



**Kazan  
Federal  
University**

**INSTITUTE  
of Geology and Petroleum  
Technologies**

**Kazan school of geology  
combines cutting-edge technology  
with 220 years of classic university traditions**





# Kazan Federal UNIVERSITY

Kazan University is one of the oldest Russian universities. It was established in 1804 by Emperor Alexander I. The University has had such prominent students as writer Leo Tolstoy, chemist Alexander Butlerov, and founder of Soviet Russia Vladimir Ulyanov (Lenin). One of the famous rectors was geometer Nikolai Lobachevsky.



KFU is 396th in the world and 5th in Russia QS World University Rankings. Our University is also 40th globally and 2nd in Russia in QS Subject Rankings in petroleum engineering.



334 bachelor's programs  
20 specialty programs  
259 master's programs  
95 PhD programs



55,000  
students



16 institutes  
3 branches  
1 faculty  
2 higher schools  
2 lyceums  
1 secondary school  
University Clinic  
Kindergarten



245 cooperation partners  
from 58 countries

Over 11,500 international students  
from 100+ countries



Over 8,000 employees  
Including more than  
4,000 teaching  
and research staff



910,000 sqm of real estate  
726 buildings and structures  
Over 100 land plots (245 ha)





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The cabinet of mineralogy opened at the University in its very first days, as did programs in geological science. In 1949, the Faculty of Geology was established. In 2011, it became the Institute of Geology and Petroleum Technologies. The storied Kazan school of geology is well known across the world.



### Danis Nurgaliev

Vice-Rector for Earth Sciences, Director of the Institute of Geology and Petroleum Technologies, Doctor of Science in Geology and Mineralogy, Professor

*“In all the leading geological companies, our Institute’s alumni rise to the top and earn respect both for their professionalism and personal qualities. In IGPT, we have a motto – we graduate successful and happy people! And that’s because our alumni have everything to bring this motto to life.”*

**8 teaching and laboratory buildings**  
**5 research and educational centers**  
**29 research labs**

### Research areas:

- Physico-chemical methods of research of minerals and rocks; petrophysics
- Stratigraphy, paleontology and evolution of the biosphere in the Paleozoic
- Search and exploration of oil and gas deposits
- Development and implementation of innovative, environmentally friendly and energy-efficient hydrocarbon extraction technologies (chemical EOR, catalysts, etc.)
- Hydrocarbon production technologies
- Development of hydrocarbon deposits. Geological and hydrodynamic modeling of hydrocarbon reservoirs. Monitoring of the development of hydrocarbon deposits and reservoirs
- Isotope geochemistry in oil and gas geology.
- Geothermochronology
- Reconstruction of the geomagnetic field, environment and climate in the geologic past
- Studies of underground potable and mineral waters of the region as a strategically important resource of the future

## SPECIALIZATIONS

# BACHELOR'S PROGRAMS

**GEOLOGY (Program duration - 4 years)**

- Geology
- Geophysics
- Engineering geology and hydrogeology
- Geology and development of oil and gas fields

**FULL-TIME**

**PETROLEUM ENGINEERING (Program duration - 4 years)**

Development of hydrocarbon deposits

**FULL-TIME**

**GEOLOGY (Program duration - 4 years and 6 months)**

- Geology
- Geophysics
- Engineering geology and hydrogeology
- Geology and development of oil and gas fields

**PART-TIME**

# MASTER'S PROGRAMS

## GEOLOGY (Program duration – 2 years)

- Stratigraphy of oil and gas bearing basins (English program)
- Complex data analysis in petroleum geology (English program)
- Modern geophysical technologies of prospecting and exploration of hydrocarbon deposits
- Engineering geology and hydrogeology of urban territories
- Geology of mineral deposits

FULL-TIME

## PETROLEUM ENGINEERING (Program duration – 2 years)

- Technologies of oil, gas and natural bitumen
- Integrated field modeling
- Development of deposits of hard-to-recover and unconventional hydrocarbons
- Petroleum engineering (English program)

FULL-TIME

# World-Class Research Center for Liquid Hydrocarbons



Kazan Federal University is the only Russian institution to have a world-class research center for liquid hydrocarbons. The project consortium also comprises Ufa State Petroleum University, Skoltech University, and Gubkin University.

## The Center's objectives:

Carrying out fundamental, prospecting and applied research in the field of geology, geochemistry and development of oil deposits using modern physico-chemical methods and end-to-end technologies; creation of environmentally friendly, energy-efficient and cost-effective technologies for forecasting, exploration, development, preparation, transportation and refining of liquid hydrocarbons

25

Applications for patents and certificates



Russian and international PhD students

30

## **Russia's Energy Transition: Balancing Natural Potential and Global Trends**

As part of the Priority 2030 strategic project, the University plans to create a system of technological solutions for a smooth transition from the hydrocarbon economy to the green economy with the use of local oil and gas infrastructure and the nation's immense natural reserves, including land, underground reserves, flora and fauna.

### **Priority:**

Transitioning to an eco-friendly and resource-saving energy, increasing the effectiveness and deep refining of the hydrocarbon resources, finding new sources and ways of energy transport and storage

### **Laboratories:**

- Laboratory of Utilization of Carbon Dioxide in Natural Underground Reservoirs
- Center for Digital Earth
- Laboratory of Production, Storage and Transport of Hydrogen and Energy Carriers with Low Carbon Footprint
- Laboratory of Hydrate Technologies of Utilization and Storage of Greenhouse Gases

**Renowned Russian  
and international  
researchers**

**109**

**130**

**Papers in Scopus  
and Web  
of Science databases**

## LABORATORY OF ENHANCED OIL EXTRACTION

Development of environmentally friendly, energy-efficient and economically viable technologies for oil production, treatment, transportation and storage in old oil-producing regions and ensuring rational development of their complex structure reserves (low-viscosity, viscous, extra-viscous oil, oil of carbonate reservoirs, oil of dense and oil-bearing rocks) based of in-depth studies of objects by modern physical and chemical methods with the use of elements of end-to-end technologies.

### Enhanced oil extraction methods (EOR):

#### Thermal:

- Hot water injection
- Steam injection (steam cycling, SAGD, Steam and Gas Push (SAGP), VAPEX, catalytic refining/aquathermolysis)
- In-situ combustion (ISC)
- Supercritical water injection
- Thermal-gas-chemical treatment (injection of binary mixes and peroxides)

#### Chemical:

- Solvent injection
- Joint solvent and steam injection
- Surfactant flooding
- Polymer flooding
- Restriction of water inflow and equalization of injectivity profile

#### Gas:

- Water-gas treatment (WAG, SWAG, FAWAG)
- Gas treatment (Slim tube - Miscible/Immiscible Gas Injection)
- H&P test





## **Utilization (storage and transport) of associated petroleum gas with the use of hydrate technologies**

The objective is to offer a domestic hydrate technology of storage and transport of associated petroleum gas with the use of highly effective eco-friendly and safe chemical reagents – promoters of hydrate formation.



### **Unique installation for in-situ combustion and SAGD chemical modeling**

The installation helps research hydrothermal and gas thermal treatment of model systems of oil + mineral. It models steam-assisted gravity drainage, in-situ combustion, and various cyclical processes with the use of gas or heating.

### **Catalysts for steam-assisted methods of extraction of ultra-viscous oil**

A collector of non-traditional hydrocarbons can be used as a catalytic reactor for oil refining with the use of steam thermal methods. As a result, oil viscosity and density decreases, the ratio of sulfur and nitrogen drops, and the process of oil extraction becomes easier, as well as further preparation, transport and refining.

# STUDIES OF THE STATE AND EVOLUTION OF UNDERGROUND RESERVOIRS

Creating a new paradigm of deposit development based on innovative monitoring methods

## Development of software kits



SIM – a unified platform for the optimization of processes of the oil and gas industry



Res Neuro – a software tool for the localization and extraction of oil pillars with the use of AI algorithms



Geoindicator – a geochemical monitoring technology



GISneuro – a software kit for automated processing of geological and geophysical data



Automated analysis of petrological sections

## Navigator



## Geological and hydrodynamic modeling

Geological modeling of fields with a large number of wells

Probabilistic geological modeling of exploration targets and poorly explored fields with uncertainty estimation

Geological modeling of shallow reservoirs of ultra-viscous oil

Geological modeling of Domanik formations



Semi-analytical gas breakthrough simulator module  
for gas cap oil reservoir development

Module of the mutual influence of wells on the basis  
of capacitance resistance modeling

Microservice for the analysis of problems  
of downhole pumping equipment on the basis of dynamograms

Microservice for automatic interpretation of echograms

Microservice for production curve approximation and analysis

Microservices for pre-processing and post-processing  
of hydrodynamic models

Module of automatic determination of watering causes

Automatic well pad module

Digital pipeline twin

>30

postgraduate  
and PhD students

>30

experts

>15

clients  
a year

>50000

treated wells

>30

geological  
and hydrodynamic models



## CENTER FOR ADVANCED TRAINING, QUALITY MANAGEMENT AND MARKETING (CdoGEO)



Kazan Federal  
UNIVERSITY  
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Technologies



**We combine everyone's capabilities  
for each one's success!**

**CdoGEO offers programs of professional retraining, advanced training, individual educational tracks, and holds webinars and personal internships for executives and employees of oil and gas companies, educators, and students.**

### **Why choose CdoGEO:**

We organize courses in any convenient format: full-time, part-time, mixed, hybrid, on-site for companies and/or geological locations, webinars;

The classes are held by top educators of Kazan Federal University, experts of the oil and oilfield services industries, partners, developers and suppliers of key technologies;

The classes are conducted at Kazan Federal University, with its top laboratories and advanced equipment;

After course completion a certified KFU document of professional retraining or advanced training is given out;

As perks, we offer local pastries, organize trips to Kazan Kremlin and Kazan University museums

Deputy Director for Marketing of the Institute of Geology and Petroleum Technologies, Director of CdoGEO

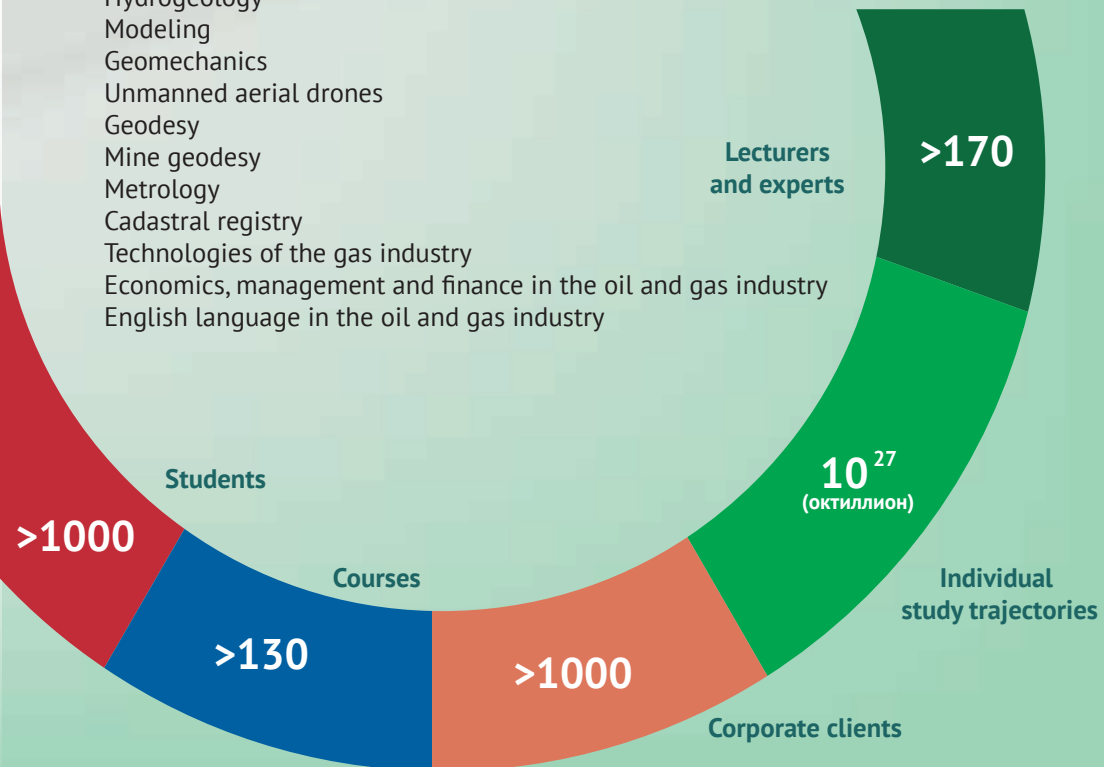
**Ildus Chukmarov:**

For over 10 years, CdoGEO has been among the leaders of additional professional education. We teach students, employees and executives of companies the most pertinent issues of the oil and gas industry. CdoGEO courses are of high quality thanks to our unceasing development and a combination of Kazan University's storied traditions and contemporary technologies.



### CdoGEO's courses:

- Geology
- Petroleum engineering (deposit development)
- Geophysics
- Geological engineering surveys
- Hydrogeology
- Modeling
- Geomechanics
- Unmanned aerial drones
- Geodesy
- Mine geodesy
- Metrology
- Cadastral registry
- Technologies of the gas industry
- Economics, management and finance in the oil and gas industry
- English language in the oil and gas industry



## PROJECTS AND INTERNATIONAL COOPERATION

CdoGEO is an educational exporter in additional professional education. We have provided courses to representatives of such countries as Cuba, Iraq, Kazakhstan, Belarus, Latvia, Uzbekistan, China, Vietnam, Germany, Hungary, Bolivia, Belgium, Indonesia, Serbia, and others.

Since 2020, CdoGEO has been a part of **the World-Class Research Center in Liquid Hydrocarbons**. During this time, CdoGEO has compiled new programs of professional retraining and advanced training in popular areas.

**The Knowledge Center for Green Energy Transition and Compensation of Carbon Footprint** is based at CdoGEO. Programs in carbon footprint management have also been produced recently.



# OUR PARTNERS



- Rosneft
- Gazprom
- Gazpromneft
- LUKOIL
- Tatneft
- TNG Group
- Surgutneftegaz
- Bashneftegeofizika
- NPF Paker
- GEOTEC Holding
- Burgylau (Kazakhstan)
- MH Industry (Kazakhstan)
- CUPET (Cuba)
- Uzbekgeofizika (Uzbekistan)
- IGIRNIGM (Uzbekistan)
- Suez Oil Company (Iraq)
- China University of Petroleum – East
- Belorusneft (Belarus)
- Schlumberger (Netherlands Antilles)
- Conexus Baltic Grid (Latvia)
- CMG (Canada)
- Trimble (United States)
- IFP (France)
- Roxas Service AS Ltd. (China)

# OUR CONTACTS

## Director of the Institute of Geology and Petroleum Technologies

**Danis Nurgaliev**

Phone: + 7 843 2065461

E-mail: [Danis.Nourgaliev@kpfu.ru](mailto:Danis.Nourgaliev@kpfu.ru)

## Deputy Director of IGPT for Marketing, Director of CdoGEO

**Ildus Chukmarov**

Phone: + 7 843 2337970

Mobile and messaging:  
+ 7 996 3370962

E-mail: [Ildus.Chukmarov@kpfu.ru](mailto:Ildus.Chukmarov@kpfu.ru)

## Deputy Director of IGPT for Innovation

**Vladislav Sudakov**

Mobile and messaging:

+ 7 9600 441495

E-mail: [vlasudakov@kpfu.ru](mailto:vlasudakov@kpfu.ru)

[sudakovav@gmail.com](mailto:sudakovav@gmail.com)

## Head of the Department of Petroleum Engineering

**Mikhail Varfolomeev**

Phone: + 7 843 2337606

Phone: + 7 843 2387901

E-mail: [vma.ksu@gmail.com](mailto:vma.ksu@gmail.com)



Institute of Geology and  
Petroleum Technologies  
<https://en.geo.kpfu.ru>



The Institute's YouTube channel –  
lectures from our educators and  
partners



Apply for CdoGEO programs at  
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Our Telegram channel



HQ Diary (High Quality Life  
Diary)



Courses in professional  
retraining and advanced  
training



The Institute's video  
introduction