universität wien

# The University of Vienna's strategic priorities

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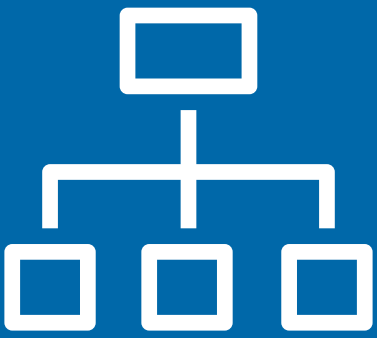
The University of Vienna aims at strengthening its position in interdisciplinary and internationally visible fields of research that are not only eligible for funding but also relevant to society in which it is rooted through the achievements of excellent academics. These strategic priorities of the University are attractive to job applicants. The priorities develop dynamically and focus on current issues: cutting-edge research and teaching.

The performance agreement between the University of Vienna and the Federal Ministry of Science, Research and Economy for the period 2019–2021, i.e. the implementation of the new university financing scheme, results in an increase of 17 percent in the University of Vienna's budget. This additional budget is used to further improve the University's research competitiveness and study conditions.

# The University of Vienna's strategic priorities

Data Science and Digital Humanities
Health and Microbiome
Society and Communication
Molecular Biology and Cognitive Neuroscience
Materials and Quantum Science

# Data Science & Digital Humanities



The University of Vienna invests heavily in the field of data science and digital humanities. With 25 new professors, it pools a high number of experts in digitisation and research on digital transformation of society across faculty boundaries. These professorships were advertised from November 2018 on and will be appointed until 2021. Funding is channelled through an increase in the university budget.

A significant increase in funding enables the University of Vienna to specifically invest in more than 73 new professorships and tenure track professorships in the coming years. It therefore sets interdisciplinary, interconnected and future-oriented priorities across faculties: Data science and other socially relevant areas such as health and microbiome, society and communication, molecular biology and cognitive neuroscience as well as materials and quantum science.

**Collection of data as a global phenomenon**

Through progressive digitisation in all areas of life, we produce data on a daily basis that will enable us to continuously develop new applications in business, industry, medicine, communication or in yet unknown areas. The global phenomenon of collecting data and the large amount of data poses new questions to the field of data science: What can this discipline do for other research areas? How does it contribute to the understanding of (societal) processes of digitisation? And what methods and models are necessary to visualise these processes?

**25 new professors – two new master's programmes**

To find answers to these questions, we need data science that works and provides education and information beyond its borders. The University of Vienna is ready to face these new challenges, thereby appointing 19 new professors in the field of Data Science and Digital Humanities. These professors will strengthen the interdisciplinary cooperation between the faculties. In addition, they allow for additional courses in the field of digitisation. Newly established are master's programmes in Data Science and Digital Humanities. There is a clear need for it: Society needs graduates who have the necessary skills to deal with the challenges of digital change.

**Networked thinking and inter-disciplinarity as success factors**

The University of Vienna is proud to have, among others, two ERC grants, five FWF START Prizes and four FWF thematic doctoral programmes and special research areas that can be thematically assigned to the field of data science. The interdisciplinary research platform Data Science@Univie has been in place since 2018 and covers methodology and application in the research fields of finance and industry 4.0, astronomy and medicine. A new focus is on the digital humanities. In doing so, the humanities and social sciences work with digital analysis methods.

The aim is to use innovative, dynamic processes such as digitisation through networks and interdisciplinarity for academic research in a sustainable way.

**New professor-ships**

- Business Analytics
- Quantitative Risk Management
- Digital Media Theory and Aesthetics
- Digital Philology
- Technosciences, Materiality and Digital Cultures
- Computational Communication Science
- Chemical Bioinformatics Network Analysis
- Data Science in Astrophysics
- Computational Terminology and Machine Translation
- Digital Education and Learning
- Security and Privacy
- Computational Medicine (in cooperation with the Medical University of Vienna)
- Mathematical foundations of deep learning
- Business Administration – Service Management/Financial Services
- Mathematical Logic Taking into Account the Foundations of Computer Science
- Statistics and Stochastic Optimisation

**Tenure track professor-ships**

- Machine Learning (2 positions)
- Statistical Machine Learning
- Partial Differential Equations in the Applied Sciences
- Data Driven Partial Differential Equations
- In silico Metabolism for Drug Discovery
- Physical Chemistry
- Algebraic Topology
- Data Mining

# Health & Microbiome

The University of Vienna invests heavily in the field of health and microbiome research. With 15 new professors, it pools a high number of experts across faculty boundaries in this area which covers the diverse relationships between living beings and their environment. These professorships were advertised from November 2018 on and will be appointed until 2021. Funding is channelled through an increase in the university budget.

A significant increase in funding enables the University of Vienna to specifically invest in more than 73 new professorships and tenure track professorships in the coming years. It therefore sets interdisciplinary, interconnected and future-oriented priorities across faculties: Health and microbiome and other socially relevant areas such as data science and digital humanities, society and communication, molecular biology and cognitive neuroscience as well as materials and quantum science.

The University of Vienna currently conducts research in the field of health and in the field of microbiome. In addition, it also researches the interface between the two areas to answer complex questions in an interdisciplinary way. The University of Vienna meets this challenge by appointing 15 new professors in this research area. The spectrum ranges from the rather medical and pharmaceutical aspect (microbial biochemistry, clinical pharmacy or public health nutrition), global health and medical law to the psychological perspective with professorships in the area of psychology of motivation, urban and environmental psychology, but also psychology of ageing and sport.

The Faculty of Psychology has been running its own research, teaching and practice ambulance since 2018, where the focus is on psychological assessment and counselling. Furthermore, academics from the Faculty of Social Sciences also explore the social dimension of health issues. Aspects related to natural sciences are covered by scientists from the fields of microbiology, chemistry and life sciences as well as from the Centre for Molecular Biology at the University of Vienna.

In early 2019, the University of Vienna established its own Centre for Microbiology and Environmental Systems Science to create an attractive organisational framework for two of its cross-faculty research specialisations and to enable intensive interdisciplinary cooperation in the field of the University's strategic priority of Health and Microbiome. The microbiome, i.e. the totality of microorganisms in a system, plays a decisive role for all ecosystems and humans. Also in this area, intensive research is conducted at the University of Vienna, also in cooperation with the Medical University of Vienna.

The University of Vienna implements joint translational research projects and operates core facilities with the Medical University of Vienna to share infrastructure. Here, cooperation ranges from imaging, research into anti-epileptics and cancer therapeutics to the previously mentioned microbiome and metabolome research. This cooperation is aimed at strengthening and deepening cooperation between the two universities, developing synergies in strategic research areas and embedding them at the institutional level. This includes effective cooperation in the Max Perutz Labs, which is a joint venture in the field of molecular biology between the University of Vienna and the Medical University of Vienna.

The erection of a separate biology centre located at the Vienna Biocenter in St. Marx by 2021 is intended to ensure that life-science research and teaching continues to be future-oriented and internationally competitive, thus creating one of Europe's most comprehensive life science clusters in Vienna.

The University of Vienna is also trying to expand high-profile research collaborations between business/industry partners and science. For the University's strategic priority of Health and Microbiome, two Christian Doppler laboratories (CD) are available at the University of Vienna. One CD covers research on taste, especially research on taste receptors involved in the perception of sweet food in the human body. Another CD laboratory that addresses entropy-oriented drug design will be founded in 2019.

## International cutting-edge research

Currently, ten ERC grants at the University of Vienna cover the topic of microbiome and health.

**New professorships**

- Microbial Biochemistry
- Motivational Psychology
- Psychology of Ageing
- Urban and Environmental Psychology
- Medical Anthropology and Global Health
- Emerging Pollutants
- Sports Nutrition
- Medical Law
- Public Health Nutrition
  (in cooperation with the Medical University of Vienna)
- Microbial Population Biology and Genetics
- Pharmaceutical Technology and Biopharmacy
- Pharmacology and Toxicology

**Tenure track professorships**

- Clinical Pharmacy
- Sports Psychology
- Terrestrial Ecosystem Science

# Society & Communication

The University of Vienna invests heavily in the field of society and communication. With 33 new professors, it pools a high number of experts in this research area covering topical challenges of high relevance in society across faculty boundaries. These professorships were advertised from November 2018 on and will be appointed until 2021. Funding is channelled through an increase in the university budget.

A significant increase in funding enables the University of Vienna to specifically invest in more than 73 new professorships and tenure track professorships in the coming years. It therefore sets interdisciplinary, interconnected and future-oriented priorities across faculties: Society and communication and other socially relevant areas such as data science and digital humanities, health and microbiome, molecular biology and cognitive neuroscience as well as materials and quantum science.

The cross-faculty research specialisation Society and Communication shares an interest in shaping human cooperation by answering questions about who we are, how we deal with each other, where we come from and how we will develop as society. To respond to the challenges that our societies face we need technical and scientific development as well as social and cultural reflection and design.

Research and teaching enrich the understanding of how society works and what holds it together, how cultural and communicative phenomena permeate coexistence and help achieve consensus, and which aspects of human coexistence are shaped by law, philosophy and religions. Cultural and geographical diversity receive special attention in this respect.

## "DNA" of human coexistence

Reflections on the present and future are enshrined in a comprehensive understanding of coexistence and cultural achievements of the past – taking into consideration a historical perspective. Professorships advertised as part of the Society and Communication focus, are, so to speak, dedicated to the "DNA" of human coexistence and interpersonal interaction, which are an indispensable foundation for questions of the future.

**New professors – new master's programmes**

The University of Vienna meets these new societal challenges and appoints 33 new professors – in disciplines far beyond social sciences, business and economics and law, such as historical and philological studies as well as philosophy and education. A plethora of topics cover globalisation and right-wing pluralism, global economic and social history, cultural heritage, urban studies, the sociology of social change and research on education and schooling.

Several interdisciplinary master's programmes that take into account digital transformation of society are newly established, such as Philosophy and Economics, Business Analytics, and Digital Humanities.

**Interdisciplinarity as a success factor**

Currently, the University of Vienna holds six renowned ERC grants in the field of philosophy, another five in historical and philological cultural studies as well as social sciences. The discipline of philosophy at the University of Vienna addresses many issues "beyond the ivory tower," which have links to current problems, such as philosophy of technology or ethical issues of artificial intelligence and robotics.

The interdisciplinary research centre Religion and Transformation in Contemporary Society was established in 2018. It explores the reciprocal relationship between religion, religiousness and transformation processes in the current global context. An independent research network creates the structural basis for value research across faculties at the University of Vienna.

The research areas of national and behavioural economics are to be strengthened by enhanced cooperation with the Institute for Advanced Studies (IHS).

The European Law Institute (ELI) is very special in this respect. The ELI is a pan-European, independent institution that is committed to improving legislation in Europe. The General Secretariat of the internationally renowned institute is located at the Faculty of Law at the University of Vienna.

**New professorships**

- International Commercial and Business Law
- Innovation and Private Law
- Globalisation and Legal Pluralism
- Social Ethics
- Global Economic and Social History
- Classical Archaeology
- Public History
- Cultural Heritage

- Historical Transregional Studies
- West Slavic Literature and Cultural Studies
- French and Spanish Literature and Cultural Studies
- China Studies
- Modern German Literature
  with a Focus on 17th and 18th-Century Literature
- Modern German Literature with a Focus on Austrian Literature
- Yiddish Literature and Cultural Studies
- Comparative Research on Education and Schooling
- Moral and Political Philosophy
- Social Psychology in the Context of Work, Society and Economy
- International Development
- Urban Studies
- Interpreting Studies with a Focus on Community Interpreting
- School Pedagogy with Emphasis on the Secondary Level
- International Law
- Comparative Politics
- Employment Law and Social Security Law

**Tenure track professorships**

- Religion and Aesthetics
- Philosophy and Didactics of Philosophy
- Romance Linguistics
- Sociolinguistics of German (German in Austria)
- Sociology
  with Focus on Quantitative Social Science Research Methods
- Sociology of Social Change
- Social and Cultural Anthropology
  with a Focus on Visual Anthropology
- Literary Translation

# Climate research

The University of Vienna invests in the field of climate research. With 5 new professors, it pools a high number of experts across faculty boundaries. These professorships were advertised from November 2018 on and will be appointed until 2021. Funding is channelled through an increase in the university budget.

A significant increase in funding enables the University of Vienna to specifically invest in more than 73 new professorships and tenure track professorships in the coming years. It therefore sets interdisciplinary, interconnected and future-oriented priorities across faculties: Climate research and other socially relevant areas such as data science and digital humanities, health and microbiome, society and communication, molecular biology and cognitive neuroscience as well as materials and quantum science.

**Climate change as a global challenge**

When Arctic ice melts and glaciers retreat, sea levels rise. Thawing permafrost releases carbon in the form of methane in large amounts. Carbon dioxide produced by human activities is making the oceans more acidic. Forest fires, whirlwinds, droughts – extreme weather events become more frequent. Climate change has become a topic between the poles of research, economics and politics and, therefore, enjoys a lot of public interest. What are the strategies to combat ongoing climate change? Generating knowledge of the climate, processing climate data and understanding climate models – these are all part of climate research. In this area of research, the University of Vienna relies on its considerable expertise in the fields of geography, chemistry and physics, microbiology and environmental systems science, biology and biodiversity research as well as business and economics and political science. It further develops this expertise by appointing new professors.

**New professorships**

- Climate Science
- General Meteorology
- Theoretical Meteorology

**Tenure track professorships**

- Environmental and Resource Economics
- Terrestrial Ecosystem Science

# Molecular Biology & Cognitive Neuroscience

The University of Vienna invests heavily in the field of molecular biology and cognitive neuroscience. With seven new professors, it pools a high number of experts in this area across faculty boundaries. These professorships were advertised from November 2018 on and will be appointed until 2021. Funding is channelled through an increase in the university budget.

A significant increase in funding enables the University of Vienna to specifically invest in more than 73 new professorships and tenure track professorships in the coming years. It therefore sets interdisciplinary, interconnected and future-oriented priorities across faculties: Molecular biology and cognitive neuroscience and other socially relevant areas such as health and microbiome, data science and digital humanities, society and communication, molecular biology and cognitive neuroscience as well as materials and quantum science.

## Molecular biology

How does life work? Research groups at the Centre for Molecular Biology as well as the Faculties of Chemistry (especially the discipline of biological chemistry), life sciences and psychology are trying to find answers to this question. At the interface between biology and medicine, researchers focus on chromosome dynamics, RNA biology or cellular signal transduction. In the field of molecular biology, effective cooperation is ensured in the Max Perutz Labs, which is a joint venture between the University of Vienna and the Medical University of Vienna. The Max Perutz Labs are a joint centre for research and education which employs 500 people from 40 nations. 60 research groups are active in basic research and teaching in the field of molecular biology.

In early 2019, the University of Vienna established its own Centre for Microbiology and Environmental Systems Science to create an attractive organisational framework for two of its cross-faculty research specialisations, and microbiome research in particular. The erection of a separate biology centre located at the Vienna Biocenter in St. Marx by 2021 is intended to ensure that life-science research and teaching continues to be future-oriented and internationally competitive, thus creating one of Europe's most comprehensive life science clusters in Vienna. Synergies exist, for example, in doctoral

education, including a planned PhD programme together with the Medical University of Vienna.

## Cognitive neuroscience

Already in 2017, the University of Vienna set a new priority in the field of neuroscience and cognitive science by advertising a high number of new professorships, such as in the field of neurobiology, neuroinformatics or neuropsychology but also in psychology and behavioural biology.

## Vienna Cognitive Science Hub

Fundamentals of neuroscience and cognitive science form the basis for research on the function and structure of the brain – in relation to human consciousness, social behaviour in society, language and knowledge. The interaction of mind and brain is one of the most exciting questions science ever raised. The University of Vienna founded the Vienna Cognitive Science Hub research network to foster the integration of neuroscience into cognition research. This research network promotes the sustainable establishment of an internationally competitive common research specialisation in cognitive science and neuroscience at the University of Vienna, the Medical University of Vienna and the University of Veterinary Medicine, Vienna.

A tangible result of the cooperation between these three universities is the Messerli Research Institute, which has a focus on animal cognition and behaviour. Furthermore, scientists at the Konrad Lorenz Research Station in Grünau are also active in the field of behavioural and cognitive biology. A new professor who explores the neuroscientific basis of human-animal interactions supports the further development of cognitive neuroscience at the University of Vienna. This should also result in joint studies offered by the participating universities.

In teaching, an international and interdisciplinary master's programme in Cognitive Science is already established. The Middle European Interdisciplinary Master's Programme in Cognitive Science (Mei:CogSci) imparts knowledge and understanding of the basic concepts of its core disciplines as well as interdisciplinary specialisation in selected areas of cognitive science. The Medical University of Vienna also participates in this English-language master's programme.

The University of Vienna is also trying to expand high-profile research collaborations between business/industry partners and science. In the field of Molecular Biology and Cognitive Neuroscience, which is one of the University's strategic priorities, a Christian Doppler laboratory (CD) is available at the University of Vienna to conduct research on structural biology and biotechnology.

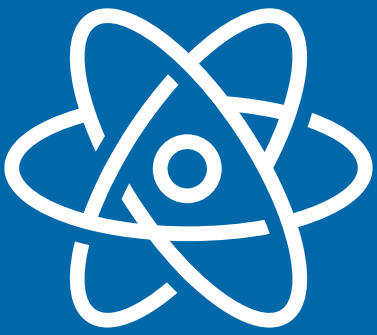
**International cutting-edge research**

Currently, more than ten ERC grants at the University of Vienna cover the topic of molecular biology.

**New professor-ships**

- Quantitative Modelling of Biological Networks
- Molecular Drug Targeting
- Advanced Microscopy and Cellular Dynamics
- Molecular Biology (together with the Medical University of Vienna)
- Cell and Developmental Biology
- Psycholinguistics
- RNA-Biology

# Materials & Quantum Science



The University of Vienna invests heavily in the Materials and Quantum Science strategic priority, thereby further pooling a high number of experts in this area. Eight new professorships were advertised from November 2018 on and will be appointed until 2021. Funding is channelled through an increase in the university budget.

A significant increase in funding enables the University of Vienna to specifically invest in more than 73 new professorships and tenure track professorships in the coming years. It therefore sets interdisciplinary, interconnected and future-oriented priorities across faculties: Materials and quantum science and other socially relevant areas such as data science and digital humanities, society and communication, health and microbiome as well as molecular biology and cognitive neuroscience.

## Quantum physics

Quantum physics is one of the theories about inanimate nature that is confirmed on a broad basis through experiments. For 120 years, it has been shaping our scientific ideas and – directly or indirectly – large areas of cutting-edge technology. Interestingly, a completely new scientific discipline has emerged from this research oriented towards basic research: quantum optics, quantum nanophysics and quantum information processing. At the Faculty of Physics, nine research groups address this topic.

The University of Vienna has become an international hub for quantum physics, embedded in a well-funded European and international funding and science landscape. Therefore, the University of Vienna participates in European projects of the Horizon 2020 programme as well as the European Quantum Flagship. Here, scientists cooperate with numerous partners like the FWF in the form of thematic doctoral programmes and special research areas, and the Austrian Academy of Sciences. Two professors at the University of Vienna hold leading positions at the latter, such as at the Institute for Quantum Optics and Quantum Information.

The University of Vienna joins forces with the Chinese Academy of Sciences and the Austrian Academy of Sciences in the QUESS project, which conducts state-of-the-art research in the field of quantum encryption.

On a national level, the University cooperates with the Vienna Center for Quantum Science and Technology (VCQ) and the Erwin Schrödinger Center for Quantum Science and Technology (ESQ).

## Materials physics

New materials are a central basis of tomorrow's high technology. What materials will work in future sensors or produce high-strength constructions? Carbon-based nanostructures such as carbon nanotubes, fullerenes, graphenes or nanostructured metals and superconductors are investigated by scientists at the University of Vienna. Computer-assisted materials research on all scales is a special focus of the University of Vienna: from atomic quantum simulation and molecular modelling to the description of long-chain polymers and soft matter.

Six research groups are currently active in the materials field. VASP, the Vienna Ab Initio Simulation Package, is one of the world's most successful software packages to simulate material properties. Due to the international market uptake, VASP Software GmbH, in which the University of Vienna holds shares, was founded in 2018.

Together with the Technical University of Vienna, scientists from the University of Vienna are conducting research in the Computational Materials Laboratory, a FWF special research area. In addition, the universities offer a joint master's programme in Materials Chemistry.

## Vienna Scientific Cluster VSC

The Technical University of Vienna and the University of Vienna are also spearheading the Vienna Scientific Cluster VSC in order to solve highly complex scientific computing tasks in the field of materials and quantum physics. Since 2019, the participating universities can already use the VSC 4.

## Christian Doppler laboratories

The University of Vienna is also trying to expand high-profile research collaborations between business/industry partners and science. In the field of materials physics, two Christian Doppler laboratories (CD) have been established at the University of Vienna. One CD covers research on magnetic sensors and materials. Another CD laboratory addresses mid-IR spectroscopy and semiconductor optics.

In 2020, an additional CD laboratory in the field of quantum physics/photon quantum computers was established.

## International cutting-edge research

Research in this field, which is one of the University's strategic priorities, relies on strategic investments from the University of Vienna, the Federal Ministry's structural funds for the higher education area,

funds from six ERC Starting Grants, three ERC Consolidator Grants, an ERC Proof of Concept Grant, two ERC Advanced Grants, six FWF START Prizes and an FWF Wittgenstein Prize. Currently, two START Prize projects as well as three ERC Starting and two ERC Consolidator Grants are ongoing. This strategic priority currently comprises 90 third-party funded projects with an average annual total funding volume of 9.6 million euros.

**New professorships**

- Low-Dimensional Transport and Nanotechnology
- Quantum Algorithms
- Computational Material Discovery
- Experimental Soft Matter Physics

**Tenure track professorships**

- Theoretical Quantum Physics
- Quantum Optics in Microscopy
- Far-from-equilibrium Quantum Systems
- Nanomaterials and Nanotechnology

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