
MUNI
FACULTY
OF SCIENCE
The future is in the hands of our students
Information about the faculty
SCI.MUNI.CZ/EN

# MASARYK UNIVERSITY

**“We believe that education is not a matter of age or social status. We actively support research. We are open-minded and dedicated to influencing the lives of the people around us.”**


- Founded in 1919 thanks to the efforts of T.G. Masaryk.
- Develops Masaryk's values: respect, freedom and responsibility.
- The most successful Czech grant applicant in the H2020 programme – including prestigious grants from the European Science Council.
- 35,000 students.
- 20% students from abroad.
- 98% of graduates find employment in their chosen field.

FOR MORE INFORMATION READ THE MUNI.CZ WEBSITE:

B | R | N | O

# A city with a student soul

## A great place to live and study

- A centre for research and technological institutions, excellent infrastructure, many job opportunities.
- Cafes, pubs, parks, theatres and sports grounds.
- Situated in the heart of Europe.
- More than 85,000 students.
- 14 universities.
- 380,000 inhabitants.


READ WHAT THE MUNI.CZ WEBSITE HAS TO SAY ABOUT BRNO

MUNI
SCI

## Introducing the faculty in numbers

- The largest MU faculty.
- Founded in 1919.
- More than 3,000 students.
- More than 1,300 employees.
- 20 Bachelor's, 41 Master's, 20 Doctoral study programs.
- 24 study programs in English (1 Bachelor's, 3 Master's and 20 Doctoral).
- 16 departments and workplaces.
- 1 research station in Antarctica.

## We invest in students

- We prepare students for careers as scientists, high school teachers or experts through experimental and laboratory work.
- We involve students in research teams and projects.



"Welcome to the most modern academic complex in the Czech Republic. Our range of courses responds to the requirements of employers. The exclusivity of a Diploma from our faculty is guaranteed – we don't give it to just anyone, thus it has a high price on the labour market."
*Tomáš Kašparovský, Dean of SCI MUNI*

YOU CAN READ ALL ABOUT THE HISTORY OF THE FACULTY HERE:

- We reward research and popularisation of science with scholarships.
- We are constantly improving study and work conditions.

## We deliver high scientific performance

- We produce over 50% of all scientific output from Masaryk University.
- Finances from projects the faculty reinvests in students and employees.
- We have well-equipped classrooms, laboratories, libraries, relaxation zones and outdoor parks.

## We are passionate about popularising science

- We popularise science through dozens of activities for secondary and elementary students, their teachers and the public.
- We organise excursions, one-day urban and internet competitions, summer schools and lecture directly at schools, which you can read about at:

PROSTREDOSKOLAKY.MUNI.CZ

"I chose SCI MUNI because of its great reputation. I gained knowledge and contacts, got involved in research, participated in the organisation of events for the public and even received a scholarship for doing it. My studies took place in a pleasant atmosphere and the teachers had a personal approach and really tried to help us."
*Tomáš Havelka, graduate of the field of mathematical analysis*

# The Kotlářská site: An island of greenery in the centre of Brno

A historic site that has its own charm. Recently reconstructed, the site has modern classrooms, a library and canteen, a park, a geopark and even a corner for barbecuing. The botanical garden, with its mature trees, greenhouses, ponds and works of art, invites you to walk around or just sit awhile.

Photo: The Botanical Garden of the Faculty of Science, Masaryk University

**The premises are home to:**

- The Dean's Office
- The Department of Geography
- The Department of Anthropology
- The Department of Condensed Matter Physics
- The Department of Plasma Physics and Technology
- The Department of Geological Sciences
- The Department of Mathematics and Statistics
- The Department of Theoretical Physics and Astrophysics
- The Botanic Garden
- The Institute of Physics of the Earth
- The Central Library

# University Campus Bohunice: Fully equipped and modern

This modern campus has laboratories, classrooms, experimental greenhouses, a library and a canteen. It also has barbecue pits and places to sit in the open air in a flood of lavender, grasses, trees and bushes, made special by the presence of works of art.

## The premises are home to:

- BIOSKOP
- The National Centre for Biomolecular Research
- RECETOX
- Department of Biochemistry
- Department of Botany and Zoology
- Department of Experimental Biology
- Department of Chemistry



"In beautiful and modern spaces, we found everything we needed, whether it be a vast library, sports and cultural facilities or an academic canteen."
*Tomáš Havelka, graduate of mathematical analysis*

# Training teachers for secondary school natural sciences: our #1 topic

## For us, teaching is both a science and an art

- We offer dual degree programs and interesting practical experience.
- Lecturers at the faculty are passionate about teaching and their professional fields.

## Let's discover the magic of natural sciences

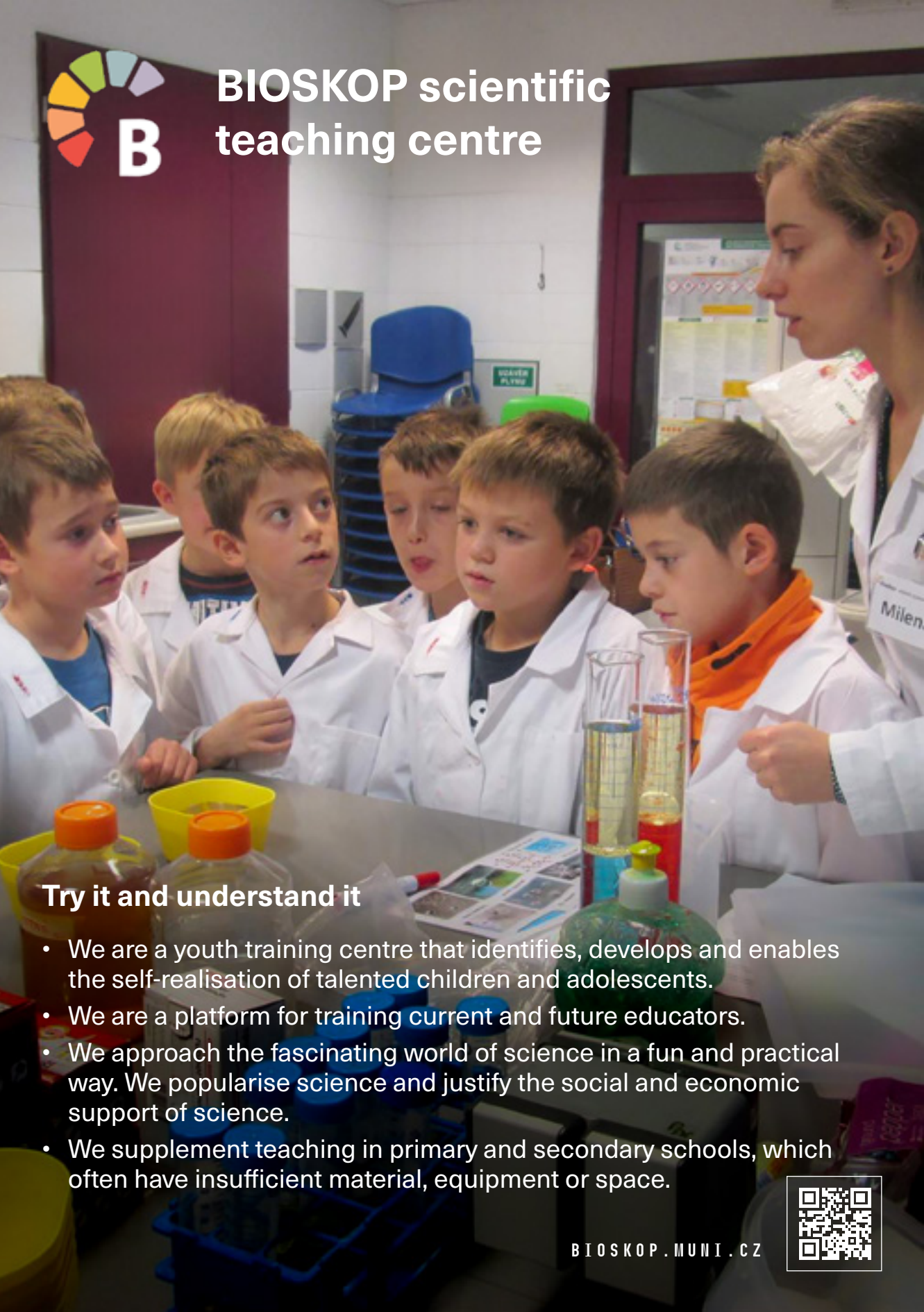
- We invite you to join communities and workshops focussed on subjects such as physics or chemistry.
- We have amazing subjects for the development of soft skills and excellent teacher training in a range of subjects.
- Subjects on the operation of secondary schools are taught by secondary school teachers.

## Dozens of activities for high school teachers

- Ideas fair for physics teachers.
- Summer schools in geography and other subjects.
- Our own website, full of inspiration:

UCITSEUCIT.CZ

# BIOSKOP scientific teaching centre



## Try it and understand it

- We are a youth training centre that identifies, develops and enables the self-realisation of talented children and adolescents.
- We are a platform for training current and future educators.
- We approach the fascinating world of science in a fun and practical way. We popularise science and justify the social and economic support of science.
- We supplement teaching in primary and secondary schools, which often have insufficient material, equipment or space.

BIOSKOP.MUNI.CZ

# Join SCI MUNI in discovering wonders of science

Chander N. Kant as a doctoral student at SCI MUNI has been conducting his research within the team of top scientists and students unraveling molecular mechanisms of toxic effects of dangerous substances. His article published in *Endocrinology & Metabolism* rated as a Highly Cited Paper belongs to the 1% of most cited articles in Biology & Biochemistry.

Accepting the Dean's Award of Masaryk University's Faculty of Science for the year 2023 from the Dean, Tomáš Kašparovský. Photo: Radek Míča

SCI.MUNI.CZ/EN/INTERNATIONAL

# Choose SCI MUNI – your ultimate destination for excellence

## International students

- **Enrol** in accredited degree programmes in English – BSc., MSc., and PhD.
- **Embrace** the rich science, culture, history, and arts at Masaryk University, ranked among TOP 400 universities in the world.
- **Expand** your horizons and create lifelong memories.

## International staff

- **Join** our diverse community offering excellent opportunities for your scientific and academic development.
- **Collaborate** with faculty colleagues from more than 45 countries in English as a common language.
- **Visit** us to give lectures and share expertise.


SCI.MUNI.CZ/EN/INTERNATIONAL

# An opportunity for personal and professional growth

## A friendly environment, stability and security

We strive to create professional and friendly working conditions and transparent procedures for recruitment employees. We provide multiple training and professional development courses.
We strive to create a work environment that is friendly to the needs of our employees and their work-life balance.

During the year, we like to meet informally at events such as the Garden Party, Grilling with the Deans, the Advent Meeting or MUNI Day. The faculty supports activities organised by the Association of Natural Scientists or university-wide social and sports events.

MUNI SCI | HR EXCELLENCE IN RESEARCH

Since 2018, we have been a holder of the HR Excellence in Research Award granted by EU and by implementing modern international practices in the care of employees and PhD students, we have joined the open European Research Area enabling the free movement of scientists.

SCI.MUNI.CZ/EN/CAREERS-AT-THE-SCI-MUNI

# SCI MUNI ALUMNI
## they are doing great in the job market

"I lecture in Protein Engineering at SCI MUNI. I introduce students to the approaches and methods used when working with newly isolated or modified proteins. I see teaching as an integral part of my work at the university; imparting knowledge to students and younger colleagues is the primary task of the teacher."

*Radka Chaloupková*
*Head of Research at the Enantis spin-off company, Associate Professor, Department of Experimental Biology, SCI MUNI*

"At CONTIPRO, we produce high-quality hyaluronic acid. We invest a significant part of our profits into research and development, where we are looking for new forms of acid, such as drug carriers. We have big visions and development plans, and we need skilled young people with a science education to implement them."

*Vladimír Velebný*
*Graduate of SCI MUNI, majoring in Biochemistry*
*Teacher, Department of Biochemistry SCI MUNI*
*CEO at CONTIPRO*

READ SUCCESS STORIES FROM OUR FACULTY:

MUNI SCI Department of Geography

# You will learn how to think and work with geographic information systems in comprehensive ways

Our topic is landscapes and the interaction between the natural environment and society. In physical geography, we study dynamic river floodplain landscapes and biodiversity. We also study climate change in a historical context and model it using modern-day technology.

Our polar research is performed in partnership with the J.G. Mendel Czech polar station. Our social geographers analyse the timing and rythms of population mobility and social processes. In cartography, geoinformatics and remote sensing, we create virtual geographical environments, analyse satellite images and model environmental phenomena.

This photograph shows a donkey penguin on James Ross Island. Photo: Kamil Láska

GEOGR.SCI.MUNI.CZ/EN

MUNI SCI

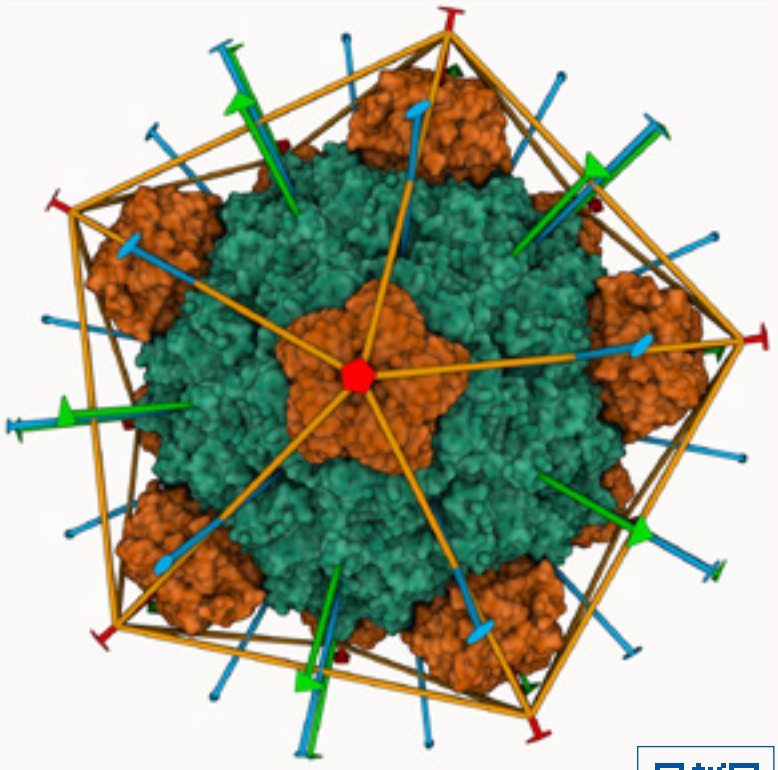
National Centre for Biomolecular Research

# Biomolecules under scrutiny, Genomics and proteomics

We study the structure and function of biomolecules and interactions between them using advanced methods of structural biology and computational chemistry.

We We aim to gain a better understanding of vital processes. Our scientific results are applicable in the medical research and drug design fields. We also investigate the mechanisms regulating the growth and development of plants and factors responsible for chromosome stability.

We are involved in teaching and training students and talented school pupils under the Students Professional Activities scheme. Our graduates continue their careers in basic or pharmaceutical research, bioanalytics, biotechnology and applied development, or in fields exploiting computer simulation methods and bioinformatics.



Visualisation of the J protein of bacteriophage φX174 in Mol*, software developed in the Structural Bioinformatics research group at NCBR.

NCBR.MUNI.CZ/EN

MUNI | RECETOX SCI

## We study the environment and its impact on health

At RECETOX, we study the relationships between chemicals, the environment, biological systems, and human health. We are among the world leaders in exposome research. We provide education in Environment and Health, and Mathematical Biology and Biomedicine. Our graduates find employment in the public and private sectors and in research locally and abroad.

RECETOX is building a unique research infrastructure and expertise for internal and external users. We participate in implementing international conventions and work closely with institutions at regional, national, and global levels. We partner with United Nations agencies and act as the WHO Collaborating Centre.

Lucie Ráčková from the Environmental Research Group Physiology, is focusing on the trajectory of acute and chronic stress in isolation experiments. As a member of the polar expedition on James Ross Island, she investigated how they perceive polar explorers feel when they are separated from their daily lives, and whether they feel stressed. Photo: Fllip Haiduk

RECETOX.MUNI.CZ/EN

MUNI SCI

Department of Anthropology

# Join us in exploring human beings and their environment using cutting-edge methods.

Delve into the study of human life! Examine the biological and behavioural differences between individuals and populations. How do they adapt to ever-changing conditions? Help ensure the health and future of society by examining aspects such as nutrition, body composition, and stressors.

Help create healthier environments that better meet the needs of the human body.

Or focus on safety and develop state-of-the-art methods for human identification. Become part of research teams and refine your expertise through hands-on final theses during your studies. All this using the latest techniques and digital technologies, including 3D scanning, medical imaging, 3D modeling, advanced computational methods, and chemical and biochemical analyses.

Scanning a volunteer on a full-body 3D scanner developed within the project A.D.A.P.T.
Photo: Mikoláš Jurda

ANTHRO.SCI.MUNI.CZ/ENG

MUNI SCI

Department of Biochemistry

# Explore the Essence of Life

We are a modern and ever-evolving workplace. We educate and research in the fields of biochemistry and biotechnology. We guarantee study programs. We provide study programmes in biochemistry, biotechnology and bioanalytics.

Our research unravels the mechanisms that made possible the origin of living organisms and their diversity. It plays a central role in solving the mysteries of cell biology, microbiology, biotechnology and biomedicine.

Join us in the search for answers to the regulation of cellular processes by studying the structure and function of the “molecules of life”: proteins, carbohydrates, lipids and nucleic acids.

Our students acquire a broad interdisciplinary foundation in chemistry, biology, genetics, and medicine.

Graduates find rewarding roles in academia, biotech industry, pharmaceuticals, healthcare, and environmental protection.

Artist‘s rendering of a yeast cell. Photo: Col Ford and Natasha de Vere/National Botanic Garden of Wales (CC-BY 2.0)

UBCH.SCI.MUNI.CZ/EN

MUNI SCI

Department of Botany and Zoology

# We explore ecosystems and how they change over time

Our course opens up opens up career opportunities in basic and applied biological research, nature conservation and education. Students work in research teams and take part in expeditions expeditions around the world, e.g. the Altai Mtns., Spitsbergen or Antarctica. We focus on research in biosystematic and ecological fields.

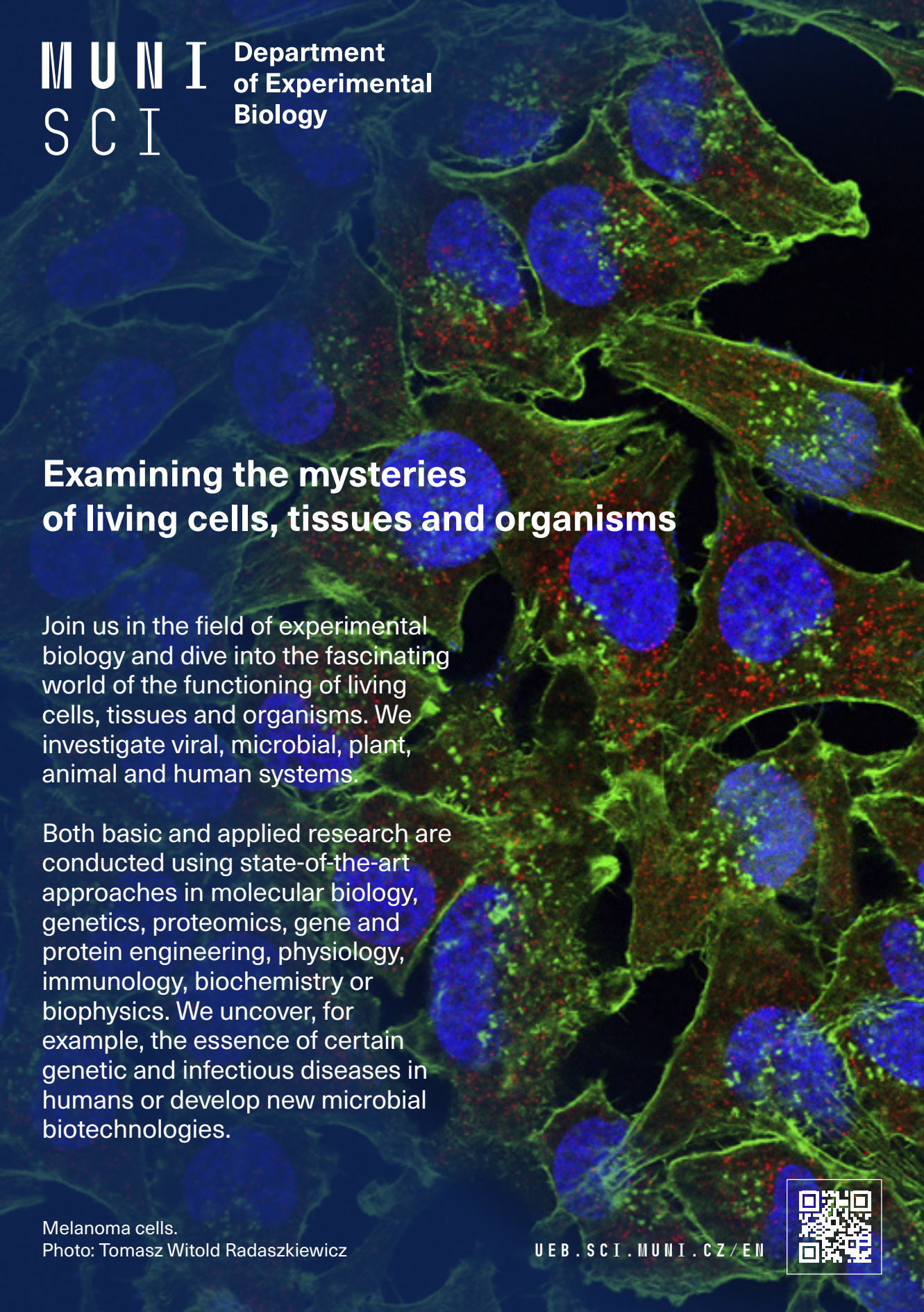
Our teams explore the classification and mutual relationships of organisms, their diversity at local and continental scales, the ecological relationships of individual species, their populations and communities in relation to natural and human-induced changes in entire ecosystems.

Researchers from the Department of Botany and Zoology have discovered a unique tetraploid ginkgo (it has four sets of chromosomes, not the common two sets). Photo: Věra Kuttelvašerová Stuchelová

BOTZOOL.SCI.MUNI.CZ/ENG

MUNI SCI

Department of Experimental Biology



# Examining the mysteries of living cells, tissues and organisms

Join us in the field of experimental biology and dive into the fascinating world of the functioning of living cells, tissues and organisms. We investigate viral, microbial, plant, animal and human systems.

Both basic and applied research are conducted using state-of-the-art approaches in molecular biology, genetics, proteomics, gene and protein engineering, physiology, immunology, biochemistry or biophysics. We uncover, for example, the essence of certain genetic and infectious diseases in humans or develop new microbial biotechnologies.

Melanoma cells.
Photo: Tomasz Witold Radaszkiewicz

UEB.SCI.MUNI.CZ/EN

MUNI SCI

Department of Plasma Physics and Technology

# Plasma and nanotechnologies – research into nanomaterials of the future

We focus on plasma physics and electric discharges. Plasma discharge diagnostics and process diagnostics are integral to our work.

We model and simulate physical phenomena and entire processes and apply them in practice through subsequent analysis. Our specialty is low-temperature plasma, ionized gases, and plasma-chemical reactions in non-equilibrium plasma.

We study and synthesise diverse nanostructures and thin protective layers. Plasma cleaning, modification, activation, etching, decontamination, and surface sterilisation of different materials is our daily bread.

We offer our services to industrial and research partners. Students may already be involved in research during their studies. Our graduates have no trouble finding employment.

Gliding arc discharge plasma in argon.
Photo: Lucia Kuthanová a Vít Kudrle

PHYSICS.MUNI.CZ/EN

MUNI SCI

**Department of Condensed Matter Physics**

# We reveal the secrets of materials and structures

We mainly study the structural properties of substances through X-ray diffraction and reflection, with special emphasis on low-dimensional semiconductor structures, multilayer-metal semiconductors and insulators, and polymers.

We study high-temperature superconductors both theoretically and experimentally.

We use optical spectroscopy to study vibrational and electronic states and their interactions, including changes in optical response with temperature. Teaching takes place in the 'clean spaces' of the Laboratory of Semiconductor Technologies, sponsored by ONSEMI.

Our students, graduates and alumni often work together.

We also make use of biophysical experimental instruments and material at CEITEC.

A lens focusing radiation from a tunable laser onto a capillary containing a biomolecular sample solution. The setup includes a Raman spectrometer used at our institute for studying substance properties.
Photo: Libor Teplý

PHYSICS.MUNI.CZ/EN/ABOUT-US/DEPARTMENTS-AND-RD-CENTRE#DCMP

MUNI SCI

Department of Geological Sciences

# We examine the the systems that create the conditions for life on Earth

Geology is a field of science that deals with the the most pressing isues today – lack of natural resources, natural disasters, groundwater preservation, human impact on the environment and environmental protection. Geology comprises a wide range of topics from environmental geochemistry to critical resource deposits and ore minerals – areas spanning the history of our planet to date to vital questions on the future of humanity.

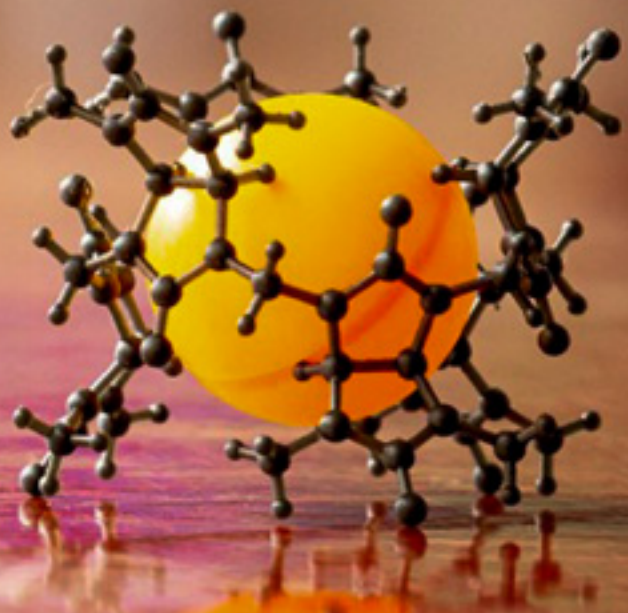
Our students become expert scientists thanks to our study programmes in which practical field excursions and laboratory work with modern instruments are combined. Geology helps us understand the world around us and is vital for the sustainable advancement of human societies.

Crater during eruption.
Photo: Made by AI

UGV.SCI.MUNI.CZ/EN

MUNI SCI Department of Chemistry

# Discover the secrets of matter



We are engaged in the synthesis of new organic and inorganic substances and study their properties using physicochemical and computational methods.

We develop innovative approaches for analysing biologically and medicinally important substances, geological or environmental materials, or cultural heritage objects, as well as methods for elemental analysis and tissue imaging.

We prepare future experts in all areas of chemistry. We engage students in research leading to new materials and compounds with fascinating properties, and together, we move the frontiers of biomedicine or nanotechnology.

A model of bambusuril. The new bambusuril compound was created by the team of the Supramolecular Chemistry Group. The outer, black structure represents bambusuril, while the orange ball indicates an anion bound inside. Photo: Helena Brunnerová

USTAVCHEMIE.SCI.MUNI.CZ/EN

MUNI SCI

Department of Mathematics and Statistics

# Mathematics is our life

We teach and learn mathematics. We like to discover new theoretical results as well as use maths to solve practical problems. We educate academics, practically-oriented mathematicians, and secondary school maths teachers.

Our research interests go cross various maths disciplines, from algebraic theories through geometric and mathematical analysis to statistics and mathematical modeling.

Our graduates pursue careers not just in science but also in banking houses and various industries – wherever logical and analytical thinking is required, supported by deep knowledge of mathematics and statistics.

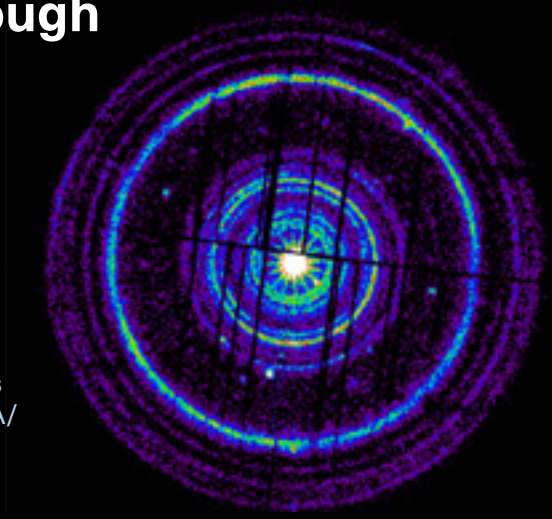
Photo: Irina Matusevich

MATH.MUNI.CZ/ENGLISH/

MUNI SCI

**Department of Theoretical Physics and Astrophysics**

# From quantum gravity through satellite development to optical fibre thinning.



Probably the brightest gamma ray burst in human history 221009A, detected by the XMM-Newton X-ray space observatory. The burst was so bright that in several moments it saturated the detectors of large satellites. The brightest part of the light curve was detected thanks to our satellite GRBAlpha. Photo: NASA/ Swift/A. Beardmore, (University of Leicester)

From quantum gravity through satellite development to optical fibre thinning. There is no better way of getting to understand the problem than explaining it to others. At the same time, there is no better teacher than the researcher in the given field. Both these things you can find in our institute's team of international scientists. They educate future generations of physicists while researching current problems of modern theoretical physics and astrophysics.

- Researching theories unifying quantum mechanics and theory of gravity.
- Taking part in the development and flight control of gamma burst monitoring satellites. Preparation of a medium-sized UV satellite.
- Doing research in the field of ideal optical elements theory, theory of invisibility cloaking, optical fibre imaging and the optics of curved surfaces.
- Observing and modelling stars and multiple stellar systems.
- Developing mathematical structures necessary for theoretical physics.
- Observing results of active supermassive black holes in the centres of giant elliptical galaxies.

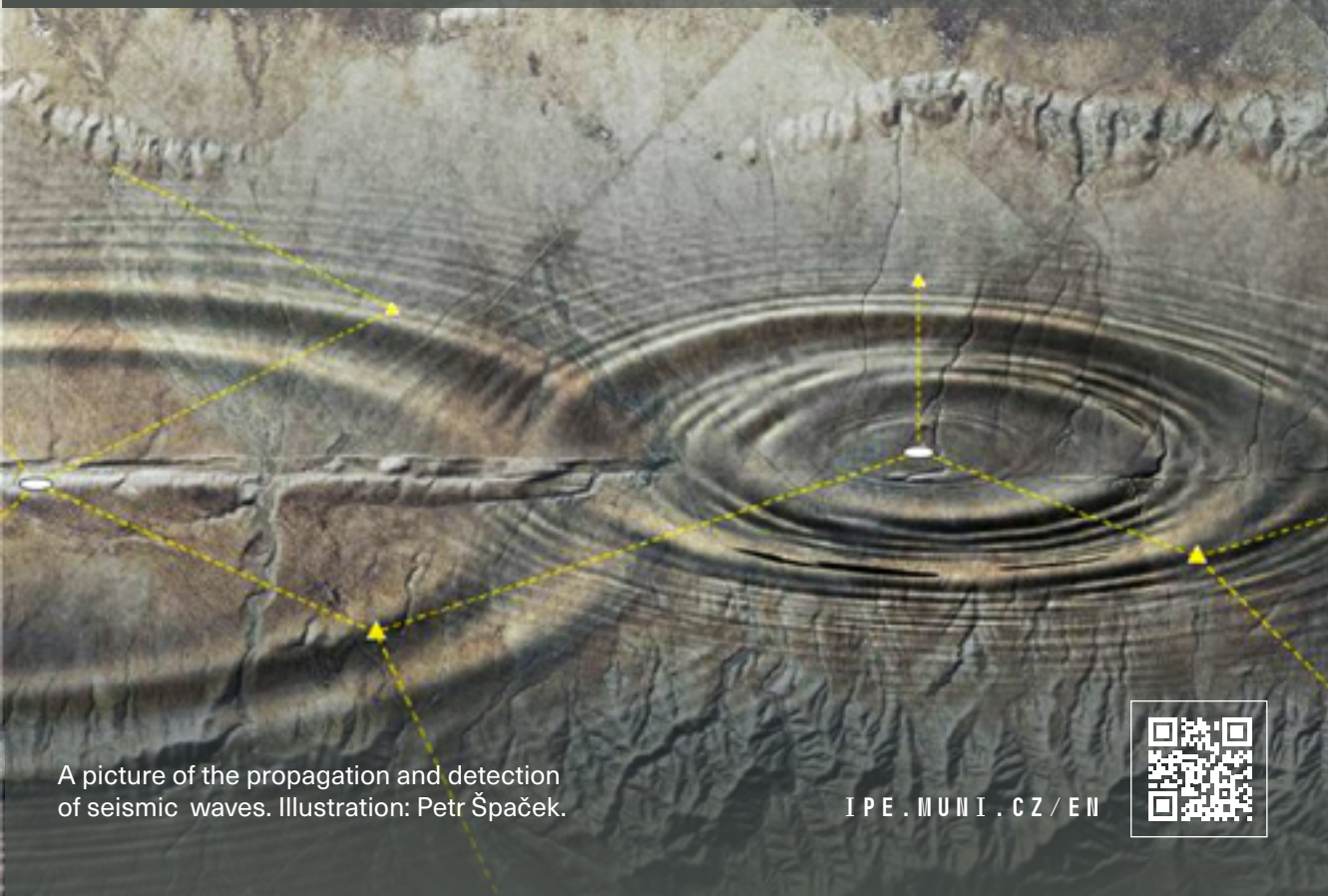
PHYSICS.MUNI.CZ/EN/ABOUT-US/DEPARTMENTS-AND-RD-CENTRE#UTFA

MUNI SCI

Institute of Physics of the Earth

# We study earthquakes in the Czech Republic and around the world

We are a geoscientific institute focused primarily on researching seismic activity at local, regional and global scales and its relation to tectonic processes. We contribute to safety requirements for nuclear power plant operations, seismic hazard calculations and monitoring compliance with the nuclear test ban within the global CTBTO system. We use 23 of our own permanent observation stations for detailed monitoring of the Czech Republic and Central Europe. We are part of an international community of cooperating seismological centres with open data exchange. We are involved in teaching students of Geology.



A picture of the propagation and detection of seismic waves. Illustration: Petr Špaček.

IPE.MUNI.CZ/EN

MUNI SCI Botanical Garden

# The Botanical Garden is not only a place of study with a unique collection of domestic and foreign plants but also an oasis of peace and nature in the centre of Brno.

Over 2,500 exotic plant species grow in four greenhouses imitating tropical and subtropical climates from deserts and semi-deserts, through Mediterranean conditions to tropical rainforests. The greenhouses are suitable for visiting especially during bad weather and when selected rare plant species are blooming, such as the tropical lily Victoria.

A further 3,000 frost resistant plant species can be admired in the garden. This is divided into two parts, a formal section with a sytematic plant layout, and an informal section with thematic sections horticulturally arranged or dedicated to plants from different areas. Thus, you can visit a Japanese garden, a rock garden from the European highlands or Luzni forest, all without leaving the centre of Brno.

Permanent plant exhibitions vary throughout the year, with several events, exhibitions, and even concerts. It is possible to visit the greenhouses with an expert guide.

Photo: The Botanical Garden of the Faculty of Science, Masaryk University

SCI.MUNI.CZ/BOT_ZAHR/INDEX.PHP/EN-GB

MUNI SCI Library

# Space for study and relaxation

The library on the Kotlarska campus is a welcoming place for students and academics. It supports science and research and provides information services and professional resources focused on Physics, Mathematics, Geography, Geology and Anthropology. It offers quiet study rooms with a view of the Botanical Garden, team study rooms for joint work, relaxation areas with comfortable sofas and a popular kitchenette where it is possible to heat up food or make tea.

LIBRARY.SCI.MUNI.CZ

# The Johann Gregor Mendel Czech Antarctic Station

## We are revealing the secrets of the white continent

Czech research started on James Ross Island, Antarctica, in 2004. The scientific station was founded here by Prof. Pavel Prosek from the SCI MUNI Department of Geography in 2007. Scientists from 50 different courses spend five to nine weeks here every year during the southern summer (December-March).

What about climate change and its effect on glaciers or permafrost? What about the ozone hole? What if a new one forms? What types of microorganisms does the white continent hide? This is just a fraction of the questions that Czech and foreign scientists are trying to answer here.

## Czech Antarctic research program

Includes atmospheric sciences, geosciences, microbiology and plant eco-physiology. The J.G. Mendel station provides for the international scientific community and services such as data acquisition or air sampling, ice, water, rocks, soils, microorganisms, plant parts and animals, without which scientists would not exist access to material for own research. The J.G. Mendel Czech Science Station is owned and operated by Masaryk University.

The northern part of James Ross Island was chosen for constructing the Research Centre.
Photo: Daniel Nývlt, MU

CARP.SCI.MUNI.CZ

“I went abroad determined that one day I would return to my home region and start developing a new research direction. Masaryk University in Brno provided me with a great opportunity to fulfil this dream. Brno, with its budging space industry, planetarium, and universities, became a centre for space activities. I like the vibe of the city, which is also conveniently close to Rožňava, my place of birth where my parents live.”

Since 2016, Norbert Werner has been an associate professor (since 2022, a full professor) in the Department of Theoretical Physics and Astrophysics, Faculty of Science, MU. In 2020, he received the MUNI Award for Science and Humanities, an extraordinary grant from the MU Internal Grant Agency. Photo: Radek Míča

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If you are interested in the brochure, contact: pr@sci.muni.cz.

PDF BROCHURES CAN BE FOUND HERE: