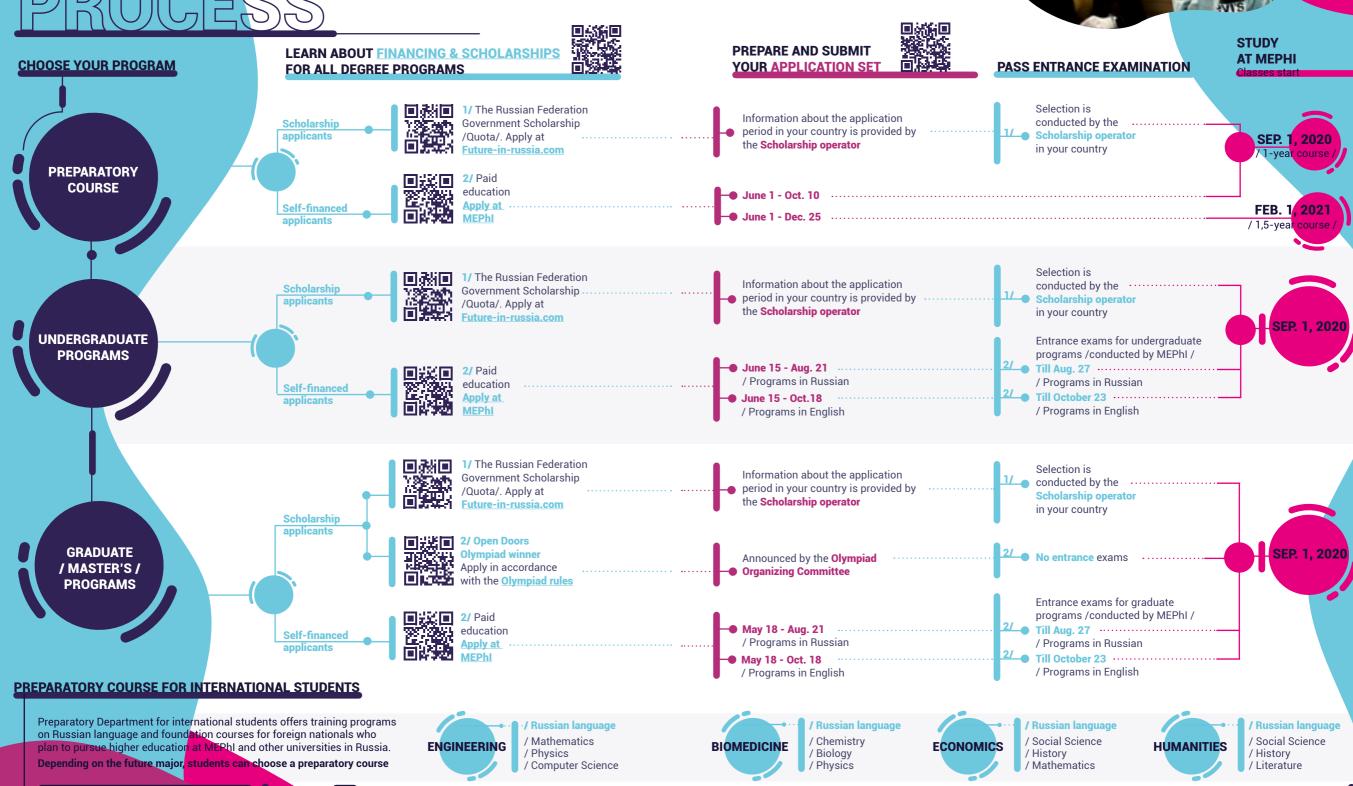
INTERNATIONAL YOUTH FESTIVAL FOR STUDENTS WITH MAJOR IN NUCLEAR TECHNOLOGIES The festival program includes educational events with top experts in nuclear technologies, cultural program, intellectual, sports and art competitions, meetings with representatives of State Corporation



MEPHI IN SUMMER

## ADMISSION

## PROCESS



## STUDENTS ABOUT MEPHI



### NASIBA NURZHANOVA Institute of Nuclear Physics and Engineering

It was my strong desire to get a technical profession that would be in demand in my homeland, Uzbekistan. And as MEPhI has the leaging position in training specialists for nuclear industry, I didn't spend much time for choosing the university. Studying at MEPhI is not easy but it is worth it. The university is famous for its high-professional specialists and the faculty. I am proud of learning from the scientists of world reputation. I am sure that MEPhI diploma is a lucky ticket to the future.

### KHANAMAT EPHENDIEV Institute of Engineering Physics for biomedicine

It is well-known that in the nearest 5 years we should expect the groundbreaking changes in approach to diagnostics and therapy of diseases. I believe that MEPhI PhysBio has all necessary resources for training specialists demanded all over the world. The laboratories conducting research on the junction of physics, biology and chemistry make PhysBio the unique institute in the field. We develop new innovative methods of cancer therapy.

### SCHAKHNAZAR AMONGELDIEV Institute of Nuclear Physics and Engineering

I have chosen MEPhI because it is a global leader in nuclear sphere. Classes are very productive and interesting. All professors are and enthusiastic. I would like to work in State Atomic Energy Corporation «Uzatom» and develop my country after my graduation. MEPhI diploma is ranked high in the world and undoubtedly gives additional chances for a successful career.



## RANKINGS MEPHI

20**18** 



2019

QS WORLD UNIVERSITY RANKINGS

146

/ Natural Science /

/ Physics & Astronomy /

301-350

51-100

/ Materials Science / / Electrical & Electronic Engineering /



ROUND UNIVERSITY RANKINGS

/ Natural Science /

TIMES HIGHER EDUCATION WORLD UNIVERSITY RANKINGS

7

/ Physical Sciences /

/ Computer Science / / Engineering and Technology /

USNews

U.S. NEWS & WORLD REPORT UNIVERSITY RANKING

/ Physics

ACADEMIC RANKING
OF WORLD
UNIVERSITIES

101-150

/ Physics /

THE THREE
UNIVERSITY MISSIONS
MOSCOW INTERNATIONAL
UNIVERSITY RANKING



147





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