



International education and research

NU BRICS
April 06-08, 2016

History and present day

1930 – Moscow Power Engineering Institute: provides engineers to soviet industry (Electrical, Power, Thermal Engineering)

1992 – MPEI – Technical University (various fields of interest besides Electrical Power: Radio Engineering and Electronics, Computer Science, Arts and Humanities, etc.)

2010 – National Research University
“Moscow Power Engineering Institute”

24

Bachelor and Master
fields of study

14,000

Full-time Students

65

Graduate programs

34

Training Centers

47

PhD specialties

7,500

Trainees per year

MPEI Institutes

Institute of Power Machinery and Mechanics
 Institute of Thermal and Nuclear Power Engineering
 Institute of Energy Efficiency Problems
 Institute of Electrical Engineering
 Institute of Electrical Power Engineering
 Institute of Automatics and Computer Engineering
 Institute of Radio Engineering and Electronics
 Institute of Arts and Humanities
 Institute of Engineering and Economics

MPEI Branches

- Smolensk
- Voljskiy
- Konakovo
- Dushanbe

Infrastructure

- Thermal Power Plant
- Hostel
- Library
- Stadium “Energia”
- Cultural Center
- Student’s sport camps



National and International ratings

11th position

on educational quality among Russian universities (Round University Ranking 2015)



TOP-130

QS BRICS top universities 2015/16

TOP-110

QS University Rankings: Eastern Europe and Central Asia 2015/16

TOP-20

Best Russian Universities (RAEX 2015)



13th position

"Academic Reputation" among Russian universities

52nd position

"Academic Reputation" among all region



International education

1946

MPEI starts training of international students

11000

international graduates



118

countries with MPEI graduates

1995

MPEI starts training in English

2015

MPEI became
Basic university of CIS
in the field of Electrical Engineering personnel training



Russian President (2008-2012) **Dmitry Medvedev**
meeting with MPEI students 29.03.2011

International students



Bachelor students

642

Master students

174

PhD students

77

Total number of foreign students
(60 countries)

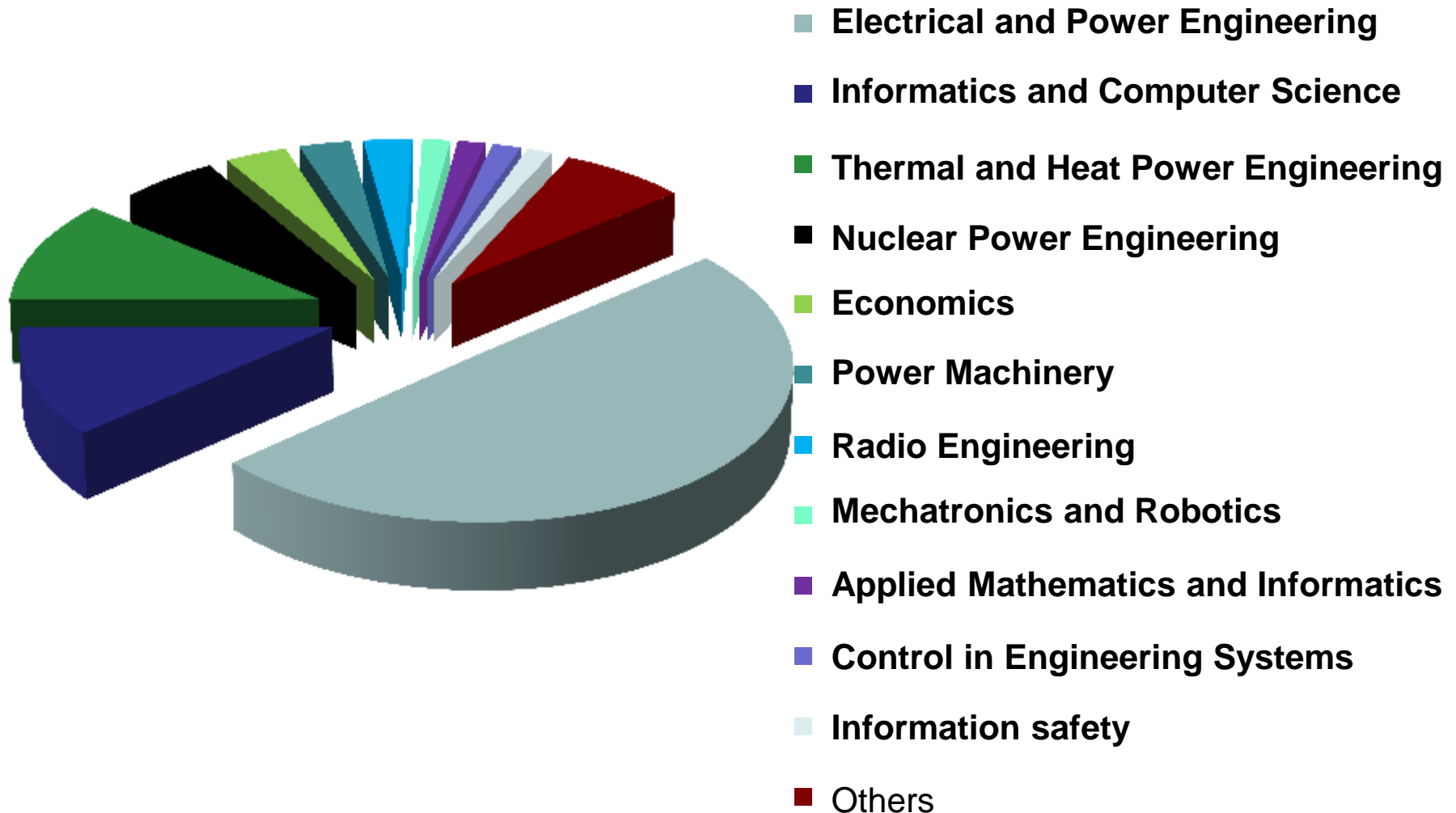
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92

foreign students at Preliminary course

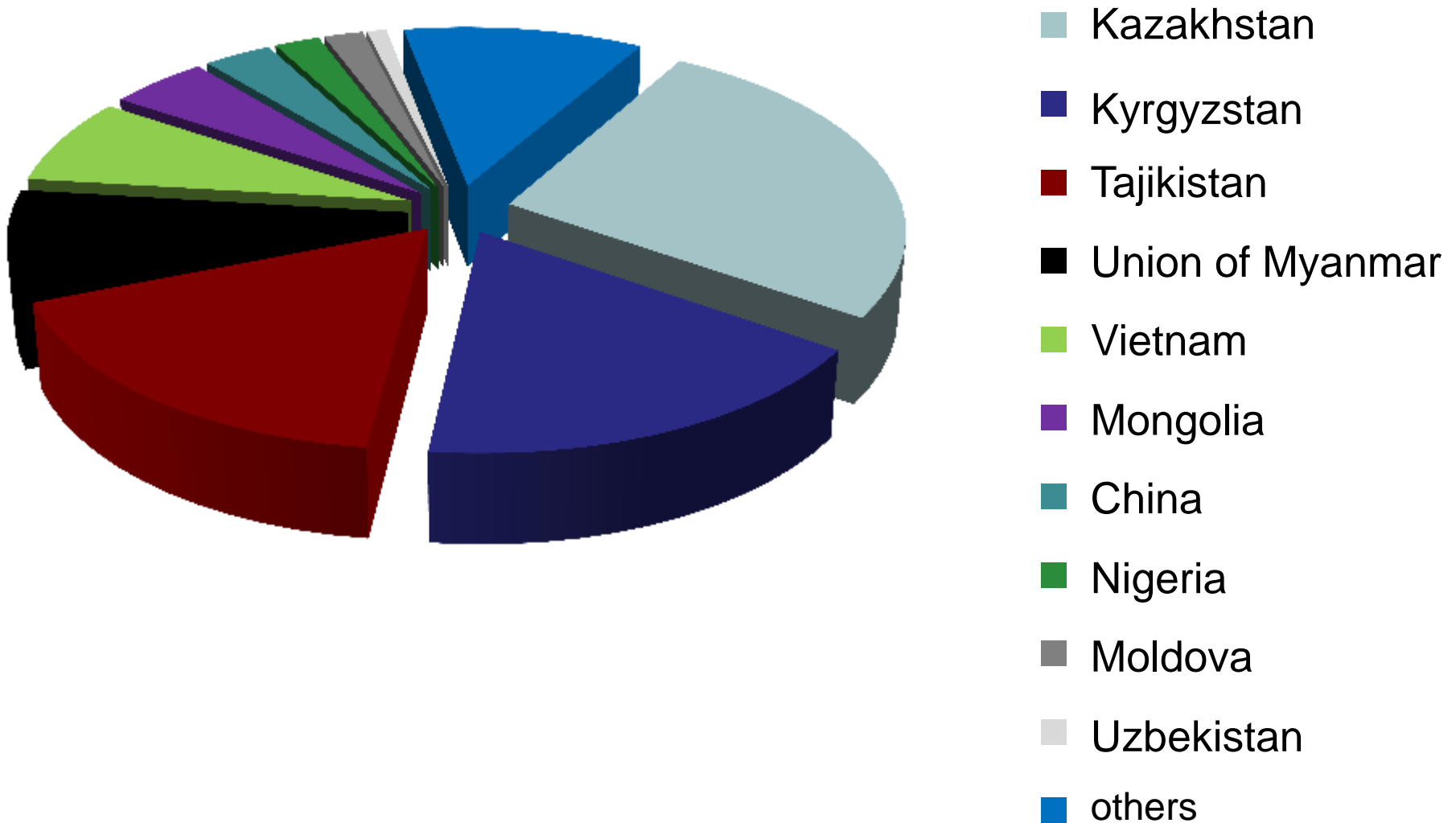
International students

Foreign students vs fields of study (full-time students)



International students

Foreign students vs country



MPEI Department of Russian Language

1952

Section of Russian Language at MPEI
Department of Foreign Languages

1955

Department of Russian Language (with aim to
teach Russian Language to foreign students)

1998

got the right to provide State Test of Russian
as Foreign Language

24

Professors teach students at MPEI
Preliminary course

2006

Annual Russian Language Olympiads
for students of technical universities

250 students

27 countries

14 universities – in 2016

Russian Language Olympiad is a part of
traditional MPEI InterFestival



Partner universities abroad



208

Cooperation agreements with
foreign universities and companies

from

66

countries



“Double Diploma” projects

Partners:

- ✓ Technical University of Ilmenau (Germany)
- ✓ Lappeenranta University of Technology (Finland)
- ✓ Brandenburg University of Technology (Germany)
- ✓ Glyndwr University (UK)
- ✓ Almaty University of Power Engineering and Telecommunications (Kazakhstan)
- ✓ Kyrgyz State Technical University named after I.Razzakov (Kyrgyzstan)



Academic mobility

52

acting programs of international academic mobility

114

MPEI students took part in academic mobility in 2015

15

years of joint educational program with Technical University of Ilmenau (Germany)

7

years of joint educational program with Lappeenranta University of Technology (Finland)

6

Partner-Universities, with whom MPEI started to participate in new European Erasmus+ Program in 2015



MPEI Branch in Dushanbe (Tajikistan)



«Electrical and Power Engineering»
since 2013



282

students of 1-2-3 year

27

academic staff

6

Dr.Sc.

14

Ph.D.

Russian-Kyrgyz Technical Universities Consortium



21

Russian universities

6

Kyrgyz universities

35

joint educational programs
under Consortium

116

Kyrgyz students arrived in
Russian universities in 2015

46

joint educational
programs among
RKKTU universities

12

joint educational
programs between
MPEI and KGTU

University of Shanghai Cooperation Organization

MPEI – coordinator of educational school on Energy



2010

first USCO students at MPEI

25

USCO students at MPEI now



15

universities from

5

countries

Since 2014 MPEI takes part in educational school on Economics

Consortium of Russian universities "Time to study in Russia"

The concept of Math Olympiad was approved by "Rossotrudnichestvo" and confirmed by Ministry of Education and Science

13

countries covered

50

Russian universities – participants

20000

students take part in Math Olympiad

155

State scholarships for winners to enter Russian universities - participants



MPEI

MISiS



Energy Educational Consortium

June 2014



1. Ivanovo State Power Engineering University
2. Kazan State Power Engineering University
3. National Research Irkutsk State Technical University
- 4. National Research University "MPEI"**
5. National Research Tomsk Polytechnic University
6. Novosibirsk State Technical University
7. Saint-Petersburg State Polytechnic University
8. Siberian Federal University
9. Ural Federal University
10. South-Russian State Polytechnic University
11. South-Ural State University (National Research University)

MPEI Rector – Chairman of the Board



International academic and research networks

- ✓ **The International Academic Forum for the Development of Electric Power Technologies (universities from 5 continents)**
- ✓ **CIGRE – International Council on Large Electric Systems (Russian students board)**
- ✓ **Association of International Offices of Higher Education Institutions (AMO)**
- ✓ **International Association of Universities (IAU)**
- ✓ **Russian-German University Consortium SPITSE**
- ✓ **Russia and Armenia University Association**
- ✓ **Association of Sino-Russian Technical Universities (ASRTU)**
- ✓ **Russia and Azerbaijan Universities Association**
- ✓ **Universities Alliance of the New Silk Road**

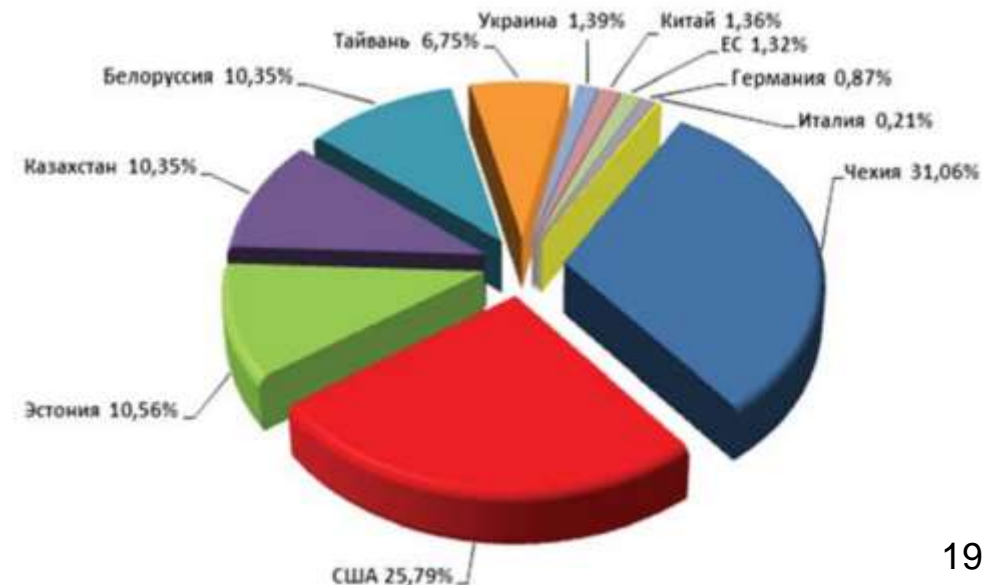


Research projects – international customers

- Quantum Design, Inc., USA
- Advanced Research Systems, Inc., USA
- RF Micro Devices, INC., USA
- Cryomech, Inc., USA
- German Aero-Space Center, Germany
- Oerlikon Leybold Vacuum Dresden GmbH, Germany
- Kazakh Institute of Technical Development (KITR),
Kazakhstan
- Brooks Automation, Inc., USA
- HIWIN Microsystem Corporation, Taipei
- «Skoda Energy», Czech Republic
- Center of Hydraulic Research «SIGMA»,
Czech Republic
- Eesti Energia Narva Elektriijaamad AS,
Estonia
- Vacree Technologies Co.,Ltd., China
- National Academy of Science, Ukraine



**MPEI Research income
structure 2015**



International MPEI graduates

Among MPEI foreign graduates:

- Premier of the State Council of **People's Republic of China** (1988-1998), Chairman of the National People's Congress (1998-2003) Li Peng;
- President of **Romania** (1990-1996 and 2000-2004) Ion Iliescu;
- Minister of Communications and High Technologies of **Azerbaijan Republic** (2004-2015) Abbasov Ali Mamed ogly;
- Minister of Energetics and Water Resources of **Tajikistan Republic** Usmonov Usmonaly;
- eminent scientists, political figures, business leaders and rectors of universities



Annual meeting
of MPEI foreign graduates

MPEI experience in educational and research support of Russian high-tech Power Engineering projects abroad

- **Training of international students** with the aim of national Power Engineering industry development
- **Training and retraining** of national Power Engineering specialists
- **Export of educational technologies** for training national specialists abroad
- **Development of strategy** on technical personnel development for big Power Engineering projects abroad



РусГидро



РОСАТОМ



ИНТЕР РАО ЕЭС



NU BRICS – Energy

Master programs

- **Electric Power Engineering and Electrical Engineering**
 - Electromechanical Energy Conversion and Methods of Investigation
 - Electrical Apparatuses for Energy Control and Distribution
 - Electrical Technology Processes and Installations with Systems of Control and Power Supply
 - Electrical Drive and Automatics
 - Electrical Materials Science, Physics and Engineering of Electrical Isolation, Cables and Electrical Capacitors
 - Motion Theory of Electrical Rolling-Stock and Optimization Problems of Haulage Equipment and Devices for Electric Supply of Transport Systems
 - Electrical, Electromechanical and Electronic Systems of Autonomous Objects
 - Engineering and Information Support of Construction and Functioning of Supply Sources, Networks and Objects of Electrical Systems of Consumers
 - Man-Caused Safety in Electrical Power Engineering and Electrical Engineering

NU BRICS – Energy

Master programs

- **Electric Power Engineering and Electrical Engineering**
 - Electrical Power Plants and Substations
 - Electrical Systems and Networks, its Modes, Stability, Reliability and Quality of Electrical Energy
 - Optimization of Structures, Parameters and Modes of Electrical Supply Systems and Effectiveness Increase of its Functioning
 - Engineering and Electrical Physics of High Voltages
 - Energy Installations on the Basis of Renewable Energy Sources
 - Hydro-Power Installations
 - Relay Protection and Automation of Electrical Power Systems

NU BRICS – Energy

Master programs**• Thermal Power Engineering and Heat Engineering**

- Thermal Power Plants: schemes, technological processes, auxiliary equipment, systems and installations
- Technology of Water and Fuel in Power Engineering
- Theoretical Fundamentals of Heat Engineering
- Automated Control Systems for Objects of Thermal and Nuclear Power Plants
- Effective Thermal Power Engineering systems of Enterprises and Housing and Communal Services
- Energetics of Heat Technologies
- Energy Supply of Enterprises. Heat-and-Mass Exchange Processes and Installations
- Energy Supply of Enterprises. High-Temperature processes and Installations
- Innovative Technologies in Thermal Power Engineering and Heat Engineering
- Autonomous Power Engineering Systems. Hydrogen and Electric-Chemical Power Engineering

NU BRICS – Energy

Master programs

- **Nuclear Power Engineering and Thermophysics**
 - Thermophysics and Molecular Physics
 - Physical-Engineering Problems of Nuclear Power Engineering
 - Low Temperatures Physics and Engineering
 - Applied Plasma Physics and Controllable Thermonuclear Fusion
 - Nano-Technologies and Nano-Materials in Power Engineering
- **Power Engineering Machinery**
 - Power Installations on Organic and Nuclear Fuel
 - Gas-Turbine, Steam-Turbine Installations and Engines
 - Research and Design of Automatic Hydraulic and Pneumatic Systems, Machines and Aggregates
 - Power Engineering Equipment Manufacturing
- **Mechatronics and Robotics**
 - Computer Technologies for Control in Robotics and Mechatronics
- **Applied Mechanics**
 - Dynamics and Strength of Machines, Instruments and Equipment

NU BRICS – Energy

Modular courses (in English)

- Optimization of Water-Chemical Processes
- Automated Control Systems For Industrial Heat-Power Units
- Principles of Effective Process Control in Thermal Power Engineering, Thermal Technics and Technologies
- Dataware of Control Systems
- Chemical Control of Coolants
- Chemical-Technological Processes, Apparatus and Regimes
- Load Changing Modes of Steam Turbine Plants
- Mechatronics and Robotics
- Theoretical Bases of Material's Treatment by Means of Concentrated Flows of Energy
- Semiconducting Alternative Energy Sources
- Physics of Disordered Semiconductors
- Devices on the Basis of Disordered Semiconductors: Physics and Technology

NU BRICS – Energy

Modular courses (in English)

- Theory of Stochastic Processes, Statistical Synthesis of Radio Device (Special Mathematics)
- Digital Signal Processing
- Multi-Dimensional Digital Signal Processing
- Hydrogen Energy Storage
- Modern Energy Technology
- Continuous Mathematical Models
- Theory of Games and Research of Operations
- Optimization Methods
- Analytical Dynamics And Theory Of Oscillations

NU BRICS – Energy

MPEI Conferences for master and PhD-students

- International young researcher conference “Energy saving: theory and practice” – October 2016 (biennial)
- International scientific and technical conference named after Fedorov (in the form of scientific school) – November 2016 (annual)
- International conference “Electromagnetic field and materials” – November 2016 (annual)
- International scientific and technical student’s conference “Hydraulic Machines, Hydro-drives and Hydraulic-Pneumatic Automation” – December 2016 (annual)
- International student’s conference “Radio Electronics, Electrical and Power Engineering” – February 2017 (annual)

NU BRICS – Energy

Summer school

Russia-China-Germany student's summer school

- ✓ National Research University "Moscow Power Engineering Institute"; Moscow, Russia
- ✓ Rostov State University of Civil Engineering; Rostov, Russia
- ✓ Sino-German College of Applied Sciences, Tongji University; Shanghai, China
- ✓ Erfurt University of Applied Sciences; Erfurt, Germany
- ✓ Lausitz University of Applied Sciences; Lausitz, Germany



Thank you!



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