Military University of Technology

Military University of Technology

Military University of Technology - milestones

1951 – 1956 – engineering studies for technical staff of the Polish Armed Forces (100-200 graduate students per year)

1956 – 1965 – transformation from officers' school into military technical university: increasing number of academic staff (holders of national professor's degree and Ph.D. degree), development of graduate and postgraduate studies

1996 – 2004 – transformation of WAT into a military-civilian university

1997 – beginning of civilian part-time studies

1999 – female cadets begin military studies

2002 – beginning of civilian full-time studies

2003 – parliament's act transforming WAT into a military-civilian university of technology

2019 – Doctoral School established

2023 – WAT offers undergraduate, graduate and postgraduate studies, MBA, postgraduate, development and language courses

First Polish lasers designed in WAT:

HeNe (Helium-Neonium)	1963 r.
$Al_2 O_3$ (Ruby)	1963 r.
CO_2 (Carbon dioxide)	1966 r.
TEA CO_2 (TEA = Transelectrical atmosphere)	1971 r.
the first ophthalmologic laser in Europe	1965 r.

Military University of Technology - nowadays

WAT is:

- public university
- military university supervised by the minister of national defense
- civil university supervised by the minister responsible for higher education in agreement with the minister of national defense
- educates military and civilian students
- military unit
- educates students in 21 fields of studies

WAT's mission:

- research and implementation to industry
- education of students and doctoral students, including candidates for professional soldiers, military training and professional development of officers
- professional support for central institutions of the Ministry of National Defense and other ministries

WAT as a military unit:

- participation in the work of NATO panels and working groups, European Defense Agency (EDA) and NATO Industrial Advisory Group
- integration of scientific-research and industrial groups around security research and development programmes within the Polish Technology Platform for Security Systems

Military University of Technology - campus

One campus

8 academic faculties:

- Faculty of Security, Logistics and Management
- Faculty of Cybernetics
- Faculty of Electronics
- Faculty of Civil Engineering and Geodesy
- Faculty of Mechanical Engineering
- Faculty of Mechatronics, Armament, and Aerospace
- Faculty of Advanced Technologies and Chemistry
- Institute of Optoelectronics

Modern facilities:

- 173 fully-equipped lecture halls
- 224 laboratory rooms
- 80 technical rooms

WAT Library:

- 300 thousand books, scripts and manuals
- 66 thousand e-book titles
- 30 thousand records in the WAT Data Base
- 818 WAT script titles online
- full NORM PKN collection online
- 26 licensed databases
- 27 open access databases
- Center for Bibliometric Analysis and Scientific Communication
- silence zones – 3 acoustic cabins
- 24/7 library – drop box, book machine, ordering copies online

Training Center:

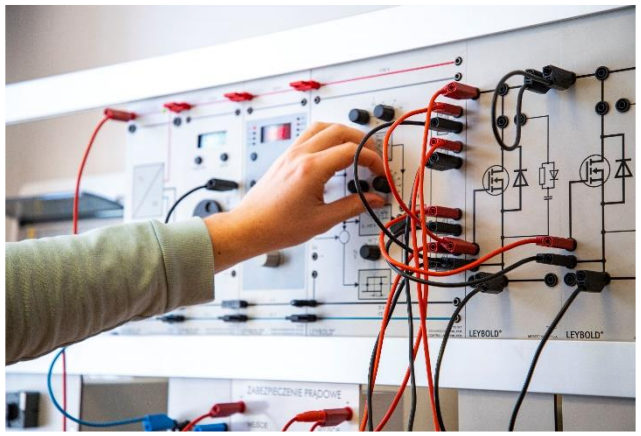
- shooting ranges
- Śnieżnik training and training system for small arms
- Tactical Exercise Square

Sports base:

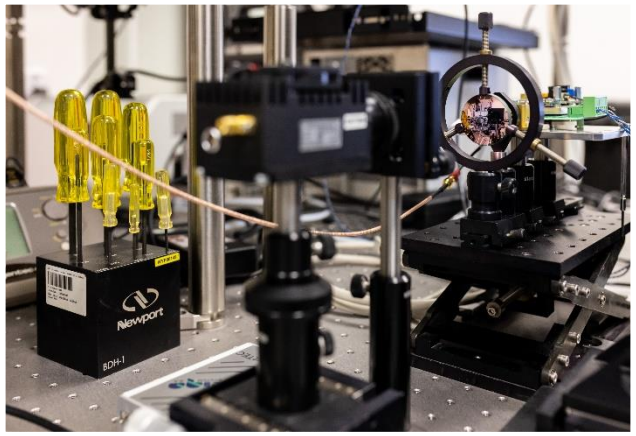
- stadium
- swimming pool
- shooting range
- sports halls
- gym
- training room
- athletics hall
- outdoor fields for team games
- outdoor gymnastics center
- Land Obstacle Course
- Physical Fitness Center

Military University of Technology - faculties

Faculty of Cybernetics



Faculty of Electronics



Faculty of Civil Engineering and Geodesy

Faculty of Advanced Technologies and Chemistry

Faculty of Mechanical Engineering

Faculty of Mechatronics, Armament, and Aerospace

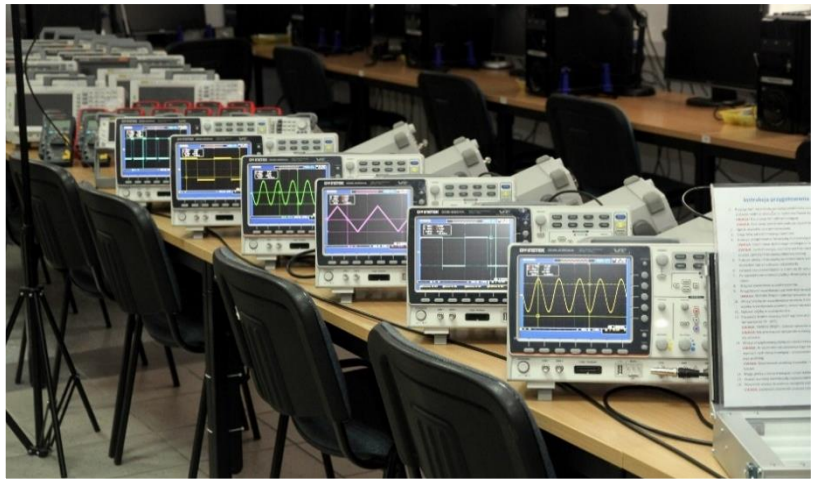
Faculty of Security, Logistics and Management

Institute of Optoelectronics

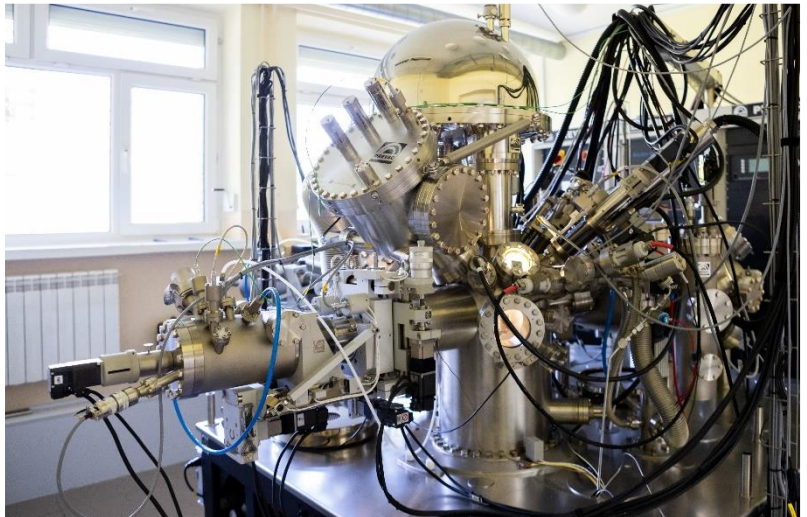
Military University of Technology

One spacious campus

173 fully-equipped lecture halls (*for 7 000 attendees*)



224 laboratory rooms, 80 technical rooms, sport centre



Military University of Technology - people

Scientific staff: **1194**

- Prof. - 89
- Assoc. Prof. - 152
- Ph.D. - 502
- M.Sc. - 451

and about 170 non-academic research and technical staff

Shooting ranges and training grounds

„Śnieżnik” shooting simulator

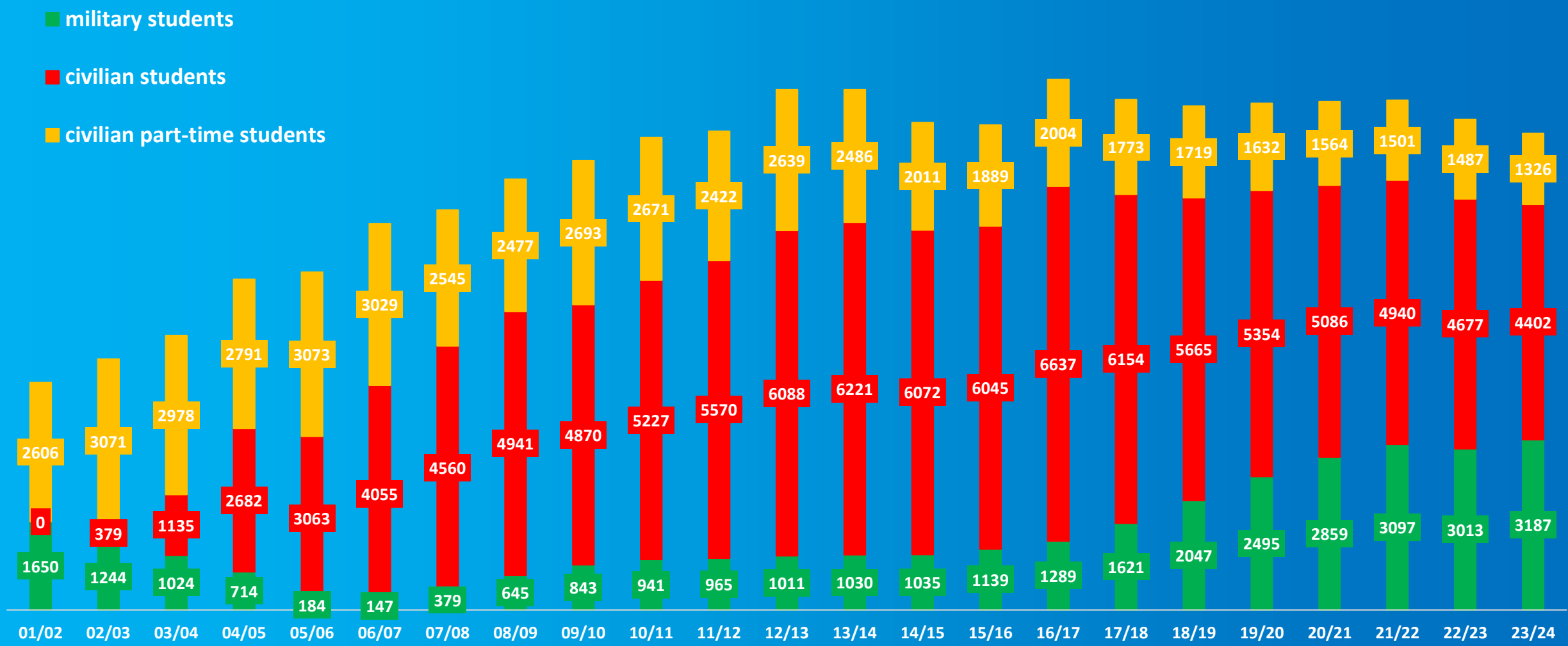
Pistol shooting range

Long riffle shooting range

Training grounds

Military University of Technology

Students at Military University of Technology



In general – about 8915 students with capacity up to 10 000 (including 85% full time)

Military University of Technology

Fields of study – first cycle civilian studies

WAT educates civilian students within 30 fields of study* and 90 specializations

Civilian studies (engineering):

- building engineering
- civil engineering
- biocybernetics and biomedical engineering
- chemistry
- electronics and telecommunications
- power engineering
- geodesy and catasdre
- computer science
- security engineering
- geospatial engineering
- space and satellite engineering
- materials engineering
- unmanned systems engineering
- cryptology and cyber security
- logistics (general academic)
- logistics (practical)
- aviation and cosmonautics
- mechanical engineering
- mechatronics
- optoelectronics

Civilian studies (Bachelor's degree):

- public administration in the national security system
- national security
- national defence (practical)
- management

Civilian studies (Bachelor's degree) in English:

- Aeronautics and Astronautics
- Mechatronics

Civilian full Master's degree:

- geoinformatics
- cutting-edge technologies

*due to open in 2023/2024

Military University of Technology

Fields of study – second cycle civilian studies

WAT educates civilian students within 30 fields of study* and 90 specializations

Civilian studies (Master's degree):

- national security
- biocybernetics and biomedical engineering
- sustainable construction
- general and communication construction
- chemistry
- operation of communication infrastructure
- electronics and telecommunications
- power engineering
- geodesy and cadastre
- geodesy and geoinformatics
- computer science
- geospatial engineering
- materials engineering
- cryptology and cyber security
- logistics (general academic and practical)
- aviation and cosmonautics
- mechanical engineering
- mechatronics
- microeceonomy
- state defense (practical)
- optoelectronics
- management

Civilian studies (Master's degree) in English:

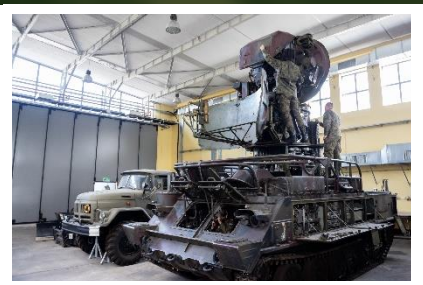
- Chemistry
- Data Science
- Electronics and Telecommunications
- Geospatial Engineering
- Materials Engineering
- Mechanics and Machine Construction (Mechanical Engineering)
- National Security
- Optoelectronics

*due to open in 2023/2024

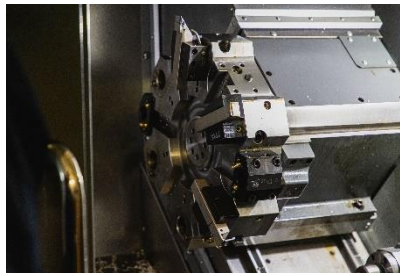
Fields of study – military full MSc

Military studies (full M.Sc. degree):

- aviation and cosmonautics
- building engineering
- chemistry
- computer science
- cryptology and cyber security
- electronics and telecommunications
- geodesy and cartography
- logistics
- economic logistics
- mechanical engineering
- mechatronics
- safety engineering








Military University of Technology

Ph.D. & Post-Doc. degrees

WAT is entitled to confer Ph.D. in 3 fields of study and 7 disciplines:

in the fields of engineering and technical sciences in disciplines:

- automatics, electronics and electrical engineering
- technical information technology and telecommunications
- civil engineering and transportation
- materials engineering
- mechanical engineering

in the fields of social sciences:

- in the discipline of security sciences

in the field of natural sciences:

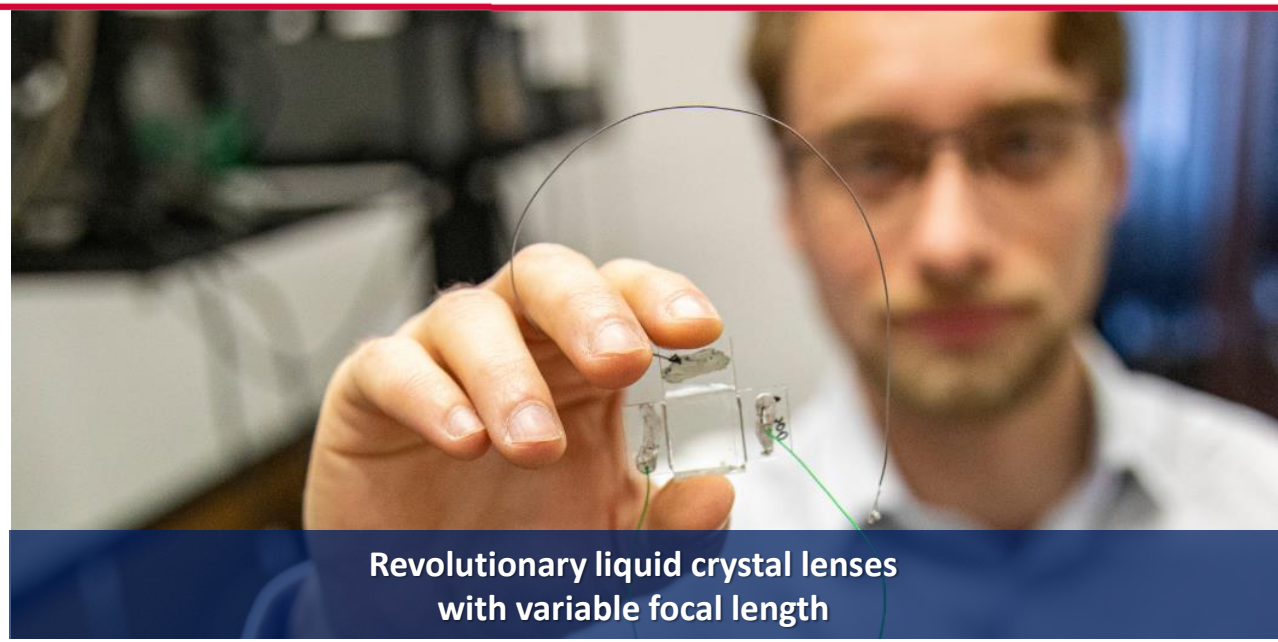
- in the discipline of chemistry

As for 2023/2024, 250 doctoral students have been studying for 4 years.

Military University of Technology

Achievements of students

A new front-side impact model developed at Military University of Technology



Revolutionary liquid crystal lenses with variable focal length

WAT cadet wins his second professional boxing fight

1st place in the Ministry of National Defense competition for the Striker-1 unmanned aerial system

Military University of Technology

International scientific activity

European funds

25 applications for the implementation of research, investment and training projects in the academic year 2022/2023 within:

- international projects(m.in. Etiuda, M-ERA Net)
- Horizon Europe
- EDA/EDF

European projects

- ACHILE (Augmented Capability for High end soLdiErs)
- COMMANDS (Convoy Operations with manned - unmanned Systems)
- INNOGLOBO – Passivation layers for barier and avalanche detectors based on AIIIBV materials
- LWIRPSBDA – Longwave detectors supported by dielectric antennas
- LEONARDO – Microvehiclefor stand-alone and shared mobility

EDA and NATO projects

- LORACO (Long Range Communications Study)
- SAMAS 2 – Structural Health and Ballistic Impact Monitoring and Prognosis on a Military Helicopter
- SOFTANET – Software Defined Tactical and Theatre Network
- WINLAS – WIreless sensor Networks for urban Local Areas Surveillance
- AMALIA – Additive Manufacturing of Metallic Auxetic Structures and Materials for Lightweight Armour
- Q-LAMPS – Quantum LAser-based Multi-parametric Portable Sensors
- IRIS – Inspection, maintenance and security pursued by innovative Robots, enhanced data communication and Infrastructure digital twinS

NATO OTAN

#EUDefence THE EUROPEAN DEFENCE FUND

EUROPEAN DEFENCE AGENCY

NARODOWE CENTRUM NAUKI

HORYZONT europa

Military University of Technology

Exchange of students and lecturers

WAT has signed bilateral agreements with over 90 partner universities and academies, in frame of Erasmus+

- University of Chemistry and Technology, Czech Republic
- University of Southern Denmark, Denmark
- Jyväskylä University of Applied Sciences, Finland
- Institut Superieur d'Electronique de Paris, France
- Hochschule Darmstadt, Germany
- Hellenic Mediterranean University, Greece
- University of Padova, Italy
- University of Calabria, Italy
- Riga Technical University, Latvia
- Vilniaus Gedimino Technikos Universitetas, Lithuania
- Polytechnic Institute of Bragança , Portugal
- National University of Political and Administration Studies, Romania
- Slovak University of Technology in Bratislava, Slovakia
- University of Maribor, Slovenia
- University of Ljubljana, Slovenia
- Polytechnic University of Madrid, Spain
- Polytechnic University of Valencia, Spain

Exchange of students and lecturers

WAT has signed 24 bilateral agreements for exchange of students and academics with following military academies/universities:

- Vasil Levski National Military University, Bulgaria;
- University of Defense, Czech Republic;
- National University of Public Service, Hungary;
- Theresan Military Academy, Austria
- Saint-Cyr Coëtquidan Academy, France;
- Armed Forces Academy, Slovakia;
- Military Technical Academy, Romania;
- Royal Military Academy, Belgium;
- Hellenic Air Force Academy, Greece;
- Air Force Academy, Romania;
- Naval Academy, Bulgaria;
- Land Forces Academy, Romania
- Academia Militar, Portugal
- Military Academy, Lithuania
- National Defence Academy of Latvia
- Hellenic Army Academy
- National Defence College G.S. Rakovski,Bulgaria
- Bulgarian Air Force Academy, Bulgaria
- Helmut Schmidt Universität, Germany
- Mircea cel Batran Naval Academy, Romania
- Carol I National Defense University, Romania

Military University of Technology

Students' international achievements

Admitted at San-Cyr Academy France

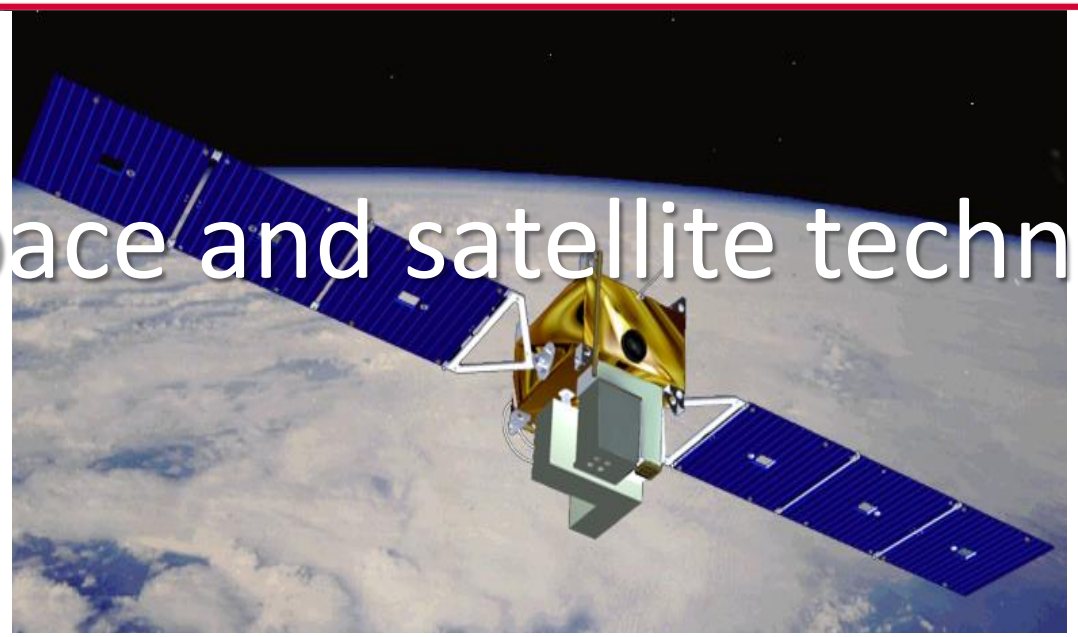
Selected to West Point and Annapolis Academies

Winner of Common Security and Defense Policy Olympiad

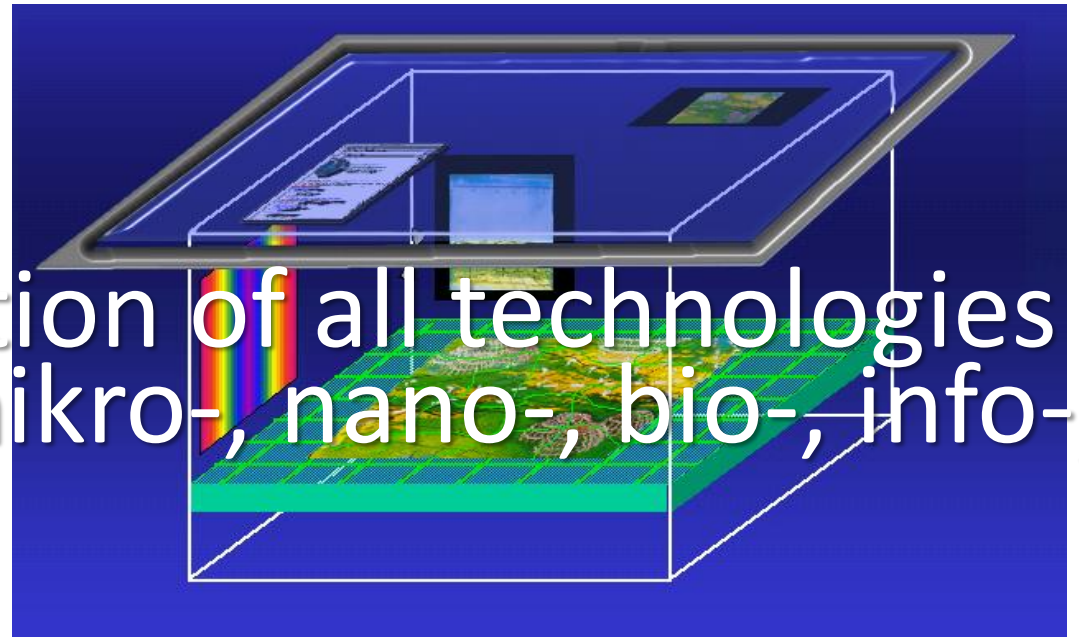
Winners of Sports and Shooting Competition - Hamburg

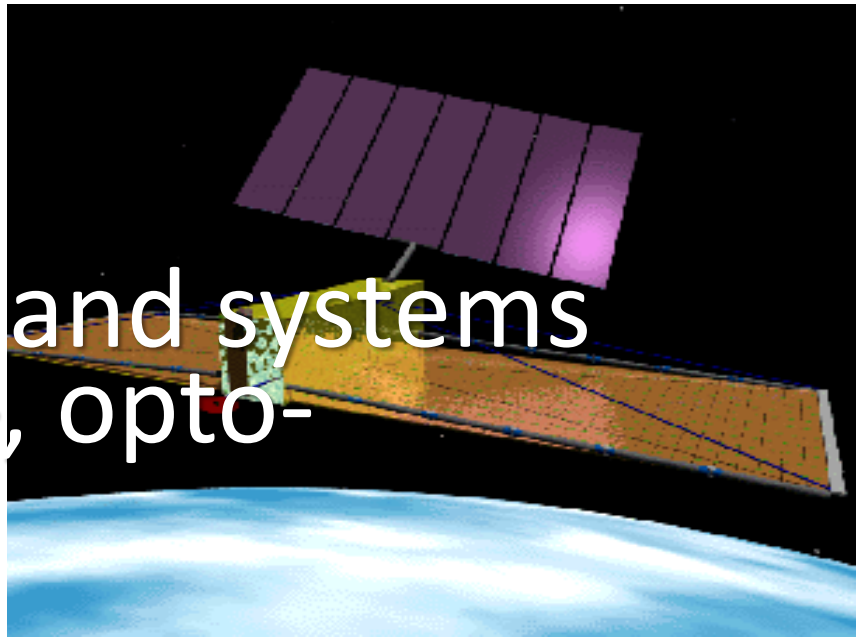
Military University of Technology

Key technologies



Space and satellite technologies





Integration of all technologies and systems
mikro-, nano-, bio-, info-, opto-

Key technologies

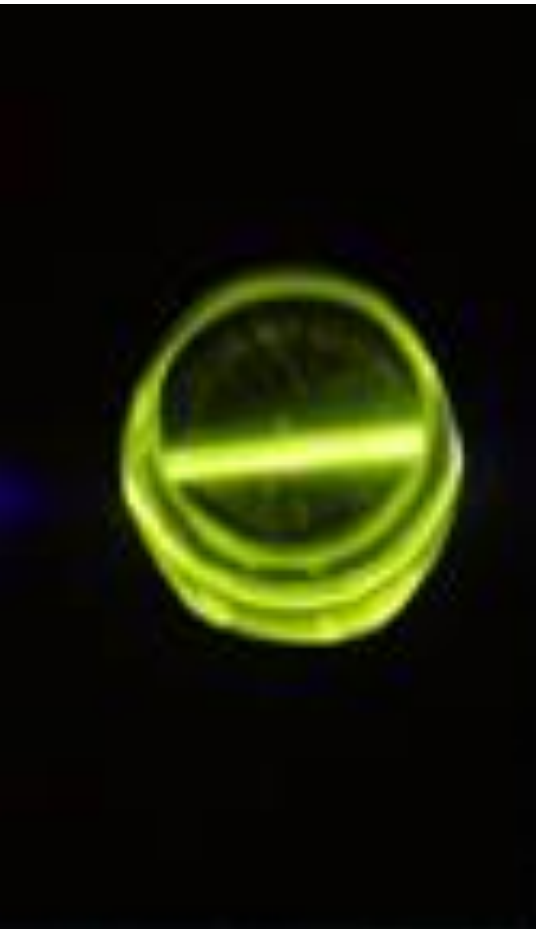
Military University of Technology

PPTSB

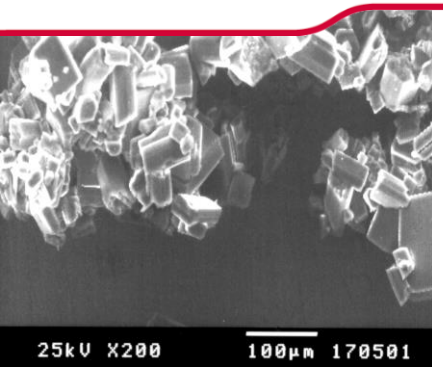
POLISH TECHNOLOGICAL PLATFORM FOR SECURITY SYSTEMS

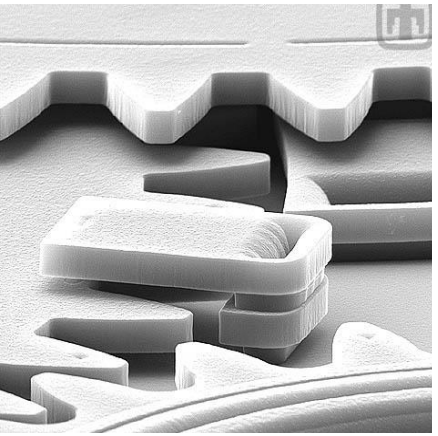
Priority research areas:

- early warning systems for crisis situations
- materials, components and structures for safety systems
- sensors for security monitoring systems
- safety management systems
- security of information systems



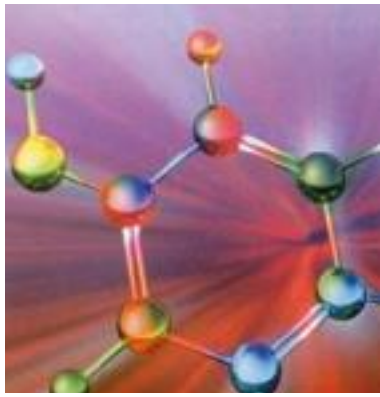
Key technologies

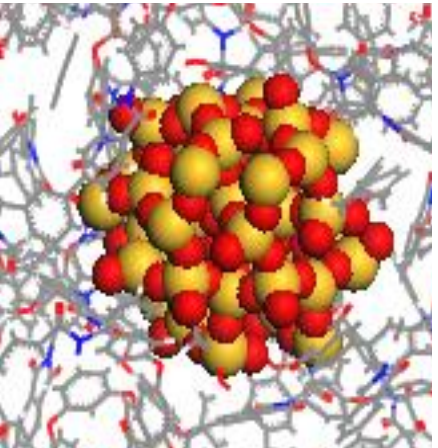


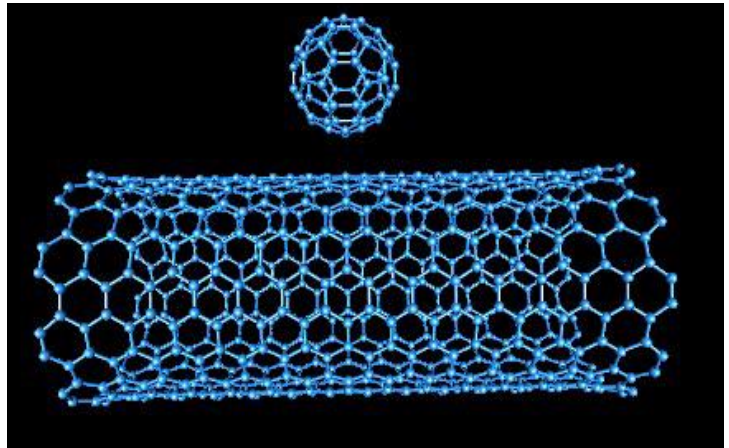


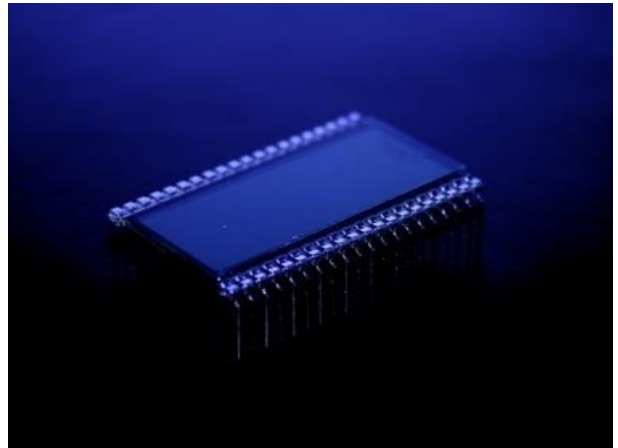
Materials engineering and nanotechnologies:

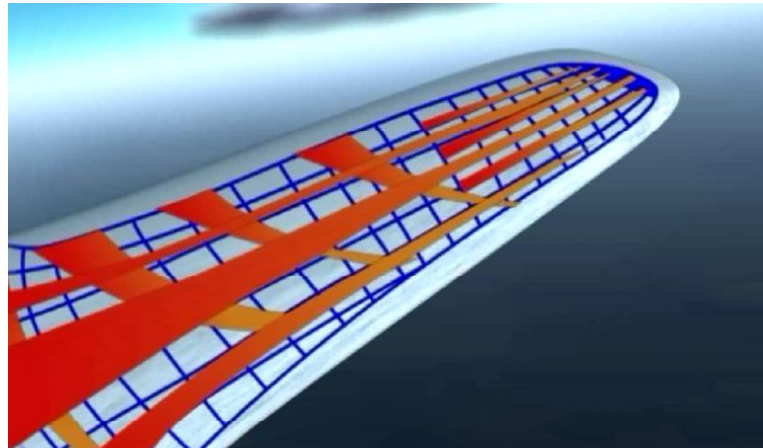
- new properties and functions of materials
- materials with programmable properties (optical, thermal, mechanical)
- polimers, ceramics and composite materials
- high-energy materials
- fuel cells, hybrid drives
- ultralight armour
- nanotubes
- MEMS and NEMS systems
- integrated nanosensors
- imaging systems
- adaptive camouflage, STEALTH technologies







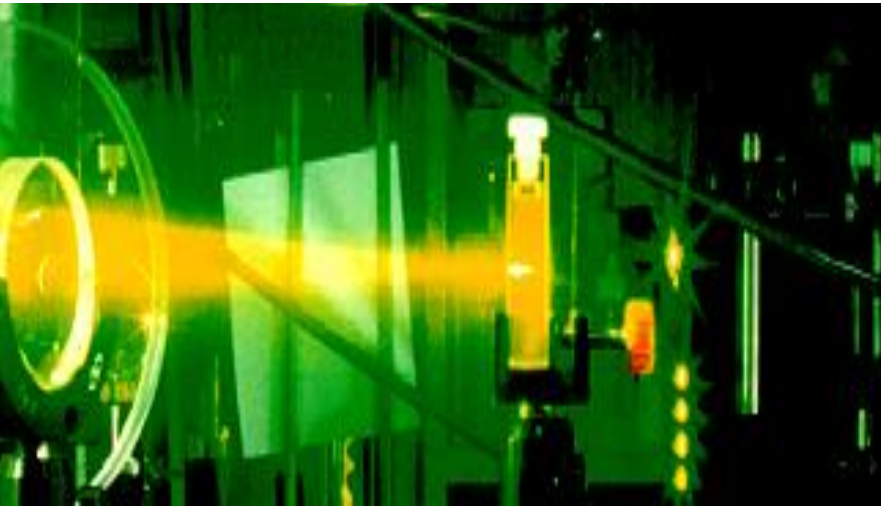


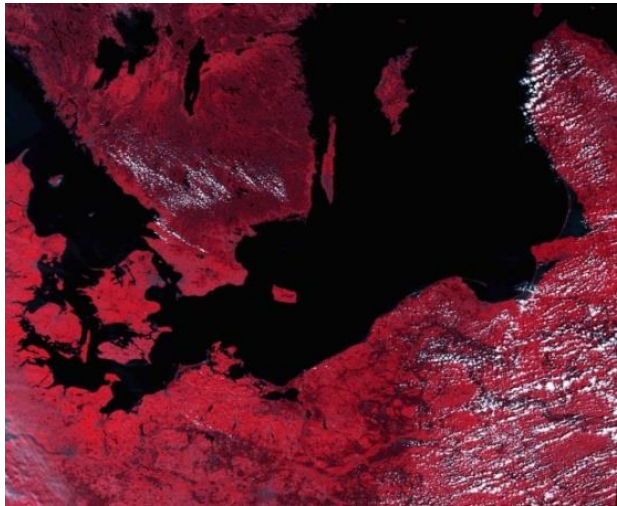


Key technologies

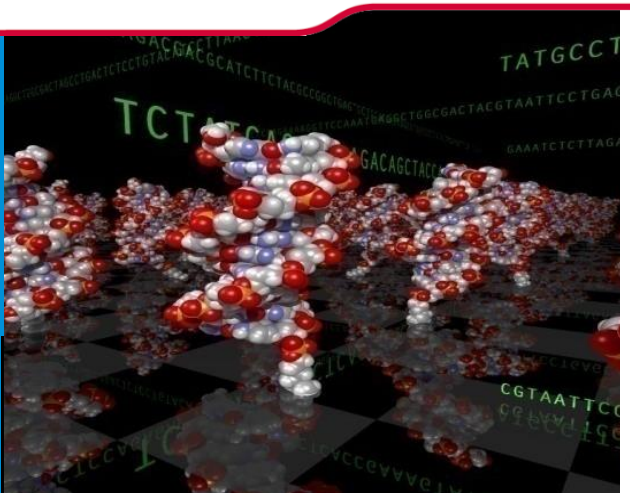
Photonic technologies:

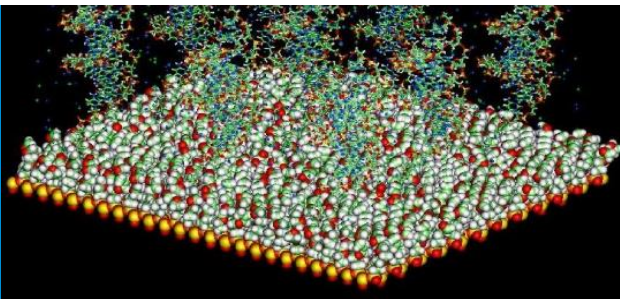
- photonic materials
- optical fibres and fiberscopes
- radiation detectors
- light sources
- solar panels and displays
- observation and reconnaissance systems
- laser technologies
- threat monitoring systems
- broadband laser communication
- biomedical optics





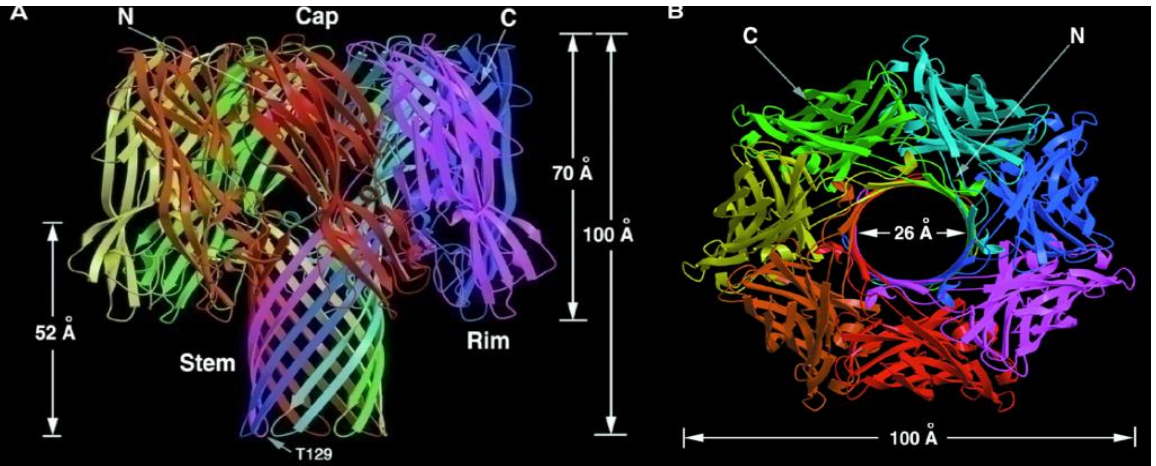
Key technologies

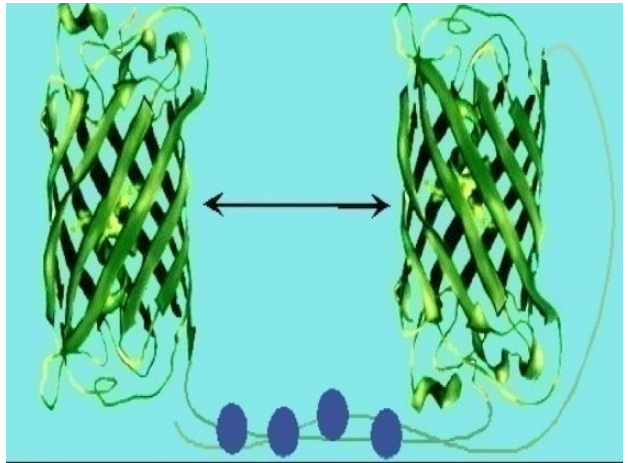


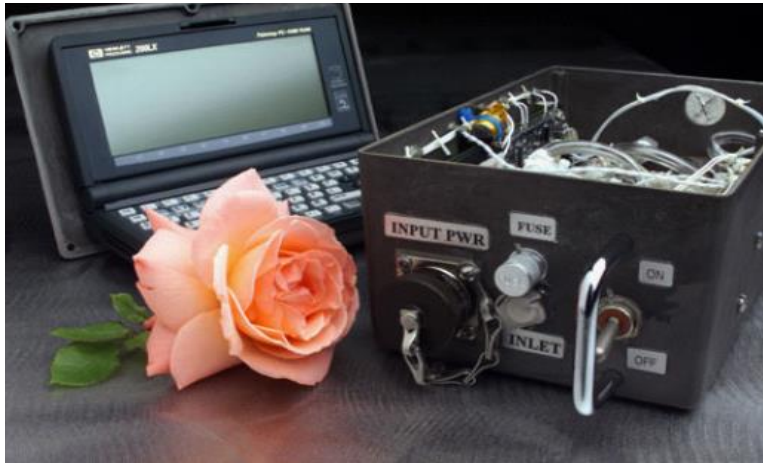


Biomedical technologies:

- bio- and nanomaterials
- protein nanotubes
- biopolymers
- biomolecular sensors
- gravity detectors
- bioradiometer
- miniature bioreactors
- DNA (Bio-IFF) tags
- diagnostic systems
- therapy devices







Military University of Technology

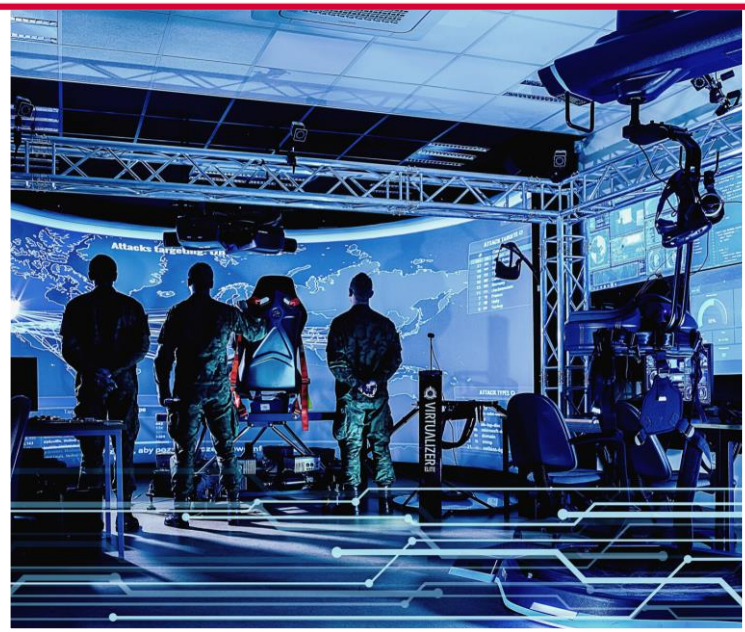
Key technologies

Information technologies and telecommunications:

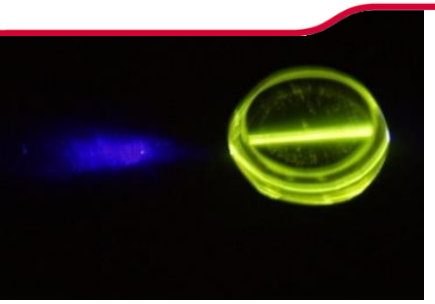
- artificial intelligence
- supporting the decision-making process
- communication devices
- information protection
- security in cyberspace
- scenarios and simulations of decisions
- signal protection
- electronic authentication
- medical IT, telemedicine
- image processing
- analysis of physiological signals

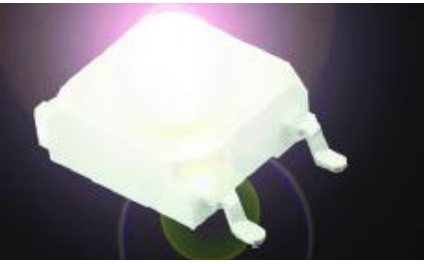
Network-Internet:

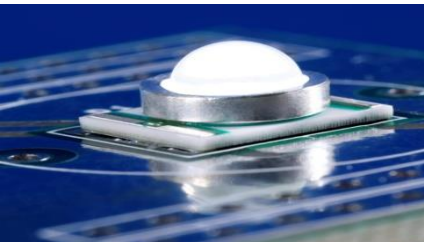
- introducing universal accessibility on the web reliable, consistent information in real time
- filling the web with new dynamic sources of information
- ensuring dynamic and flexible management



Key technologies

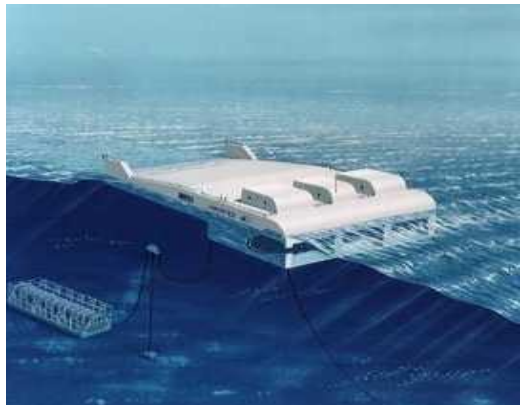


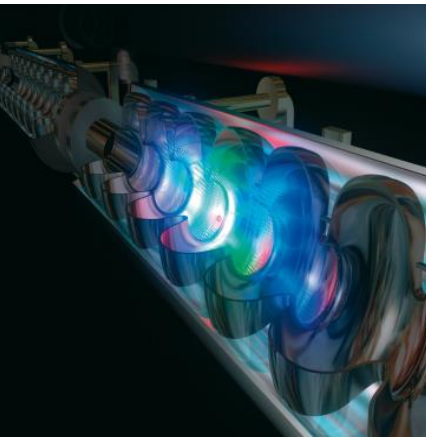




Energy technology:

- production and conversion of biomass
- hydrogen fuel systems
- geothermal systems
- heat pumps with high efficiency
- photovoltaic cells – multilayer structures
- fuel cells
- wind turbines
- nuclear Energy, nuclear fusion
- coal gasification
- clean coal technologies
- energy-saving light sources
- artificial photosynthesis





Military University of Technology in 2025

Military University of Technology will become:

- professional teaching, cutting-edge research and science as well as the experts of the Ministry of National Defense
- a scientific centre employing 850-900 academic teachers and educating approximately 10 000 students, including about 3 000 military cadets
- a place open to the Polish and European educational market
- an elite university due to the quality of education, promoting appropriate ethical and patriotic attitudes of the students
- a university focused on technology transfer from the research phase to the industry through the use of various organizational solutions (Security Engineering Centre, technology park, business incubtors, spin-off companies, innovation hubs)