



NATIONAL  
AEROSPACE  
UNIVERSITY  
"KHARKIV AVIATION  
INSTITUTE"

Our address: 17, Chkalova str., Kharkiv, 61070, Ukraine

Telephone: +38 (068) 788 40 50

Fax: +38 057 788 42 55

Website: [www.inter.khai.edu](http://www.inter.khai.edu)

E-mail:

[khai@khai.edu](mailto:khai@khai.edu)

[international@khai.edu](mailto:international@khai.edu)

[invitation@khai.edu](mailto:invitation@khai.edu)



2020



Dear friends!

Welcome you on behalf of multinational team of the National Aerospace University "Kharkiv Aviation Institute".

Our University – is one of the oldest and well-known aviation schools of Europe, actively developing new technologies in science and training system of high-skilled specialists in different fields: from design, manufacturing and testing of aircrafts, rocket-space systems, satellites and UAV to electronics, control systems, IT, Big Data Science and Cyber security.

Nowadays KhAI is the biggest aerospace center in Ukraine implementing joint projects with universities, R&D centers and industrial companies from Germany, Sweden, UK, France, China, India, Pakistan, Turkey, Morocco and many other countries.

As high-tech international aerospace hub and active player of EU research and academic programs, National Aerospace University "Kharkiv Aviation Institute" is open for bilateral collaboration with new partners. We hope that our joint efforts will help us to develop the new world, based on harmonious unity of high technologies and versatile personality.

Rector of the National Aerospace University  
"Kharkiv Aviation Institute"

Professor Mykola Nechyporuk

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# OUR COUNTRY UKRAINE

Ukraine is a state located in the heart of Europe, a member of European Council.  
Before 1991 it had been the part of the USSR and in 1991 Ukraine gained its independence and became a sovereign state.  
Territory – 600,000 sq. km.  
Population – about 42,000,000 inhabitants.  
Capital – Kyiv, with population of around 2,800,000 inhabitants.  
Climate – moderate, with average temperatures ranging from  $-7^{\circ}\text{C}$  in January and  $+30^{\circ}\text{C}$  in July.  
Religion – Christianity, Islam, Judaism.  
Industry – aerospace, metallurgical, mechanical engineering, instrument engineering, chemical and refining industries.  
Agriculture – production of grain, industrial crops and stock-breeding.



## OUR CITY



Kharkiv city is the second largest city in Ukraine after Kyiv according to its size and population. It is a former capital of Ukraine.

Kharkiv city is a large industrial, scientific and cultural centre of the country.  
Territory – more than 300 sq. km.

Population – more than 1,400,000 inhabitants.

Industry – Kharkiv has 270 big industrial enterprises which produce aircraft, tractors, turbines, electric engines, tower cranes, software controlled machine-tools, radio and electronic equipment, medical devices, light and food industries products.

Transport – international airport, railway stations, bus and coach stations, metro and other means of transport.

Education – 25 state higher educational institutions among which there are 6 academies, 10 universities, 8 institutes, over 10 private higher educational institutions where 150,000 students including 3,000 foreigners from 50 countries of the world are trained.

Kharkiv city has its own rich history and cultural traditions. It was founded in 1654. The city's favourable geographical position at the intersection of trade ways became a powerful boost for its economical development. In 100 years after its foundation Kharkiv became a trade centre of the region and by the end of 19th century it turned into a large industrial city. Within the period from 1919 to 1934 it was a capital of Ukraine.

The cultural life of Kharkiv is bright and vivid. There are 6 theatres, philharmonic, hall of organ music, circus, museums, planetarium etc. Numerous sports buildings including stadiums, swimming pools, and sports halls which offer good possibilities for practicing sport and taking part in sports events.

The city has various religious places as churches, mosques, Roman Catholic churches, and synagogues, and furthermore, various national communities (Arabic, Indian, Chinese, Vietnamese etc.) where foreigners can get help in socialization and solving any questions while studying and living in Ukraine.

Kharkiv is situated in the eastern part of Ukraine in an ecological area. The city is surrounded with partially-wooded steppe district which makes this place wonderful to work and rest at.



# GENERAL INFORMATION

Ukraine is one of the few countries of the world, which develop and manufacture airspace engineering and train highly qualified specialists in this field. National Aerospace University "Kharkiv Aviation Institute" is the only higher educational establishment in Ukraine that comprehensively trains specialists not only for Aircraft Engineering field (design, production, testing, maintenance and repair of all types and systems of aerospace equipment), but in the other fields of study, such as computer sciences, information systems and technologies, metrology, power engineering, electrical engineering, biomedical engineering, telecommunications and radio engineering, economics, management, finance, banking and insurance, psychology, linguistics etc. The University is well-known in world educational and scientific community.

National Aerospace University "Kharkiv Aviation Institute" was established in 1930, when there were only two faculties: Aircraft Design and Aircraft Engine Design. There were also only 12 lecturers and 69 students at the Institute in 1930. From that time the educational process was improved, new departments were opened and the scope of research activity was subsequently expanded.

After Ukraine gained its independence in 1991, KhAI became the only higher educational establishment in Ukraine which conducted versatile training of specialists for aerospace industry. In 1992 for the first time in its history KhAI commenced training of foreign students. In 2000 it obtained both the status of the National higher educational establishment and the new title of the National Aerospace University "Kharkiv Aviation Institute".

The University continues its development. Nowadays more than 7,000 students and 160 postgraduate students are trained at University. 700 teachers (among them more than 100 Professors and Doctors of Sciences, 300 Associate Professors and Candidates of Sciences) are employed at KhAI. Within the period of KhAI lifetime the scientists and instructors of the University made more than 4000 inventions, which were patented in more than 20 countries of the world. KhAI is a permanent participant of many international exhibitions.

Since its establishment the University has trained more than 80 000 engineers. 80 per cent of the KhAI's graduates are among the specialists engaged in aerospace industry of Ukraine.

The University's alumni are very proud of the achievements gained by our scientists in the fields of supersonic aerodynamics, aircraft structural strength, aircraft and rocket engine design, aircraft control systems, etc.

They occupy leading positions at more than 50 world-famous enterprises, such as ANTONOV COMPANY, Motor Sich JSC, Yuzhnoye Design Bureau, SE "Ivchenko-Progress Machine Building Design Bureau", Malysheva Plant, Turboatom, JSC FED, Design Bureau "Luch", Artema Plant, Progresstech Ukraine, Southern Machine-Building Plant (Pivdenmash) and others. Our graduates successfully work for Boeing, Airbus, General Electric, EASA and NASA. Among the most famous graduates of KhAI are Igor F. Kravchenko, Director of Enterprise and General Designer of SE "Ivchenko-Progress"; Fedor M. Muravchenko, General Designer of SE "Ivchenko-Progress"; Vladimir A. Lotarev, General Designer of SE "Ivchenko-Progress Machine Building Design Bureau"; Vladimir T. Shirkov, Marketing Director of Motor Sich JSC; Dmitriy V. Krikunov, Senior electric power plant engineer, customer service and technical support department of "General Electric"; Vyacheslav A. Filjaev, Senior engineer of "Bombardier"; Petro V. Balabuyev, Chief designer of the Antonov Design Bureau; Sergii A. Bychkov, General Engineer of Antonov State Enterprise; Anatolij K. Mjalycia, Director of Kharkiv State Aircraft Manufacturing Company; Ivan D. Kravchenko, General Designer of Kharkiv State Aircraft Manufacturing Company; Viktor Tolmachev, Chief designer of the Antonov An-124 Ruslan and An-225 Mriya transport aircrafts; Dmitrii S. Kiva, General Designer of Antonov State Enterprise.

With its rich history KhAI not only offers high quality services in education and science to its students and partners, but also expands its activities in the international arena, while strengthening the existing relationships. Every year KhAI receives foreign delegations which propose cooperation in research and education. A growing number of international programs and projects are carried out by the University. Recently, scientific laboratories of KhAI have carried out a number of developments in the field of high technologies together with well-known enterprises and research institutions in China, USA, France, Germany, Finland, Israel, Australia and other countries.

KhAI covers a separate territory of the city in the forest-park zone, its area amounts to about 25 hectares. The University has 8 academic buildings, research institute and laboratories, library containing one million volumes, campus, sports complex, swimming pool, dispensary, clinic of first medical aid, dining halls, etc.



# KHAI AROUND THE WORLD

European and Global International Associations and Communities

KhAI involvement into the global educational community started in 2003 with joining the International Association of Universities (IAU/UNESCO) that facilitates experience exchange and fosters cooperation among its members. To provide advanced globally-recognized education and excellent employment prospects for our alumni KhAI became a member of Partnership of a European Group of Aeronautics and Space Universities (PEGASUS), The Magna Charta of the European Universities, International Association of Technical Universities from CIS Countries, Academic Association of CIS Higher Education Institutions, etc. Active partnership with the European Aeronautic Science Network (EASN) supports University's international research cooperation and provides excellent chances for efficient networking.

## Bilateral cooperation

KhAI is deeply involved in world-wide bilateral cooperation in high tech aerospace industry. We conduct collaborative research and implement joint R&D projects with leading research institutions and industrial enterprises from the USA, France, Germany, UK, Sweden, Finland, Israel, Greece, Australia, Japan, Mexico, South Korea, China, etc, which include: development of the unique test-bed for two-phase mechanically-pumped loop for the thermal control of telecommunication satellite for Thales Alenia Space; Egyptsat-1 basic design for Egyptian Council for Space Science and Technology Research; design and development of self-heated hollow cathodes for electric space thrusters for Technion Research and Development Foundation LTD (Israel), etc.

## EU Framework Programmes

Since 2006, KhAI has been focusing on international collaborative research projects funded by the European Commission within multi-lateral Framework Programmes for Research and Technological Development (FP6, FP7, H2020). Participation in these projects broadens KhAI researchers' experience, stimulates further advanced developments and supports further integration into the European research community.

KhAI research teams were successfully involved in 2 FP6, 5 FP7 and 7 H2020 projects focused on a wide range of R&D challenges and topics: innovative designs of aerospace components and systems (e.g. ALCAS, HPH.com, WASIS, EVAL); advanced manufacturing and maintenance technologies (e.g. SENARIO, CORSAIR, DiCoMi); numerical simulation and modelling of aerospace systems and processes (e.g. AMBEC); cybersecurity issues (ECHO). KhAI is also actively participating in collaborative initiatives focused on strengthening research collaboration between Ukraine and other countries (e.g. AERO-UA, RADIANT) as well as facilitating KhAI's connections with leading international partners (e.g. KhAI-ERA).

KhAI is proud to have in its portfolio three H2020 projects funded by the Clean Sky 2 Joint Undertaking, a public-private partnership between the European Commission and the European aeronautics industry that coordinates and funds research activities to deliver significantly quieter and more environmentally friendly aircraft. For example, one of them – 1.0 million Euro DENOX project – is aimed at the development of breakthrough technologies for NOx reduction in aircraft engines.

Admittedly, KhAI is a national leader in securing FP's funding in the aerospace field. As of April 2020, KhAI received the highest in Ukraine amount of funding in Horizon 2020 (circa 2.1 million Euro) and is a leader in terms of the number of H2020 projects implemented by the University researchers.

## TEMPUS/ERASMUS+ EU Programmes

Since 2005, KhAI has been actively participating in the TEMPUS program of the European Commission and has successfully implemented a number of EU funded projects:

**Intellectual Property Law: New Master's Program for the National Intellectual Property Management Consulting Center (IPMASTER)**

**National Engineering Safeware Network of Centers for Innovative University Industrial Cooperation (SAFEGUARD)**

**Innovation Offices in Higher Education Institutions of Ukraine (UNI4INNO)**

**Implementation of Institutional Quality Policies and Tools (UNIQT00L)**

**Development of Regional Interdisciplinary Legal Studies on Energy and the Environment (REGENLAW)**

**Green Technology Program in Computer and Communication (GREENCO)**

**Modernization of Master and Postgraduate Studies in the Area of Security and Sustainability for the Social, Humanities and Industrial Sectors (SEREIN)**

**Knowledge Transfer Units – from Applied Research and Exchange of Technological and Business Know-how to the Development of Interdisciplinary Training Modules (KTU)**

**Model-Based Approach and Intellectual System for the Evolutionary Collaboration of Education and Industry in Electronic and Computer Engineering (CABRIOLET)**

**Interregional Network for Innovative Ecosystem Technosphere Development Based on Micro and Nano-Object Technologies (ECOTESY)**

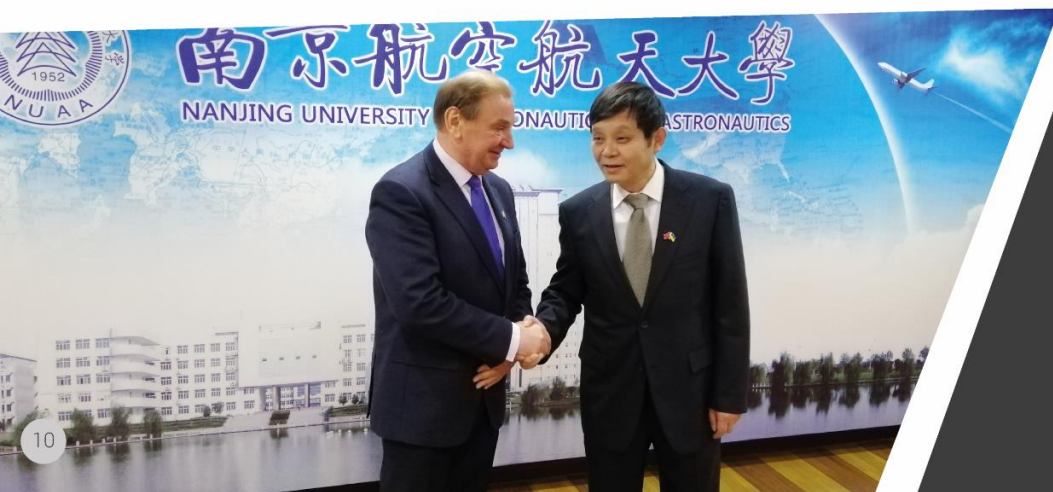
**Internet of Things: Emerging Curriculum for Industry and Human Applications (ALIOT)**

**European Human Rights Law for Universities of Ukraine and Moldova (HRLAW)**

Compared to other Ukrainian organizations KhAI ranks first in the level of funding in the program HORIZON-2020.

During the last four years KhAI projections of funds to be received from the grant programs totaled:

- AERO-UA – project Strategic and Targeted Support for Europe-Ukraine Collaboration in Aviation Research;
- RADIANT – project Facilitating Collaboration in Research and Development to Foster Further Innovation in European AeroNautics;
- AMBEC – project Advanced Modelling Methodology for Bearing Chamber in Hot Environment;
- DiCoMi – project Directional Composites through Manufacturing Innovation;
- ECHO – project Cyber Security Network of Competence Centres for Europe;
- DENOX – project Innovative Technologies of Electrochemical Suppression and Electromagnetic Decomposition for NOx Reduction in Aeroengines.



## Dual Degree Programmes with World Leading Universities

To provide our students with the best knowledge and ensure their further successful career KhAI realizes Dual Degree Programmes with several world leading Universities. Since 2007 "2+2" Dual Degree B.Sc. and M.Sc. Programmes are available for Chinese students from Nanjing University of Aeronautics and Astronautics, who are trained at KhAI after 2 years of education in China. In 2011 KhAI started joint training of students with the University of Turin (Italy) in aerospace engineering and joint training in logistics with the Otto von Guericke University of Magdeburg (Germany). Following 3-year training in Ukraine, KhAI students spend 2 years in foreign higher education institutions and receive diplomas from two universities at the end of their studies. In 2019 KhAI started joint training of students with Nanchang Hangkong University (China).

## Working and Training Abroad for KhAI Students and Staff

KhAI Bachelor, Master and Ph.D. students, research and academic staff are actively taking part in international mobility grant programmes for short- and long-term studies or trainings in the EU and around the world. KhAI has the experience in such ERASMUS+ mobility programs as EWENT - Erasmus Mundus Action 2, "East-West European Network on higher Technical education" (Agreement No. 2011-4049/002-001-EMA2) (coordinator – Warsaw University of Technology), ACTIVE (Erasmus Mundus 2, coordinator – Warsaw University of Technology). In addition to that KhAI has the experience of mobility projects with:

- Trento University, Trento, Italy;
- ITU, Istanbul, Turkey;
- University of the Basque Country, Spain;
- Ecole Centrale de Nantes (ECN), France;
- Otto von Guericke university, Magdeburg, Germany.

We are proud to have UGRAD, MITACS, Fulbright, DAAD and Marie Curie Fellows among our students and staff.

## Educational Programmes for Foreign Citizens

Training programmes for international students in KhAI were introduced in 1991. Every year more than 1000 young people from 50 countries all over the world select National Aerospace University "KhAI" to receive advanced education in aerospace field. Today we offer full-time Bachelor and Master Degree Programmes in Aircraft and Spacecraft Design, Avionics and Computer Engineering in English as well as 1-year training at the Preparatory Department for further study in Ukrainian, Russian and English. To support training of foreign citizens KhAI maintains and regularly updates a dedicated web-site with all required information for foreign students in English, Ukrainian and Russian. Additionally applicants can find testimonials in Arabic, French, Portuguese and Chinese on our YouTube channel.



# UNIVERSITY ACADEMIC STRUCTURE

*KhAI academic structure has been developed for years – initially from 2 faculties in 1930 to 41 departments to 8 currently existing faculties. Today KhAI academic structure is diverse, comprehensive and transparent. All our training programmes are provided by 8 Faculties.*

## Faculty of Aircraft Engineering

Faculty of Aircraft Engineering was one of the 2 first KhAI faculties and its first alumni completed their education in 1935. Today, more than 1,200 students of the Faculty acquire comprehensive knowledge and skills on modern aircraft, helicopters and complex engineering elements design under the guidance of the Faculty's highly qualified staff.

- Departments of the Faculty:
- Aerohydrodynamics
  - Airplanes and Helicopters Design
  - Aircraft Manufacturing Technology
  - Informational Technologies of Aircraft Design
  - Chemistry, Ecology and Expertise
  - Automobiles and Transport Infrastructure



## Faculty of Aircraft Engines

Faculty of Aircraft Engines is the oldest and the best equipped engine-building faculty in Ukraine. It was founded in 1930 simultaneously with the University's establishment. Today the faculty trains about 1,000 students from different countries who study the aircraft engines theory and design, specific manufacturing processes and maintenance procedures, aerospace heat engineering and robotics.

- Departments of the Faculty:
- Aviation Engines Theory
  - Aerospace Thermal Engineering
  - Theoretical Mechanics, Machine Science and Robotics and Mechanical Systems
  - Aviation Engines Design
  - Aviation Engines Manufacturing Technologies



## Faculty of Rocket and Aerospace Engineering

For its 30-year history the Faculty of Rocket and Aerospace Engineering has become the leader of aerospace engineers training. Today it is the only Faculty that is training experts in electrojet engines in the former USSR. The Faculty educational and research labs are equipped with modern facilities, unique test benches and equipment to ensure advanced education for more than 1,000 students.

- Departments of the Faculty:
- Rocket Engineering Design and Construction
  - Aerospace Engineering and Alternative Energy Sources
  - Composite Structures and Aviation Material Engineering
  - Mathematic and System Analysis
  - Graphical and Computer Simulation
  - Geoinformation Technologies and Earth Space Monitoring



## Faculty of Radio Electronics, Computer Systems and Infocommunications

Faculty of Radio Electronics, Computer Systems and Infocommunications was founded in 1959 and now employs about 100 teaching and research staff performing training in aircraft radio electronic systems design and production, computer systems and networks, etc. The Faculty alumni are highly valued not only in Ukraine, but in former USSR and all over the world.

Departments of the Faculty:

- Aircraft Radio Electronic Systems
- Radio Electronic and Biomedical Computerized Tools and Technologies
- Computer Systems, Networks and Cybersecurity
- Information and Communication Technologies



## Faculty of Program Engineering and Business

Faculty of Program Engineering and Business was founded in 1991. Now the Faculty teaching staff trains Bachelors, Specialists and Masters in 11 different training programmes in order to graduate highly-experienced economists, marketing managers, logisticians, financiers, etc., that are worthy of senior positions in high-level Ukrainian and international companies.

Departments of the Faculty:

- Public Management and Administration
- Management
- Software Engineering
- Economics and Marketing
- Finances



## Faculty of Humanities and Law

The youngest KhAI faculty was founded in 1999 to meet the demand for high-qualified and all-round researchers and engineers. Specific training courses in philosophy, political science and history, psychology, foreign languages, and culture help our alumni to have clear mind, make well-thought decisions and find innovative, cutting-edge solutions in aerospace engineering.

Departments of the Faculty:

- Philosophy
- Law
- Physical Training
- Psychology
- Applied Linguistics

## Faculty of International Communications and Foreign Students Training

The training of foreign students in KhAI began in 1992 after the announcement of the Ukrainian independence. Since then over 1,000 students from 45 different countries are trained in our University every year. Foreign students study at the University according to the standard curriculum on 52 basic major. KhAI offers training courses in three languages: Ukrainian, Russian and English, and each year it welcomes new foreign students.

Departments of the Faculty:

- Language Training
- Foreign Languages
- Documentary and Ukrainian language

## DEGREES AND DIPLOMAS

The University graduates obtain the following degrees and diplomas:

Bachelor of Engineering Science (diploma) – 4 years of training (B.S.);

Master of Engineering Science (diploma) – 1.4 –1.9 years after obtaining Bachelor's degree (M.S.);

Ph. D (diploma) – 4 years after obtaining Master's degree;

Doctor of Science (diploma) – 3 years after obtaining the degree of Candidate of Engineering Science.

## TERMS OF TRAINING

Training of students is conducted in accordance with the curricula and syllabi according to state standards of each major.

The academic year at National Aerospace University consists of 2 semesters.

There are two admission waves per year: fall intake and winter intake. Admission process for winter intake starts in November and finishes on March 1. The following majors for Bachelors are available during this period:

- Maintenance and Repair of Aircraft and Aircraft Engines;
- Radio-electronic Computerized Based-tools;
- Computer Systems and Networks;
- Aircraft Autonomous Navigation and Adaptive Control Systems;
- Aircraft Engines and Power Plants;
- Design, Manufacture and Certification of Aircraft.

International students are trained at the preparatory department for 10 months where they study the Russian language and major disciplines (physics, mathematics, drawing, etc.) in Ukrainian, Russian and English. The theoretical knowledge at KhAI is combined with all-round practical grounding.

## MEDIA OF INSTRUCTION

The training at KhAI is conducted in Ukrainian, Russian, English languages. Bachelor's programmes for International Oriented Studies (IOS) are as follows:

- Design, manufacture and certification of aircraft
- Maintenance and repair of aircraft and aircraft engines
- Aircraft engines and power plant
- Technologies of design and manufacturing of aviation engines and power units
- Intelligent systems and technologies
- Aircraft autonomous navigation and adaptive control systems
- Design and production of structures made of composite materials
- Rocket engines and power plants
- Rocket and space complexes
- Satellites, engines and power plants
- Unconventional and renewable power sources
- Computer systems and networks
- Programmable mobile systems and internet of things
- Systems programming
- Economy of enterprise
- Finances, banking and insurance
- Psychology

English-trained (E) Master of Science programs are based on the above-mentioned Bachelor majors.





Among unique research facilities available at KhAI there are two with the status of National Heritage of Ukraine:

- Aerodynamic Complex, consisting of supersonic wind tunnel, 5 subsonic wind tunnels and acoustics laboratory;
- Inter-branch Research Institute of Aircraft Flight Modes Physical Modeling Problems. KhAI research teams are always open for starting new research collaborations in different types of projects and will be glad to become a part of consortia created to tackle issues arising in aerospace industry growth and development.

## Key areas of KhAI research

- Aerodynamics, including subsonic, supersonic, hypersonic fluid dynamics and wind tunnel tests
- CAD/CAM/CAE design of aeronautic structures and elements
- Strength analysis and FEM simulation
- Aircraft structures full-scale structural testing and durability study
- Advanced coatings development
- High-strength composite structures design and simulation
- Aircraft manufacturing and assembly processes development
- Advanced manufacturing tools development for processes automation increase
- Aircraft propulsion
- Gas-dynamic processes simulation
- Aircraft control systems, including: avionics, dependable embedded systems and fault-tolerant adaptive systems
- Unmanned aerial vehicles
- Remote sensing systems

More specific information on these and other KhAI research directions may be found in the research profiles hereafter.



## RESEARCH ENVIRONMENT

Ukraine is one of the nine world countries with the entire cycle of aerospace products design and manufacturing. Therefore the demand for high qualified professionals and new emerging ideas and technologies is continuously growing. Since its establishment in 1930 National Aerospace University "Kharkiv Aviation Institute" has played an important role in aerospace S&T development due to its high-level potential and sustainable generation of new knowledge by University staff and students. We have strong international reputation in various research areas through our understanding of future needs and opportunities which are set to drive KhAI interdisciplinary research and education strategies. Our R&D focus is generally aligned with the national goal of achieving technological excellence and self-reliance. The University has on-going academic and research collaborations with many national and international universities and industries, in order to remain current in terms of knowledge and global developments, and to be always aware of community needs. Our S&T Labs and Centers carry out research in key areas of science and engineering, e.g. mathematics, solid physics, fluid, gas and plasma mechanics, design and manufacturing of aerospace models, engines, various devices, radio electronic systems, information technologies, etc.



# UNIVERSITY RESEARCH FACILITIES

## Aerodynamic and Acoustics Laboratory

KhAI aerodynamic complex has the status of National Heritage of Ukraine. It includes 5 subsonic wind tunnels that are used for various researches and educational purposes and a supersonic wind tunnel for 1-4 Mach numbers wind tunnel tests. T-6 Supersonic wind tunnel is equipped with automated systems for control and registration of flow parameters in order to ensure high system precision and reliability and to optimize research processes. The Acoustics Laboratory is equipped with an aero acoustic chamber (size – 3x3x4.5 m, range of frequencies – 125 – 8000 Hz).



## Micro Electrojet Thrusters Testing Facility

This Facility allows performing multi-purpose testing and analysis of plasma thrusters and hollow cathodes for further design optimization and characteristics improvement. The Facility includes a 0.9 m<sup>3</sup> vacuum chamber equipped with all relevant measuring and pumping units, power supply system and propellant supply system, devices for current, voltage, and temperature measurement, probes for plasma parameters identification, the equipment for plasma spectral analysis.



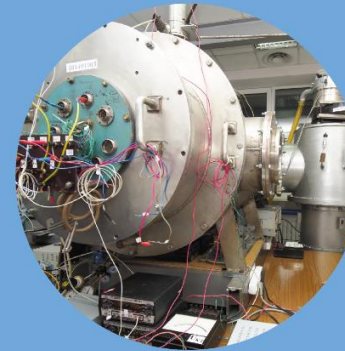
## Experimental Equipment for Static and Fatigue Tests

Strength Laboratory has a structural test hall (10 m high and 430 m<sup>2</sup> in area) equipped with precise hydraulic loading systems, up to 100 kN/m<sup>2</sup>. The Laboratory also has the following hydraulic and electromechanical test machines: "GRM" hydraulic test machine producing static and cyclic loads up to 500 kN; "ZD10/90" electromechanical test machines (up to 100 kN), fully automated and equipped with analog-digital converters; "UMM" and "UMP" electromechanical fatigue test machines, cyclic loads up to 100 kN. All fatigue machines are automated and equipped with complex electronics and software ensuring precise measurements of residual strain kinetics.



## Plasma Electrojet Thrusters Testing Facility

KhAI unique laboratory facility for low and medium power (up to 5 kWt) plasma electrojet thrusters testing in the conditions close to the space environment includes: a 10 m<sup>3</sup> vacuum chamber; an advanced vacuum system based on the high-pressure vacuum pump for 5\*10<sup>-4</sup> Pa rarefaction level achievement without gas puffing; an appropriate power supply system; a unique hardware/software for electrojet thrusters and auxiliary aggregates and subsystems characteristics for automatic measurement.





## Space Power Supply Systems Testing Facility

KhAI Laboratory of Autonomous Power Engineering is equipped with the set of multipurpose test benches for simulation, scientific research and experimental validation of autonomous power supply systems for space application (including solar cells/batteries and electrochemical energy storage devices). This equipment permit testing for both full-sized chemical batteries and separate electrochemical energy storage devices and their scaled models to reduce material cost and required time without negative effect on information value of research results.



## Advanced Coating, Machining and Manufacturing Facilities

The manufacturing facilities include electro hydraulic press for the manufacturing of small-size components (enables the production of sheet parts with a maximum dimension of 300 mm) and multi-circuit electro hydraulic press for the production of large-size sheet parts. High-speed deep grinding wheels are used for high-productive machining of parts made of metal and different alloys. Coatings deposition facilities include cold spray, gas detonation and thermal spray coating deposition units allowing the creation of thermal-barrier, heat-resistant, wear-resistant and other types of coatings on different substrates.

## Physical Modeling of Flight Critical Modes

The Research Institute of Aircraft Modes Physical Modeling Problems is equipped with the facilities for physical modeling of flight critical modes for free flying aerodynamically similar aircraft models. These facilities give the opportunity to investigate the flight critical modes for real aircraft models.



## Composite Structures Manufacturing and Testing Facilities

Composite Materials Laboratory is equipped with all the required facilities and tools for composite structures manufacturing at different levels (sample, sub-component, and small-scale component), and their further static and dynamic testing. Laboratory's key facilities include a 3D laser templating system, several ovens with different temperature ranges, vacuum system for room-temperature curing, autoclave, machining facilities, tensile testing machine with automatic data processing, etc.



## Fast Freezing and Cold Wind Tunnels

Fast freezing and cold wind tunnels are designated for the investigation of freezing process in gas environment at temperature ranging from  $-100^{\circ}\text{C}$  to  $-10^{\circ}\text{C}$ . The fast freezing tunnel has a form of heat-insulated chamber with blades moving inside. The cold wind tunnel is represented as a closed circuit. The plant is equipped with information-measuring and regulating systems based on the advanced measuring and control devices.



## Electron Microscopy

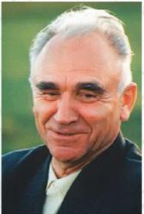
The Laboratory of Electron Microscopy currently includes electron-focused beam measuring microscope with REM-106 low vacuum chamber, DRON-3M X-ray diffractometer, PEM-100-01 light-sized transmission electron microscope, NEOPHOT-30 top-light microscope (Carl Zeiss), VUP-5M multipurpose exhaust cart, and UZDN-A ultrasonic disperser. The Laboratory facilities provide opportunity to perform electron microscopic, X-ray diffraction and optical investigations in different fields, such as material science, nanoscience, physics, chemistry, geology, microelectronics, biology, and medicine.

# OUR ALUMNI

The Alumni of KhAI are of the highest caliber. For its long history our University has trained thousands of engineers, researchers and developers. We are justifiably proud of our graduates who have become excellent specialists and made their mark in aviation, rocket & space engineering and in other industries. KhAI education provides our students with a critical thinking and leadership skills to become successful in any path they are eager to choose.

KhAI alumni never forget their Alma Mater. KhAI, in turn, recognizes its alumni. Traditionally, in late May the University graduates arrive to KhAI from all over the world to meet their friends and lecturers and to take a trip down the memory lane. Many of them are members of "International KhAI Alumni Association" whose principal objective is to consolidate KhAI graduates, students and academic staff to stimulate their cooperation and increase KhAI excellence.

## Prominent graduates. Where are they now?



**Petro Balabuev**

*Graduated in 1954*

Doctor of Engineering, Professor, Honored Master of Science and Engineering, Edward Warner Award Winner, Hero of Ukraine, General Designer of Antonov ASTC (1984-2005), leader of An-225 super-cargo airplane Design Group.



**Fedir Muravchenko**

*Graduated in 1954*

Prominent engineer of 20th century based on the International Engineering Academy rank, Doctor of Engineering, Professor, Hero of Ukraine, Designer General of State Enterprise "Ivchenko-Progress" Design Bureau (1994 – 2010).



**Dmytro Kiva**

*Graduated in 1965*

Doctor of Engineering, Professor, Hero of Ukraine, Honored Master of Science and Engineering. Former President and General Designer of Antonov ASTC, member of the National Academy of Sciences of Ukraine. Current Counselor to the President of "Silk Way Holding" LLC.



**Viktor Chuyko**

*Graduated in 1956*

Chairman of "International Association of Aero Engines Manufacturing".



**Anatoliy Myalitsa**

*Graduated in 1966*

General Director of Kharkiv State-Owned Aircraft Production Enterprise; Honored Mechanical Engineer of Ukraine.



**Ludmila Shvetsova**

*Graduated in 1973*

State Deputy of Russia Federation, 2001-2011 - Deputy-Mayor of Moscow-city.



**Vladimir Vovk**

*Graduated in 1978*

Doctor of Science, Professor of Ottovon- Guericke-University Magdeburg, Institute of Manufacturing Technology and Quality Management.



**Oleg Kononenko**

*Graduated in 1988*

Russian Pilot-cosmonaut, Hero of the Russian Federation. Performed 2 space flights in 2011.



**Oleksiy Torokhtiy**

*Graduated in 2010*

Ukrainian weightlifter, European and World Championships multiple medalist. Won the gold medal at London Olympic Games in 2012.

# STUDENT'S LIFE

KhAI offers its students, faculty members and staff a unique atmosphere embracing a vast range of cultural, educational, athletic and social activities. There is an ample opportunity to nurture all kinds of talent in students.

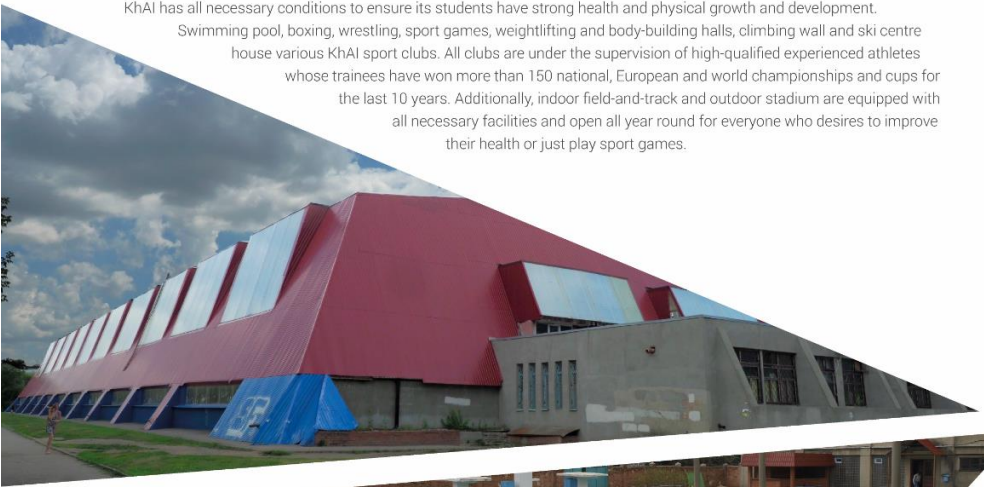
## AIR SPORT

As an aviation University, KhAI encourages air sport growth and development. Hang Gliding Club, established in 1976, has more than 50 hang gliders designed and manufactured. Today it numbers dozens of members, who constantly conduct trainings and perform flights. Experienced trainers of Paragliding Club provide training in paragliding for students and anyone interested. Flights are performed almost each weekend in Kharkiv and twice a year in the Carpathian Mountains.

## SPORT

KhAI has all necessary conditions to ensure its students have strong health and physical growth and development.

Swimming pool, boxing, wrestling, sport games, weightlifting and body-building halls, climbing wall and ski centre house various KhAI sport clubs. All clubs are under the supervision of high-qualified experienced athletes whose trainees have won more than 150 national, European and world championships and cups for the last 10 years. Additionally, indoor field-and-track and outdoor stadium are equipped with all necessary facilities and open all year round for everyone who desires to improve their health or just play sport games.



## UNIVERSITY FESTIVALS

Each May KhAI celebrates the University Day. The alumni from all over the world come to Alma Mater to meet their mates and visit academic buildings. The festive occasion begins with the parade of students, teaching staff and personnel accompanied by welcoming speeches and greetings from the University rector and special guests. At this event, KhAI stadium holds an exhibition of hang-gliders, autogyros and aircraft made by students and staff. The sky is filled with aircraft models and all visitors can take a short flight in a hot air balloon. In the evening KhAI creative groups (dancers, musicians, etc.) organize a great talent show. Traditionally, the day ends with festive fireworks. Another traditional festival is the annual freshmen "initiation". The event, which is similar to the University Day, takes place in late August. Additionally, gala concerts are given for all KhAI members for each national holiday.

## DANCE

KhAI dancing has more than a 30-year history. Professional world class dancers perform trainings in different dance styles, including Latin, European, Caribbean, belly dance, contemporary, modern, cheerleading, tribal-dance, etc. Dance groups are organized by age and attainment level. The dancing team provides its members with warm and encouraging environment, bright emotions and individual approach and aims to share its love for dance through lessons, competitions and organizing shows.

## ART

KhAI Art Studio and Fashion Theatre are always open for all beauty and art lovers with creative thinking. Admirable paintings of Art Studio members are exhibited at the local, regional, state and international exhibitions and festivals. Fashion Theatre members participate at different fashion projects, advertising activities, shows and festivals.

## MUSIC

KhAI wind band amounts more than 40 musicians whose work constantly keeps students interested in music. The band's wide-ranging repertoire includes famous pieces of classical music, different arrangements, modern jazz and symphonic compositions etc. Additionally, talented singers have the opportunity to join one of two KhAI choirs. For amateurs KhAI organizes different concerts, shows and competitions.



# ACCOMMODATION

The University has its own campus situated around the academic buildings. It consists of 10 halls of residence with 6110 places available. The halls of residence house reading halls, dining halls, canteens, cafes. Students can live in a two or three-bed dormitory on-campus with the following facilities:

- 2-3 beds, bedside-tables, a wardrobe, a table, bookshelves, chairs in the room;
- bathroom facilities;
- fitted kitchen with cooker.

Students have possibility to cook their meal on their own.

The accommodation in the halls of residence is not included in the tuition fee and shall be paid separately. The cost of living in the hostels in a two-bed dormitory varies from 40 USD to 70 USD per month subject to living conditions. International students may rent a private lodging. The cost of private rented accommodation varies according to a city district, lifestyle, furniture, etc. and amount to 250-300 USD per month.

KhAI students have a great possibility to practice various kinds of sport. KhAI has sports complex which houses track and field hall, swimming pool, and stadium. The University has "PROLISOK" sporting health camp which is located on the bank of the river. It is a wonderful place to spend summer holidays and practice sport.





# AWARDS

Annually KhAI participates in the following national and international exhibitions:

- 1) International exhibition of education abroad "World Edu" and exhibition "Modern Educational Establishments" – annual exhibition with the support and participation of Ministry of Education and Science of Ukraine and National Academy of Educational Sciences of Ukraine. It has already received public recognition and is the most extensive and highly rated educational exhibition in scientific and professional level, which addresses the problems of priority development of the education sector. KhAI was awarded with the gold medal in the category "International cooperation in the field of education", gold medal in the nomination "Innovations in the development of international cooperation and presentation of national education in the world and European educational and scientific space", gold medal in the category "Development and use of innovative mixed-educational methods", Grand Prix "Leader of international activities" and others.
- 2) exhibition "Innovation in Modern Education" – annual exhibition with the support and participation of Ministry of Education and

Science of Ukraine and National Academy of Educational Sciences of Ukraine.

- During last years KhAI was awarded with the numerous prizes, for example: "Gold Medal for the winner of the competition in the category "Innovations in the use of information and communication technologies in the educational process", Gold Medal in nomination "Psychological support of educational reforms", 1st degree laureate in "Modern information systems, technical training tools, technologies and solutions for implementation in educational practice", 1st degree laureate in nomination "Innovations in activity of higher education institution on integration in the European educational and scientific space" and many others.
- 3) National Rating System is a component of monitoring higher education. The information obtained by the university as a result of the rating makes it possible to identify the strengths and weaknesses of its own activity by certain criteria and to design strategies for the future development of higher education in the field of higher education quality assurance. By the results of this evaluation KhAI was twice awarded with certificate "Leader of the national rating of the Ministry of Education and Science of Ukraine".



# LAYOUT OF KHAI

