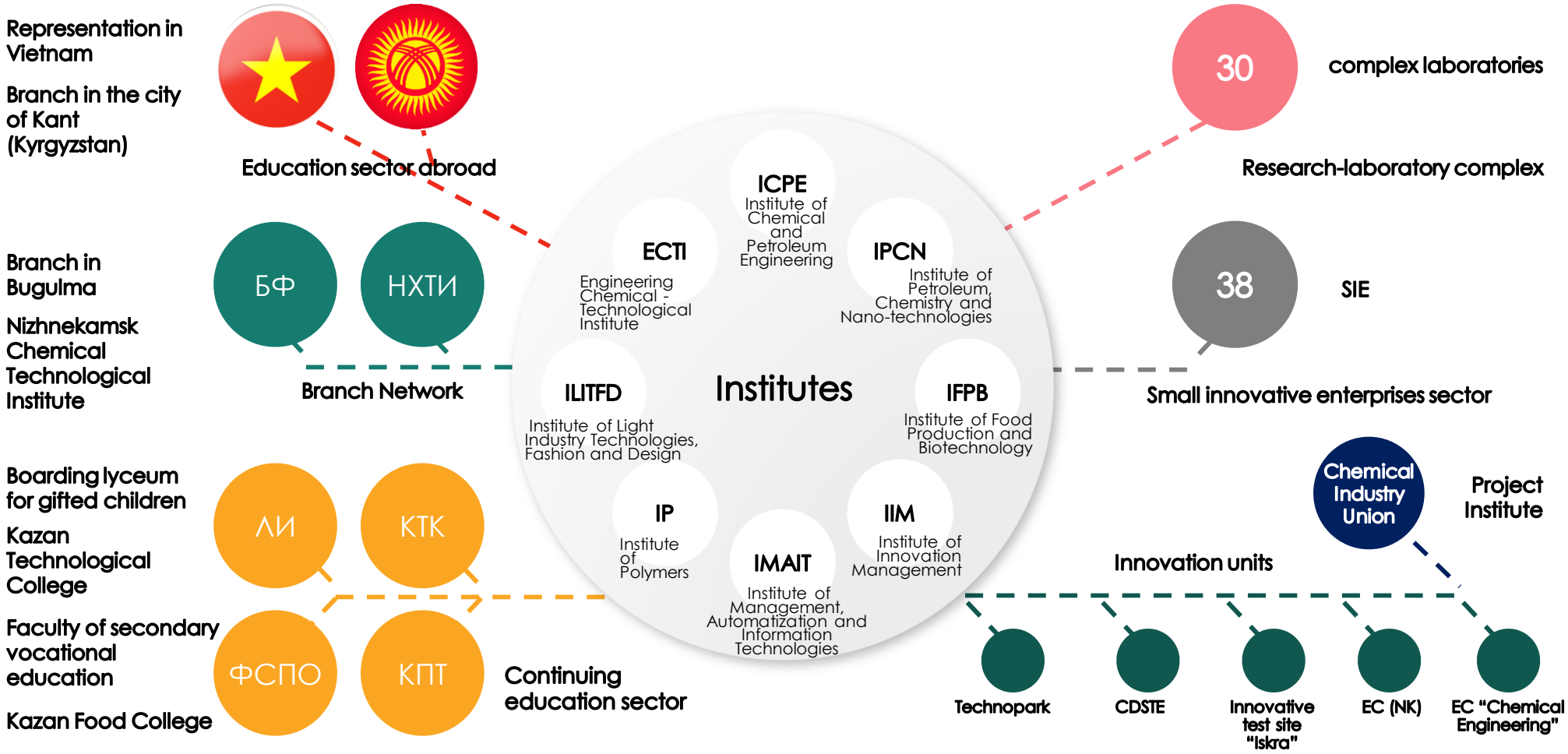
Kazan National Research Technological University

Kazan

One of the largest economic, scientific, educational, cultural and sports centers in Russia

1,2 million **citizens**

The Structure of KNRTU



25 500 students and postgraduates	about 300 doctors of sciences	about 1000 candidates of sciences

KNRTU in Rankings

THE WORLD UNIVERSITY RANKINGS

1000
best universities of the world

RUR

476th
among the best technical universities of the world

QS

158th
among the best BRICS countries universities

Социальный навигатор | Россия сегодня

Social Navigator - Russia Today

12 th
among the most demanded universities of Russia

интерфакс INTERFAX

29 th
among the best universities of Russia

History

1890
Kazan Industrial College

1919
Kazan Polytechnic Institute

1930
Kazan Institute of Chemical Technology

1992
Kazan State Technological University (KSTU)

2010
Kazan National Research Technological University (KNRTU)

KNRTU Today

314
professors and doctors of sciences

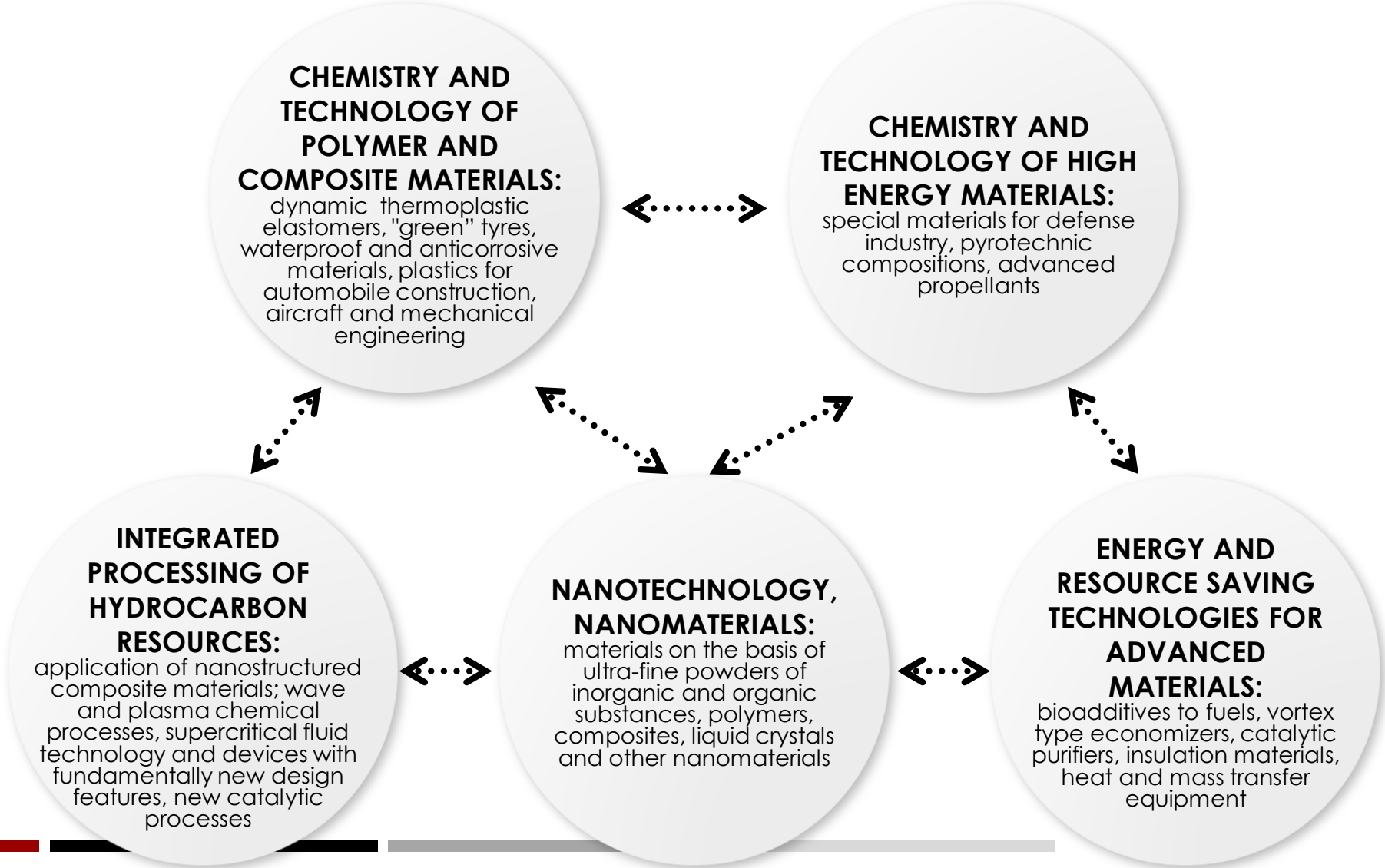
1100
PhD

13
Dissertation Councils

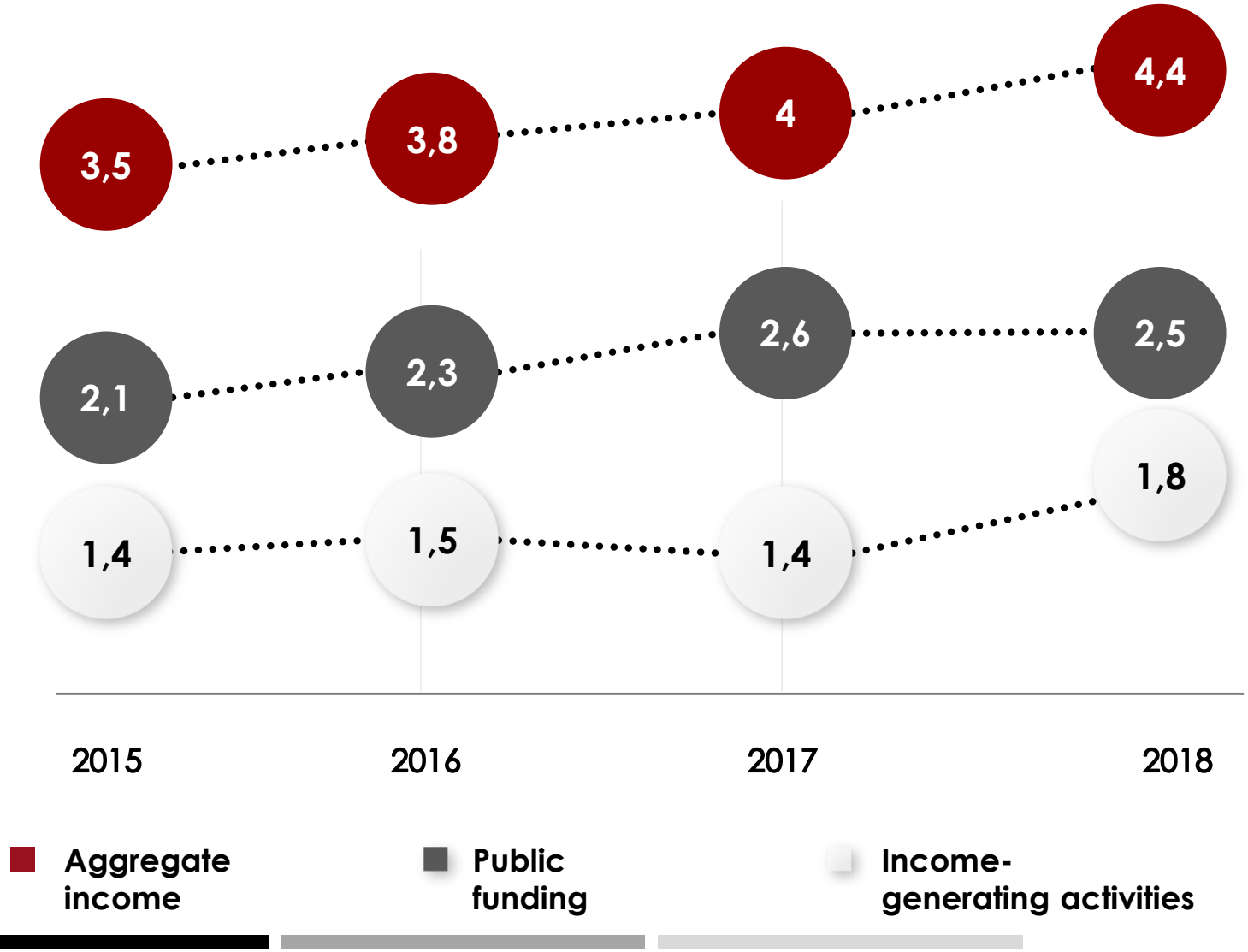
More than
25 000
students

Cumulative budget is about
~ 4,4
billion rub.

University Development Priorities



Financial Activities (billion rubles)



A Number of Principal Educational Programs

23
secondary vocational education programs

170
Master's degree programs

11
Specialist's degree programs

41
Postgraduate training programs

193
Bachelor's degree programs

KNRTU boarding lyceum for gifted children with chemistry in-depth study

75%
of graduates entered KNRTU

The best Tatarstan's educational program in 2018

L.R. Ibrasheva –

"The Best Director of School in Tatarstan 2019"

1
graduate with 100 points for the Uniform state exam

3
medalists 2019

A Number of Medal Places:

- 22 — "Gazprom" Olympiad
- 16 — "Nobel Hopes" competition
- 16 — "Big Challenges" (Educational centre "Sirius")
- 22 — "Young Professionals" WorldSkills Russia
- 30 — "The Future of Great Chemistry" Volga region interregional Olympiad

KNRTU and Schools Interaction

11000
of pupils –

"Gazprom" industry-based Olympiad

150
participants –

"Zolotoy Nabor" target Olympiad

3700
of pupils –

"The Future of Great Chemistry" Olympiad

400
schools-partners from 11 Russian regions

More than
85000
participants of the University actions

203
University specialized classes

KNRTU- a centre for the popularization of chemical technology among pupils

Cooperation with “Sirius” Educational centre

The centre of youth innovative art

“Safenet” modal centre project

Chemistry lyceum for gifted children

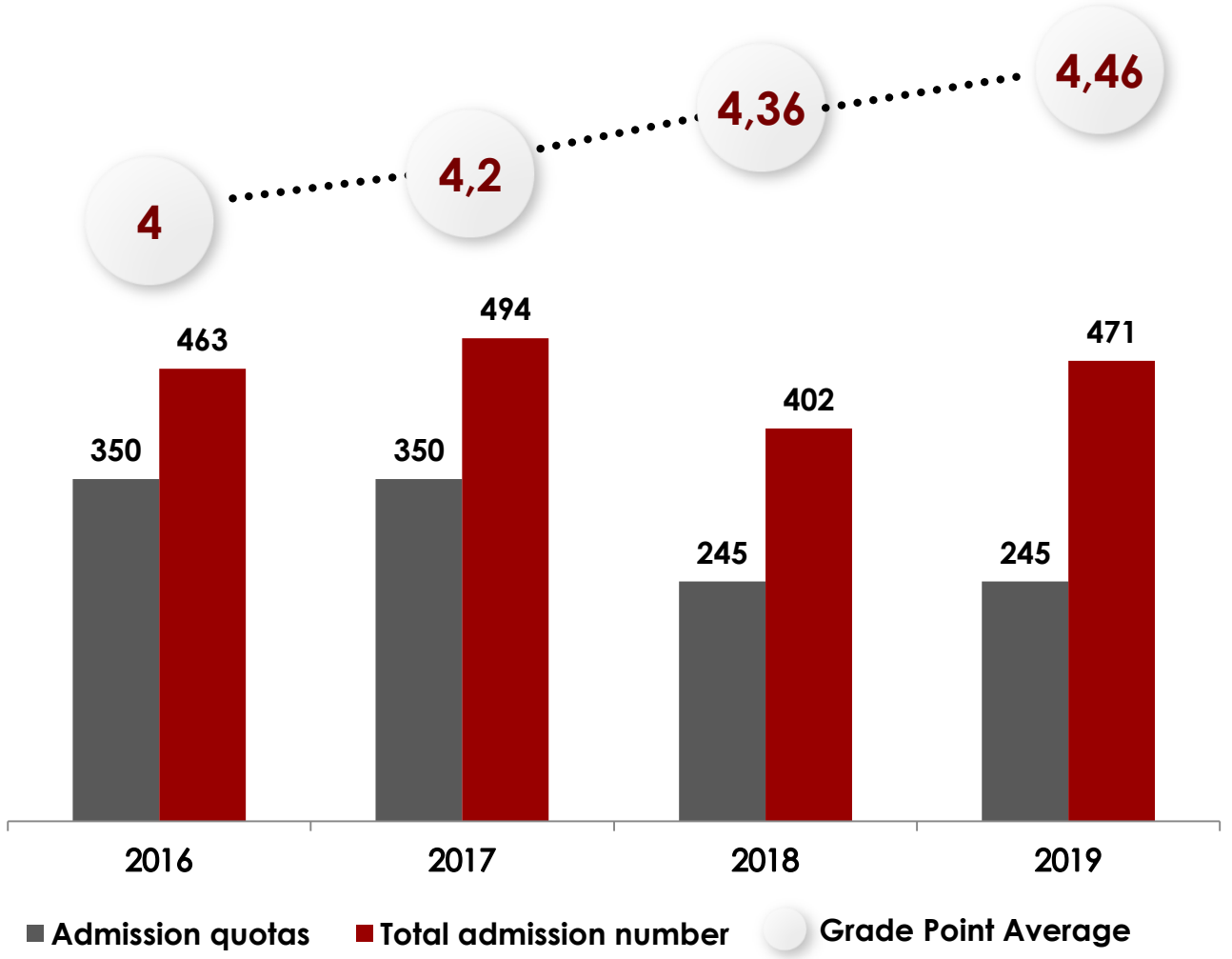
“Fab Lab” project- from idea to prototype

Pupils’ vocational training centre

Olympiads, scientific competitions and career-guidance actions

“Quantorium” technopark

Secondary Vocational Education in KNRTU



KNRTU- Associate Member of “Young Professionals (WorldSkills)” Movement Major Victories of KNRTU

Крупные победы КНИТУ

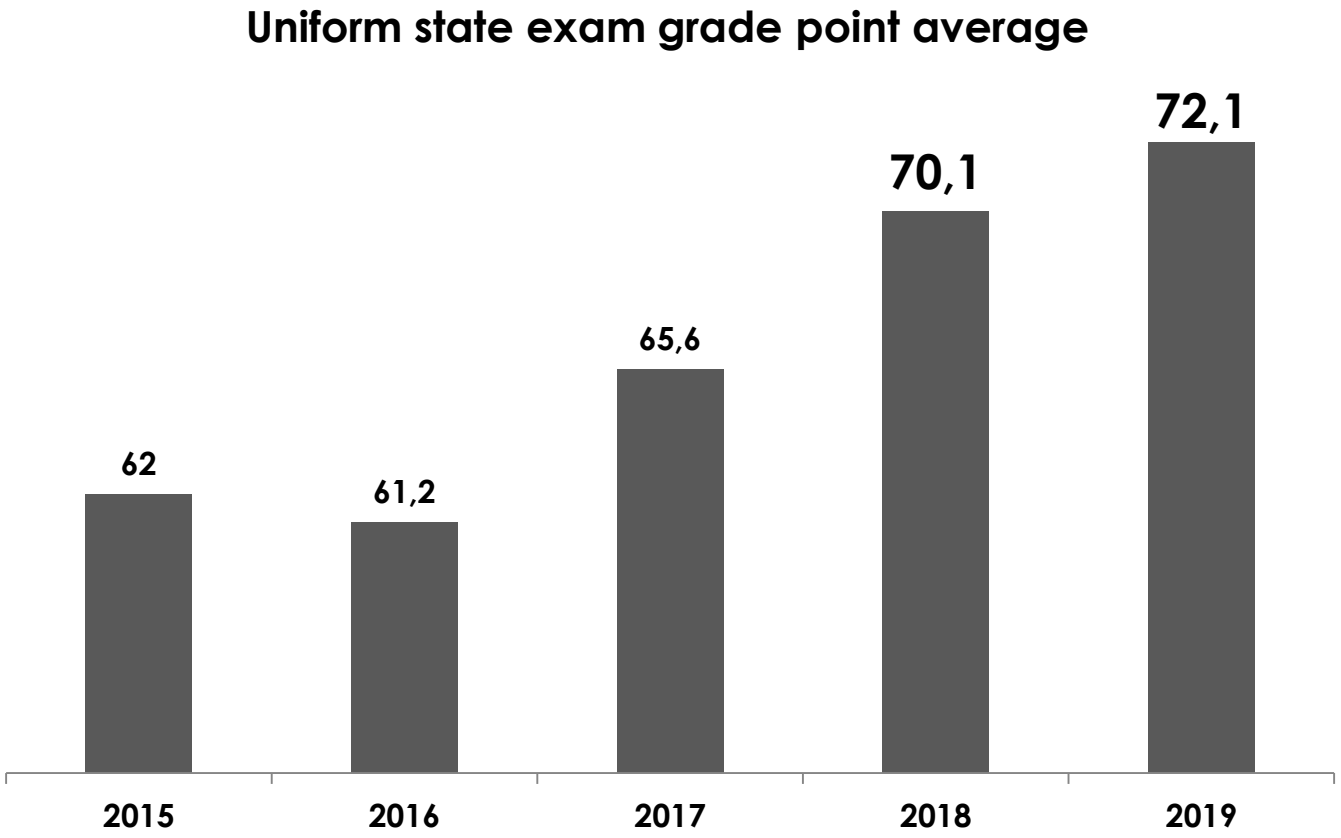
Gold medal — **Vadim Polyakov,** World Championship (Abu Dhabi, 2017)

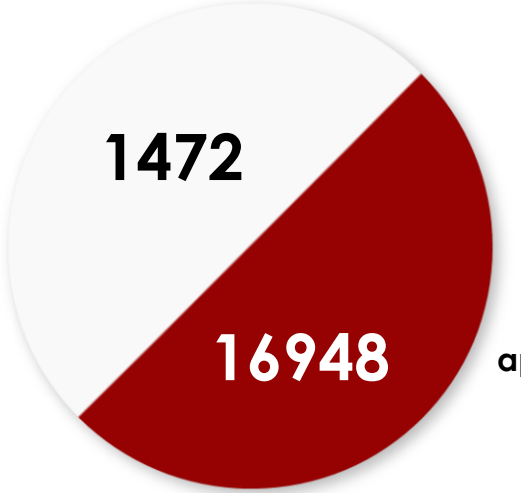
Gold medal — **Nikita Baryshev,** World Championship (Kazan, 2019)

Russian national team coach — **Elmira Khammatova** (Design Department Docent) Euroskills European Championship (2018)

Gold medal — **Albert Mineev,** Euroskills 2018 (Budapest 2018)

2019 Enrollment Campaign Results





budget places

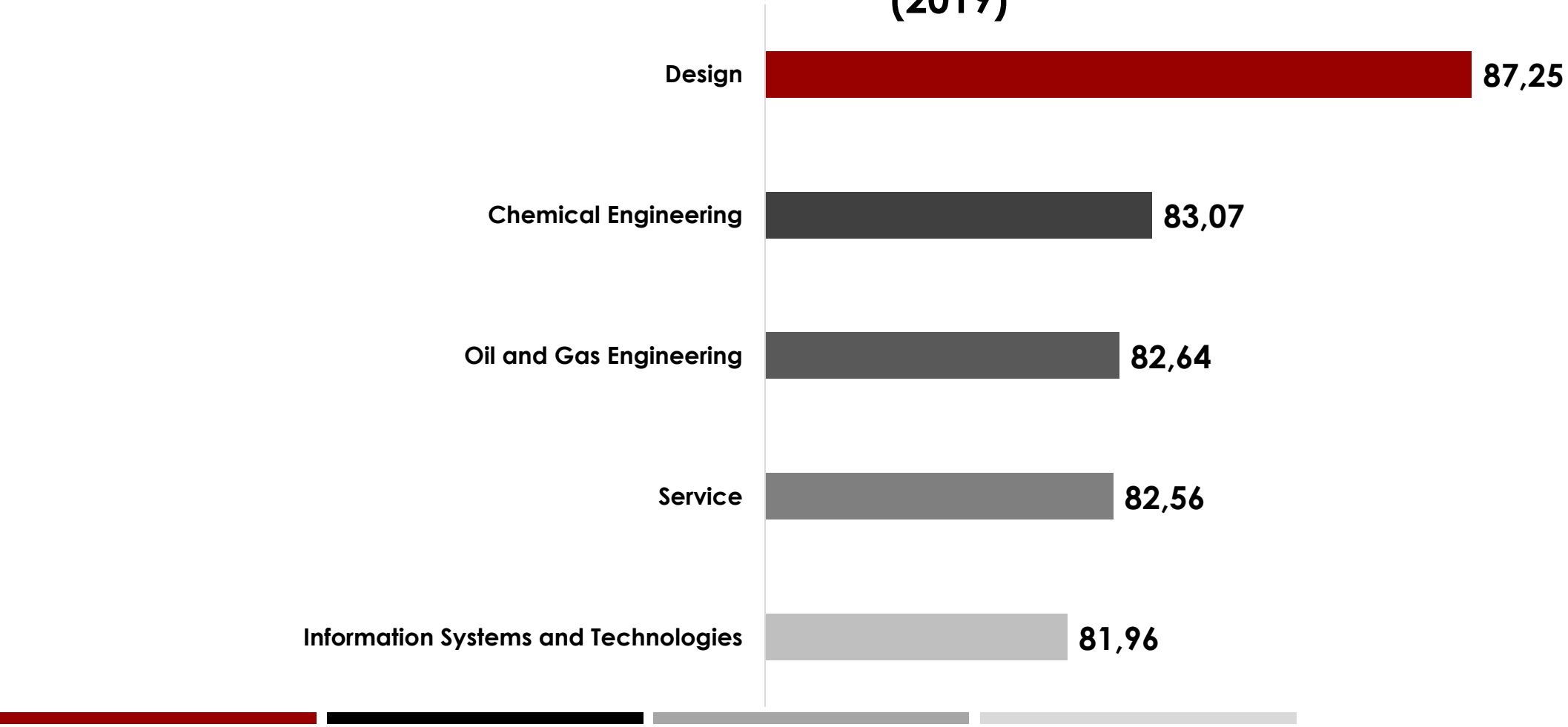
applications

7 graduates with 100 points for the Uniform state exam

214 medalists

Top 5 According to Uniform State Exam Grade Point Average

(2019)

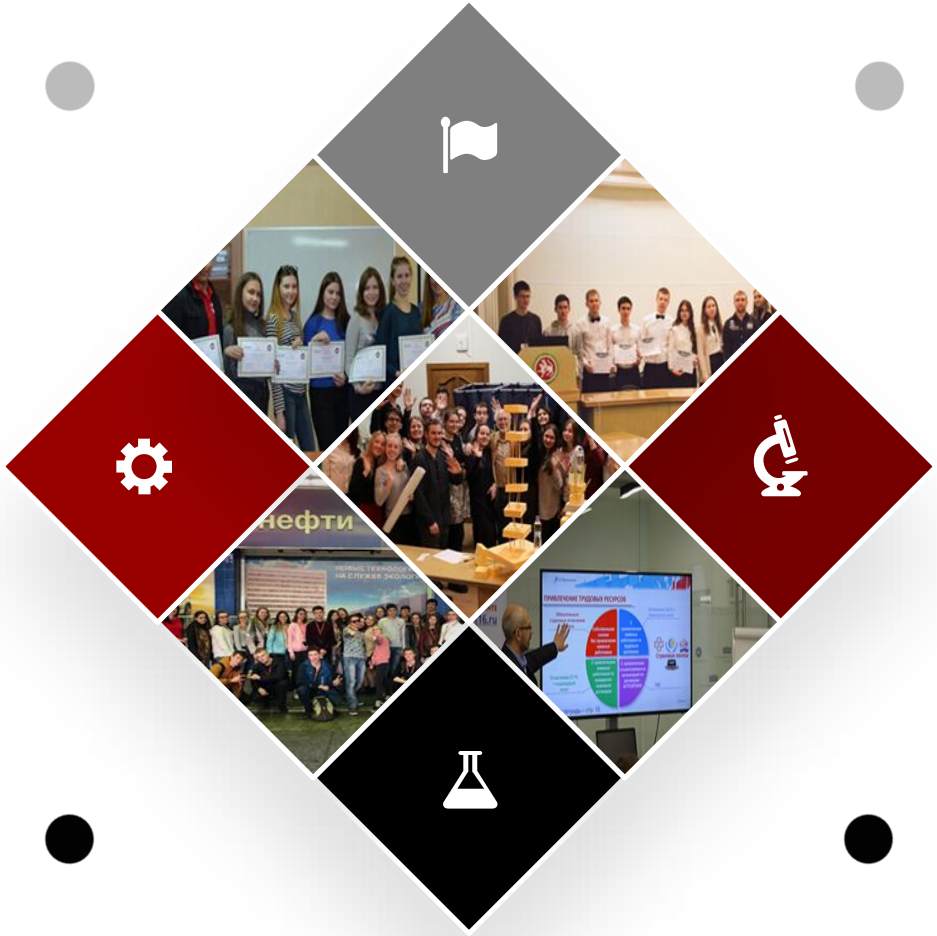


“TechnOleadeR” School Of Supplementary Vocational Education (TOR)

Elite technical education for the students with high points

The creation of innovative scientific and technological projects, the opportunity of implementing your own development into a real production

Training in the supplementary educational program "Management of innovative and technological projects"



Company internship, a chance to get a job in the prestige company and to create your own start-up

Formation of professional and additional (personal) competencies

An active participation in large international and Russian grants, Olympiads, competitions, conferences

Interaction with leading scientists, experts, as well as with federal institutions of development representatives and KNRTU partner enterprises

“My Intellectual Property” KNRTU Competition

Tasks:

- Attracting of schoolchildren and students to intellectual, project and inventive activities;
- Assistance in establishing effective contacts among creative youth;
- Supporting ideas, projects and developments of innovative creative youth.

>50 competition projects

13 winners and laureates

Competition partners:

KNRTU patent school

20

participants 2018

20

applications to the Federal Institute of Industrial Property

Program modules:

1. Patent law,
2. Patent information search,
3. The preparation of the claims and utility model,
4. Drawing up an application for an invention, utility model, industrial design, computer program,
5. Commercialization of intellectual property.

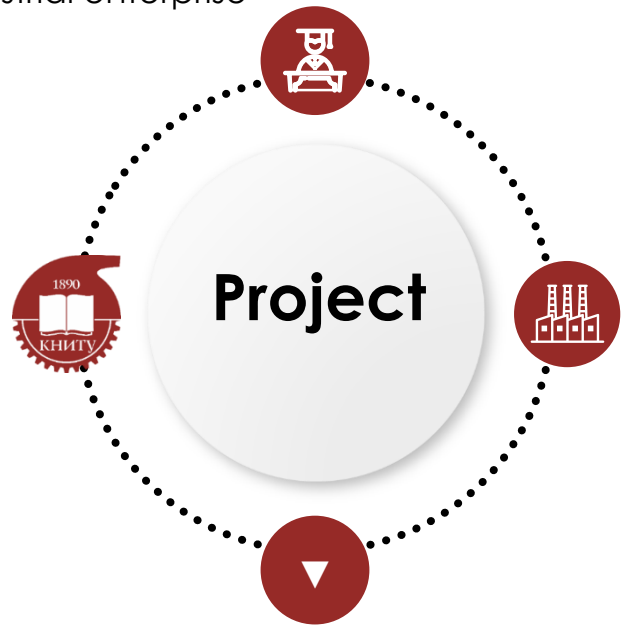
KNRTU Postgraduates Support Competition “Technostart”

The participant of the competition (postgraduate) should:

- Represent a project, aimed at the solution of production enterprise technological problem
- Enlist the support of an industrial enterprise

KNRTU

Scholarship is **12,5 thousand rub. per month =** 300 thousand rub.



Partner enterprise

Scholarship is **12,5 thousand rub. per month =** 300 thousand for 2 years

Results:

1. New knowledge (dissertation)
2. Highly qualified personnel
3. The solved enterprise technological problem
4. RIA (intangible asset / license)
5. Groundwork for new joint projects with enterprise

Результаты 2018:

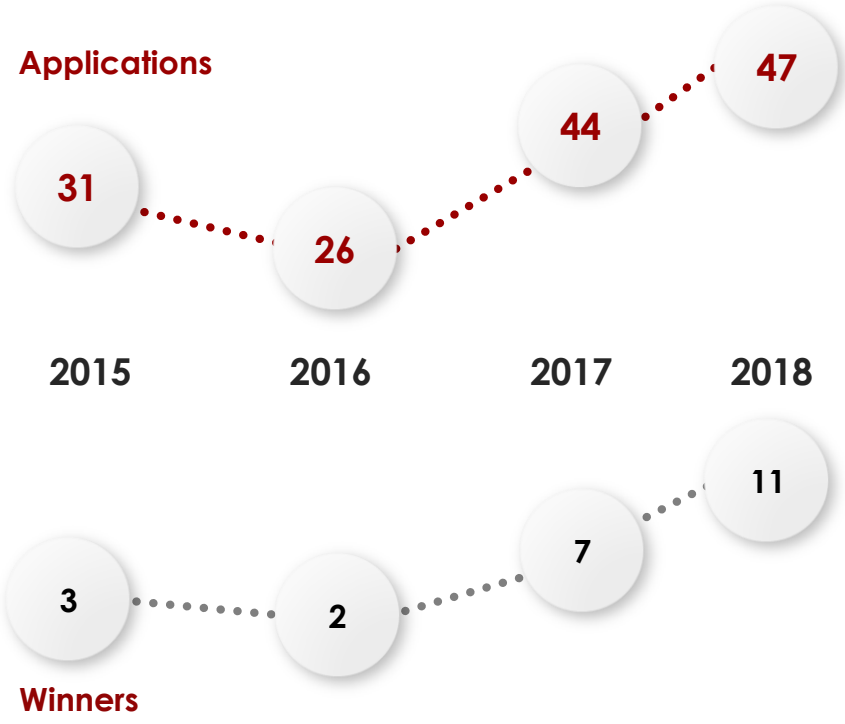
Financing from KNRTU is 3 million rub.
10 competition winners

The Participation of KNRTU Young Scientists in “Umnik” Program

ФОНД СОДЕЙСТВИЯ РАЗВИТИЮ
малых форм предприятий в научно-технической сфере

УМНИК

- Support of commercially-driven science and technology projects of young scientists
- Innovators from 18 to 30
- 500 thousand rubles



KNRTU Military-Training Centre

Military Training Programs:

- Radiation, chemical, biological reconnaissance and dosimetry control
- Liquid special treatment
- Artillery ammunition
- Fuels and lubricants

Duration of training:

2,5 years for reserve officers

2 years for reserve sergeants

1,5 years for reserve soldiers

Student Life

Students and postgraduates union	Cultural and leisure studio	Squad of social volunteers “Alchemists of goodness”
Coordination council of students	Student newspaper “KNRTU/LIVE”	Search squad “Chemist”
Student club	Student cheerleading movement	Sport club

KNRTU Students Victories 2019

Achievements

The best tutoring project — XXI Century Leader

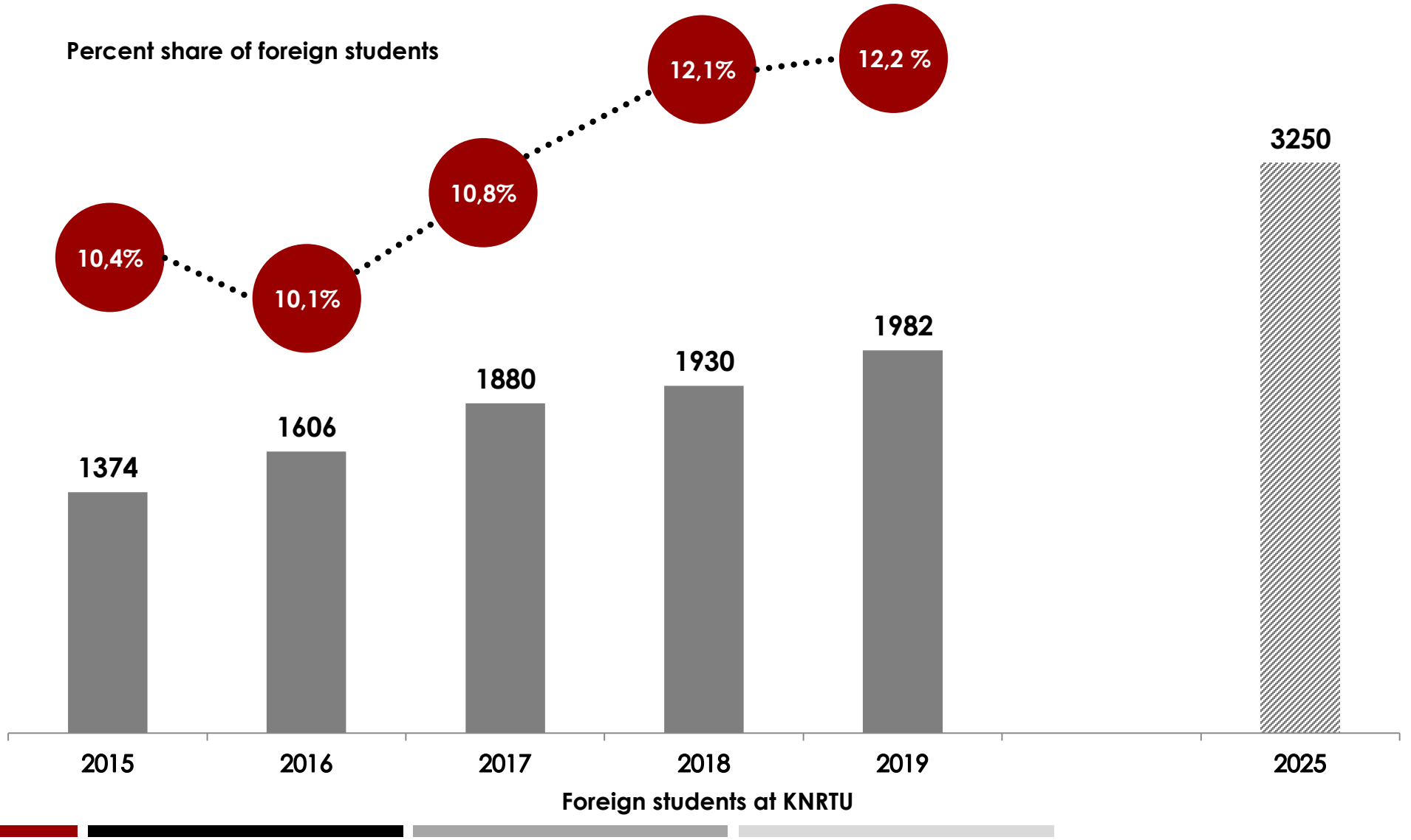
Grand-prix — «Tatarstan Student Spring 2019»

1st place — Tatarstan Cheerleading Championship, Volga Federal District Cheerleading Championship

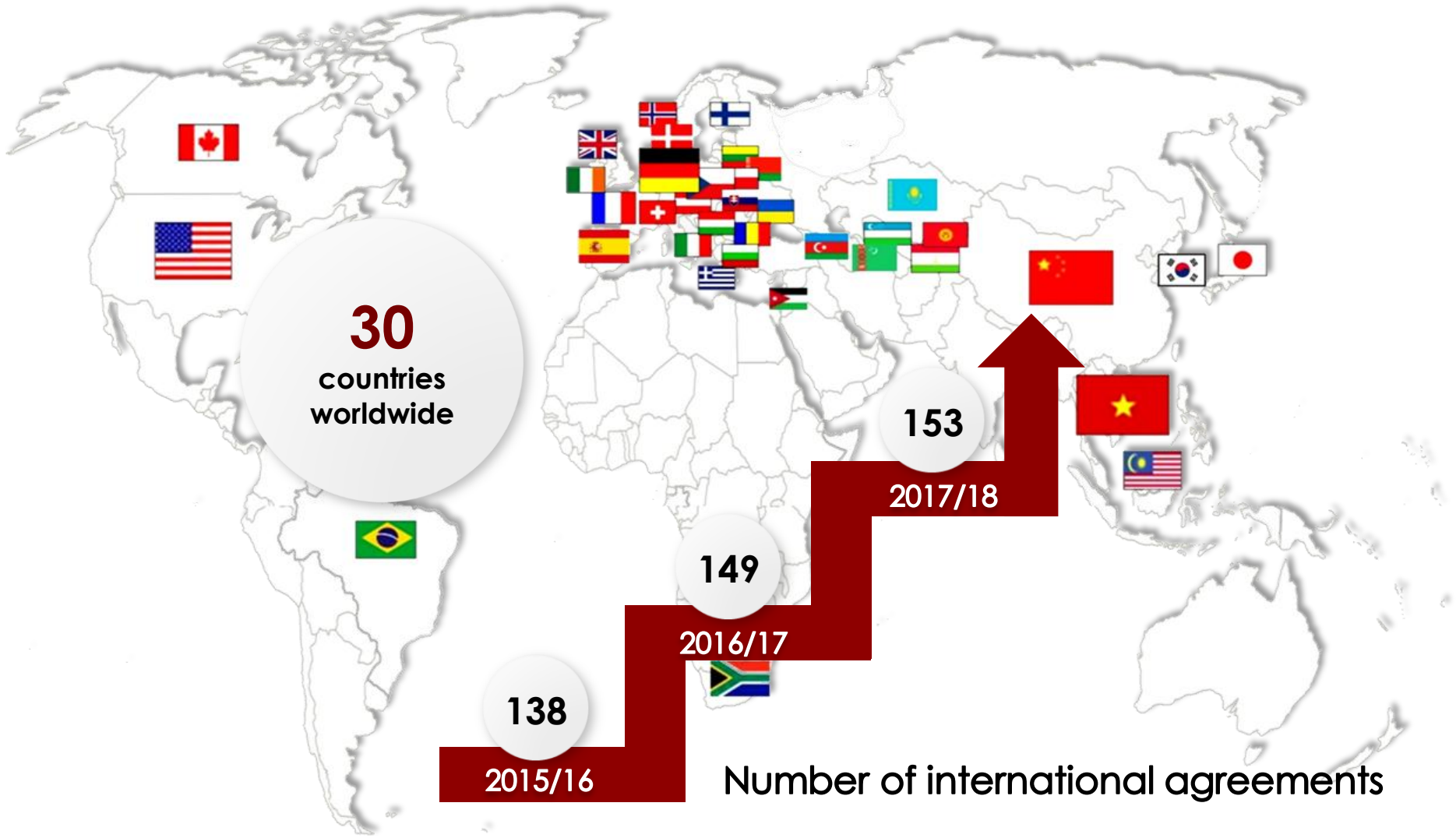
2nd place — «Freshman Day 2018»

3 gold medals — Professional Excellence of State Youth Policy Workers Competition, Kazan

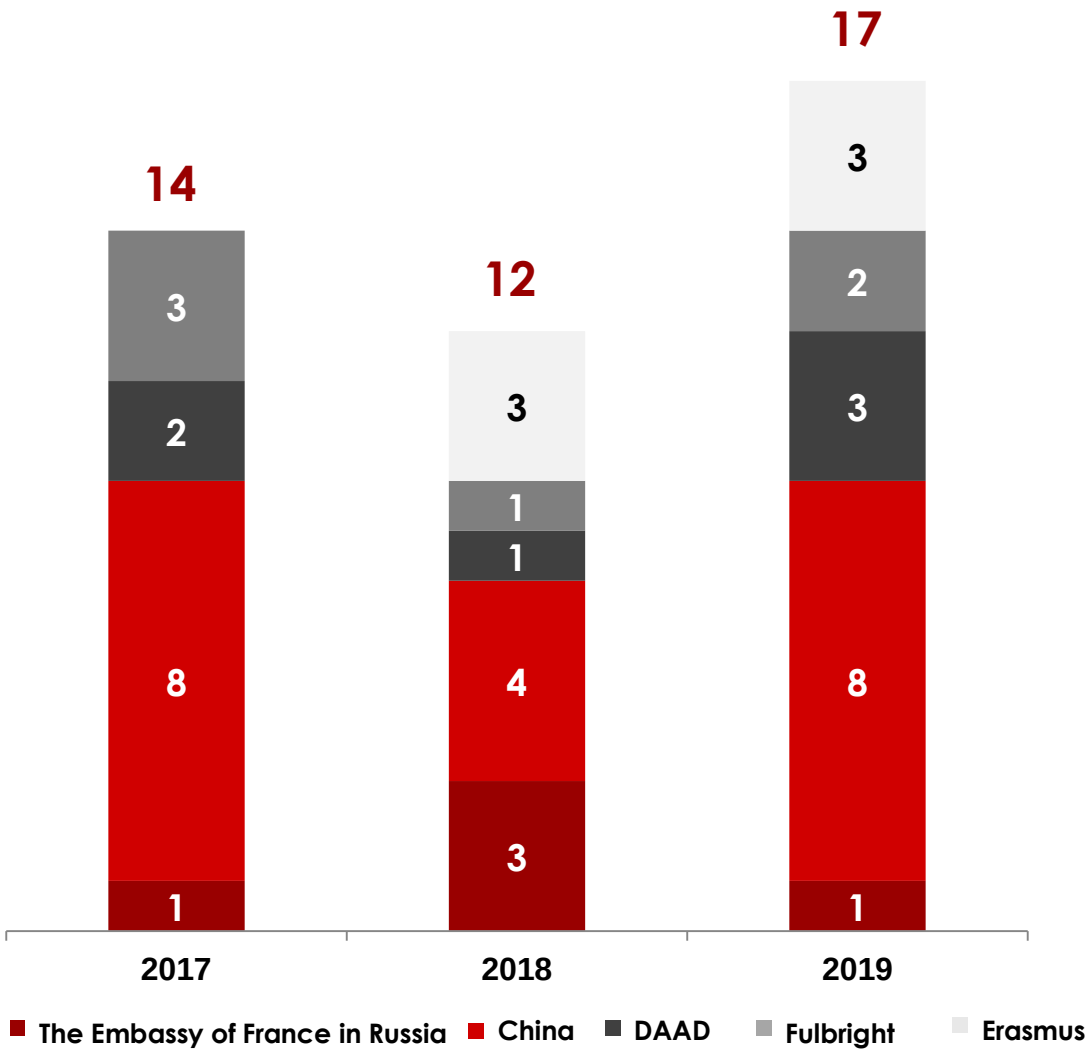
Export of Educational services



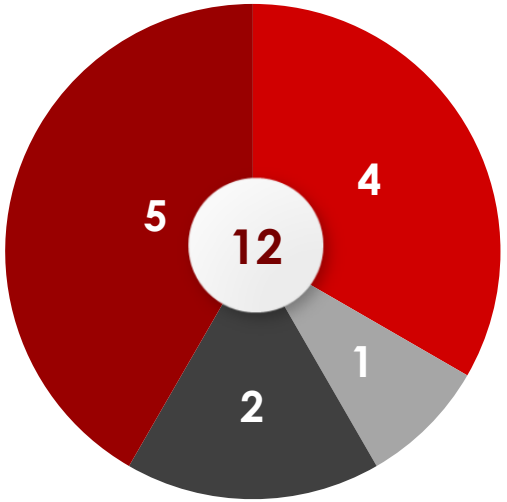
International Cooperation



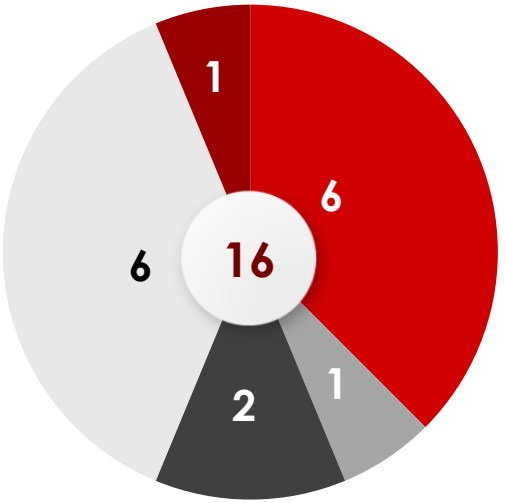
International Grants



The Republic of Tatarstan Government grant «Algarysh»



2018 г.



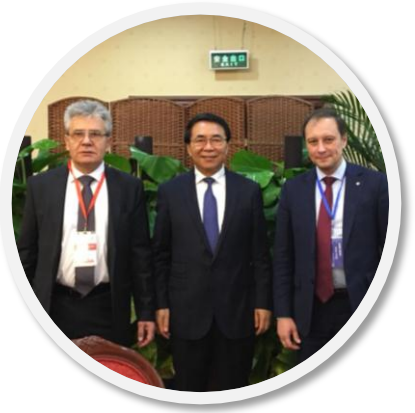
2019 г.

KNRTU Partners in Europe

KNRTU Partners in the USA and Canada

KNRTU Partners in Asia

The Representative Office of KNRTU in Vietnam is housed by the Vietchi Industrial University



KNRTU is one of the first Russian universities to have signed an agreement with Chinese Academy of Sciences

INSTITUT KIMIA MALAYSIA

LEMBAGA GETAH MALAYSIA LGM MALAYSIAN RUBBER BOARD

KOREA UNIVERSITY 1905

EAST CHINA UNIVERSITY OF SCIENCE AND TECHNOLOGY

LIAONING SHIHUA UNIVERSITY 1950

FACS FEDERATION OF ASIAN CHEMICAL SOCIETIES

YOKOGAWA

SINOPEC

HANOI UNIVERSITY OF INDUSTRY

CHINESE ACADEMY OF SCIENCES

北京化工大学 Beijing University of Chemical Technology

KNRTU Key Industrial Partners

Business Cooperation and Industrial Integration

KNRTU Industrial Projects

Scaling and project works at KNRTU «Soyuzkhimpromproect» design institute

- Designing new technologies, equipment and materials
- Mutual approval of Master's and PhD theses
- Product designing, producing and marketing
- 4 projects of the Federal Law-218 successfully implemented
- 33 specialized departments of KNRTU at enterprises

Participation in Innovative Development of State Corporation Programs

- Conduct pipes isolation
- Compression plants
- Methodologies
- Risk assesment
- Absorbents
- Membranes

- Rail sleepers
- 3D simulators
- Heat-conducting media

- Fire extinguishers
- Pumps
- PCM
- Heavy-duty coating

- Pumps
- Coatings
- PCM
- Rubbers and sealing materials
- Maintenance techniques
- Workwear

- Fire-resistant paint
- Energy-saturated materials
- Gas scrubbers

KNRTU Department

- Soyuzkhimpromproect Design Institute

Core functions:

Top-secret chemical sites design

Drafting special sections of design documentation

Industrial safety examination of hazardous industrial facilities hardware;
Expert examination of building structures at hazardous industrial facilities

Functioning as a General Design Organization

Implemented Infrastructural Projects

Steel Cord Truck Tire Production Plant

1,2 million pieces/year
Neftegazengineering

Oil Extraction Plant

1,200 tons/day
Kazan Oil Extraction Plant

Polyethylene Production

230,000 tpa
Nizhnekamskneftekhim

High Octane Petrol Component

175,000 tpa
OJSC “TAIF-NK”

Main Objects Designed

№ п/п	Clients	Contract description
1	**PJSC «Taif-NK» The Republic of Tatarstan, Nizhnekamsk**	High-octane petrol components production (design and working documentation, including 3D-modelling)
2	**«TECHNIMONT» S.p.a. ITALY for PJSC «Niznekamskneftehim»**	Polyethylene production. Output: 230,000 tpa (design and working documentation)
3	**PLC «Neftegazinzhiniring», Niznekamsk**	All-still cargo tyre plant (Output: 1,200,000 pieces a year) for PJSC «Nizhnekamskshina»
4	**PJSC «Ammoniy», Mendeleevsk industrial park**	Ammonia, Methanol, Carbamide production in Mendeleevsk. Output: ammonia/methanol/carbamide/1470/668/2050 tpd (design documentation)
5	**PJSC «Voronehsintezkauchuk», Voronezh**	Butadiene-styrene TEP production. Output: 50,000 tpa (design and working documentation, including 3D-modelling)
6	**PJSC «Taif-NK» The Republic of Tatarstan, Nizhnekamsk**	Basic plant facilities for advanced refining of black oil complex and off-site mains (design and working documentation)
7	**«Sibur-Himprom», Perm**	Technical re-equipment of merchantable products and raw materials storage facility, methanol-reagent facility (working documentation)

Main Objects Designed

№ п/п	Clients	Contract description
8	**PJSC «Kazan Synthetic Rubber Plant»**	Special industrial production of methylchlorsilane for PJSC «KZSK-Silicone». Output: 40,000 tpa
9	**FSOE «Zavod im. Sverdlova», Dzerzhynsk**	Hexogen production and assembling of goods (design documentation)
10	**PJSC «Tatneft im. V.D. Shashina»**	Naphtha hydro treatment unit (working documentation)
11	**PJSC «Nizhnekamskneftehim», Nizhnekamsk**	Isobutilene production through dehydration of isobutane (working documentation, including 3D-modelling)
12	**PJSC «Kazanorgsintez»**	Pressure swing absorption (PSA) assembling for «Linde AG» workshop 65-76 of an ethylene plant (design and working documentation)
13	**FSOE «Kazan Federal State-Owned Gunpowder Plant»**	Reconstruction of the main industrial objects and a test facility within the framework of the Federal Target Program
14	**PJSC «Voronezhsintezkauchuk», Voronezh**	Reconstruction of TEP shop with capacity expanding to 100,000 tpa

Main objects designed

Scientific Research Infrastructure

Common use of scientific equipment center «Special-Purpose Chemistry and Special Technology»

Common use of scientific equipment for nanoparticles manufacturing and exploration center (CUC «Nanomaterials and Nanotechnologies»)

Integrated Laboratory «NanoAnalitika»

Laboratories specialized in special properties of energy-saturated materials and goods exploration

Scientific Research Infrastructure CUC «Special-Purpose Chemistry and Special Technology»

CUC «Special-Purpose Chemistry and Special Technology» at KNRTU Institute of Chemistry and Engineering incorporates analytical and special-purpose equipment for exploring structures of energy-saturated systems, their physico-chemical, physico-mehanical and specific properties.

Hardware and software suite of materials research on an X-ray diffractometer Rigaku Ultima IV

Laboratory of thermal analysis is equipped with METTLER TOLEDO devices: Thermogravimetric Analyser, Differential Scanning Calorimetry (DSC), Thermomechanical Analyser

Ultra-wideband non-conducting spectroscopy and conductivity spectroscopy

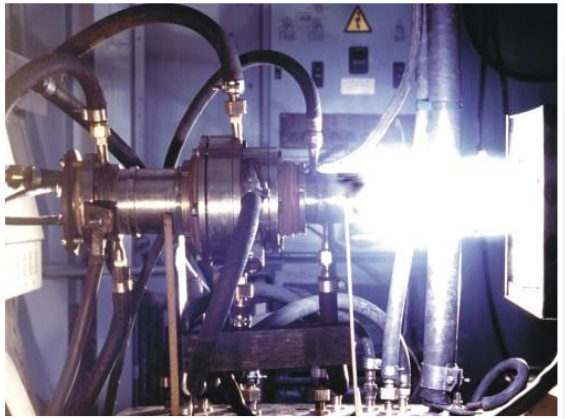
58
specialized equipment units

Overall cost of equipment:
3,140,000
US$

Scientific research infrastructure CUC «Nanomaterials and nanotechnologies»

Structure

- Laboratory of plasmatic methods in nanoparticles manufacturing
- Laboratory of electrochemical and chemical methods in nanoparticles manufacturing
- Laboratory of hypercritical methods in nanoparticles manufacturing
- Nanoparticles manufacturing and modification department, incorporating:
  - Plasmatic modification sector
  - Spark Plasma Sintering sector
  - Plasmatic modification of tissues sector
  - Laboratory of spectroscopy, microscopy and thermal analysis
  - Laboratory of spectral research methods
  - Laboratory of physico-chemical research methods



KNRTU Technopark Test Laboratory

Accreditation certificate RA.RU.21AP70

The main goal of the laboratory is to uplift the product competitiveness of Tatarstan's leading petrochemical enterprises.

Core work:

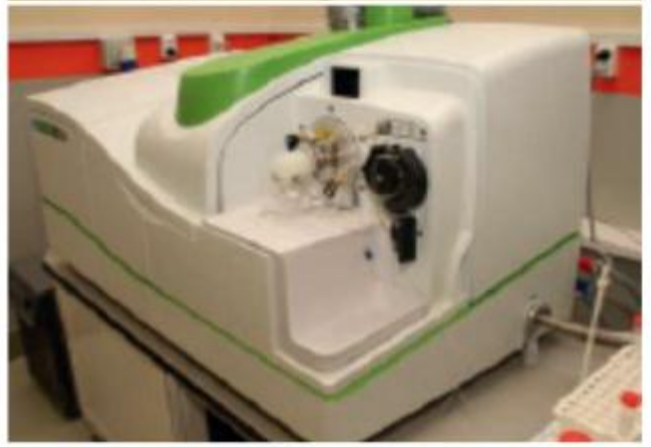
- Climatic testing of end products;
- Rheologic testing of polymers;
- Fire safety testing of polymers;
- Film materials testing;
- Cable products testing.
  - Incoming quality control of raw materials;
  - Final quality inspection;
  - Formulation in accordance with terms of reference;
  - Scientific research.

Specialized Laboratories

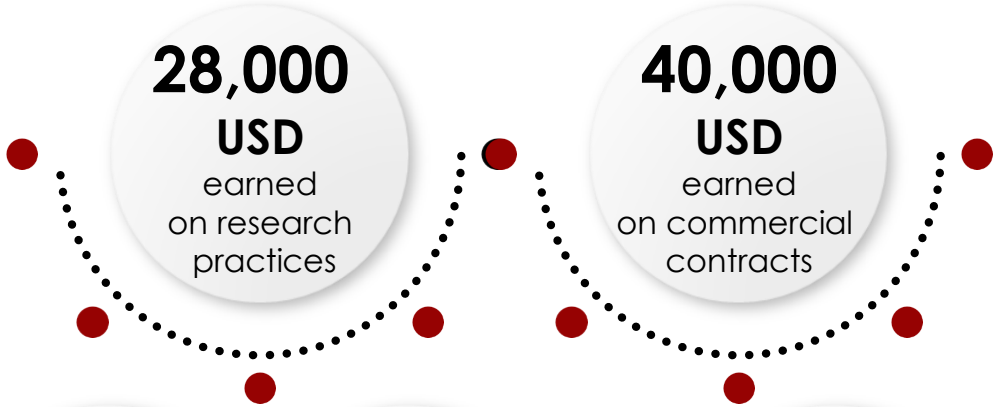
- Laboratory of energy-saturated materials components synthesis
- Laboratory of energy-saturated materals physico-chemical properties
- Laboratory of aerodispersion systems characteristics studies
- Laboratory of combustion and pyrotechnic compositions radiation
- Laboratory of chemical physics of gunpowder combustion processes and solid rocket propellants
- Laboratory of energy-saturated materials explosive characteristics
- «Technological safety» laboratory
- Laboratory of physico-mechanical testing of energy-saturated materials

Scientific Research Infrastructure: «NanoAnalytics» Integrated laboratory

- Laboratory of microanalysis and electronic spectroscopy
- Laboratory of optic analysis methods
- Laboratory of X-ray analysis methods
- Laboratory of mass-spectrometry and spectrophotometry
- Laboratory of thermal analysis
- Laboratory of gas and liquid chromatography
- Laboratory of sample preparation
- Laboratory of general chemistry analysis methods
- Laboratory of physico-mechanical research



«NanoAnalytics» Integrated Laboratory Scope of Work



Laboratory park

54
measuring equipment units

(included into the State Register of Measuring Equipment and undergo state metrological examination)

15
testing equipment units

40
units of support equipment

72 шт.
chemical reference substances

Over **110**
of all-Union State Standards, international Standards (ISO, ASTM, NIST, etc.)

Standardizing and methodological support

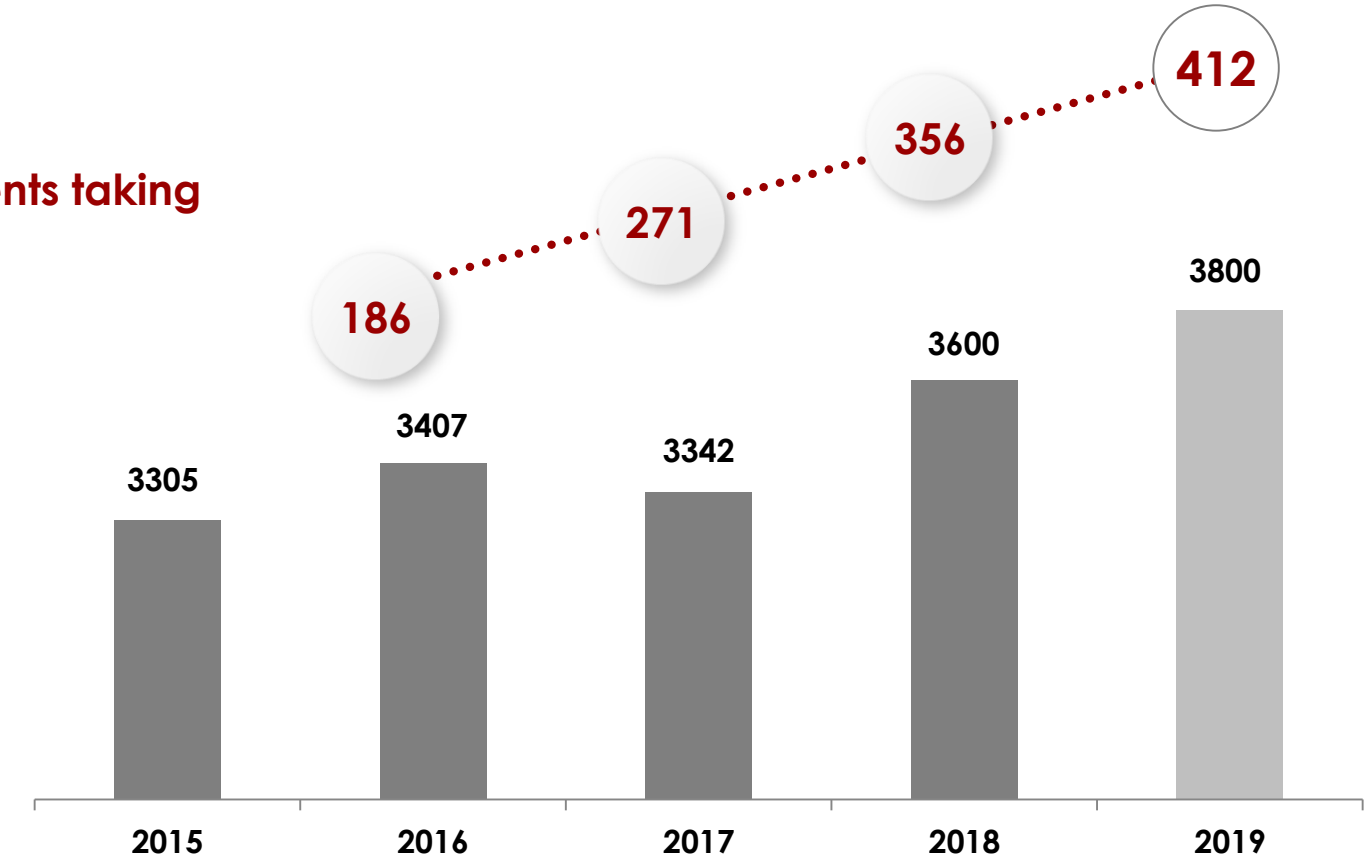
Equipment upgrade

Equipment unit	Cost, USD	Equipment unit	Cost, USD
Simultaneous thermal analyzer STA 449 F1 Jupiter, NETZSCH (Germany)	251,200 USD	**Cyclic corrosion test chamber** Q-FOG (CRH600-HSC with humidity regulation), Q-Lab Corporation (USA)	70,650 USD
Automatic gas sorption analyzer Autosorb iQ-C-MP	110,000 USD	**Fourier-IR spectrometer** Vertex with FTIR and IR microscope, GmbH (Germany)	251,200 USD
Liquid Chromatogragh Agilent 1260 Infinity II	282,600 USD	**Particle size analyzer** IG-100, Shimadzu (Japan)	125,680 USD
Lazer particle size analyzer LA-960V2 Horiba	94,200 USD	**ICP-OES** Avio 200, PerkinElmer (USA)	188,520 USD
Weathering machine Q-SUN Xe-3, Q-Lab Corporation (USA)	70,650 USD	**X-ray Photoelectron Spectrometer** ESCA 2SR, Scienta Omicron (Sweden-Germany)	942,600 USD

Overall cost of the equipment to be purchased with grant funds: 2,387,920 USD

Continuing professional education at KNRTU

FSOE «Gazprom» students taking CPU courses



CPU graduates

215 CPU programs

44 distance-learning programs

Kazan National Research Technological University

Thank you for your attention!