

We foster networks

We think without borders

A portrait of a
University of Excellence

UNIVERSITÄT **BONN**

Welcome





Left-to-right:

Prof. Dr. Klaus Sandmann

Vice Rector for Learning,
Teaching and University
Development

Prof. Dr. Dr. h. c.

Michael Hoch

Rector

Prof. Dr. Birgit Ulrike Münch

Vice Rector for
International Affairs

Holger Gottschalk

Provost

Prof. Dr. Irmgard Förster

Vice Rector for Equal
Opportunity and Diversity

Prof. Dr. Annette Scheerso

Vice Rector for
Sustainability

Prof. Dr. Andreas Zimmer

Vice Rector for Research
and Early-Career
Researchers

Prof. Dr. Maren Bennewitz

Vice Rector for
Digitalization and
Information Management

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The University of Bonn in Figures

The University of Bonn is among the largest universities with the strongest track records for research in Germany. This is reflected not least in the leading positions that the University and many of its departments currently occupy in national and international university rankings. It is one of 11 German Universities of Excellence. With partner universities on six continents and research partnerships spanning some 20,000 multilateral projects, the University of Bonn is part of an extensive global network.



6,900

doctoral students

/1,730

international doctoral students



636
/81

professors

4,800
/985

research
associates



33,400
/140

students
/from different countries

4,250

degree programs completed per year

240

academic disciplines

820

doctorates completed per year



6



Clusters of Excellence

773.5

million euros
in budgetary
funding



2

palaces

176.7

million euros
in third-party research
funding



9

Nobel laureates

3

recipients of
the Fields Medal



12,238

/7,921

academic publications
/international
co-publications (2016–2019)



"We" = Excellence and Diversity

An interview with
University of Bonn Rector
Michael Hoch



Michael Hoch is the 143rd Rector of the University of Bonn and has been in office since 2015. He studied biology in Heidelberg and Paris and has taught molecular developmental biology in Bonn since 1999. Under his leadership, the University of Bonn has been awarded six Clusters of Excellence, more than any other German university. In our interview, the University Head of the Year for 2019 and Rector of the Year for both 2020 and 2021 reveals why more and more early-career researchers are being attracted to Bonn from all around the world.

What three things do you think make the University of Bonn special?

First of all: excellence in research and teaching. Many of our researchers are among the best in their field internationally, and many of our disciplines, such as mathematics, economics, agricultural science, physics and life sciences, are world-renowned. Just consider the numerous research awards that have been won here, including Nobel Prizes, Fields Medals, Leibniz Prizes, Alexander von Humboldt Professorships and ERC Grants.

Second: diversity—with regard to both the full spectrum of disciplines at our seven faculties and the variety of people from all over the world who are developing these disciplines further.

And third: the sense of “We,” which actually comes directly from our diversity. This first word of our

founding charter from 1818 can be felt more strongly today than ever. In the whole of my academic career, I’ve never yet come across another university community of researchers, teachers, students and staff from so many different countries that sees itself in this way.

With six Clusters of Excellence, the University of Bonn is the most successful of the 11 Universities and Consortia of Excellence in Germany. What makes Bonn’s own brand of excellence unique?

It comes down to the people, who achieve outstanding things in both academia and administration. The University’s management team has successfully brought them all on board in support of a common strategic goal. Needless to say, our researchers play a crucial role, and the University has to give them the necessary freedom to pursue their research driven by the spirit of curiosity. We want to do even more to attract, encourage and support precisely these kinds of researchers and other talented individuals.

Excellence is closely linked to the approach known as transdisciplinary research ...

We firmly believe that megatrends such as climate change, bioeconomics and digitalization can only be tackled successfully with innovations and interdisciplinary problem-solving approaches from the academic and scientific community. Our six Clusters of Excellence are just one example of this. With our six Transdisciplinary Research Areas (TRAs), we’ve also created spaces for exploration and innovation in a systematic

Megatrends such as climate change, bioeconomics and digitalization can only be tackled successfully with innovations and interdisciplinary problem-solving approaches from the academic and scientific community.

”

way that are tackling the big issues and challenges across faculty and subject boundaries with the help of external partners.

What do you think researchers need when they first come to a university?

Time and space to develop creativity, rapid integration into existing networks, and a private space where they and their family feel comfortable. This is why we have an excellent onboarding strategy in place: we provide support right from the start, helping new arrivals find suitable accommodation or the right school for their children, for example. And they can contact us in University management, the Rectorate and the deans of the faculties at any time.

What spaces for interaction with academic and scientific partners does Bonn offer as a research hub, beyond the University itself?

The Bonn region is among the most powerful research hubs in Europe. We have developed close partnerships with the non-University institutions based here,

including 14 Max Planck, Helmholtz, Fraunhofer and Leibniz institutes alone. The same goes for the United Nations University and the world-leading think tanks on sustainability. We're expanding these networks as part of our Bonn Research Alliance (BORA). We're also working with the strong universities in the Rhineland region, in Cologne and Aachen, and enjoy really close partnerships with other leading research universities throughout Germany and with strategic partner universities around the world.

What makes Bonn such a strong location besides its strength in science and research?

Bonn is a strong location politically, economically and culturally, and it has an international flair. People from every corner of the globe live and work here. Why should that be? Bonn is the German city of the United Nations. Some 1,000 of its staff are working here on a sustainable future, including 450 at the UN Climate Change Secretariat (UNFCCC) alone, for instance. Bonn serves as another seat of Germany's federal government besides Berlin. Specifically, this means that all federal ministries have a base in Bonn, which for some—the Ministry of Research, the Ministry for the Environment, or the Ministry for Economic Cooperation and Development—is actually their main headquarters. Bonn is among Germany's leading economic centers, not least as it's home to the DAX-listed global players Deutsche Post DHL and Deutsche Telekom. This all goes hand-in-hand with a wealth of cultural activities and recreational

opportunities that's simply fantastic. Ludwig van Beethoven, who as you know was born and assumed true greatness here, never stopped yearning to come back to Bonn.

And where should a new-comer to Bonn visit first?

That's a pretty tough question. Looking back over the city's 2,000-year history, it's clear that Bonn has always been a hotspot for writers and intellectuals, who've been inspired by a unique spirit of openness and freedom at the heart of Europe. Heinrich Heine described this spirit in great detail while he was a student here.

But, to answer your question, let me take you into our University's main building, the former palace of the Prince-Electors of Cologne. The second-floor windows offer a majestic view toward the south: with the historical old town behind us, and the Rhine flowing over to the left, the imposing Siebengebirge mountains with the famous Drachenfels hill rise up on the horizon. Straight ahead, the UN and DHL skyscrapers office towers stretch up to the sky, and right in front of us is the massive lawn of the Hofgarten. At virtually any time of year, you will find students, teachers and researchers

here, learning, musing, chatting or meeting friends on a sunny evening after a hard day's study.

Where will the University of Bonn be ten years from now?

As the latest Shanghai Rankings show, we are well within the top 100 universities worldwide. Our mission is to become an even stronger global pace-setter in and for science and research. I'm confident that we at the University of Bonn will play an active role in helping to shape the transformation processes that lie ahead of us.



On the Cutting Edge of Intellectual History

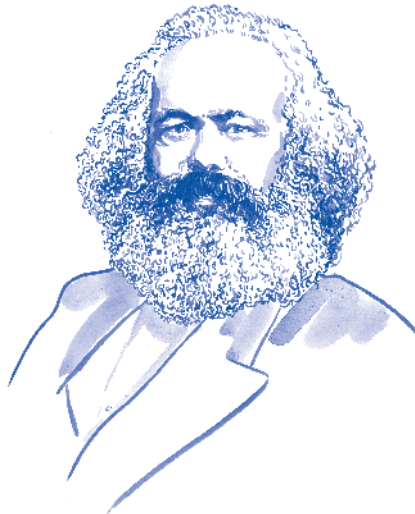
Philosopher **Friedrich Nietzsche (1844–1900)** studies theology and philology in Bonn from 1864 to 1865, though without noteworthy accomplishment. "Every other exam in secondary school was better," he would later record. He greatly appreciates Bonn's rich music history, however. Living near Beethoven's birthplace, Nietzsche lays a wreath on Robert Schumann's grave, sings in choirs, plays piano and attends many concerts and plays.

1818

The University of Bonn is founded on October 18 of the year 1818. Informed by the Enlightenment and German Idealism, the spirit of the times was embodied by humanist education reformer Wilhelm von Humboldt. Humboldt is made Secretary of Education by the **King of Prussia, Friedrich Wilhelm III (1770–1840)**, who gave the University of Bonn its official German name.

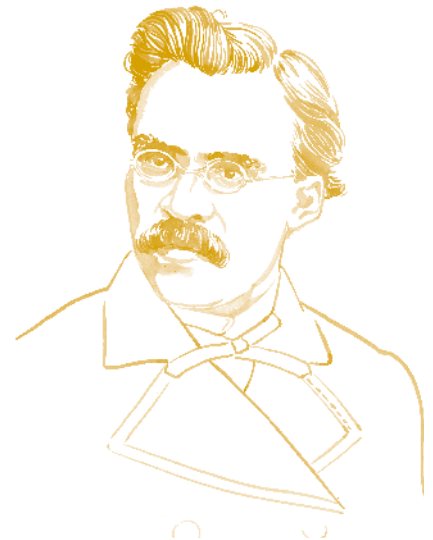
1835

Karl Marx (1818–1883), one of the fathers of Communism, commences study in the fields of law and fiscal accounting in Bonn in 1835. In June 1836 Marx spends a day in the university jail for "drunken disturbance of the nightly peace." The thinker would later move on to Berlin.



Karl Marx (1818–1883): German philosopher, economist, social theorist, political journalist—a protagonist of the labor movement and famous critic of both capitalism and religion.

1864



Friedrich Nietzsche (1844–1900): German classical philologist and philosopher.

Heinrich Rudolf Hertz (1857–1894): German physicist; first scientist to conclusively prove the existence of electromagnetic waves.



1889

Heinrich Rudolf Hertz (1857–1894) comes to the University of Bonn as a professor of physics in 1889, having rejected offers in Berlin and Gießen and even in America. Though Hertz never receives a Nobel Prize, a unit of measurement is named after him. The frequencies of radio, sound and light are all measured in hertz (Hz). Opened in 1913, the new Institute of Physics has a Heinrich Hertz Room, dedicated to the memory of Bonn's famous researcher.

A man more about practice than theory: **Konrad Hermann Joseph Adenauer (1876–1967)**, the first Federal Chancellor of the nascent Federal Republic of Germany. Adenauer passes the first state examination in Bonn in 1897 in the fields of law and political science. His overall grade: "good." Four years later, he passes the second state examination before an external board in Berlin, but this time only attaining the grade "sufficient." Adenauer would go on to demonstrate great ingenuity in his later career, in politics and other areas of his work, having secured three patents: one for wholemeal bread production, one for a stocking mending insert ball with a light inside and for a spout with movable flap that could be used on watering cans.

1897



Konrad Hermann Joseph Adenauer (1876–1967): the first Chancellor of the Federal Republic of Germany.

Maria von Linden-Aspermont (1869–1936): zoologist, parasitologist and the first German woman to hold the title of professor, bestowed by the University of Bonn in 1910.



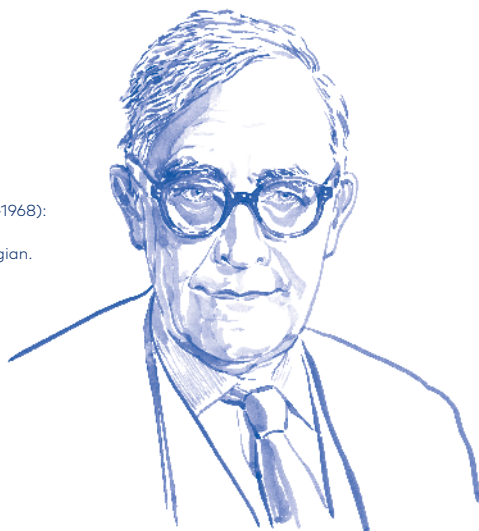
1899

After working as a scientific assistant in Halle and Tübingen for four years, **Countess Maria von Linden-Aspermont (1869–1936)** moves to the Institute of Zoology and Comparative Anatomy at the University of Bonn in 1899. By now an award-winning scientist, in 1910 she became the University's first honorary professor, making her the first woman to bear such title in all of Germany.

Li Fuji of Shanghai (1885–1947)

earns his doctorate in Bonn in 1907, thus becoming the first Chinese national to obtain an academic degree from a different country. He studies under physicist and spectroscopy expert Heinrich Kayser as doctoral adviser. Li Fuji would later return to China, where he works for the Han-Ye-Ping Corporation.

Karl Barth (1886–1968):
Swiss Protestant
Reformed theologian.



1907

1933

1934

"Every day is a new one under the sun"—a line from a poem by writer **Leah Goldberg (1911–1970)**, Jewish poet, translator, literary scholar and children's book author. Goldberg receives her doctorate at the University of Bonn in 1933 with a dissertation on the Samaritan Targum manuscripts. In 1935, Goldberg departs for Tel Aviv, where she campaigns for Palestine in the League of Nations Mandate and serves as literary advisor to the Habima National Theater.

Theology professor **Karl Barth (1886–1968)** is fired from the University of Bonn for refusing to take the civil servant's oath to Hitler in 1934, whereupon he returns to his native Switzerland. In his years in Bonn the Swiss theologian outlines a conception of God deemed radical, responding to the question of whether man can know God with a resounding "no." Barth is seen as one of the most influential Protestant theologians of the past century and a towering Swiss intellectual of modernity.



Leah Goldberg (1911–1970):
Jewish poet, translator,
literary scholar and children's
book author.

Annette Kuhn (1934–2019)

becomes a professor at the University of Bonn when the Rhineland University of Education closed in 1980. A scholar in the fields of peace research and women's studies, Kuhn was holder of Germany's first Chair for Women's History.



Annette Kuhn (1934–2019): German historian, peace researcher and women's studies scholar.

1980

1989

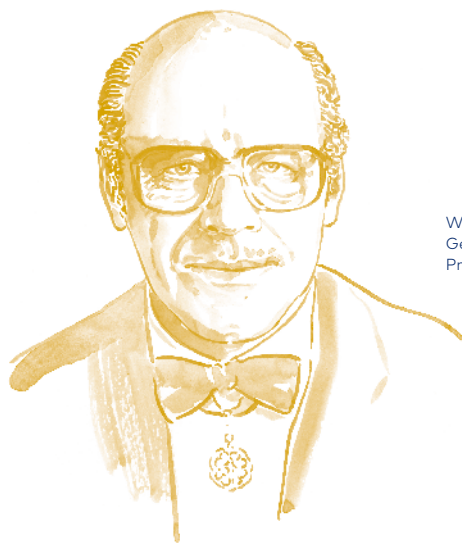
2015



Isabel Schnabel (*1971): German economist, member of the Executive Board of the European Central Bank (ECB).

Named Professor of Experimental Physics at the University of Bonn in 1952, **Wolfgang Paul (1913–1993)** receives the Nobel Prize in Physics in 1989 for his "ion trap" technology for capturing electrically charged atoms (ions) for observation.

Wolfgang Paul (1913–1993): German physicist and Nobel Prize winner in Physics.



Isabel Schnabel (born 1971)

moves over to the University of Bonn in 2015 from the University of Mainz. An economist, Professor Schnabel is a member of the German Council of Economic Experts, i.e. one of the "Five Sages" serving as advisors to the German federal government. A specialist in banking and financial crises, Schnabel has been a member of the Berlin-Brandenburg Academy of Sciences and Humanities since 2018 and of the North Rhine-Westphalian Academy of Sciences, Humanities and the Arts since 2019. She was appointed to the Executive Board of the European Central Bank in 2020, responsible for the Directorates General Market Operations, Research and Statistics.



View over Bonn towards the west with the baroque University Main Building—the former Electoral Palace—in the foreground.



Where the Future Has a Future

Bonn: a location with excellent prospects



Generosity and a love of detail, enthusiasm and despair, and freedom of thought translated into music—Ludwig van Beethoven (1770–1827) is one of Bonn’s most famous sons. His Ode to Joy was adopted as the official Anthem of Europe by the European Community in 1985. The key themes of Beethoven’s life, such as friendship, liberty and equality, are more relevant today than they have ever been.

Dominating the Bonn skyline: the Post Tower and UN building, with the UN campus in between.



Strolling through Bonn, there are many places where you will “stumble” across reminders of Beethoven the revolutionary and visionary, such as the statues in the Rheinaue, in the Redoutenpark and on Münsterplatz. Echoes of the past, they also point the way into the future.

Bonn: Germany’s former capital

Following the end of the Second World War, the Western Allies decided in spring 1948 to form a German state on the territory of their zones of occupation. The Parliamentary Council devised the “basic law”—the de facto constitution—for this new state, the Federal Republic of Germany, in Bonn between September 1948 and May 1949. This law was then proclaimed in a ceremony on May 23, 1949.

Its status as capital of West Germany gave Bonn a prominent position on the world map from 1949 to 1990, and the city would remain the seat of government for the newly reunified country until as late as 1999. To this day, Bonn is the only German city to bear the

title of “Bundesstadt,” or “Federal City.” It serves as the primary seat for six federal ministries and the secondary seat for all the others.

Home to the United Nations

As Germany’s second seat of government, Bonn became an ideal location for international conferences and environmental summits. It is from here that the United Nations (UN)—which has been based in Bonn since 1951—is working on implementing Agenda 2030. The former home of the West German parliament, known as “Langer Eugen,” now houses various UN organizations, while a total of 20 UN institutions have been concentrated on the UN Campus since 2006. Alongside Tokyo, Paris and New York, the United Nations University (UNU) also has a base in Bonn. UNU is regarded as a global think tank and the academic arm of the United Nations. Besides research, UNU is also engaged in teaching and has offered a joint Master’s degree program in Geography of Environmental Risks and Human Security in collaboration with the University of Bonn since 2013.

Bonn: a city of sustainability

Within the space of two decades, Bonn has developed into a center for global issues of the future. It has become a sustainability hub that is built around the United Nations but that also includes numerous other organizations based in the city besides the University of Bonn. The University’s Innovation and Technology for Sustainable Futures Transdisciplinary Research Area focuses specifically on the rapidly evolving sustainability debate.



In the "Beethoven Year" 2020, conceptual artist Ottmar Hörl installed his piece entitled *Ludwig van Beethoven—Ode to Joy* on Münsterplatz in Bonn to mark the 250th anniversary of the composer's birth.

My homeland, the beautiful area where I was born I still remember clearly, with all its beauty, as though I departed only yesterday. Among the most treasured moments in my life will be the time when we meet again and my eyes may glance again upon the Rhine river.

”

Ludwig van Beethoven,
to Franz Gerhard Wegeler in Bonn,
Vienna, June 29, 1801 (BGA 65).
Beethoven-Haus Bonn, Wegeler collection, W 17

Collaboration at the Innovation Campus Bonn (ICB) centers on the activities of the Bonn Alliance for Sustainability Research, which pools the efforts being undertaken on strategy, research, training and transfer formats through to events and public relations.

The Alliance was formed at COP23 in November 2017 under the overall leadership of the University of Bonn and counts five other Bonn-based institutions among its

members: the BICC (International Centre for Conflict Studies); German Institute of Development and Sustainability (IDOS); Hochschule Bonn-Rhein-Sieg, University of Applied Sciences; and the Institute for Environment and Human Security at the United Nations University (UNU-EHS).

Established global companies
With Deutsche Telekom and Deutsche Post DHL, Bonn is home to two of Germany's largest compa-

nies, world leaders in integrated telecommunications and logistics respectively. Demand for highly skilled workers and effective support for research departments is growing. International experts and researchers are working together on pioneering projects such as self-driving vehicles in logistics or on blockchain, AI and digital education ventures.

The Rhineland is also among Europe's leading regions for the chemicals industry: some 260 firms of all sizes and from all sectors—including Bayer, BASF and Shell Germany—employing over



80,000 people between them, have based themselves between Bonn and Leverkusen and have joined forces to form the ChemCologne network together with research and higher education institutions.

Now let us take another look at Bonn's history and go right back to the beginning: archaeological digs have revealed traces of settlements in what is now Bonn dating back around 70,000 years. Inhabitants built a fortified settlement on the Venusberg 6,000 years ago. "Bonna" owes its first appearance in writing to the Roman historian Florus some 2,000 years ago. The phrase "Bonna solum felix" appears in early modern Latin literature from the 16th century, and it would seem to have lost none of its relevance: "O Bonn, you blessed land."

In spring, the streets in Bonn's old town are lined with countless cherry trees in full bloom.



Issues of future global relevance— Bonn-based NGOs (selection)

ICLEI (Local Governments for Sustainability)

is a global network of cities, towns, local authorities and rural districts geared toward making tangible improvements to global sustainability through local activities (low emissions, circular economy, nature-based solutions, resilience and inclusion).

Deutsche Welthungerhilfe

is one of Germany's largest private aid organizations and is not affiliated to any political party or religious denomination. Germany's Federal President serves as its patron.

Germanwatch

is an independent development and environmental organization dedicated to the situation of particularly disadvantaged groups in the Global South. It aims to influence policymaking and global market structures that are depriving these people of their environmental and economic livelihoods on account of the Global North's hunger for resources to fuel its economies.

Fairtrade Labelling Organisation International (FLO)

comprises 28 members—25 national fair trade organizations (NFOs) and three producer networks. Also headquartered in

Bonn is Fairtrade Germany, which wants to negotiate fairer prices for smallholders' produce and decent conditions for plantation workers in developing countries and emerging economies.

Forest Stewardship Council (FSC)

is an alliance formed of representatives of environmental groups, the timber and forestry industry, social NGOs, associations of indigenous peoples and forest certification organizations as well as local forestry groups. It was set up in 1993 in the wake of the United Nations Conference on Environment and Development in Rio de Janeiro. The German members of the FSC include environmental associations such as the WWF and NABU as well as representatives from industry, business and trade unions.

International Federation of Organic Agriculture

brings together 750 member organizations from 116 countries. It aims to help implement sustainable environmental, social and economic systems worldwide in line with the principles of organic farming, to formulate international standards and to organize aid programs in developing countries.





The Desert House of the Botanic Garden is home to over 200 plant species from America, Africa and Arabia.

In the Heart of Europe

Connected with the world

The University of Bonn is situated in the heart of Europe. Those wanting to study European policy right where it is made can be in Brussels in a matter of hours. Admiring works by the Old Masters or exchanging ideas with colleagues in neighboring countries—no problem after just a short hop to Amsterdam, Leuven or Nijmegen, for example.

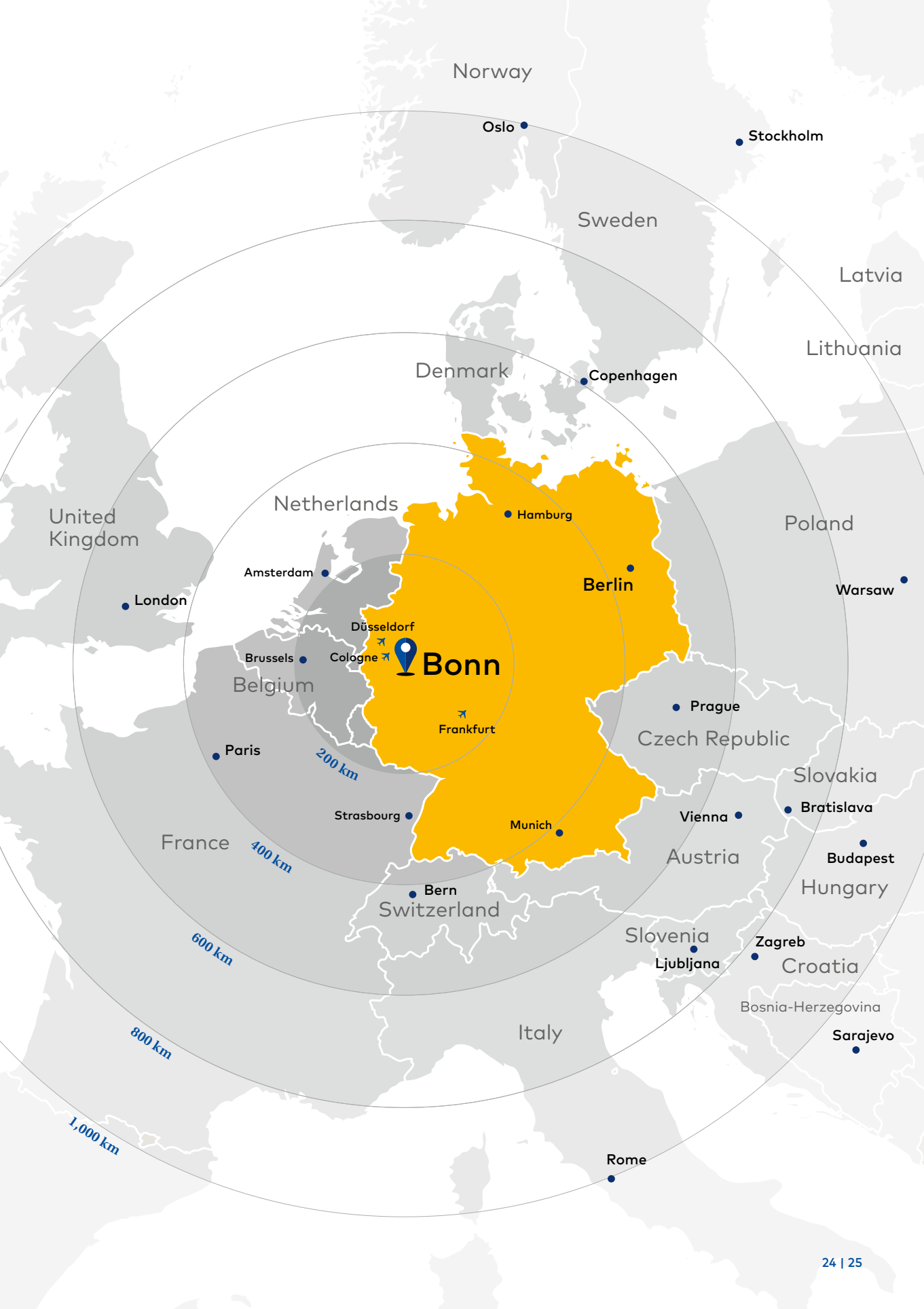
The French capital Paris, home to one of the oldest and most important universities in Europe—the Sorbonne—is just half a day's journey away. Whether they are heading for the Tate Gallery or King's College, travelers can get from Bonn to London by train in under eight hours thanks to the Eurostar.

For researchers, teachers and students who come to the University of Bonn from all over the world, the city's geographical location opens up numerous attractive possibilities for getting to know Europe's major cities. Centers of research and holiday destinations

in Northern, Southern and Eastern Europe are less than a day's train journey away, and you can even get to Vienna while you sleep on board the night train. The most popular European destinations for rail travel include Amsterdam, Antwerp, Copenhagen, Wrocław, Prague, Budapest, Zurich and Venice. Our tip: the Interrail pass, which is offered by European rail companies, enables keen travelers who live in Europe to discover over 10,000 destinations all across the continent and take the train to 40,000 stations.

This gives people a fantastic opportunity to get to know Europe even when there are not any lectures or research to be done. The beaches of the North and Baltic Sea; the rolling hills of the Ardennes, Rhön or Black Forest mountains; the fantastic hiking, climbing and skiing scene in the Alps; the laid-back flair of the Mediterranean—the sheer diversity of Europe's landscapes is simply crying out to be discovered.





Close Together

The excellent research landscape in Bonn

The University of Bonn forms part of a vibrant knowledge and research landscape that extends beyond its own walls. Numerous leading research institutes and research funding organizations have based themselves in Bonn because of the city's status as an international sustainability hub, its growing reputation as a center for science and knowledge, and its attractive location in the heart of Germany and Europe. Many researchers working at these organizations also have ties to the University of Bonn through professorships. Collaboration not competition—this is what makes the Bonn region unique as a center for knowledge.

MAX PLANCK
GESELLSCHAFT



Interdisciplinary approach to research

Bonn's academic and scientific landscape is enriched by the Max Planck Society in the form of the Max Planck Institute for Radio As-

tronomy (mpifr-bonn.mpg.de), the Institute for Research on Collective Goods (www.coll.mpg.de) and the Max Planck Institute for Mathematics (mpim-bonn.mpg.de).

The **Max Planck Society** is one of the most successful research organizations in the world, having produced 20 Nobel Prize winners since it was founded in 1948. The Max Planck Institute for Radio Astronomy is devoted to studying the physics of stars, galaxies and the entire universe. At the Institute for Research on Collective Goods, meanwhile, researchers from fields including economics, law, psychology and sociology address topics such as moral courage and economic cognition. The Max Planck Institute for Mathematics is a research institute for pure mathematics research and promotes international exchange via its internationally renowned Guest Program. The institute set up the International Max Planck Research School on Moduli Spaces (IMPRS) graduate program together with the University of Bonn. >

Aachen
92 km



Endenich
Campus



Klein-Altendorf
Campus
20 km



► For further information on the
Bonn research landscape visit
wissenschaftsregion-bonn.de



Studying the mysteries of the mind

The **Max Planck Institute for Neurobiology of Behavior – caesar** is a neuroscience research institute with two scientific sections and numerous research groups studying neural circuitry and the associated behaviors. caesar works closely with the Universities of Bonn and Cologne and established an International Max Planck Research School Graduate Program (IMPRS) for Brain and Behavior in partnership with the Max Planck Florida Institute for Neuroscience (MPFI), the University of Bonn and Florida Atlantic University. (caesar.de)



From idea to cutting-edge medicine

Some have innovative research ideas, others know how pioneering products and services for researching diseases and developing treatments need to be designed. The **Life & Brain** biomedical and neuroscience technology platform brings the two groups of experts together. The translational medical company set up by the University of Bonn and the University Hospital Bonn has been successfully pursuing this approach—the only one of its kind in Germany—since 2002. University research teams supply the ideas, while experienced staff provide support with licensing and financing options. This allows researchers to engage in entrepreneurship without having to abandon academia. (lifeandbrain.com)



Research for hope

The causes of diseases such as Alzheimer's, Parkinson's and amyotrophic lateral sclerosis (ALS) remain largely unknown to this day. The **German Center for Neurodegenerative Diseases (DZNE)**, part of the Helmholtz Association, promotes basic research in Bonn through strong scientific partnerships with the Universities and University Hospitals of Bonn and Cologne, the caesar research institute, Forschungszentrum Jülich and the Bonn-based Federal Institute for Drugs and Medical Devices. Linking clinical research to existing diagnostic services and treatments is opening up some fascinating prospects. (dzne.de)



Fraunhofer

Wanted: discoverers, visionaries, pioneers!

The **Fraunhofer Society** is Europe's largest organization dedicated to applied research. There is a Fraunhofer Institute Center at Schloss Birlinghoven in Sankt Augustin, not far from Bonn. Behind the palace's historic walls, bright minds from various disciplines are working at the interface between research and industry in three institutes: SCAI, the Institute for Algorithms and Scientific Computing (scai.fraunhofer.de); FIT, the Institute for Applied Information Technology (fit.fraunhofer.de); and IAIS, the Institute for Intelligent Analysis and Informa-

tion Systems (iais.fraunhofer.de). These institutes help businesses to optimize products, services, processes and structures and develop new digital business models. Close partnerships are in place with the University of Bonn for both research and teaching. The Fraunhofer Institutes are always on the lookout for highly skilled post-graduate and post-doctoral students to join their teams.

The Fraunhofer Institute for Communication, Information Processing and Ergonomics FKIE (fkie.fraunhofer.de) is based in Bad Godesberg, Bonn's former embassy district. Young, international teams are working on digitalization solutions aimed at bringing peace and prosperity and on effective defense strategies against new forms of cyberthreat.



IDOS | German Institute of Development and Sustainability

German Institute of Development and Sustainability (IDOS)

Poverty and social inequality, societal conflict and war, financial market instability, climate change, imperiled ecosystems—these are the issues addressed by the **German Institute of Development and Sustainability (IDOS)**, which is headquartered in the “UN city” of Bonn. Teams with an international makeup combine research, consulting and training in leading think tanks on issues of global development and international cooperation. The IDOS's research is incorporated into policymaking,

and its experts advise ministries, governments and international organizations. The IDOS is also an attractive employer and offers German and international students the opportunity to complete an internship in research and consulting or in communications. (*idos-research.de*)



Deutsche
Forschungsgemeinschaft

Center for research in Germany

As well as being Germany's main self-governing research organization, the **German Research Foundation (DFG)** is also an attractive employer for 850 people. The DFG holds nationwide competitions to find the best research projects pursued by researchers at universities and research institutes in order to provide them with significant co-financing. The foundation also supports outstanding researchers, including some in the early stages of their careers. Specific funding programs focus on interdisciplinary collaboration between researchers. In addition, the DFG is the first port of call for policymakers, with its experts advising parliaments, governments and public institutions. (*dfg.de*)



Alexander von Humboldt Stiftung / Foundation

A truly unique family

The **Alexander von Humboldt Foundation** awards Germany's most generous research prize.

Rather than projects, though, it supports individuals. The foundation awards scholarships and prizes, brings people together and helps them on their journey—every step of the way. For instance, the global Humboldt Network now numbers some 30,000 researchers from more than 140 different countries, including 56 Nobel laureates. With around 240 staff at its headquarters in Bonn and office in Berlin, the Humboldt Foundation is also an attractive employer, as its experts hold the reins of its extensive global network. (*humboldt-foundation.de*)



Deutscher Akademischer Austauschdienst
German Academic Exchange Service

Fostering a fairer global community through exchange

Back in 1925, one single student had the idea to link up people, academia and research across national borders. Today, the **German Academic Exchange Service (DAAD)** is the most important institution in Germany that funds international exchanges for students and researchers. Headquartered in Bonn, the DAAD enables over 145,000 students and researchers from all over the world every year to study, complete doctorates and work in other countries. It awards grants and scholarships, organizes exchange programs and coordinates research groups. For this work at the interface between education and research, society, culture and development, the DAAD

is always on the hunt for highly dedicated individuals looking to contribute their knowledge and skills to shape a tolerant, open and sustainable global community. (*daad.de*)



UNITED NATIONS
UNIVERSITY

United Nations University (UNU)

UNU is an autonomous sub-organization of the United Nations. Founded in 1975 to facilitate the transfer of academic expertise to international policymaking, the university acts as a think tank and “network of networks.” Besides research, UNU is also engaged in teaching and was granted degree-awarding powers in 2009. It has offered the Master's degree program in Geography of Environmental Risks and Human Security in collaboration with the University of Bonn since 2013. (*unu.edu*)



Bonn Research Alliance (BORA)

With the Bonn Research Alliance (BORA), the University of Bonn has established a network together with numerous local non-university partners in the city. The alliance has several common aims: making international appointments, setting up graduate schools, improving infrastructure and creating an outstanding environment in Bonn for living and working.





Poppelsdorf Campus, one of the largest development sites of the University of Bonn, is a modern campus boasting an innovative infrastructure.

Higher Education: at Home and around the World

A roundtable talk

Professor Birgit Ulrike Münch,
Vice Rector for International
Affairs, and Dr. Lucas Secchim
Ribeiro, post-doctoral fellow at
the Institute of Innate Immunity,
discussing the German
higher education system.

Professor Münch, the German higher education system has recently undergone some structural change and is now well on the way toward embracing a new form of diversity. What are the challenges and main priorities for German higher education policy at present?

The main challenges facing German universities boil down to three things: diversity, sustainability and digitalization. Like others, we at the University of Bonn are also working flat out on these issues to put ourselves in a good position for the future. For us in university management, this is about making ourselves more visible internationally, guaranteeing a good study experience for foreign students and being transparent about the career opportunities for postdocs and early-career researchers from other countries. We want to attract top international

talent from abroad. Eleven German universities and university alliances, including the University of Bonn, are entitled to call themselves a “University of Excellence.” It’s now a matter of showcasing our excellence to the outside world, without holding back.

Since 1999, higher education in Germany has been integrated into the so-called Bologna Process, a joint declaration by European national education ministers that is geared toward creating a European Higher Education Area. Can you explain its main features?

The Bologna Process has had a significant impact on university policy at federal level in Germany, not least as it also introduced the European Credit Transfer System. This allows students to switch universities within Europe, as everything they have achieved up to that point



Professor Birgit Ulrike Münch, Vice Rector for International Affairs (r.), and Dr. Lucas Secchim Ribeiro, post-doctoral fellow at the Institute of Innate Immunity.

will still be recognized. Needless to say, this also promotes international exchange. In addition, we currently have 10 dual degree programs running in Bonn. These are international programs that enable students to earn a degree at two universities in different countries.

Another aim of the Bologna Process is to prepare students sooner and better for climbing onto the career ladder, i.e. by integrating more practical elements into their degree programs.

Dr. Ribeiro, you earned your degrees from universities in Brazil, where you also began your academic career. How long have you been working at the University of Bonn?

I studied at the Federal University of Espírito Santo in Vitória and worked as a research fellow at the University of Minas Gerais in Belo Horizonte. I then came to Bonn in 2017.

How did you first come into contact with researchers in Bonn?

Through a research network in Brazil, I heard about a job ad posted by the University's Institute of Innate Immunity. Among the people working there is the biologist Bernardo Franklin. As well as being Assistant Professor of Immunology and head of his lab and working group, he's also a Visiting Professor at the Center for Research in Inflammatory Diseases (CRID) at the Medical Faculty of Ribeirão Preto at the University of São Paulo. I sent him my application and was hired three months later. I saw it as a great opportunity to continue my studies and my research in Germany. Bonn itself was very much an unknown quantity to me, though. But the cherry trees were just coming out in bloom when I got here. That was incredibly beautiful ...

What do you see as the main differences between the higher education systems in your home country and here in Germany?

As far as academia goes, the biggest difference between Germany and Brazil is that, back home, the profession of researcher still doesn't get the same level of recognition as it does in Germany. Salaries are fairly low until you get to postdoc level, and there's little social security. Only a handful make it as far as a professorship. Despite these tough conditions, I'm grateful to the public education system in Brazil, without which my current career in Germany wouldn't have been possible.

Professor Münch, a professorship is the pinnacle of someone's academic career in Germany too. How are people appointed over here?

A traditional appointment procedure in Germany can take two years from the time the job specification is finalized to when an appointment is actually made. This is partly because you need to ensure maximum transparency and objectivity via the appointment committees, which results in a comprehensive process. German appointment committees always include representatives from all status groups—students, non-academic staff, professors from other departments and, of course, equal opportunities officers. And you seek references from people outside the University. In other words, academics in Germany need a fair bit of staying power in order to secure a permanent professorship.

Now, however, the postdoc phase offers more potential routes to a professorship as it gives assistant professors, heads of research groups and other academics with comparable track records of independent research a pathway to the position. Tenure track professorships, for instance, allow someone to be admitted to a permanent professorship if they complete a time-limited probationary period successfully—without having to apply again or be formally appointed. This is making German universities an increasingly attractive proposition for early-career researchers from abroad.

You've also spent time at the Sorbonne and Oxford University during your academic career. What did you come to appreciate about these other countries that you'd

like to incorporate into new ideas for the higher education system at the University of Bonn?

Most of my personal experience as an art historian relates to France, where I was able to gain an insight into the work that goes on at museums, Jewish memorial sites and research institutions. What impressed me right from an early stage was how much it's seen as a given there for leadership positions to be held by women, particularly mothers to several children. Work-life balance was something that was better developed in France at that time, during the 2000s. I also built up a close network of fellow academics very early on in the U.S., where I appreciated the flat hierarchies and the acceptance shown to young female researchers. A lot has changed since then, and we've now reached this stage at German universities too. The University of Bonn has adopted its "Perspective Science" gender equality policy and has many initiatives underlining the need for diversity—in terms of both gender and culture. In Bonn, internationalization starts with the first-semester students and goes all the way up to senior professorships. This is also thanks to our strategic partnerships: we're developing joint teaching and research programs with selected universities, and the network that's growing in this way is benefiting not just early-career researchers but students as well. We are cultivating a global network with half a dozen leading universities, are part of one of the European Universities that Emmanuel Macron proposed creating in his Sorbonne speech in

September 2017, and have global ambassadors who enjoy close ties to our University through teaching or research partnerships stretching back many years.

Dr. Ribeiro, and what's your impression? Is there such a thing as the "special Bonn spirit?"

Definitely. We're an international team in the Institute who also really enjoy meeting up outside work because Bonn offers a fantastic quality of life. It has small-town charm but big-city infrastructure. We've already discovered a few of our favorite places together: the Hofgarten, the Rheinaue ... Personally, I love going for walks in the Siebengebirge, and I find the Drachenfels particularly fascinating. It's been nice exploring the area on my bike. A cycling trip from Bonn to Koblenz is something I can highly recommend.

You were talking about your international research team. Maybe you could explain your research focus to our readers in a few words ...

Our research group is studying various cellular interactions relevant to the body's innate immune system and how autoimmune diseases, for example, come to develop. These questions tie in directly with the work I did in Brazil, where I was also doing research into immunology and infectious diseases.

Professor Münch, what would you say a dynamic, high-performing higher education system needs to achieve, ignoring the issue of money for a moment?

One of the unique strengths of the German higher education system is how relevant its research is to society and how readily society accepts it. It is a prized commodity that needs to be preserved: we offer people scope to think and do research, even if their results aren't commercially viable straight away or even at all. The wide-ranging career opportunities that master's graduates have are another reason to pursue an advanced degree program in Germany.

What are the University of Bonn's unique strengths?

The success of our Clusters has shown that taking the innovative route, such as by setting up inter-

faculty research areas, is the right thing to do: the potential that's unleashed when you look beyond faculty boundaries and enter into new, unconventional research partnerships is huge. I'd say that Bonn's greatest strength lies in its international links. As the "Federal City," Bonn is the second seat of the German federal government, and it's also home to over 20 UN organizations—all this has a major influence on the University's international flavor. Many of our courses and doctoral programs are taught exclusively in English. We organize a comprehensive onboarding program for international professors, which we'll be steadily expanding over the

next few years. This makes sure they get support not only during the appointment process but also while they're getting established. Teaching in English is also being continuously developed further and bolstered by digital formats. There are many different ways to learn German, and we offer extensive support in this area. As far as international researchers coming to our University are concerned, however, academic and social skills are the main things people need to get along well with everyone, not word-perfect proficiency in the language.

Dr. Ribeiro, do you have any tips for what early-career researchers from other countries will need to get used to if they come to Bonn? What made a positive impression on you? What could still be improved do you think?

I had a very warm welcome when I arrived. The staff at the Welcome Center for International Researchers gave me a lot of support with the onboarding process here in Bonn. However, I did really need that help because I'd never have dealt with all that red tape on my own. I like German culture and the unique way they celebrate Carnival in Bonn. But I had to get used to the food in Germany at the start because I'd say that Brazilian food is spicier and more varied. I've been eating a lot less meat, though, since my arrival in Germany; that's a good thing as it's doing me good and is better for the climate. I feel very much at home in Bonn, and I'd definitely like to stay here for a few more years.



Global Partnerships



Professor Sally Mapstone FRSE

*Principal and Vice-Chancellor
University of St Andrews, Scotland*

Our partnership with Bonn is central to the University of St Andrews' international engagement. We are long-established institutions that cultivate a forward-thinking outlook that strives for the highest levels of excellence. That closely aligns our approaches to teaching and research, as well as leadership and innovation. These values manifest themselves in our quality exchange schemes, joint Masters and PhD programs, and a strong range of collaborative research projects. Bonn has been a powerhouse of teaching and research for over two centuries and we are proud to be its partner.

University of
St Andrews
(GB)

Emory
University,
Atlanta (US)



Kelly Richmond Yates

*Associate Director, Halle Institute for
Global Research, Emory University,
United States*

For an institute like ours that seeks to connect Emory to researchers around the world, the University of Bonn has emerged as a highly attractive partner with its excellent research conditions and transdisciplinary profile. The Collaborative Research Grants that we fund together have been particularly helpful in deepening the cooperation between our universities and extending it to more fields. On top of this, we are excited about the opportunity to send our researchers to a place with a special charm.



Professor Edward Nketiah-Amponsah

*Associate Professor, Department of
Economics, University of Ghana, Ghana*

I got to know the University of Bonn as a PhD student at the Center for Development Research in 2006. I especially remember the superb training in a small international group and the beautiful location on the river Rhine. Bonn is an excellent place to address global challenges like climate change and sustainability. I am thrilled that we are about to establish exchange programs enabling students from both universities to jointly work on these challenges.

University
of Ghana,
Accra (GH)



Jane Turner

*Director, International Office,
Hebrew University of Jerusalem, Israel*

HUJI and Bonn cooperate on many levels, from student exchange in the Erasmus KA171 Programme to various research projects funded by our universities or large third-party grants. Especially noteworthy is the excellent cooperation at staff level that we continue to build through diverse partner events as well as through virtual and in-person staff exchanges. The significance of the mutual understanding and trust gained in these encounters for new collaborative endeavours cannot be overestimated.



Professor Masahiko Gemma

*Vice President for International Affairs,
Waseda University, Japan*

We have been in cooperation for more than 60 years, and what we appreciate most is that our students and researchers have always been taken very good care of. Bonn offers a great range of support for students—orientation courses, language classes, individual advice and support, and the Welcome Center has been a great help for the large number of colleagues who have gone to Bonn for research visits. For our graduate students, the opportunities to present their research in an international context are extremely helpful.

The Hebrew
University of
Jerusalem (IL)



Professor Sammy Bedoui

*Director, Bonn and Melbourne Research
and Graduate School Immunosciences,
University of Melbourne, Australia*

Excellent graduate education is a top priority of the University of Melbourne. Bonn is a first choice for joint PhD programs because of the excellent research conditions that our graduate researchers find there. This is not least due to the Clusters of Excellence Bonn has set up in different research areas across various disciplines. Our joint graduate school currently has 60 students enrolled and we have already graduated 20 students with jointly awarded PhD degrees that will give them a head start towards finding interesting and rewarding positions in research and industry.

Waseda
University,
Tokio (JP)

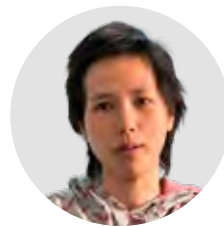
University
of Melbourne
(AUS)



Professor Seán Allan (GB)
University of St Andrews
(German studies)



Dr. Daniel Ayalew Mekonnen (NL)
Wageningen University & Research
(international politics)



Professor Ngoc Tran (US)
University of Texas at Austin
(mathematics)

Our universities complement each other perfectly, and I look forward to playing a role in promoting that collaboration in new and exciting ways.



Professor Daniel Peterson (US)
Rosalind Franklin University of Medicine and Science, Chicago
(neurology)

As a mathematician, I'd say that Bonn equals academic excellence plus freedom. The University of Bonn is the dream place to do math.



Professor Roberto Hofmeister Pich (BRA)
Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre
(philosophy)

University Ambassadors

The University of Bonn has succeeded in recruiting researchers who have spent time researching at the University and are now working at a research institution elsewhere in the world as its ambassadors, known formally as the “Bonn University Ambassadors.” In so doing, the University is strengthening its international partnerships on a sustainable basis and facilitating academic dialogue at an ever-higher level. These Bonn University Ambassadors now represent the University of Bonn in nine countries across five continents, help build networks for our University and serve as local points of contact for early-career researchers interested in coming to Bonn.



Professor Koichiro Agata (JP)
Waseda University, Tokyo
(public administration)



Professor Kikuko Kashiwagi (JP)
Kansai University, Osaka
(German studies)



Professor Nir Davidson (ISR)
Weizmann Institute of Science,
Rehovot (physics)



Dr. Christine De Nardo (AUS)
Monash University, Melbourne
(biomedical sciences)



Professor Reuven Amitai (ISR)
The Hebrew University of Jerusalem
(Islamic history)

On each visit, I've been deeply impressed by the state-of-the-art scientific facilities, equipment and infrastructure, by the joy and excitement shown by both the faculty and students, by the dedication of the support staff, by the warm relations between people and by the excellent, open atmosphere.



Professor Sammy Bedoui (AUS)
The University of Melbourne
(microbiology)

For a young, intellectually curious researcher with wide horizons who wants to benefit from innovative inter- and transdisciplinary research groups, the University of Bonn is an excellent place to spend several years after obtaining their doctorate.



Professor Petr Sedlacek (AUS)
University of New South Wales,
Sydney (economics)



Professor Tiegist Abebe (ETH)
Bahir Dar University
(plant breeding and genetics)

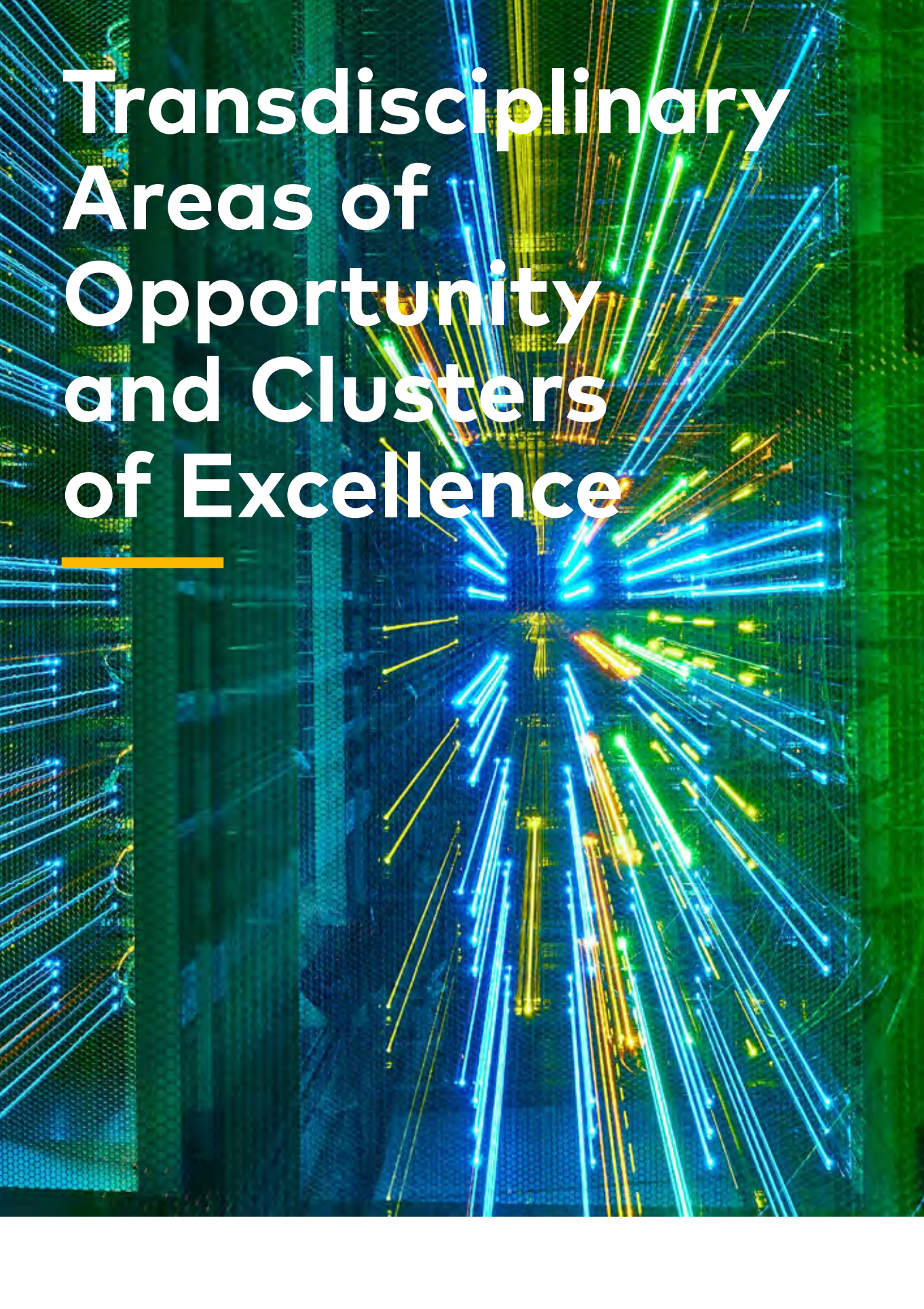
Diversity and the open-mindedness necessary to accommodate this core value, is a defining feature of the entire University of Bonn.



Professor Luma Al-Banna Al-Hawari (JOR)
University of Jordan, Amman
(plant protection)

Bonn is a place where you can achieve your dream of becoming a world-class scientist, researcher or lecturer if you work hard.

► **Further information**
uni-bonn.de/bonn-university-ambassadors



Transdisciplinary Areas of Opportunity and Clusters of Excellence

Six hundred years ago, the philosopher Francis Bacon wrote in his *Novum Organum Scientiarum* that, instead of deriving from the knowledge of individuals, science is only ever the provisional result of collective investigation. The kind of research conducted at the University of Bonn continues in this vein, albeit with the help of modern, effective structures.

Since 2016, six Transdisciplinary Research Areas (TRAs) have tackled subjects that both reflect the University's current potential for research and address some of the urgent challenges facing society. Some are of a technical nature, such as Mathematics, Modelling and Simulation of Complex Systems, while others are drawn from the humanities, such as Past Worlds and Modern Questions: Cultures Across Time and Space.

The Vice Rector for Research and Early-Career Researchers is Professor Andreas Zimmer, who is responsible for inter-university collaboration within the framework of the TRAs, implementation of Excellence Strategy measures and cooperation with non-university research organizations. "The TRAs were born out of an intensive process that lasted almost two years," he explains. Previously, the various areas of research focus had been assigned to nine faculties. However, almost all the projects had links that extended beyond the boundaries of their respective discipline. One example is the Hausdorff Center for Mathematics, the oldest Cluster of Excellence in Bonn, where economists, mathematicians, chemists, medical experts and food scientists carry out research shoulder to shoulder. Prompted by the then newly elected Rector, Professor Michael Hoch, efforts were made to identify specific research strengths at the

University regardless of what faculty they were to be found in. Intensive discussions were first held with all key stakeholders, followed by a two-day retreat with the University deans and the spokespersons for the Clusters of Excellence. Their findings culminated in a research conference in 2016, which was attended by most of the professors.

The end result was six interdisciplinary areas of research focus that work extremely effectively and productively thanks to their clear structure—complete with steering committee, spokespersons and managers—as well as substantial financial resources. "It was neither accident nor design that the TRAs should also give rise to our six Clusters of Excellence," Andreas Zimmer says. "Rather, it was a natural consequence of this successful process." As the first port of call for the TRA managers, Dr. Ines Heuer, Head of Strategic Development and Quality Assurance, provides a link between university management and the outstanding research that goes on at the University of Bonn.

"The TRAs have their own statutes but share the same governance structure. The TRAs are not in competition with the faculties and are not intended to replace them either. Rather, they create areas of opportunity in which top researchers come together across faculty boundaries."





Mathematics, Modelling and Simulation of Complex Systems

Transdisciplinary Research Area

The Mathematics, Modelling and Simulation of Complex Systems Transdisciplinary Research Area (TRA) is centered around mathematics, computer science and their application fields. In a process of interaction with empirical analyses and computer-based simulations, mathematical models are created here that do not just describe complex systems, such as in economics or medicine, but are also able to analyze them.

The researchers hard at work in the TRA Modelling include micro-economists Lena Janys and Philipp Eisenhauer, systems biologist Jan Hasenauer, mathematician Dilan Pathirana and systems biologist Elba Raimúndez.

Major social challenges and a networking platform for researchers

Among other things, they are working on integrating prediction and decision-making models about

the pandemic. “The platform [that the TRA provided] has helped us to go beyond the boundaries of our own department,” says Philipp Eisenhauer, a specialist in applied micro-economics. Jan Hasenauer, an expert in the mathematical modeling of biological systems, underlines the fact that “new, large-scale projects rely on the start-up financing that’s been granted” to get off the ground.

Factoring uncertainties into decision-making

What began as a simple exchange of knowledge has now produced numerous joint projects. These include “Uncertainty Quantification,” where researchers are working on a model that enables uncertainties in decision-making processes to be studied in detail. Modelers are frequently forced to use models that have to take a large number of uncertainties into account, often due to a lack of adequately verified data. Epidemiological models, which describe things like the effect of social distancing regulations on the spread of viruses, need

Professor Jan Hasenauer (left), Dilan Pathirana (center) and Elba Raimúndez (right) in conversation at the Arithmeum exhibition on the art of computing.



The Mathematics, Modelling and Simulation of Complex Systems TRA sees researchers from a wide range of disciplines come together to create models with major analytical potential.

”

Professor Heiko Röglin,
TRA spokesperson

to factor in uncertainties surrounding the virus's transmission rate and the trend in case numbers. Meanwhile, economic models that look at the pandemic's impact on the markets have to consider uncertainties about changing prices. Taking each model in isolation means that the uncertainties cannot be taken adequately into account as an influencing factor, and any implications derived from this may be extremely fragile.

The researchers involved are using various statistical models and machine learning strategies to investigate the uncertainties in the individual models and in the overall system created by combining them. This allows uncertainties to be accounted for in the decision-making process. “The results that we get out of this process are robust, which means that they can lead to more well-founded decision-making,” Lena Janys explains.

Analyzing the course of pandemics

The “UNCOVer” project combines elements of mathematics and epidemiology. Together with researchers and students in the fields of computer science, mathematics and biomedicine, systems biologist Elba Raimúndez and mathematician Dilan Pathirana are working on model-based analyses of the coronavirus pandemic.

“In the early days of the SARS-CoV-2 pandemic, there were only a few rather basic models for gauging what course it would take,” Elba Raimúndez explains. A series of more complex models were developed shortly afterward. However, being complex does not necessarily mean that these models also make more precise predictions. The team of researchers is now using innovative computational methods to analyze these models. Says Dilan Pathirana: “We are developing a modeling framework based on several published models, which will enable multi-model predictions of this or future pandemics, with uncertainty accounted for.”

The Hausdorff Center for Mathematics (HCM)

The Hausdorff Center for Mathematics (HCM) was the first Cluster of Excellence in mathematics to be established in Germany. It brings together researchers from Germany and all over the world who are studying all kinds of mathematical challenges and how they can be applied in an innovative way. Set up as six units, the Cluster spans a range from pure and applied mathematics through to mathematically orientated research in economics as well as interdisciplinary research, e.g. in mathematics and life sciences. Helping early-career researchers conduct independent research is one of the Cluster's key priorities. This

approach has already resulted in the HCM producing a range of outstanding researchers, as reflected in the numerous prestigious prizes that they have won. For instance, Gerd Faltings, a director at the Max Planck Institute for Mathematics (MPIM) in Bonn and a member of the HCM since its very early days, received a Fields Medal—the “Nobel Prize of mathematics”—in 1986. Peter Scholze, who became Germany's youngest university professor when he was appointed at the age of 24, was awarded the same honor in 2018. He is now also a director of the MPIM, which forms an integral part of the HCM. The HCM has

three main pillars, reflecting its fields of activity: the Hausdorff Research Institute for Mathematics (HIM) hosts research programs with international guest scientists, while the Bonn International Graduate School of Mathematics (BIGS) brings together the diverse possibilities for doctoral studies in Bonn and the Hausdorff School for Advanced Studies in Mathematics (HSM) is a training program for postdoctoral researchers. The HCM supports these three pillars and its ten research areas with several academic positions (Hausdorff Chairs, Bonn Junior Fellows, Hausdorff Postdocs) and doctoral posts.

Professor Peter Scholze is a multi-award-winning German mathematician and recipient of the Fields Medal.







Building Blocks of Matter and Fundamental Interactions

Transdisciplinary Research Area

Scientists from the TRA Building Blocks of Matter and Fundamental Interactions (TRA Matter) investigate how the building blocks of matter interact with one another and how these interactions create complex structures on all of the vastly different length scales found in nature.

Researchers from a wide range of fields are studying matter from a subnuclear and molecular level all the way up to terrestrial and astronomical length scales to steadily expand our fundamental knowledge of the natural world around us and penetrate ever further into the unknown.

Partnerships with prominent international research institutes such as the European Organization for Nuclear Research (CERN) in Switzerland and regional organizations such as the Max Planck

Institute for Radio Astronomy, the Max Planck Institute for Neurobiology of Behavior (caesar) and Forschungszentrum Jülich play a crucial role in the high-level foundational research being conducted at the University of Bonn.

The art of measurement

The work of Professor Simon Stellmer from the TRA Building Blocks of Matter and Fundamental Interactions is dedicated to the art of measurement. His Quantum Metrology research group at the University of Bonn's Institute of Physics is pursuing ways to enable faster, more stable and more precise measurements than have ever been possible. Professor Stellmer and his ten-strong team are currently building a passive ring laser gyroscope, drawing on the science of quantum optics. Students and researchers in the fields of quantum physics and geodesy started out with preparatory studies and laboratory planning back in 2018, and a prototype of this highly sensitive laser measuring instrument has now been built.

Professor Simon Stellmer, winner of the Fulbright-Cottrell Award, is constantly developing innovative ideas for student education.



“Radio telescopes are already capable of measuring the position of the Earth’s axis of rotation to within a few millimeters, and the period of the Earth’s rotation with an accuracy of as little as ten microseconds,” explains Professor Stellmer. However, such measurements, which can only be taken if the conditions are optimal, provide no information about changes in the Earth’s rotation over short time scales. What happens between starset and starrise?

The advantages of passivity

To obtain information on rapid changes in the Earth’s rotation, researchers want to make measurement more local, affordable and continuous. Laser gyroscopes are not a new invention—these rotation sensors have been installed in aircraft, spacecraft and even robots since the 1990s. Stellmer’s research group, however, is taking a new approach by building a passive laser gyroscope in which the laser source required for the precise measurement is outside

rather than inside the sensor. This has the advantage of preventing the light source from interfering with the system, affording greater sensitivity and more stable gyroscope operation. Measurements can also be cross-referenced with optical atomic clocks that are capable of measuring time to 18 decimal places. None of the active gyroscopes used to date have any of these capabilities.

But how does mankind benefit from being able to measure the Earth’s rotation precisely down to the nearest nanosecond? “Continuous measurement fills the nearly unbridgeable gaps inherent in astronomical methods,” Stellmer explains. More precise information on geodynamic effects would be valuable and would, for example, finally allow sometimes conflicting astronomical models to be validated. The geosciences would benefit from having a precise yet inexpensive measuring instrument that could be used to study the coupling between the

Earth’s crust and atmosphere, among other things. Such an instrument would also be of interest to climate researchers, affording them a better understanding of large mass transport effects such as mountain snowfall, the melting of the polar ice caps and rising sea levels.

Stellmer will be expanding his team over the next few years and is therefore interested in receiving applications from suitably qualified German and foreign students for this gyroscope project, which will be keeping researchers busy for years to come. Professor Stellmer was named the recipient of last year’s Fulbright-Cottrell Award for excellence and innovation in teaching in the fields of quantum physics and geodesy.

His research is being supported by funds from the German Excellence Strategy as part of the TRA Building Blocks of Matter and Fundamental Interactions at the University of Bonn.

Matter and Light for Quantum Computing (ML4Q)

The hardware used in information technology applications has become increasingly tiny and more powerful in recent times. However, this miniaturization of computer hardware will soon reach its limits. Technologies based on quantum physics offer a potential route to a solution. In the ML4Q Cluster of Excellence, a consortium of researchers from the Universities of Aachen, Cologne and Bonn and Forschungszentrum Jülich have been researching new technologies since 2019 that are designed to meet the rising de-

mand for novel computing principles that can tackle hitherto unsolvable problems. The consortium's partner institutions are the University of Düsseldorf, the Fraunhofer Institute for Laser Technology ILT in Aachen and the Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR in Wachtberg.

ML4Q pools its partners' unparalleled expertise in three key fields of physics (solid-state research, quantum optics and quantum information) to create the best possible hardware plat-

form for quantum information technology and blueprints for a workable quantum information network. The researchers believe that computers based on the principles of quantum mechanics could be used in areas such as materials research and pharmaceuticals. Quantum cryptography can also be used for tap-proof communication, thus enabling secure communication for the future. ML4Q comprises a network of about 50 research groups with top-level researchers from over 20 countries.

The University of Bonn's internationally recognized expertise in quantum optics is helping ML4Q to achieve its mission of creating blueprints for a functioning quantum information network together with solid-state physicists and quantum information experts from Aachen, Cologne, Düsseldorf and Jülich.



Life and Health

Transdisciplinary Research Area

What mechanisms make life possible? How do minuscule molecules interact within complex structures? In the Life and Health Transdisciplinary Research Area (TRA), researchers from the fields of medicine, biomedicine, biology, pharmacy, food sciences, chemistry and mathematics are laying the foundations for a better understanding of diseases and the development of new treatments.



Professor Elvira Mass (left)
and Professor Dagmar
Wachten (right) in the
research laboratory at the
University of Bonn's
LIMES Institute.

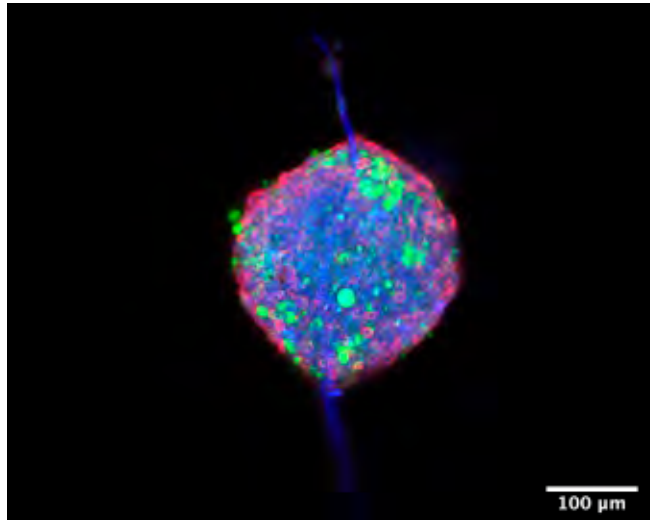


Professor Dagmar Wachten and Professor Elvira Mass each lead a research group at the University of Bonn. They have formed a team of students, doctoral students and postdocs, combining the expertise from their respective research fields to culture white fat cells in Petri dishes. The two biologists want to find out how adipose tissue, the most common type of body fat, is structured and develops. Entitled “Fat in a Dish—Decoding Cellular Crosstalk in Adipose Tissue,” the project focuses on the interaction between tissue macrophages and fat cells.

Revealing the secrets of the big eaters

“We already know that these cell types influence each other, but we’re still in the dark about how the crosstalk works,” explains Professor Elvira Mass from the LIMES Institute at the University of Bonn, who won the Paul Ehrlich and Ludwig Darmstaedter Prize for Young Researchers in 2021. Research findings on the behavior of white blood cells called macrophages, which is Greek for “big eaters,” are her contribution to the project. Professor Dagmar Wachten from the Institute of Innate Immunity at University Hospital Bonn specializes in research into

Organoid from
adipose tissue.



cilia, hair-like cell protuberances that have important signal processing functions. Using optogenetic methods, genetically encoded biosensors, high-resolution microscopy, mouse genetics and biochemistry, she has already made great advances in understanding cell-to-cell communication. Both researchers have been able to develop and expand their expertise during lengthy stays abroad: Professor Wachten was a junior research fellow at the University of Cambridge, and Professor Mass attended King's College London, worked at a cancer research institute in New York and took part in an exchange with Waseda University in Tokyo. When their paths crossed again at the University of Bonn after many years, they found they shared a great enthusiasm for transdisciplinary approaches to research. "The Transdisciplinary Research Area is an ideal environment for building on the findings we've obtained so far in a joint

If researchers succeed in decoding the underlying mechanisms of life, this will pave the way for understanding diseases better and developing new treatments.

”

Dr. Meike Brömer,
TRA Manager, Strategic Development
and Quality Assurance Unit

project with support from physics, medicine and computer science experts," Wachten says.

Hope for obesity sufferers

Fat in a Petri dish may not sound like a particularly complex thing on the surface. While organoids such as "mini-brains," "mini-livers" and "mini-kidneys" have already been created, however, culturing fat tissue has not been possible until now. If the research team succeeds in creating repro-

grammable fat cells, they will then be able to test reactions, create an extensive database and test drugs that may help sufferers from obesity and serious secondary diseases such as diabetes and inflammation further down the line. Professor Mass says: "Culturing fat in Petri dishes will enable us to study individual cells of many different kinds systematically to find out where dysfunctions occur and what drugs may support healthy cell communication."

ImmunoSensation²

A groundbreaking new understanding of the functions of the human immune system and the establishment of two biotech spin-offs are just two of the resounding successes achieved by researchers working in the ImmunoSensation Cluster of Excellence.

University of Bonn researchers are now beginning a new chapter in this success story in a sequel project entitled ImmunoSensation²—The Immune Sensory System, with over 400 researchers and other experts working together on fundamental questions in the field of immunology. “We have made tremendous advances

in understanding medicine as a whole. There is no form of disease, trauma, injury, heart attack or tumor in which immune system mechanisms do not play a key role,” explains Professor Gunther Hartmann, Director of the Institute of Clinical Chemistry and Clinical Pharmacology at the University Hospital Bonn.

This new era was unlocked by researchers who stopped seeing the immune system merely as a defense system. “We are asking research questions that frame the immune system as a system that supplies our organs and significantly influences how they work,” adds Professor Waldemar

Kolanus, Director of the Life & Medical Sciences Institute (LIMES) at the University of Bonn. While the focus used to lie on basic research, particularly into the innate immune system, it is currently on mechanisms of “immune intelligence.” How does the body manage to adapt its immune response to highly specific situations and “remember” what it has learned so it can be ideally equipped for similar challenges in the future? These are all insights that will be especially helpful in predicting and treating autoimmune diseases as well as for chronic infections, arteriosclerosis, diabetes, tumors and Alzheimer’s disease.

A team of researchers from the ImmunoSensation² Cluster of Excellence in the Biomedical Center at the University Hospital Bonn.







Individuals, Institutions and Societies

Transdisciplinary Research Area

We are all part of society. But how do we influence this society as people, as individuals? And how does it in turn affect us? What role do institutions play in this? And how can institutions be designed in such a way that equal opportunities and social cohesion are sustainably ensured in the age of globalization and digitalization?

Within the Transdisciplinary Research Area Individuals, Institutions and Societies, members of the Faculty of Law and Economics, the Faculty of Arts and the Faculties of Protestant and Catholic Theology are researching these questions with the help of colleagues from the Faculty of Mathematics and Natural Sciences and the Faculty of Medicine. One of this TRA's focus areas addresses various phenomena related to digitalization and artificial intelligence (AI) from the point of view

that an overarching AI strategy must always take into account trends in computer science and engineering in the context of social, political and philosophical issues.

Applied ethics in AI

"The TRA Individuals, Institutions and Societies is the ideal framework for the kind of philosophy that we want to explore in Bonn," says Professor Markus Gabriel from the Chair of Epistemology and Modern and Contemporary Philosophy. A philosophical education, he says, teaches methods of thinking and analyzing, while dialogue with all the other disciplines opens up new perspectives and opportunities to establish applied ethics in AI. With its new Alexander von Humboldt Professorship for Applied Ethics of Artificial Intelligence, the University of Bonn intends to foster outstanding research in human-centered AI in Europe. The University has managed to recruit Professor Aimee van Wynsberghe for the position. The Canadian brings



For Professor Markus Gabriel, dialogue with all the other disciplines brings in new perspectives and potential approaches for making applied ethics an established part of AI.

unique expertise to the research team: building on her studies of information and communication technology and robotics, as well as her practical experience in the developing of applications for care and service robots, she has spent years focusing on existential questions about the ethics of technology. “How do experts train AI systems, how do AI systems recognize patterns, and how do AI systems influence human behavior in their turn? These are the key questions we’re asking ourselves,” Aimee van Wynsberghe explains. It is not only a question of analyzing problems, she says, but also finding solutions, such as an ethical framework that shows engineers how to develop technically perfect AI machines that take into account aspects such as equal opportunities, diversity or sustainability.

AI's unique status in human-machine communication

According to the researchers, AI systems never exist in complete independence or autonomy. They

are based on mathematical variables, are trained by programmers using specific feedback roles and interact with human beings. The research focuses on the unique status of AI within this human-machine communication.

AI systems already play a leading role, not only in the digital economy, but also—and in particular—in sectors such as the automotive industry, medicine and finance. AI is faster and more precise than humans in many areas. However, as its benefits increase, so does society’s mistrust: the systems often seem too complicated, too intransparent and too manipulative. How can the gap between knowledge-based expertise and acceptance by society be narrowed?

Aimee van Wynsberghe and Markus Gabriel have already taken numerous pertinent steps to explore these and other issues and launch debate: for instance, Stiftung Mercator funds the part-

nership between the Universities of Bonn and Cambridge to the tune of €3.8 million as part of a project entitled “Desirable Digitalization: Re-Thinking AI for Just and Sustainable Futures.” At the same time, a new journal called “Philosophy and Ethics in the Digital Sphere” was founded and a Sustainable AI Lab was established at the Institute for Science and Ethics.

Aimee van Wynsberghe advises organizations including the European Commission, helped to set up the Netherlands AI Alliance and is a member of the World Economic Forum’s Global Futures Council on Artificial Intelligence and Humanity. As part of a flagship project, Professor Markus Gabriel is currently working with experts from other departments at the Fraunhofer Institute for Intelligent Analysis and Information Systems (IAIS) on the development of standards for AI systems and models for auditing these standards, which will form the basis for a new certification system.

ECONtribute: Markets & Public Policy

Markets are central to the functioning of modern societies, because they coordinate the economic activities of millions of individuals and companies and are a source of prosperity. But markets can also fail: if market prices do not properly reflect the damage inflicted on the environment by economic activities, efforts to prevent climate change are undermined. A traditional economic approach might see social costs reduced and market outcomes corrected by means of taxation or government regulation.

Besides this form of market failure, however, markets may cause additional politically or ethically undesirable outcomes, such as exacerbating inequality. Structural changes in the economy and society, such as digitalization and the global financial crisis, have also given rise to new kinds of problems that are, at best, difficult to tackle with a traditional view of market failures.

The 130 or so scientists in the ECONtribute Cluster of Excellence develop innovative solutions following an interdisciplinary research approach. Working systematically, they combine

insights from economic theory, behavioral economics, psychology, political science and law in an analysis of markets and public policy. This is geared toward developing appropriate potential solutions to urgent challenges facing society such as globalization, digitalization, major financial crises, climate change and political extremism. The Universities of Bonn and Cologne are bundling their research activities under the umbrella of the Reinhard Selten Institute (RSI). ECONtribute is promoting dialogue between top-level researchers, politicians and the general public.

Markets are an essential part of modern societies. If they work, then they coordinate the economic activities of millions of individuals and companies.







Past Worlds and Modern Questions: Cultures Across Time and Space

Transdisciplinary Research Area

The goal of the Past Worlds and Modern Questions Transdisciplinary Research Area is to view history as an interconnected whole rather than a series of individual data points while also identifying global structural trends. Researchers in this area study issues of cultural, political, social and economic significance, analyzing text collections and objects that bear witness to the past, from artworks through to weapons and other everyday items.

A rich period for historians to study

Professor Bethany J. Walker, former Deputy Director of the Annemarie Schimmel Kolleg at the University of Bonn and Director of the Islamic Archaeology Research Unit, became fascinated with the Mamluk Sultanate while she was still a student. Located in what is now Egypt and Syria, this Muslim state

was run by a political elite that governed through the medieval Islamic institution of military slavery in the 13th to early 16th centuries. “It was a very small and frankly ugly collection in a museum that first got me interested,” she recounts. “It turns out that the Mamluk Sultanate is a very rich period for historians to look at, so I’m very glad I chose it as a research focus.” It was a period during which the Middle East became global. Military history, architecture and everyday objects provide intriguing insights that also afford a better understanding of the structures in the region that are still apparent today.

In 1998, the historian and archaeologist joined the ongoing U.S. digs under way at Tell Ḥesbân, a site located in modern Jordan, which she has now led for several years. The area around Tell Ḥesbân has been the subject of investigation since 1968, initially as a source of insights into the Roman (Christian) and Byzantine periods. Walker and

The Ad Deir Monastery in Petra, Jordan's "city in the rock," was built by the Nabataeans in the first century AD.



her team focused on the phases of Islamic settlement up to the Ottoman period. Armed with this unique knowledge, she came to the University of Bonn as a professor in 2013, finding the Annamarie Schimmel Kolleg an ideal environment for specializing further in her research. She went on to conduct further field studies at Tell Ḥesḅân with an interdisciplinary team. For Professor Walker, creating opportunities for students to do work and research at excavation sites is of tremendous importance: "The University's Transdisciplinary Research Areas and status as a University of Excellence give my students some unique possibilities for developing themselves further and finding their own way in science and research with an open mind."

"Betty" the cooking pot keeping researchers busy around the world

The research team made a sensational find during a field study in 2018 that is still being analyzed by

experts in multiple fields today: a cooking pot. This 14th-century crock pot, christened "Betty" after the iconic Betty Crocker from the U.S. advertisements for baking products, still contained remnants of the last meal eaten by the building's inhabitants before it came under cannon fire. Botanists from the U.S., Greece and Berlin who were working on

The University's TRAs and status as a University of Excellence give my students some unique possibilities for developing themselves further.

”

Professor Bethany J. Walker,
Deputy Director of the
Annamarie Schimmel Kolleg
and Director of the Islamic
Archaeology Research Unit

the project came to Bonn to take samples of "Betty's" contents. The macrobotanical residues provided information on some of the spices, oils and methods used to prepare the meal, and Arabic-language cookbooks from the 16th century filled in the gaps. This example shows just how tangible history can become when researchers go off the beaten track.

Bonn Center for Dependency and Slavery Studies (BCDSS)

Researchers from across the humanities and social sciences come together at the international Bonn Center for Dependency and Slavery Studies (BCDSS) to analyze the phenomenon of slavery and other forms of strong asymmetrical dependencies. Their research is subject-led as well as inter- and transdisciplinary and spans epochs, regions and cultures.

For a long time, research into slavery has focused almost exclusively on dependency relationships in the Americas or antiquity. To broaden the scope of their investigation, researchers at the BCDSS also explore slavery-like structures beyond these regions and across all time periods. Furthermore, they consciously shift their focus away from the “slavery or freedom” dichotomy, a concept originating from the European history of ideas that obstructs our view of the multifaceted forms that

dependency takes. Instead, they have come up with the key concept of “strong asymmetrical dependency,” leaving more room for transcultural comparisons and taking into consideration further forms of human oppression such as serfdom, debt bondage, forced and child labor, human trafficking, domestic violence and sexual exploitation. The BCDSS thus questions established definitions of dependency and identifies new categories for grasping the universal phenomenon of human oppression.

The BCDSS provides the institutional framework for the Cluster of Excellence entitled Beyond Slavery and Freedom. Asymmetrical Dependencies in Premodern Societies, which is one of only three Clusters of Excellence in the humanities in Germany. It also offers two master’s degree programs taught in English: Slavery Studies and Dependency & Slavery Studies.



Etruscan terracotta drinking cup shaped like a Black African boy's head.





Innovation and Technology for Sustainable Futures

Transdisciplinary Research Area

Uniquely, research within the Innovation and Technology for Sustainable Futures Transdisciplinary Research Area is conducted with partners at the interface between science and policymaking, such as the Bonn-based UN Organizations.

The TRA Sustainable Futures researches institutional as well as science and technology-based innovations that strengthen sustainability, prioritizing strategic challenges in areas such as demographic change, poverty, nutrition and health, environmental and climate change, and the overexploitation of resources. In seeking progress toward the UN Sustainable Development Goals, TRA Sustainable Futures takes a trans- and interdisciplinary approach that is focused on finding solutions and integrates foundational research. Its members are active contributors to global networks and cooperate with the UN Organizations located in Bonn.

Unbureaucratic, uncomplicated, swift

The University of Bonn's Transdisciplinary Research Areas allow research work on issues of urgency to be launched rapidly without a lot of red tape, as demonstrated by the project entitled "COVID-19 Risks and Innovations for Sustainable Livelihoods in Ethiopia."

Shortly after the outbreak of the pandemic, an international research group from the University of Bonn applied for funding from the TRA Sustainable Futures in April 2020 for a project aimed at studying some of the impacts of COVID-19 on Ethiopia. The objective was to understand how vulnerable population groups in rural communities had been affected by the pandemic and the related containment measures and how they were responding to the crisis. On the team were: the two Ethiopians Dr. Million Gebreyes and Dr. Girma Kelboro Mensuro from the Department of Geography and Center for Development Research (ZEF) respectively, both research assistants; Professor Müller-Mahn,



Farmers on a high plain in Ethiopia.

The University of Bonn has staff all over the world who are connected up digitally. This was the only way we were able to complete this important project during the pandemic despite the travel ban.

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Professor Detlef Müller-Mahn,
Professor of Development Geography
at the Department of Geography
at the University of Bonn

Professor of Development Geography at the Department of Geography at the University of Bonn; and doctoral student Annapia Debarry. With both Germany and Ethiopia under lockdown and international flights suspended, Dr. Gebreyes was not allowed to leave his second home in Ethiopia as the project was getting under way, while Dr. Mensuro had just landed back in Germany after holding meetings with colleagues in Ethiopia. In light of the situation, the members of this geographically dispersed team mobilized their excellent contacts to get a project study moving without delay.

Robust international network

Dr. Gebreyes was able to bring two local doctoral students on board for the study within just a few days of initial funding being released by TRA Sustainable Futures. A telephone survey of 120 farmsteads was then conducted with their help and soon completed. The only reason this approach had even been possible in the first place mid-crisis was that a household survey had been completed a few months earlier by the team led by Professor Müller-Mahn and Dr. Gebreyes, for a DFG study of relationships between water, energy and food production. “At the time, we’d also noted down the cell phone numbers of the respon-

dents in case we needed to clarify anything afterward,” Müller-Mahn recounts. When the pandemic measures began to be loosened, on-site focus group interviews and qualitative target group surveys were conducted alongside the telephone survey, applying the relevant protective measures, of course. The situation of women was a main focus, which was addressed by doctoral student Annapia Debarry, a specialist in gender studies, together with her Ethiopian research assistant Meseret Tsige Abebe. While not all of the transcription, data collection and analysis for the project has been completed, it is already apparent how the virus is also having a very significant effect on the living conditions of Ethiopian women. For example, when the rural healthcare system collapsed for a time, they found themselves more reliant once again on traditional medical knowledge and help from neighbors to care for the sick, infants and pregnant women, among others. The disruption of supply chains and market systems also seriously impacted living conditions in rural areas. This is the subject of further investigations, for which more DFG funding has now been secured thanks to the initial funding provided by TRA Sustainable Futures.

PhenoRob— Robotics and Phenotyping for Sustainable Crop Production

PhenoRob is the only Cluster of Excellence in the agricultural sciences in Germany. Researchers from the University of Bonn are conducting fundamental research into pioneering crop technologies together with Forschungszentrum Jülich. The Cluster provides a platform where high-profile researchers, Junior Research Group Leaders and doctoral students can tackle some of the challenges facing society in an interdisciplinary and international setting—aiming to usher in a major shift toward sustainable, resource-efficient

crop production. This is extremely pertinent for a number of reasons: the world's population is constantly growing. The amount of arable land is limited. The use of agrochemicals is polluting the environment and thus harming biodiversity. Climate change is posing additional challenges to farming. Heiner Kuhlmann, Professor of Geodesy and Geoinformation and one of the spokespersons for the Cluster, says: "The demand for sustainable raw materials is rising; we are facing global changes that can only be successfully overcome with new technologies." Producing enough food, feed and the like while reducing agriculture's environmental footprint is one of the biggest challenges facing humanity. Cyrill Stachniss, Professor of Photogrammetry and also spokesperson for PhenoRob, adds: "Combining large-scale data collection with analysis performed by autonomous robots is giving us completely new opportunities to make a lasting change to crop production."

Robots in the field: PhenoRob uses technologies to monitor and analyze plants so that they can be better understood and treated in a targeted way. This enables researchers to record key parameters such as plant growth, soil conditions, biodiversity and the atmosphere.





Anatomisches Institut

In the foreground: one of the first research buildings from 1872. The Institute for Anatomy makes for a charming contrast to the modern Research and Technology Center for Detector Physics, opened in 2021.



3 Questions for ...

**Professor Maarten Jansen,
Distinguished Professor Emeritus**

Professor Maarten Jansen has been researching the cultural heritage of the indigenous societies of Mexico and Mesoamerica since the 1970s. He is a world-renowned specialist in the iconography and visual arts of pre-Columbian cultures in particular. He has been enriching the University of Bonn's team of professors since the start of the 2021 summer semester as a Distinguished Professor Emeritus.

Distinguished Professors Emeriti are retired professors from all over the world who are keen to spend two years researching and teaching at the University of Bonn. What is it about your role in Bonn that excites you?

I still get enthusiastic about my areas of research and, after all, I'm not exactly putting my feet up by taking this emeritus position. I think it's a great privilege to have this opportunity to continue my work together with younger researchers and students, especially with such an inspiring community of researchers as here in Bonn. Bonn has an outstanding reputation for both anthropology of the Americas and archaeology. I see a lot of common ground between my research and what's going on here and some fantastic opportunities for us to complement

one another. While I've focused mainly on the visual arts and pictographic writing systems of the Aztecs, Bonn is famous for its research into Maya scripts. Now we're putting our heads together to compare our research work and find some new angles.

The University is hoping that your work will bring a further boost to scientific excellence and the Past Worlds and Modern Questions Transdisciplinary Research Area. How are you intending to meet these expectations?

Through my numerous research visits to Mexico and the many years I've spent working at Leiden University, I've built up a network of specialists and researchers in the field of indigenous studies. I'd like to bring these researchers together with the experts in Bonn. I firmly

believe that decoding the traditional scripts will also give us a better understanding of the world we're currently living in. Up until now, research into indigenous cultural heritage has been heavily influenced by the colonialist perspective. If we succeed in "hearing the original voices of the Aztecs and Maya," it'll give us a better understanding of the rights of indigenous peoples in the present day. We can make it easier for indigenous children today to learn about their true cultural heritage. Another research angle that links the past to a question of contemporary relevance

relates to the spiritual relationship between indigenous cultures and the natural world, their wealth of environmental knowledge and how they treat resources with respect. As we know, this kind of worldview has become more important to us too over the last 10 to 15 years. It now serves as a counterbalance to our self-centeredness and has to be taken seriously.

How are you starting your work in Bonn—with lectures and seminars?

I gave an initial lecture at the University of Bonn with Gabina

Aurora Pérez Jiménez, an indigenous studies scholar, in February 2021. This is followed by a series of seminars and lectures in the summer semester. Right now, we're having weekly research meetings. We've set up a research group with experts from various faculties at the University and are reaching out to doctoral students and postdocs, who tend to elevate projects like this to a high standard through their hard work and dedication. I'm really looking forward to exchanging ideas and opinions across disciplinary boundaries.

Professor Maarten Jansen is Distinguished Professor Emeritus and an expert in Mesoamerican studies at the Department of Archaeology and Cultural Anthropology, which is part of the Department for the Anthropology of the Americas.



A Wealth of Study Options

The University of Bonn is a full-fledged classic university of the arts and sciences that boasts a strong track record in research and covers a broad range of subjects. Its seven faculties offer students a choice of close to 240 degree programs, from agricultural science and mathematics through to media studies and dentistry, and qualifications including bachelor's and master's degrees and the state examination.

The seven faculties

- 1. Faculty of Mathematics and Natural Sciences**
degree programs including biology, chemistry, computer science, mathematics, disaster management and physics
- 2. Faculty of Medicine**
study options in medicine and dentistry
- 3. Faculty of Law and Economics**
degree programs including law, economics and both combined
- 4. Faculty of Arts**
degree programs including English, archaeology, art history, Asian studies, psychology and media studies
- 5. Faculty of Agriculture**
study options including agricultural sciences, human nutrition, nature conservation and landscape ecology
- 6. Faculty of Catholic Theology**
study options including Christian social studies, canon law and liturgy
- 7. Faculty of Protestant Theology**
degree programs including Protestant theology, teaching degrees for secondary schools, and ecumenical studies

More than 13.3% of students at the University of Bonn come from abroad, meaning that 4,500 young people from a total of 140 different countries are studying in the city on the Rhine. Many bright minds are drawn to Bonn on account of its status as a University of Excellence but also by the high standards it sets for the quality of its teaching. The link between research and teaching plays an important role even during the first few semesters, with students being introduced to topical research questions and projects as early as possible. This enables them to bring their personality to the fore and fulfill their potential in their chosen field. All the degree programs, some of which are interdisciplinary in nature, are geared towards kindling the flame of research among students and arming them with the best skills and qualifications for any future career.

Not only a pleasant place to live and work, Bonn is also an attractive location thanks to the wealth of



opportunities for training and continuing professional development that are available in one of Germany's leading economic regions.

German is the main language of instruction at the University of Bonn, particularly on its bachelor's degree programs. Exchange students also have the opportunity to take a program of courses in English via the Germany in a Global Context Program. Degree programs taught entirely in English and English-language courses can mainly be found on master's programs and in the Bonn International Graduate Schools. Some 30 degree programs in all are taught in English. Thirteen bi-national programs lead to a double degree: run in cooperation with partner universities in other countries, these include German-French studies, the master's degree programs in Geography of Environmental Risks and Human Security, and the European Master's in Agricultural, Food and Environmental Policy Analysis (AFEPA), which is an Erasmus Mundus degree pro-

gram. There are currently 12 Bonn International Graduate Schools (BIGS) that offer doctoral students high-quality research curricula in English and give them access to international research partnerships. International students need not be apprehensive about embarking on their studies in Bonn, as the University provides current and

prospective students with various ways to improve and consolidate their German skills. Intercultural exchange is also very important to the University of Bonn, and its Campus International services give students a wide range of options for acquiring intercultural experience and skills in a targeted way.

Boosting exchange and cooperation: Erasmus+

The Erasmus Programme, also known as the European Action Scheme for the Mobility of University Students, was launched by the European Union (EU) in 1987 as its study exchange program for higher education, merging with other schemes to form Erasmus+ in 2014. And the University of Bonn has been there right from day one. To date, its faculties have forged partnerships with over 250

universities both within and outside Europe. Every year, the University of Bonn welcomes some 300 Erasmus+ students from across Europe but also from non-European countries via the Erasmus+ Worldwide Exchange Programme. They come to study, do a doctorate or complete an internship at the University or a local company.
uni-bonn.de/erasmus

Neurotech^{EU} Elevates Brain Research to New Level

From Bonn to Istanbul, from Stockholm to Nijmegen and Elche—the Neurotech^{EU} European University currently brings together seven leading European universities as well as numerous partners from industry, research and civil society. It aims to share knowledge, create the best-possible conditions for educating bachelor's, master's and doctoral students, and promote lifelong learning in all areas of society.

The neurosciences have a key role to play in overcoming one of the most pressing challenges facing Europe today: our aging societies. Demographic change predicts that, in 2050, as many as one in four people in Europe will be over 65. As life expectancy rises and the population ages at an ever-faster rate, brain and brain-related diseases such as dementia will also increase in the future. Neurotech^{EU} wants to elevate European brain research to a new level in order to tackle this challenge, among others.

How it all began

Neurotech^{EU} is one of 41 European university alliances that are now in place. The idea to set up these alliances came from a speech by French President Emmanuel Macron in 2017 in which he outlined how European higher education could become more competitive and fit for the future. His vision was to create an infrastructure that allowed universities, research institutions and businesses across Europe to work together systemically, structurally and sustainably.

What it's about

There are currently seven partner universities in the Neurotech^{EU} alliance, although this number is set to increase going forward. It is organized into a total of eight work packages, with representatives from all the partners involved in each. The University of Bonn is leading on the *Education and Research* work package, which is primarily about increasing the quality of teaching and the range of topics covered for all students in the alliance and making this available to them via Campus+, an inter-university open-source digital platform. At the University of Bonn alone, researchers from four faculties and numerous members



Board of Rectors Meeting
in Bonn, 2021.



The Neurotech^{EU} European University wants to solve the current and future challenges in brain research, its clinical application and related fields. Tackling this across the board is a major challenge. The expertise and experience of numerous European institutions is being brought together in Neurotech^{EU} in order to achieve this goal.



Professor Christian Henneberger,
Institute of Cellular Neurosciences

of staff from central administration are involved in Neurotech^{EU} and are working to achieve the project's main objectives.

Shaping the European research and higher education area

Neurotech^{EU} is one of the most important projects currently on the agenda at the Rectorate of the University of Bonn. Being a member of such a close European partnership not only means raising the University of Bonn's international profile but also gives the University an opportunity to play an active part in helping to shape the future of the European research and higher education area. Besides the direct access to high-caliber research in the neurosciences that is benefiting students, teachers and researchers in equal measure, partnerships are also being formed that go beyond the narrower subject-specific context of the alliance and thus help achieve the core aim of the University of Bonn's Europe Strategy, namely even closer cooperation and networking at European level.



► Further information

uni-bonn.de/neurotecheu

Attracting Excellent Minds

International professorships



Professor Christiane Woopen

Ethicist, TRA Individuals & Societies

Hertz Chair

The professorship held by the ethicist Christiane Woopen forms part of the TRA Individuals, Institutions and Societies. Together with her team, the specialist in human medicine and philosophy conducts research at the Center of Life Ethics into ethically and legally relevant aspects of all manner of social challenges. Christiane Woopen has already been part of numerous international groups of experts, including chairing the European Group on Ethics in Science and New Technologies and the German Ethics Council and serving as a member of UNESCO's International Bioethics Committee.

Every year, the University of Bonn successfully secures funding for additional professorships, provides its own funding to support researchers with high potential, and collaborates on joint appointments with a wide range of research institutions. This enables it to attract some of the world's brightest minds in line with its Excellence Strategy. Generously endowed Hertz Chairs, Schlegel Chairs and Argelander Tenure Track Professorships have been set up to ensure the dynamic development of the University and the continuous revitalization of its departments and institutions. They are designed to strengthen the Transdisciplinary Research Areas (TRAs) and faculties. The University of Bonn also works continually to raise its profile through Alexander von Humboldt Professorships, which are endowed with up to €5 million by the Federal Ministry of Education and Research (BMBF) as part of Germany's international research fund.

Hertz Chairs

The Hertz Chairs are awarded to excellent researchers, either established academics whose international peer-reviewed performance marks them out as leaders in their respective fields or those who are at the start of their career but are judged to have the potential to excel.





Professor Florian Brandl

Mathematician and economic theorist,
Hausdorff Center for Mathematics
Argelander Tenure Track Professorship

The Bonn Junior Fellow Florian Brandl firmly believes that complex questions cannot be answered by a single academic or scientific discipline on its own. This is why his research brings mathematics, economics and computer science together. One of the research questions that he is investigating is how decisions are influenced by general uncertainties or differing information. Between 2019 and 2021, he held a German Research Foundation scholarship at Stanford and Princeton Universities.

Professor Paul Basu

Anthropologist, TRA Present Pasts
Hertz Chair

Paul Basu, an internationally renowned anthropologist, curator and specialist in critical heritage, is setting up a Global Heritage Lab together with his team. His main focus is on how dominated academia continues to be by colonial structures and how these structures shape both museum collections and Western epistemologies. Paul Basu is broadening the perspective on this issue by also involving non-academics in the debate.

Argelander Tenure Track Professorships

Argelander Tenure Track Professorships are a particularly attractive option for early-career researchers in the four years after completing their doctorate. The first six years of these professorships are financed by the tenure track program run by the German federal government and states. They come with a generous starting package and support research projects that straddle two disciplines.



Junior Professor Alena Khmelinskaia

Biophysicist, TRA Matter
Argelander Tenure Track Professorship

How do proteins organize themselves? Alena Khmelinskaia is studying this question at the Life & Medical Sciences Institute (LIMES) in Bonn. The building blocks of proteins are programmed to be able to interact and assume various forms as a result of the interactions between molecules. Science is using this discovery to create "biohybrids," combinations of biological and chemical constituents. The greater stability and resistance that biohybrids offer make them highly promising tools for future research.

Schlegel Chairs

The Schlegel Chairs are based in the various faculties of the University of Bonn. To this end, areas were identified that harbor potential for development based on a concept for boosting research quality. Schlegel professors develop thematic links to TRAs and act as catalysts for third-party-funded initiatives.



Professor Matin Qaim
Agricultural economist,
Faculty of Agriculture
Schlegel Chair

At the Institute for Food and Resource Economics, the agricultural economist Matin Qaim tackles issues key to feeding the world, combating poverty, new agricultural technologies and sustainable farming in light of the increasing scarcity of natural resources. He took up the Schlegel Chair of Economic and Technological Change in the Faculty of Agriculture at the University of Bonn in October 2021. Qaim is Director of the Center for Development Research (ZEF), a member of the National Academy of Sciences Leopoldina and a fellow of the American Agricultural & Applied Economics Association (AAEA).



Professor Carmen Ruiz de Almodóvar
Biochemist, Faculty of Medicine
Schlegel Chair

Carmen Ruiz de Almodóvar and her interdisciplinary team at the Institute for Neurovascular Cell Biology bring together knowledge and expertise from the neurosciences and vascular sciences in order to advance studies of the human brain. Among other things, they are interested in how the vessels and nerves interact with one another in various parts of the central nervous system. How do cells and vessels communicate, and how does this communication change in the event of neurological disorders?

Alexander von Humboldt Professorships

Endowed with €3.5 million for theoretical and €5 million for experimental researchers, the Alexander von Humboldt Professorships provide some unique opportunities for researchers. The money is used to fund the first five years of a professorship. When they nominate their preferred candidates to the Alexander von Humboldt Foundation, German universities present a concept for how they will finance their professorship over the long term, i.e. once this period has come to an end. There is a lot of flexibility in terms of how the funding can be used. It mainly goes toward setting up research teams or obtaining premises and technical equipment.



Professor Michael Neil Forster

Philosopher, International Center for Philosophy NRW (IZPH)

Alexander von Humboldt Professorship

Michael Neil Forster combines the approaches of analytical philosophy from the Anglo-American world with European angles. His specialisms include the philosophy of German idealism as understood by Kant and Hegel as well as the hermeneutics of Heidegger and Gadamer. Neil Forster expanded his research profile—which is unique anywhere in the world—during his Humboldt Professorship at the University of Bonn from 2013 to 2018. He currently teaches at the Chair of Theoretical Philosophy and is Co-Director of the International Center for Philosophy NRW (IZPH) at the University of Bonn.



Professor Aimee van Wynsberghe

Philosopher, TRA Individuals & Societies

Alexander von Humboldt Professorship

Canadian Aimee van Wynsberghe is one of the world's leading researchers into the ethics of artificial intelligence (AI) and robots. AI, and thus the use of robots, will become increasingly prevalent in society in the future. Van Wynsberghe sees this phenomenon as an ongoing experiment and is keen to highlight the need for new rules and control mechanisms in this highly fraught field. She holds the new Professorship for Applied Ethics of Artificial Intelligence and heads up the Institute of Science and Ethics at the University of Bonn as its Director.

Favorite Places



2.

Prof. Takemitsu Morikawa
Forum Internationale
Wissenschaft
Museum August Macke Haus



1.

Dr. Susanna Shuszen Ng
Institute of
Experimental Oncology
Frau Kreuzberg Café,
Musikerviertel district







Studying Out and About

Dr. Susanna Ng, an oncologist from Malaysia, shares her favorite place

It is the homemade cakes that Susanna Ng, holder of a Humboldt Research Fellowship and post-doctoral researcher at the Institute of Experimental Oncology at the University Hospital Bonn, really enjoys: the Frau Kreuzberg café in the Musikerviertel district bakes them fresh every day. “If the weather’s nice, I like to sit on one of the wooden benches or brightly colored chairs outside the café, soak up the sun and treat myself to something sweet,” the researcher says. She also enjoys the “hustle and bustle” and the easy-going, friendly atmosphere inside. Students from all faculties meet here to take a breather between lectures, which is hardly surprising as there are a few University buildings close by.

I like reading academic publications somewhere other than where I work, such as in a nice café with a good cup of coffee and a delicious slice of cake.

”

“The University of Bonn is strong on collaborative research,” Susanna Ng explains. Above all, she appreciates the support that early-career researchers are offered in the form of funding opportunities and career development initiatives. However, she says, this spirit is also reflected in the collegial relations among teachers and students that endure long after the day’s research is ended—for instance, when they do something fun together or arrange an informal get-together at the café.

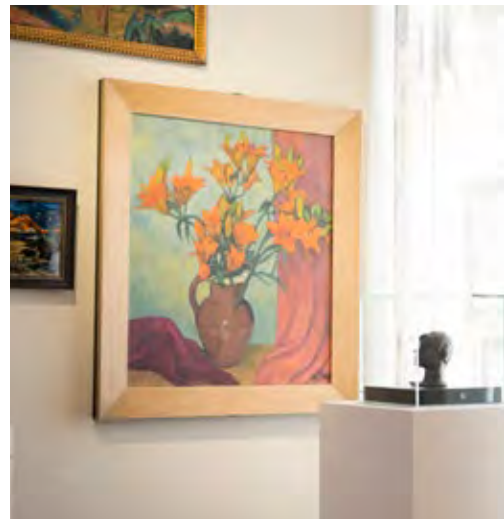
Malaysian oncologist
Dr. Susanna Ng works at
the Institute of Experimental
Oncology at the University
Hospital Bonn.





A Tranquil Oasis of Relaxation

**Professor Takemitsu Morikawa,
a sociologist from Japan,
shares his favorite place**



Professor Takemitsu Morikawa, from the Faculty of Letters at Keio University in Tokyo, was a visiting fellow at the University of Bonn's Forum Internationale Wissenschaft (FIW) from July to September 2021 thanks to support from the DAAD's Re-Invitation Programme for Former Scholarship Holders.



What was once the home and studio of the world-famous Expressionist painter August Macke (1887–1914) is now a museum. Takemitsu Morikawa, a visiting fellow at the Section for Comparative Research on Democracies in the Forum Internationale Wissenschaft (FIW) at the University of Bonn, is an avowed fan of German Expressionism. “I’ve visited the August Macke Haus museum several times,” the sociologist says. “The permanent exhibition is fascinating, and there are always some great special exhibitions too, featuring works by other modern and contemporary artists.”

I particularly like the museum’s garden: it’s a tranquil oasis of relaxation right in the heart of Bonn. It’s where August Macke’s richly colored garden paintings come to life—they served as inspiration for its design.

”

The sense of calm and intimacy that the museum exudes has kept him coming back for more, Professor Morikawa reveals. August Macke’s life and work is showcased in fourteen small rooms spread across four floors, supported by various multimedia and interactive elements.



Rambling through History

Dr. Aslı Kotaman, a media studies specialist from Turkey, shares her favorite place



Dr. Asli Kotaman holds a Philipp Schwartz scholarship at the University of Bonn, where she is a member of the academic staff in the Media Studies section at the Department of Language, Media Studies and Musicology. Her research focuses on film studies.



Walking through the area where she lives, Asli Kotaman spotted it straight away: the LVR-Landesmuseum Bonn. Besides the unusual architecture—the building, a three-story wooden cube enclosed by a glass facade, looks like a treasure chest—she was also particularly struck by the diverse range of topics covered by the hands-on museum. Here, at one of the oldest museums in Germany, visitors can dive deep into the cultural and art history of the Rhineland.

What better way to get to know my new country more than through this museum? I've learned a lot about the history of the art, culture and everyday life of the people of the Rhineland and haven't been bored for a single second.

”

“How people lived, from the Stone Age to the modern day, is presented in a vivid and exciting way, focusing on religion, the environment, technology and luxury,” Asli Kotaman explains. The media studies expert also never ceases to be fascinated by the photography collection, especially since the images of famous people such as Liselotte Strelow, Albert Renger-Patzsch or Bernd and Hilla Becher really make the past come alive.



In a Boat, the Daily Grind Stays on Land

Manuel Goldkuhle, a master's student of economics from Germany, shares his favorite place

The city of Bonn lies on the Rhine—the German river. Besides being steeped in legend, it is also one of the busiest waterways in the world as well as being a favored haunt of watersports fans such as Manuel Goldkuhle, who discovered his passion for rowing while studying economics. He joined the training squad at University Sports in Bonn after only a semester and was soon competing in regattas with the rest of his crew. Manuel Goldkuhle qualified as a cox and trainer in 2018 and now runs courses and training sessions himself. Although he embarked on a master's degree program in statistics at the University of Göttingen after obtaining his bachelor's, he retained his affinity with the University of Bonn. He is currently writing his master's thesis in partnership with the Institute for Genomic Statistics

For me, rowing is the perfect sport. I can get close to nature and do some physical exercise to counterbalance my mental exertions. Whether I'm on my own in the gym, training with my team on the water or competing in a regatta, the wide-ranging opportunities available to me give me everything I could want for my sport.

”

and Bioinformatics (IGSB) at the University Hospital Bonn, focusing on the use of artificial intelligence in medicine.

The University of Bonn has its own boathouse in Beuel that is equipped with a large number of rowing boats. Manuel Goldkuhle has made many new friends through the sport. “After all, we don't just sit around in a boat—we also look after the boats together and enjoy the time we spend together on land.”





Manuel Goldkuhle trains up to four times a week at the University Sports rowing center in Bonn.



My Home is My Castle

**Dr. Charlotte Colding Smith, an art
and cultural historian from Australia,
shares her favorite place**

There are still many residential buildings from the Wilhelmine and Historicist periods in Bonn-Poppelsdorf and especially in the adjacent districts of Südstadt and Weststadt.



Centrally located yet surrounded by green space—Charlotte Colding Smith, an art and cultural historian specializing in the history of collections, has been living in Bonn since mid-2021. In November of that year, she was able to move into an apartment on the outskirts of Poppelsdorf with her husband and daughter. “We looked for a kindergarten place for our daughter first and then for an apartment nearby,” she says. The small family were supported in their endeavors by the Office of Family Services at the University of Bonn.

One of the first properties they saw won them over right from the start: Charlotte Colding Smith, who is originally from Melbourne in Australia, loved the proximity to the River Rhine and the Melbbachtal valley, a densely wooded nature reserve with many of the features of



Bonn has one of the largest Gründerzeit-era quarters in Germany—our apartment is right in the middle of it. I never cease to be fascinated by the architecture of this period.

”



a primeval forest. When asked to name her favorite place in Bonn, she answers, without hesitation: “Our apartment!”

In her academic work, Charlotte Colding Smith focuses primarily on materials and sources generated by the whaling industry. In her free time, she enjoys the calm atmosphere of the late-19th-century Gründerzeit-era quarter, the cordial chats she has with her neighbors and the fact that she has green space and the Rhine right on her doorstep. Says Charlotte Colding Smith: “Our daughter is always out practicing on her balance bike along the Rheinpromenade and is bound to graduate to her first proper bike soon. She’s going to become a real local.” Melbourne is a major city with over five million inhabitants, whereas Bonn is home to just under 330,000. A culture shock? Far from it! Over the course of her academic career, Charlotte Colding Smith has already got to know Heidelberg, Mannheim, Wolfenbüttel and Bremerhaven—all towns and cities with a unique charm. In Bonn, however, she felt at home straight away. If her research projects permit, she would like to stay in the city for an extended period—on account of her fantastic University colleagues and the exceptional quality of life here.

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