

Health in Cities

Why the balance between humans, animals, and the environment is crucial for our well-being

The Future in Figures

The MATH+ Cluster of Excellence shows how mathematics shapes our lives, the economy, and sustainable action

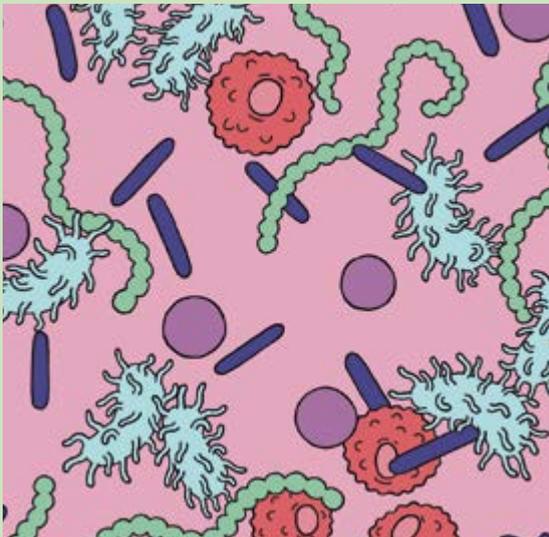
A Strong Alliance

Lars Oeverdieck, TU vice president for administration, on the BUA's vision and Berlin as a science hub



We/Four

Technische Universität Berlin in the Berlin University Alliance



Health for All

How do humans coexist with all the other visible and invisible beings that surround them? Julia Specht's illustration on the magazine cover invites us to take a whole new look at this question. It shows the idea of a city in which people, animals, plants, and microorganisms are part of a shared organism – intertwined, interdependent, and reliant on one another.

As part of the BUA research project, “Re-Scaling Global Health,” scientists from a variety of disciplines are investigating the close link between human health and the diversity of life, as well as the impact of environmental changes. Old ideas of control and demarcation are reaching their limits, particularly in urban areas.

Planetary health is a concept that views health as a shared responsibility of all living beings, and as essential for the cities of the future. The illustration invites us to take a closer look at who is involved in the concept of “health for all” and how they influence each other. You can find out how scientists are approaching this complex topic on page 24.

PUBLISHING INFORMATION

PUBLISHER

Technische Universität Berlin
Office of Communication,
Events and Alumni
Straße des 17. Juni 135
10623 Berlin

CONCEPT & COORDINATION

Barbara Halstenberg (ME)
Steffi Terp (EIC)

AUTHORS

Barbara Halstenberg (hal)
Karsten Lemm
Juri Rappsilber
Wolfgang Richter (wr)
Julie Spielmann
Kerstin Viering

DESIGN

Jonas Schulte

EDITORIAL

Helen Bauerfeind

Climate-neutral printing
on Circleoffset Premium White
from 100% recycled paper,
FSC®-certified, Blue Angel,
EU Ecolabel

Issue 4, November 2025,
3rd vol.



[www.tu.berlin/en/
berlin-university-alliance](http://www.tu.berlin/en/berlin-university-alliance)

We/Four Magazine:

Technische Universität Berlin
in the Berlin University Alliance



Berlin University Alliance

We/Four

CONTENT

- 4 From Numbers to Impact: MATH+ Cluster of Excellence
- 7 Going Down Rough Paths: Using Math to Understand Financial Markets
- 8 Chemical Revolution: UniSysCat Cluster of Excellence
- 10 The Eight Principles of Intelligence: SClol Cluster of Excellence
- 12 Jewels of Partnership: The BUA in Figures
- 14 When Forces Unite: Interview With Lars Overdieck
- 16 Global Impact: The BUA's International Network
- 18 From Vision to Action: The BUA Provides Impetus
- 24 Health for All: "Re-Scaling Global Health" Project
- 28 "Everything Starts With an Idea": Interview With Science & Startups
- 30 Berlin Quantum: A Key to the Future
- 32 From Data Centers to Diversity: What's New at the BUA
- 34 Exploring the Importance of Water in Berlin

All that's left to do now is cross our fingers: In August 2025, the Berlin University Alliance (BUA) submitted its self-assessment report to the German Science and Humanities Council; the site visit by the panel of experts took place at the start of November. If the evaluation is positive, the BUA will continue to receive funding under the Excellence Strategy of the federal and state governments for another seven years, starting on 1 January 2027. Countless people from FU Berlin, HU Berlin, TU Berlin, and Charité – Universitätsmedizin Berlin have put their heart and soul, time, and energy into documenting and presenting the BUA's successes in the best possible way.

On 11 March 2026, we will find out how we've done. What gives us confidence is the same thing that takes away our fear of the decision: there's no turning back now. Berlin's university landscape is a different one today than it was on 1 November 2019, when funding for the BUA began. Today, many students routinely take courses at several universities. We share measuring equipment, computers, and data. We have collaborated on 87 projects that address major social challenges. And within our Clusters of Excellence, university affiliation has become almost irrelevant.

We have placed our collaboration on the solid platform of a corporation under public law. We promote talented minds and start-ups cooperatively, as well as good research and teaching. We publish open access in our joint publishing house, Berlin Universities Publishing, and fight together against discrimination and for gender equality. And we network. Globally in an ever-expanding network, and in Berlin with non-university research institutions that have joined forces in the Berlin Research 50 (BR50) consortium.

So, let's all keep our fingers crossed for this Berlin-based project that is so close to our hearts and has so much to give!

Professor Dr.-Ing. Stephan Völker,
Vice President for Research and Appointments at TU Berlin



Take a look at our film series
to meet the faces behind
the BUA.



From Numbers to Impact

In its second funding phase, the MATH+ Cluster of Excellence – with all three Berlin universities as applicant institutions – is using basic mathematical research to pinpoint solutions for society, the economy, and sustainability

AUTHOR Wolfgang Richter

PHOTO iStock/Orbon Alija

What if more people in Germany could say that they belong to those “at the top” making the decisions? That could become reality through a model of participatory democracy that has been around for some time now: citizens' assemblies. In these assemblies, people selected at random to represent a cross-section of the population come together for discussions. They differ in age, gender, ethnicity, and level of education. After the joint discussion, the group votes, and the result is passed on to policy-makers to help them with their decision-making.

“Criticism of citizens' assemblies often focuses on whether the participants – who, of course, take part voluntarily – are truly representative of Germany's population, and how well they work together in discussion,” says Professor Dr. Claudia Schillings, head of the Numerical Mathematics of Deterministic and Stochastic Partial Differential Equations workgroup

at FU Berlin and one of three MATH+ spokespersons. Although we have computer algorithms that can select a truly representative sample from a large volunteer pool, improvements can still be made to how the discussions are designed. “In one MATH+

“At MATH+, we aim to provide greater support for public opinion formation and study the social dynamics behind it.”

Professor Dr. Sebastian Pokutta

research project, we'll be testing new algorithms and methods that take the participants' individual backgrounds into account and ensure that people with diverse perspectives have ample opportunity to exchange ideas.”

The project is a prime example of the research strategy the cluster

is pursuing in its second funding period. “At MATH+, we aim to provide more constructive support for public opinion formation across projects and study the social dynamics behind it,” says Professor Dr. Sebastian Pokutta, who heads the Chair of Mathematical Optimization at TU Berlin and is also a MATH+ spokesperson. Such projects in mobility research include citizen reports and decision theater formats, with TU Professor Kai Nagel leading the citizen reports, and TU Professor Sarah Wolf overseeing the decision theaters. Both use simulations with digital agents – for instance commuters in a virtual Berlin – who choose different modes of transport based on their mobility goals and the services available to them.

In the workshops, participants can make political and administrative decisions themselves and immediately see the effects they have in the simulations. “By incorporating large language models such as ChatGPT, the

digital agents can even communicate with each other. This helps us understand what drives people to change their attitudes,” says Pokutta, who is involved in one of these projects.

“Beyond these applications concerning human behavior, we are also working on mathematical problems that can be applied to inanimate matter,” adds Professor Dr. Andrea Walther, who holds the Chair of Mathematical Optimization at HU Berlin and is the third spokesperson for MATH+. Using these findings, research groups at the Zuse Institute Berlin and the Helmholtz-Zentrum Berlin have optimized multi-junction solar cells. These consist of perovskite solar cells, which

primarily use blue light, and silicon cells, which mainly convert red light into electricity. This technology has achieved efficiency levels of around 30% for multi-junction solar cells, putting it among the world's best. “We discovered hidden patterns in complex structures, which was the key to our success. This is one of the special areas of expertise we have developed in the MATH+ Cluster of Excellence,” explains Walther.

Collaboration with industry

Walther is also investigating how sustainable solutions can actually be when they rely on AI systems, and in turn, the enormous amount of energy

needed to train them. “We are specifically looking for algorithms that reduce the energy needed to train AI,” she says. There is still a lot of room for improvement here – after all, our brain only uses a tiny fraction of the energy that AI needs to learn something new. MATH+ is also developing more efficient solutions for managing large amounts of data in general in collaboration with the Alliance for National High Performance Computing in Berlin and the MaRDI consortium of the National Research Data Infrastructure at the Weierstrass Institute for Applied Analysis and Stochastics in Berlin. “Another key objective of our research is to increase the transparency of AI decision-making,” Walther continues. This not only improves the safety of decisions, but is also expected to boost their acceptance.

Lastly, MATH+ is deepening its already close ties with industry across mobility, energy, health, and technology in its second funding period. “A cornerstone of this collaboration is the MODAL research campus at the Zuse Institute Berlin – supported by the institute itself, FU Berlin, and the Berlin University of Applied Sciences. It's receiving funding from the Federal Ministry of Research and is linked to MATH+ and its nationally renowned graduate school, the Berlin Mathematical School,” says Sebastian Pokutta, one of MODAL's two board members. TU Berlin is an associated partner; teams from science and industry are working together across six subject areas. “At MATH+ itself, we have also created a platform for transdisciplinarity and knowledge transfer with our Innovation Center,” Pokutta adds. This unit not only absorbs impulses from business and society, but also generates innovative ideas drawing on new mathematics. “Basic mathematics research is and will remain our core mission.”

A solar cell optimized on the basis of numerical methods

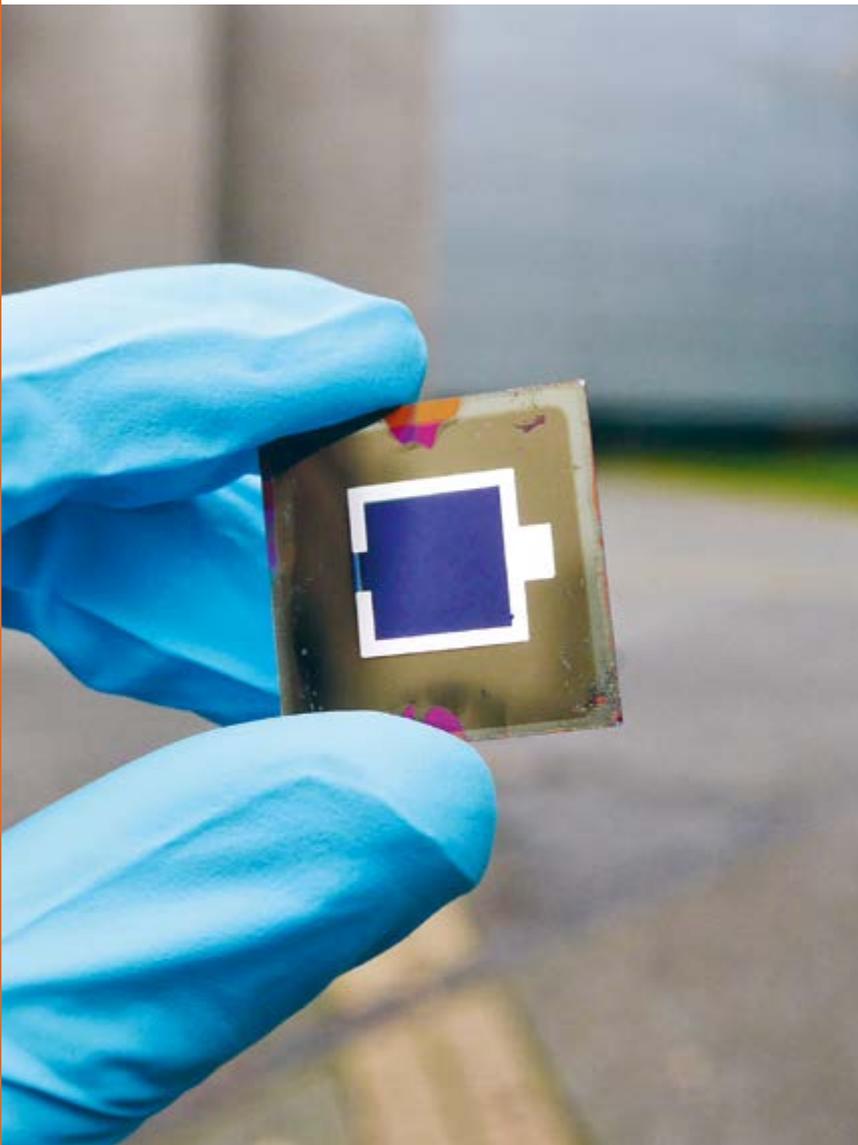


PHOTO Alexandros Cruz HZB

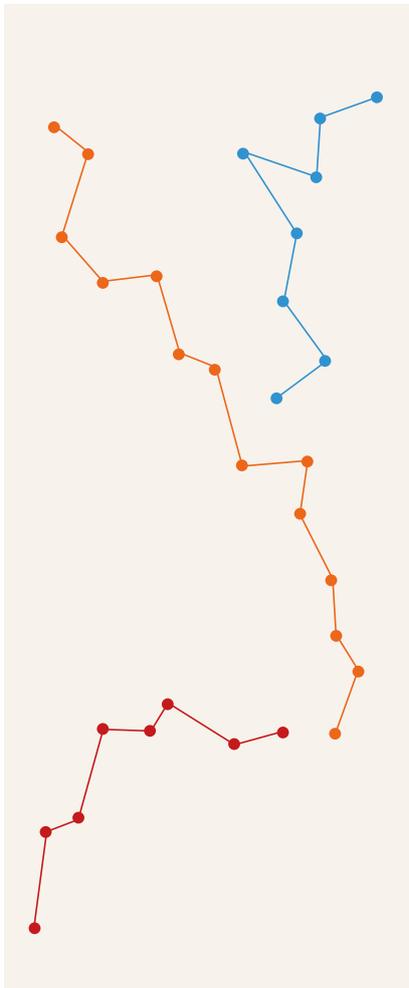
Going Down Rough Paths

How mathematics helps us understand the turbulence of financial markets

AUTHOR Wolfgang Richter

What do specks of dust have to do with financial mathematics? One person who can answer that question is Professor Peter K. Friz, head of the Chair of Financial and Actuarial Mathematics at TU Berlin and distinguished fellow at the MATH+ Cluster of Excellence. He is also spokesperson for the new Collaborative Research Centre "Theory of Rough Paths" approved for funding by the German Research Foundation (DFG) in 2024. One way to see a rough path is to look at tiny specks of dust in a drop of water under a microscope. The specks are jostled around by fast-moving water molecules, which are in motion due to temperature. As a result, the specks move along erratic, random trajectories.

This effect was discovered by botanist Robert Brown in 1827 and is known as Brownian motion. "If I now nudge one of these specks in a certain direction, Brownian motion will interfere with its path through the water droplet. The resulting trajectory won't be a straight line, but rather a zigzag," Friz explains. Visually, this rough path resembles the course of a stock market price.



The path of specks of dust in a drop of water resembles the fluctuations of share prices.

The simple motion of a particle like a speck of dust is described in mathematics using differential equations, which are part of calculus. The field of "rough analysis" grew out of work on rough path theory – a perspective developed largely in Berlin. "To study rough paths, you need stochastics, algebra, and geometry. The fact that so many areas come together here has led to an explosion of new possibilities," says Friz. In financial mathematics, the goal is to combine random market fluctuations with legal and practical insights gained from observing trading behavior, for example. The random market fluctuations, like Brownian motion, create a disruptive "noise."

Protection against misuse

"Among other things, we have helped improve models for valuing financial options. Such options are not just for financial speculation, but also serve to hedge against risks such as fluctuating exchange rates," says Peter Friz. "It is only by bettering our understanding of these instruments that we can also guard against their misuse."

The theory of rough paths was founded in 1998 by Oxford mathematician Terry Lyons. Now in his seventies, he heads the DFG's Stochastic Analysis in Interaction Research Training Group with Professor Dr. Peter Bank, head of the Chair of Mathematical Finance at TU Berlin. The research training group is a joint research initiative through the BUA involving FU Berlin, HU Berlin, TU Berlin, the Weierstrass Institute, and the University of Oxford. It enables doctoral researchers from Berlin and Oxford to spend several months at each other's institutions and was selected for a second funding period in 2024. As a part of the Berlin Mathematical School (BMS), it is also part of the MATH+ Cluster of Excellence.

Berlin Sparks the Next Chemical Revolution

Professor Dr. Juri Rappsilber, spokesperson of the UniSysCat Cluster of Excellence, explains how the capital is reinventing chemistry and securing our future

AUTHOR Juri Rappsilber

In the lab, scientists can already convert small amounts of carbon dioxide (CO₂) into valuable substances. What plants do naturally could soon be scaled up to industrial levels – a step that would render fossil raw materials redundant. The UniSysCat Cluster of Excellence is using this lever of biotechnology and chemistry to identify new ways to make the latter more environmentally friendly. The researchers are building on groundbreaking pioneering achievements made in Berlin, such as the Haber-Bosch process, which secured food for billions of people through the production of nitrogen fertilizer, and Paul Ehrlich's "magic bullet" concept, which paved the way for targeted drugs and modern pharmaceuticals.

The elegance of natural processes

Chemistry stands at another watershed today. At UniSysCat, researchers study catalytic processes – chemical reactions that are accelerated or

even made possible in the first place by special substances known as catalysts. Their goal is to make these processes more efficient in industry, medicine, and energy, while capturing the elegance found in nature. Whereas the Haber-Bosch process

“Green chemistry is not a utopian dream, but rather a question of finding the right catalysts – in science, in business, and in society.”

Professor Dr. Juri Rappsilber

demands enormous amounts of energy and fossil resources, the team is investigating climate-neutral nitrogen fixation. In the future, this could yield fertilizers that require far less energy and emit less carbon. UniSysCat also wants to rethink medicines: The researchers are focusing on catalytic methods that deliver active ingredients more precisely to where

they are needed, minimizing side effects – a direct evolution of Paul Ehrlich's "magic bullet."

But basic research alone is not enough to make green chemistry a success. Innovations must make the leap from the lab to the market, which is why the Chemical Invention Factory (CIF) was founded within the UniSysCat Cluster of Excellence. Construction on the new CIF building officially began in September 2025 on TU Berlin's Charlottenburg campus. There, up to twelve international teams will join forces in cutting-edge labs to turn their research results into market-ready products, all with the goal of transforming chemistry into a sustainable, circular economy based on renewable raw materials.

TU Berlin took the first step in this direction back in 2017 with INKULAB, a modular lab container for chemistry startups providing aspiring entrepreneurs with the necessary infrastructure. Meanwhile, FU Berlin operates the "Scale Up Lab," where chemical



PHOTO Kevin Fuchs



Professor Dr. Juri Rappsilber heads the Chair of Bioanalytics at TU Berlin.

reactions can be carried out on the next larger scale.

Networks initiated by UniSysCat that link research institutions, industry, and start-ups are equally important for scaling up to the industrial level. One example is greenCHEM, which is developing an innovation ecosystem in Berlin with funding from the Federal Ministry of Research. Together with UniSysCat, the Center for the Transformation of Chemistry in Delitzsch, the Startup Laboratory Schwedt, the Leibniz Institute for Ca-

talysis in Rostock, and the University of Greifswald, it forms the Green Chemistry East network. BASF, the world's largest chemical company, is also involved with its BasCat research lab at TU Berlin, which is integrated into the UniSysCat ecosystem for idea catalysis.

Berlin – The birthplace of ideas

The Cluster of Excellence is receiving funding from the German Research Foundation (DFG) until the end of 2027.

The structures established over the past 18 years and three funding periods will ensure that both research and knowledge transfer will continue into the future. Berlin was once the birthplace of pioneering developments such as the Haber-Bosch process and the magic bullet.

Today, the city is once again leading the way – as a place where chemistry is being reimagined. Green chemistry is not a utopian dream, but rather a question of finding the right catalysts – in science, in business, and in society.

The Eight Principles of Intelligence

Be it humans, machines, or animals: The Science of Intelligence Cluster of Excellence is uncovering the fundamental principles of intelligence

AUTHOR Karsten Lemm

There are wooden cubes on Professor Dr. Oliver Brock's desk, sitting comfortably next to plastic molecules from a chemistry kit, coloring pencils, and model figures: a mishmash of objects to fidget with while the brain ponders the nature of thought – and quite a symbolic constellation at that.

Brock is an Alexander von Humboldt professor of robotics at TU Berlin, and one of the initiators of the Science of Intelligence Cluster of Excellence (SCIoI). Launched on the initiative of the applicant universities TU Berlin and HU Berlin, the project has been bringing together more than 130 researchers from over 20 different institutes in Germany and Europe since 2019 to find out how intelligent behavior comes about.

After almost seven years of work, answers have emerged that could advance science and enable new,



A cockatoo tries to open a lockbox. Several principles of intelligence are important for this project.

revolutionary applications in artificial intelligence and robotics.

The researchers have so far identified eight candidates for "principles of intelligence" – characteristics and structures that repeatedly appear

when a spark of intelligence flashes in natural or artificial systems (see right-hand page). There is a ninth principle on the horizon, and it is wholly possible that more will be added in the future and those already



PHOTO Goffin Lab/Bene Croy, courtesy of Alice von Auerberg

identified will change. "We now have a blueprint for defining, understanding, and creating intelligence," Brock says. "And that's a breakthrough if you ask me."

A breakthrough in what had escaped researchers until now: Though they could describe what intelligent behavior looks like, they could not explain how it comes about. Brock believes that this was due, at least in part, to the nature of the research: "It was a mistake to believe that we could divide the notion of intelligence into different research areas." Aspects such as perception, information processing, thinking, acting, and reacting are too closely interwoven to be studied independently of one another.

Twelve disciplines

Hence, SClol pools researchers from twelve scientific disciplines, among them computer science, biology, psychology, behavioral science, and philosophy. And this broad spectrum also extends to the project level: while one investigates the ability of schools of fish to react in unison to a threat in the blink of an eye, another is exploring the signals that create trust between people and machines. At other times, it's about social intelligence in people in virtual worlds, or the ability of cockatoos and robots to open a lockbox – a kind of safe that can only be cracked through observation, trial and error, and a touch of clever thinking.

Several principles of intelligence can be found in the latter, well-known experiment. It involves, among other things, registering signals on multiple channels (hearing, sight, and touch) and processing them at different times in order to respond to the environment. One of the most important findings from the SClol project is that intelligence does not necessarily re-

EIGHT CANDIDATES FOR THE PRINCIPLES OF INTELLIGENCE

INTELLIGENT SYSTEMS

1. ... consist of actively networked components with interconnections that exchange information flexibly.
2. ... solve problems on multiple levels, for example through neural planning in the brain and mechanical solutions in the body.
3. ... act through a dynamic coupling of agent and environment.
4. ... adapt their representations of the world flexibly to the environment, task, and goal.
5. ... integrate information simultaneously via multiple sensory channels.
6. ... process information on several timescales simultaneously in order to adapt to changes in the environment.
7. ... master complex tasks by breaking them down into simpler, low-dimensional problems and combining the solutions step by step.
8. ... adapt their structure to short-term requirements and long-term environmental changes.

—
The candidates can change, be supplemented, or discarded with new findings.

side in a single organ or element like the brain, but can also emerge from the way components of a system interact. This principle is evident, for example, in the collective intelligence of schools of fish or bee colonies.

"None of these principles should come as a complete surprise to us," says Brock, "because they represent something inherent in all types of intelligence." For him, the great value of the SClol project lies in understanding which properties intelligent systems should have – because this could be the key to making artificial systems more robust, adaptable, and powerful. "If I were to throw all the principles into a pot and give them a stir, what I get wouldn't automatically be something intelligent," says Brock. But he recommends that anyone developing intelligent systems incorporate as many of these principles as possible as it drastically increases the likelihood of success.

Brock can already see how this approach is paying off – for example, when artificial hands learn to grasp objects without conscious control. This falls under the principle that neither signal processing nor responses to it have to take place in the brain. Such insights are expected to open up completely new possibilities in robotics. "For the first time, we can now solve problems that others have previously failed at."

That alone is a win for science, but the economy could also benefit. Brock is confident that the findings from the SClol project are paving the way for Germany and Europe to make significant advances in artificial intelligence. Thanks to the work of the SClol cluster, there is now "a new opportunity to build intelligent technology" and potentially overtake the USA and China.

The Cluster of Excellence is receiving funding from the German Research Foundation (DFG) until the end of 2027, but the unique spirit of the project will inspire its members far beyond that: "We would all say that the way we do research has completely changed," Brock says.

Jewels of Partnership

Since 2019, the Berlin University Alliance has brought together Freie Universität Berlin, Humboldt-Universität Berlin, Technische Universität Berlin, and Charité – Universitätsmedizin Berlin. Together, they are pooling their strengths in the Excellence Strategy, resolutely driving forward Berlin's position as a science and research hub, and working on solutions for the major transformations of our time. The impact of this collaboration can be demonstrated in impressive figures.

(hal)

685.4

million third-party funding per year

7

Clusters of Excellence

31

Leibniz Prizes

(1985-2025)

94

ERC Grants

(2025)

15,985

doctoral candidates

1,700

doctorates
per year

549

degree programs

31

Collaborative
Research Centres
with (co-)spokes-
persons

(as of 31 Dec 24)

106,500

students

(as of 1 Dec 24)

1,774

professorships

1,600

funded startups

(since 2019)

340

cooperations

When Forces Unite

Berlin has become one of Europe's most dynamic science hubs in recent years. And the Berlin University Alliance (BUA) is one of the reasons why. Since 2019, the alliance has been pooling its strengths, building new partnerships, and creating structures that radiate far beyond the capital. Right at the heart of the BUA since its very beginning is Lars Oeverdick, vice president for administration at TU Berlin and member of the Sharing Resources steering committee. In this interview, he talks about the power of cooperation, the successes achieved to date, and his vision for the future of TU Berlin, the BUA, and Berlin as a science hub.

INTERVIEWER Barbara Halstenberg

Which developments at the BUA and TU Berlin have left the greatest impression on you since funding began in 2019?

What I find particularly impressive is how much cooperation within the BUA has grown. Prior to 2019, collaborations tended to be more selective, for example in the Clusters of Excellence, which always involved several BUA partners. Since then, however, cooperation has broadened and deepened significantly. Examples include our joint open access publisher, Berlin Universities Publishing (BerlinUP), our institutional partnership with the University of Oxford, and the BUA Certificate Programs in teaching.

There is also great interest in jointly developing and using research infrastructures across institutions, the road to get there, however, is rocky. The Sharing Resources steering committee is one of the few BUA commit-

tees in which scientific and administrative expertise are deliberately under shared responsibility. It plays a vital role in developing and translating concepts into practice and has cultivated a productive culture of discussion over time.

What would not have been possible had the BUA institutions not joined forces?

It is only by combining our strengths, covering almost all scientific fields comprehensively, and achieving our current scale that we have gained a completely different level of influence, both internationally and politically in Berlin. A good example is the passing of a law to establish our "Collaboration Platform," the administrative service provider for implementing part of our joint projects in the alliance. This would not have been feasible for a single university or institution alone.

What did TU Berlin contribute to the BUA in the first funding period?

All partner institutions began contributing before the funding started, each bringing its strengths to the proposal phase. FU Berlin and HU Berlin contributed their experience as universities of excellence, while TU Berlin, together with Charité – Universitätsmedizin Berlin, contributed the "Der simulierte Mensch" research building. As we have spokespersons at the Einstein Center for Digital Future, we were also able to build trust among funding providers, enabling

PHOTO Philipp Arnoldt



large, interdisciplinary projects with many partners to be successfully implemented in Berlin.

In which areas will TU Berlin grow most significantly through the BUA?

I see enormous potential when it comes to sharing resources.

Expensive specialized equipment, large-scale test facilities, and valuable collections are best operated collectively.

Examples here include ACEM, the jointly supported virtual and interdisciplinary electron microscopy equipment center; the collection platform

Digital Network Collections; and the non-commercial publishing house BerlinUP.

We laid the foundations for this in the first funding period. Now it's a matter of expanding more broadly and deeply, including with other partners in Berlin. My goal is for researchers and teachers to no longer notice any difference between a device located at TU Berlin and one located at another institution, and for TU Berlin to be well positioned for the coming years. AI and sustainability are presenting us with a number of challenges that we want to solve

together with smart computing infrastructures such as the joint Data & AI Center and excellent science.

Why is it so difficult to create the administrative framework for excellent science?

The obstacles do not only lie in the administrative rules of the respective scientific institution, but also in the legal requirements as a whole. These can relate to research funding, construction and renovation, or tax issues in scientific collaborations. Reducing bureaucracy is a major societal challenge and cannot be solved by a single university alone. We must not let up in our efforts here. Fortunately, we have eased the administrative burden significantly in construction and renovation in this year's renegotiation of the university contracts.

The BUA is currently undergoing evaluation. What are your hopes for the future?

I hope to see even closer networking in Berlin's scientific landscape – also beyond the four partners – with the non-university institutes of Berlin Research 50 (BR50), museums and collections, Berlin's business community, and urban society as a whole. In the first funding period, transdisciplinary research was a key driver. In the second, the aim is to reap the rewards of this work and further develop the cooperation for the long term.

For Lars Oeverdieck, TU's vice president for administration, the joint use of research infrastructures at Berlin's universities holds enormous potential for Berlin's standing as a science metropolis.



GLOBAL

TU Berlin's impact on the international stage is increasing significantly thanks to its membership of the Berlin University Alliance (BUA). New strategic partnerships, joint research projects, and closer and more intensive exchange with leading universities around the world are opening up unique opportunities for our students and researchers to be involved in shaping responses to global challenges. For us, it is crucial that these cooperations continue to evolve to ensure that TU Berlin remains visible in the global science landscape and keeps on developing its role as a trailblazer in research, teaching, and innovation.

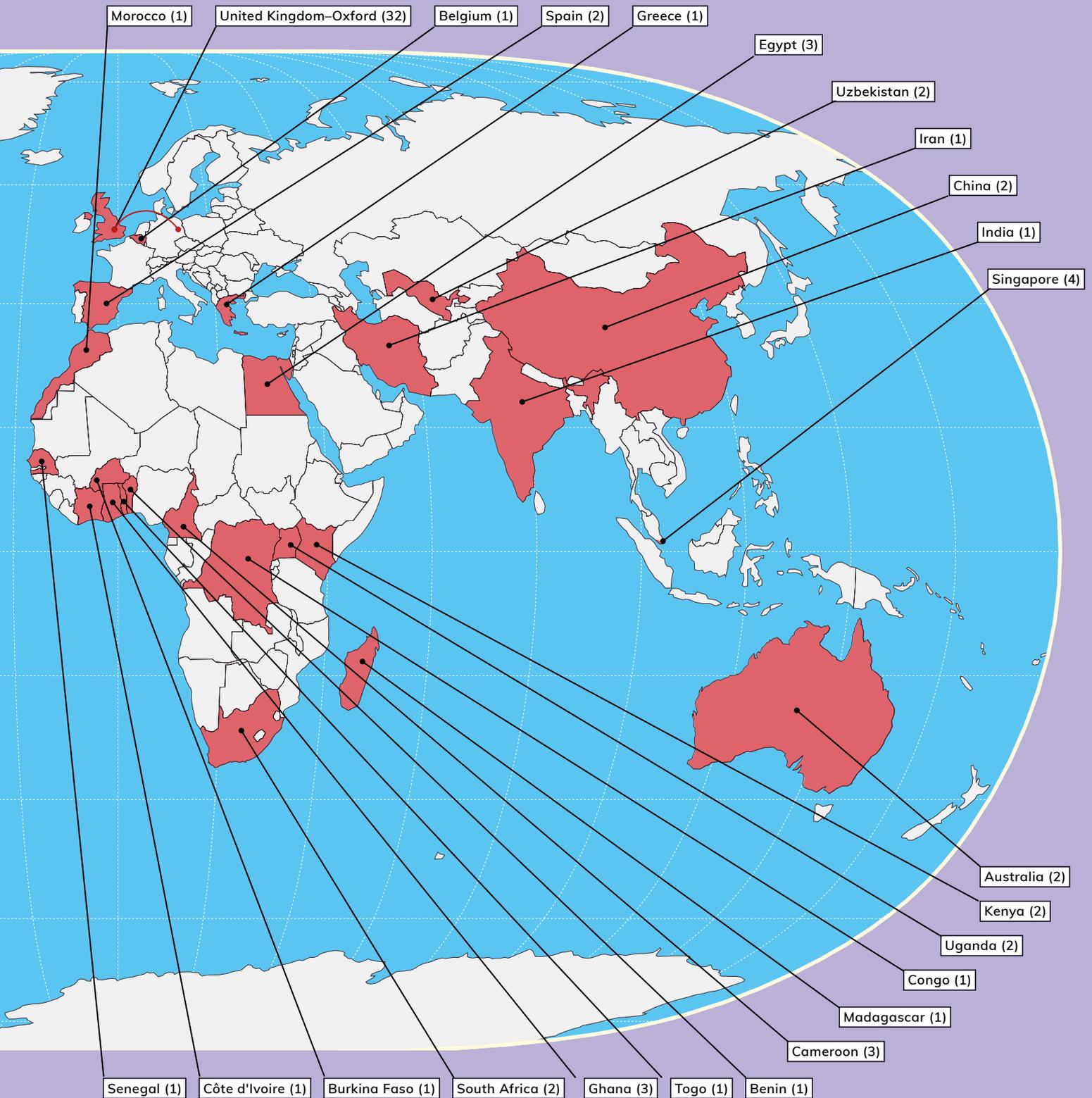
(wr)



The number of cooperations TU Berlin has been involved in as part of BUA international strategic partnerships since the start of the alliance of excellence. The BUA maintains a special research alliance with the University of Oxford.

IMPACT

MAP created with www.worldmapgenerator.com



FROM

TO

UPOLISITION

In the Berlin University Alliance, new ideas are generated by people striving to make a difference, be it students developing sustainable building ideas, researchers forging international networks, or initiatives creating spaces of solidarity. Together, they are shaping the future of the city, research, and society.

AUTHOR Barbara Halstenberg PHOTOS Kevin Fuchs

Open Workshop

Fancy making smoothies while training your calf muscles? You can do this with the "Smoothielette," a low-tech demonstrator for open-source prototyping in the Making Lab. The Making Lab is an open workshop for research hardware located in the Central Library of TU Berlin and UdK Berlin where digital machines and curious scien-

tific minds meet. Using CNC milling, laser cutting, and 3D printing, students and researchers get to create their own prototypes while also learning how to structure technical documentation and make it reusable for others all around the world. As part of the BUA project Open.Make, the lab has been expanding open science

for hardware since April 2025, opening up new forms of transfer and research results by making them visible, accessible, and reproducible. With the support of the project members (Dr. Julien Colomb on the left and Dr. Robert Mies on the right), a space is being created where hardware is both built and shared.





Berlin – Oxford

A bioreactor in Berlin, a whiteboard in Oxford – and in between, innovations that rethink energy and catalysis. Professor Dr. Peter Neubauer from TU Berlin has been vice academic director of the STEM area of the BUA-Oxford-Berlin partnership since 2021, and is spearheading the development of research collaborations in key areas such

as catalysis, green energy, digitalization, and automation. Examples include projects with the Centre for Medicines Discovery and the Oxford Zero Institute, which is developing solutions for a climate-neutral future energy supply that range from the production and storage of energy through to its use. As part of the cooperation with Oxford, three

Horizon Europe proposals were submitted in 2023, followed by an EU Pathfinder application with Berlin partners in 2025. Neubauer places a particular focus on young scientists: “The mobility of young researchers working in different laboratories for shorter periods of time is a central funding element and the basis for long-term collaborations.”

Learning Together

One desk, many perspectives: Dr. Heike Lehmann (right) from the Chair of Building Archaeology and Heritage Conservation spent a week with the managing director of the Center for Technology and Society (Zentrum Technik und Gesellschaft – ZTG), Dr. Gabriele Wendorf, as part of the BUA's job shadowing program. For Lehmann, the program couldn't have come at a bet-

ter time as it offered her insights into the transdisciplinary world of research beyond her own subject area during a period when she was reassessing her career. During her time at the ZTG, she was able to learn about the center's wide range of projects and its exchange activities with actors from civil society, as well as new forms of team leadership and research organiza-

tion. For Gabriele Wendorf, shadowing is not so much mentoring as it is a process of dialog and further building block in her many years of working for greater visibility and the advancement of women in science. The experience was intensive and productive and allowed the two women to discuss things openly. They are both sure that there is more to come.



A New Approach to Building

Creating visions with concrete: Students in the new BUA certificate program "Sustainable and Inclusive Construction" are using ideas rather than steel for scaffolding, fully in keeping with the United Nations' 17 Sustainable Development Goals. The English-language program is primarily aimed at master's students from fields such as architecture,

civil engineering, chemistry, and urban and regional planning. It not only teaches the students about the ecological and social principles of construction, it also introduces them to the entrepreneurial principles and approaches for responsible business models in the construction and design industry. Professor Dr. Jan Kratzer (left) developed the program

at the Chair of Entrepreneurship and Innovation Management at TU Berlin in cooperation with FU Berlin. Dr. Tobias Ebbing (right) is responsible for the "Design Thinking for Smart Living" module. Alejandra Mafla (center) is a student in the certificate program that not only designs spaces, but also examines and questions them.





Solidarity in Urban Spaces

For many years, Habersaathstraße in Berlin has been the focus of a conflict of interests centered on a residential building occupied by formerly homeless people and the owner company seeking to demolish it. In the middle of all this stands the Kiosk of Solidarity: Not so much a kiosk in the sense that we normally understand the word, but rather a mobile interventionist

format. Since 2023, over 30 initiatives in Berlin committed to solidarity have used the kiosk at various locations around the city to meet, network, and hold protests in public spaces. The kiosk enables marginalized groups such as migrants, refugees, queer, and homeless people to be seen and have a voice. Curator Dr. Moritz Ahlert (photo) (Habitat Unit, Institute of Architec-

ture at TU Berlin) and TU students provide support with designs, obtaining approvals, logistics, documentation, and financing. The Kiosk of Solidarity, which was created as part of the Transforming Solidarities (BUA Social Cohesion call) project, was awarded the Spiegel Social Design Award and the Saxon State Prize for Design 2023. kioskofsolidarity.net



Health for All

The Re-Scaling Global Health project examines the complex interplay between medical challenges, biological diversity, and environmental change in cities

AUTHOR Kerstin Viering ILLUSTRATION Julia Specht

"I can't help but think: Does this body belong to me? There are more bacteria and virus-DNA residing in my body than my 'human' DNA. 10% of my dry weight is made up of bacteria. My immune system, my digestive organs, and many of my bodily functions are entrusted to them. Is this body truly mine?" In his book *Animals, Justice, and the Politics of Violence*, geographer Dr. Ozan Zeybek describes the close connections between humans and the countless creatures with whom they share their bodies and their habitat.

Zeybek is based at the Center for Metropolitan Studies at TU Berlin where his work focuses primarily on the relationship between humans and animals in Turkey, spanning everything from the treatment of stray dogs in Istanbul through to the problems of factory farming. From his own experience, Zeybek is familiar with the conditions in industrial poultry farms. "I have seen how these chickens never experience the outdoors, never spread their wings, never engage in natural behaviors," he says. And as if that wasn't enough: "The air itself

carries antibiotics, diffused continuously." The massive use of these drugs also promotes the development of pathogens that are resistant to them. "And that's also a problem for human health," says Zeybek.

New solutions

It is precisely such connections that he aims to highlight in his new book. He completed the work as part of the "Re-Scaling Global Health" project, which is funded by the Berlin University Alliance and includes the involvement of all four BUA institutions – TU Berlin, Freie Universität Berlin, Humboldt-Universität zu Berlin, and Charité – Universitätsmedizin Berlin. The project falls under the "Global Health" challenge of the BUA Grand Challenges program, which seeks to tackle major issues facing society. The aim of the project, which runs until the end of 2025, is to develop new solutions for health challenges in cities. Experts from a wide range of disciplines are investigating the complex interplay between human health, biodiversity, and environmental changes.

"How complex is the coexistence of animals, plants, and microorganisms in cities?"

It has been clear for some time that adopting a too narrow view of medical issues, both spatially and in terms of topics, is not productive given that pathogens are now transported around the world by plane, and SARS, Ebola, and Covid-19 have repeatedly led to massive problems in recent years. But even looking further back in time, epidemics such as cholera, malaria, and influenza have repeatedly spread worldwide, killing millions of people. International institutions such as the World Health Organization (WHO) were set up in the 20th century to counter these cross-border threats. Since then, their goal has been "global health."

However, the focus of their work is almost exclusively on humans. There is hardly any mention of all the animals, plants, and microorganisms with which we coexist. "This approach falls somewhat short of what is needed," says

A city as a living organism: humans, animals, plants, and microorganisms live together in healthy balance.

Professor Dr. Dorothee Brantz, director of the Center for Metropolitan Studies and co-spokesperson of the BUA project. If a single person carries around a community of different organisms that is sometimes difficult to understand, how complex must living together in a city be, where millions of inhabitants of the most diverse species of living beings and a wealth of environmental factors influence each other? "It's important then that we don't only think about our own health," Brantz stresses. "What matters is the health of the entire planet and everyone and everything that lives on it."

"It's important then that we don't only think about our own health. What matters is the health of the entire planet and everyone and everything that lives on it."

This concept, which has become known as planetary health, received little attention in urban research until recently. But that is now changing. It is becoming increasingly clear that a number of old ways of thinking will no longer be effective in the cities of the future. The challenges of climate change alone are forcing us to come up with new and well thought-out ideas, and realize that it is not people alone who shape cities and decide what rules apply there.

For historian Dorothee Brantz, for example, this becomes clear when she compares the influence of the seasons on city life around the years 1900 and 2000. "Surprisingly, much of what we experience today was already known back then," she says. For example, colds and allergies occurred more frequently in certain months – a phenomenon that was associated with heat, cold, or precipitation. The fact that the flowering time of certain plants can have a strong influence on human health was also no longer a secret.

"Hay fever has been around since ancient times," says Brantz. "And it was in the 19th century that we began coming up with scientific explanations." At the time, no one knew exactly what happens in the immune system during an allergy. However, it had already been recognized that allergies are also diseases of

civilization. It was believed that their appearance had something to do with dense coexistence in cities and being alienated from nature, and a period of rest in the country was often prescribed as a remedy.

We now know that children who grow up on a farm are actually less likely to develop allergies. This could be due to the fact that constant contact with all kinds of animals and microorganisms trains their immune system particularly well. However, the increasingly frequent occurrence of misdirected immune reactions to harmless pollen is not only the result of more

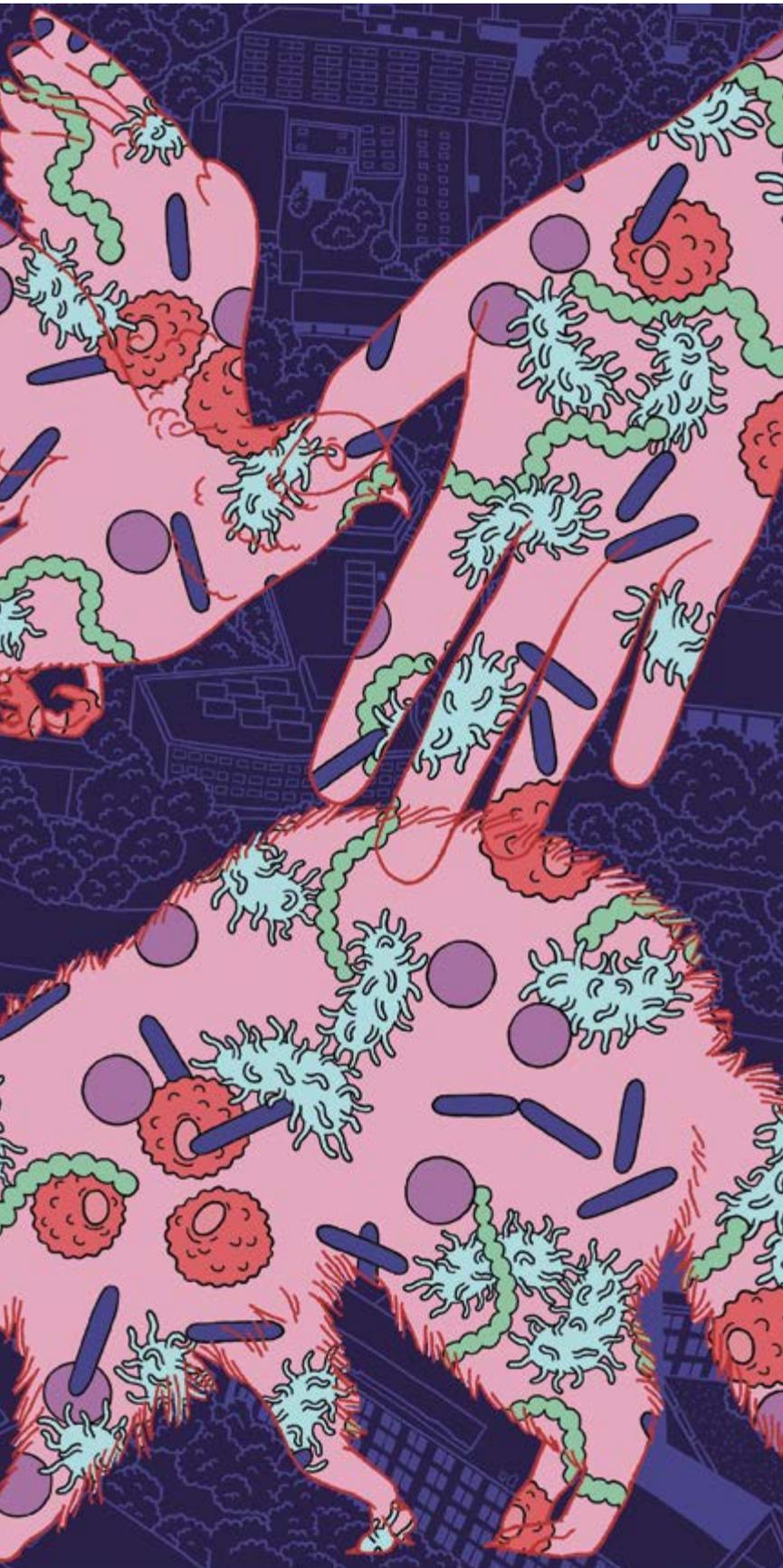
and more people living in cities. Climate change also plays a role here, as it prolongs the flowering period of allergy triggers. And in cities, which as heat islands consisting of concrete and asphalt heat up even more than their surroundings areas, this effect is particularly great.

"We will also have to deal with other health problems more in the future," says Brantz. Heat-loving animals, which are notorious as disease vectors, are also spreading to temperate climate zones as a result of climate change. These include tiger mosquitoes and tropical ticks. What new or familiar diseases will these profiteers of global warming bring with them? And what can be done about it? These are among the other questions being explored by the researchers in the BUA project.

Sponge cities

One subproject, for example, focuses on sponge cities, which are seen as offering a promising response to the upswing in heavy rainfall by preventing flooding, improving the urban climate, and storing as much water as possible for the next drought. But what happens if the necessary flood areas become breeding grounds for mosquitoes? Could this result in the spread of West Nile virus, chikungunya fever, dengue fever, and other mosquito-borne diseases? These are the kinds of





questions being explored by geographers at Freie Universität Berlin working together with virologists at Charité.

In another subproject, Professor Jörg Stollmann and Dr. Jamie-Scott Baxter from the Institute of Architecture at Technische Universität Berlin are investigating the spread of fungus-like pathogens of the genus *Phytophthora*, which are among the most notorious plant pests in the world. The researchers are addressing the challenges such problematic organisms pose for urban and landscape planning.

But not all of our neighbors from other species cause trouble. Some may even be won over as comrades-in-arms to help overcome challenges.

"We are looking at health challenges and the coexistence of species in cities from a number of very different scientific perspectives," concludes Dorothee Brantz. She believes that one of the most important results of the project so far has been to bring these different perspectives together to form an overall picture. "We are attracting a lot of interest from both politicians and the public," she says. The problem is that not every idea gets implemented. "Unsealing areas to restore a natural water balance benefits everyone. Until, that is, the question arises about how to reconcile this with the need to create additional living space."

Despite such problems, Brantz and the other members of the project team want to continue working on new ideas for the cities of the future even after the BUA project has ended. One option for doing so is offered by the network "Planetary Health – Planetary Thinking in the Social Sciences and Humanities," funded by the German Research Foundation (DFG) and based at the University of Leipzig, whose members include Professor Ulrike Beisel from Freie Universität Berlin and Dorothee Brantz. The closer the researchers look, the more exciting city dwellers of all species capture their attention. And the closer their ties become.

"Some survive after I die, and some die so I can survive," writes Ozan Zeybek in his book. "I try to set boundaries but in vain. They fly through the holes, crawl beneath the doors, and pass through my skin. I have ants in my kitchen. Is this house mine?"

“Everything Starts With an Idea”

Many research findings have economic potential and could help improve people's everyday lives. But how do we make the leap from the lecture hall or lab to real-life applications? Volker Hofmann and Florian Frank are part of the management team of Science & Startups, the joint startup service of Berlin's three major universities. In this interview, they talk about the opportunities for setting up companies based on scientific research.

INTERVIEWER Kerstin Viering

Florian Frank, you head the TU Research Department's Innovation and Law section, which was set up about one year ago. What is your remit exactly?

FLORIAN FRANK: The section is the central point of contact for technology transfer at TU Berlin, meaning we provide all the services covered by a technology transfer office. This includes supporting startups, advising on technology transfer and legal matters, helping with strategic cooperations and contracts, and licensing and patents.

Together with Volker Hofmann from Humboldt-Innovation, you form part of the management team of Science & Startups. Can you tell us a bit about it?

FF: In the past, Freie Universität Berlin, Humboldt Universität, and TU Berlin each had their own unit offering a service for startups. Science &

Startups was set up in 2019 to provide a common and standardized platform for everybody interested in startups, so people from both within the universities and external parties, based on the services of the three BUA universities.

How did this merger come about?

VOLKER HOFMANN: An important signal for this came from the Berlin University Alliance. It was the BUA that laid the foundations to enable cooperation structures such as Science & Startups to become possible. The alliance recognizes that shared services are the future, and that together we can be even stronger and better.

Tell us about the advantages.

VH: If you are looking for co-founders, for example, you have a larger pool of suitable people to draw from. And investors are interested in good

ideas – and not necessarily which university they come from.

FF: We can also create a kind of critical mass for niche technologies, which is important as it might not be possible to attract potential partners from industry to Berlin on the basis of what one of the universities alone has to offer. Being able to offer the combined expertise of all three outstanding research institutions greatly increases the chances.



Florian Frank heads the newly created Innovation and Law section at TU Berlin.

And what are the benefits for the universities?

VH: Among other things, startups offer internships for students and career opportunities for graduates. Many young companies also grow to become research partners. And last but not least, Science & Startups helps raise the profile of scientific institutions as drivers of innovation and startup culture. This strengthens the reputation of the universities and

helps attract students, researchers, alumni, and corporate partners from all over the world.

How does this kind of startup culture emerge?

FF: Berlin in particular offers great opportunities for this. The city has so much to offer and is extremely diverse. On the one hand, that's obviously a good thing. But you also have to be careful that you don't end up



Volker Hofmann is managing director of Humboldt-Innovation GmbH.

with ten different agencies responsible for the same thing. That's why we're keen to work closely with new institutions that promote innovation. These include, for example, innovate! lab gGmbH, founded by the BUA, which is active in the field of green chemistry. Another example is the UNITE network, which puts research institutions in Berlin and Brandenburg in contact with interested partners from business, poli-

tics, and society. Together, we want to turn Berlin's currently somewhat fragmented startup landscape into a well-functioning ecosystem.

What role does Science & Startups play in this ecosystem?

FF: We support people in consolidating and developing their ideas, and creating good business plans and products. We also help secure initial financing, for example through the Berlin Startup Grant. And, of course, we try – also in cooperation with UNITE – to bring young companies together with partners from the business world.

Who is your offer aimed at?

FF: Anyone with a good idea. This includes students from the three BUA universities as well as doctoral candidates, professors, alumni, and other interested parties. It never even occurs to many brilliant researchers to start a business.

We want to encourage them to think in terms of business ideas and make the results of their work available to society. Ultimately, everything starts with an idea.

What kind of ideas do you help to become businesses?

VH: The ideas come from a wide variety of fields. The startup "Green Fusion," for example, developed software that uses artificial intelligence to optimize the heating systems of apartment buildings. This saves heating costs and protects the climate. Then there is Shit2Power, and the name says it all, that uses energy from sewage sludge to generate heat, electricity, and hydrogen. Sofa-tutor is a platform for digital learning in schools that proved very successful during the pandemic.

A number of young companies have developed solutions for very

specific everyday problems. For example, apps that help you get a doctor's appointment faster or improve the healthcare of your pets. So we are not living in a scientific bubble that has nothing to do with people's everyday lives. Quite the opposite, in fact.

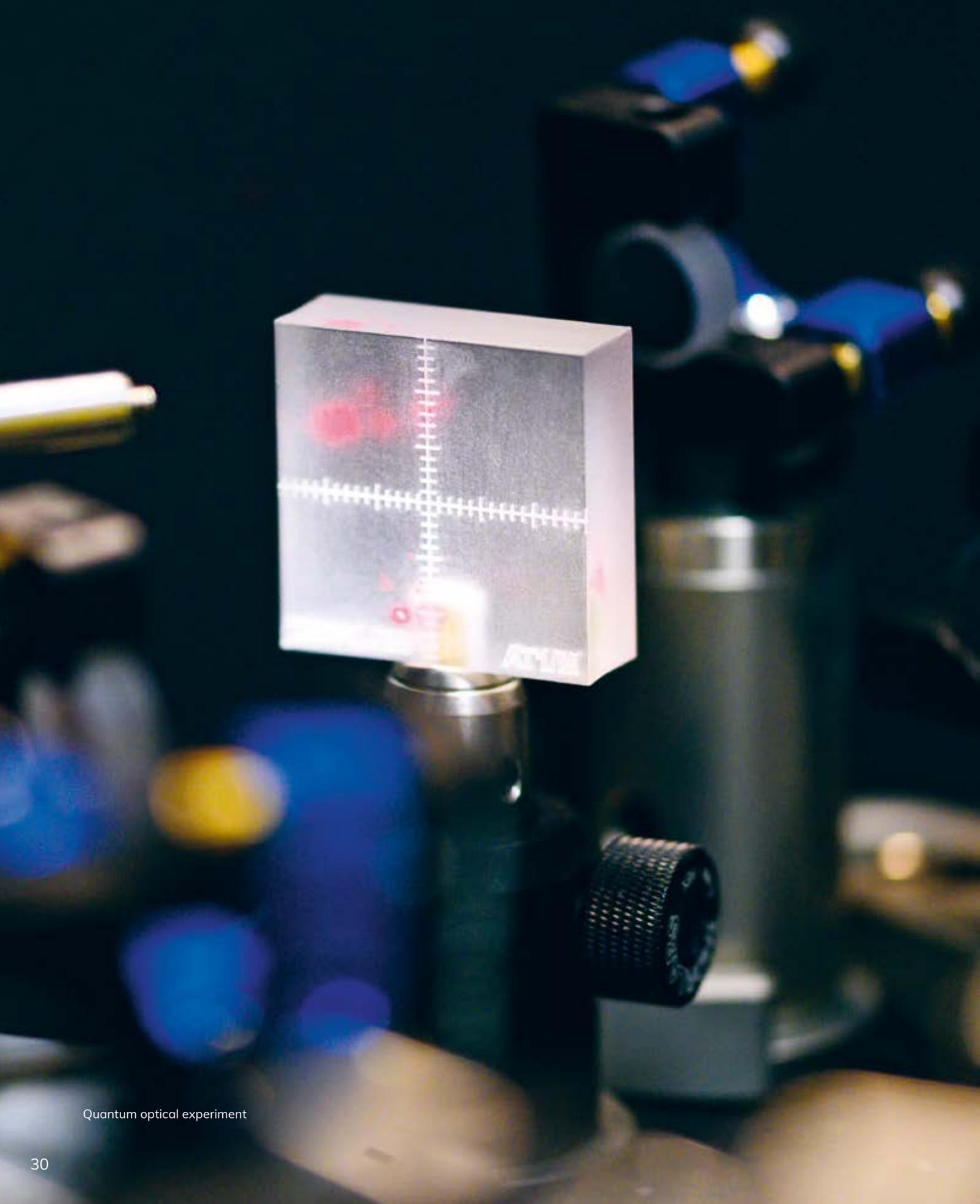
What role do such startups play in Berlin's economy?

VH: They are one of the economic drivers of our city, creating jobs and tax revenue. For example, the EXIST startup grant provided by the Federal Ministry for Economic Affairs and Energy and the EU, which is one of our most important support programs, generates almost six euros in additional value for every euro invested.

FF: Since 2019, Science & Startups has supported more than 2,600 company founders and 1,600 startups. By 2023, a total of 15 million euros will have been invested in these companies, which have a total value of 91 million euros. In addition, some 190,000 jobs have been created. We have also been able to significantly increase Berlin's visibility as a center of business. The city's startups now have a much higher profile both in Germany and abroad.

What are Science & Startups' plans for the future?

FF: Next up, we want to establish Science & Startups as a business entity and set up a limited liability company for this purpose. This will enable us to compete more effectively than before and recruit staff more quickly. We also want to further expand our position at an international level. In an analysis published by the Financial Times, we were ranked among the top 20 leading startup centers in Europe this year. We are, needless to say, very proud of this. But next year, we want to be in the top 10.



A Key to the Future

Quantum keys are seen as guaranteeing absolutely secure communication – but achieving genuinely uncrackable cryptography requires more than just a few tricks from the world of physics. With a new academic chair and support provided by the BUA-coordinated Berlin Quantum initiative, TU Berlin is further expanding its research into quantum communication.

AUTHOR Wolfgang Richter

Whoever has the key has the power, and can use it to open doors, safes, or treasure chests. But things are a little more complex in the case of quantum keys, which are used to encode messages to safeguard their contents from outsiders. "Quantum keys are designed to make absolutely secure communication possible. The usual explanation for this is that quantum keys can be exchanged between the sender and receiver using the tricks of quantum physics in such a way that it would become clear if anyone

mathematics and physics. The same is true for the further development of the protocols for the transmission of the quantum keys.

A new Chair of Quantum Communication Networks is being set up at TU Berlin with the aim of providing a more solid theoretical foundation for work in this area. The professorship was awarded to Dr. Anna Pappa, who has led a research group at TU Berlin for a number of years. "I am delighted that my new position, which is funded by the Feder-

Partner. The State of Berlin is providing a total of 25 million euros until the end of 2026 – with the proviso that further third-party funding is secured. "The appointment of Anna Pappa is a good example of how Berlin Quantum maximizes the impact of third-party funding through strategic complementary funding," says Jean-Pierre Seifert, who represents TU Berlin on the board of Berlin Quantum. In total, the three Berlin universities raised more than 45 million euros in third-party fund-

PHOTO Cathrin Bach

"I'm particularly interested in how quantum computers can be networked." Dr. Anna Pappa

were listening in on the line," says Jean-Pierre Seifert, who heads the Chair for Security in Telecommunications at TU Berlin. This is correct in principle, but only tells half the story: "After the sender and receiver have exchanged a quantum key consisting of zeros and ones via a tap-proof line, the sender still has to encrypt the actual message and send it via a normal line to the receiver, who then has the job of decoding it. Special algorithms are required to ensure that this occurs in a secure and efficient way. So a quantum key alone is not enough for truly uncrackable quantum cryptography."

Advancing the technology using new research approaches therefore requires in-depth knowledge of both

al Ministry of Research, Technology and Space, has been able to secure additional funding for personnel and equipment from the Innovation Promotion Fund of the State of Berlin," Pappa enthuses.

Strategic funding

The funding is provided through the Berlin Quantum initiative, which was set up in 2023. Non-university research institutions and the Berlin business community are also involved in the initiative along with the three Berlin universities. Berlin Quantum is coordinated by the Berlin University Alliance, Humboldt-Innovation GmbH, the optics competence network OpTecBB, and business development agency Berlin

ing for quantum research between 2023 and 2024. This included three prestigious grants from the European Research Council.

In addition to developing secure protocols for quantum networks, Anna Pappa also works with experimental groups, both at TU Berlin and elsewhere, and with companies that manufacture the devices for transmitting quantum keys using light particles. "I'm particularly interested in how quantum computers can be networked and made accessible via the cloud in a tap-proof manner," says Pappa. This could perhaps represent a chance for everyone to obtain a secure key to a computing machine with previously unattainable possibilities.

From Data Centers to Diversity: What's New at the BUA

Whether new infrastructure for data-driven research, digitally networked collections, international cooperation, or providing impetus for diversity and gender studies, the Berlin University Alliance is pursuing a wide range of initiatives to strengthen the capital city as a science hub

AUTHOR Julie Spielmann

NETWORKING

Universities and Non-University Institutions Join Forces

A new cooperation agreement has been signed to enable Berlin Research 50 (BR50) and the Berlin University Alliance to work more closely together. BR50 is an alliance of the capital's non-university research institutions, including Max

Planck, Helmholtz, Leibniz, and Fraunhofer. Together with the BUA consortium of excellence, a partnership is being created that forges a binding basis for scientific cooperation. The agreement includes plans for structures for pooling resources and expertise, as well as a joint research agenda with five profiles that will define future priorities. The aim is to strengthen Berlin as a research hub in the long term and increase its international visibility.



Professor Dr. Jutta Allmendinger, Professor Dr. Günter M. Ziegler, and Professor Dr. Thomas Sommer (from left to right) at the signing of the cooperation agreement



Eva Cheng

DIVERSITY

Eva Cheng Appointed Audre Lorde Visiting Professor at TU Berlin

Since 2021, the Diversity and Gender Equality Network (DiGENet) of the Berlin University Alliance has been awarding visiting professorships to outstanding researchers whose work sets international standards in the field of intersectional diversity studies. The professorship is intended to strengthen the academic debate on social diversity, power relations, and structural inequalities in Berlin as a research hub, and provide impetus for contemporary diversity research. It is named after the Caribbean-American literary scholar Audre Lorde.

In summer semester 2026, Eva Cheng will become the fourth Audre Lorde Visiting Professor at Technische Universität Berlin. Cheng is head of the School of Professional Practice and Leadership at the Faculty of Engineering and Computer Science at the University of Technology Sydney. Her research focuses on gender inclusion in STEM subjects.

DIGITALIZATION

Shared Data & AI Center Planned for Berlin

Data-based research is a central component of modern science, especially in areas such as health, new materials, and climate change. Collecting and evaluating large amounts of data and analyzing them with the

PHOTOS BUA, Anna Zhu

help of simulations is essential, especially in technical disciplines. The use of artificial intelligence also places high demands on the underlying infrastructure.

To provide optimal support for data-intensive projects, the Berlin University Alliance, Max Delbrück Center, Helmholtz-Zentrum Berlin (HZB), and Zuse Institute Berlin are jointly planning a Data & AI Center to provide a powerful platform for data-driven research. The first step is a new computer center at the HZB site in Berlin-Adlershof with a planned capacity of up to 5 megawatts.

PRACTICE

New innovate! lab Strengthens Technology Transfer

In March 2025, the Berlin University Alliance founded the subsidiary innovate! lab gGmbH, and by doing so created a new structure in the capital for the targeted transfer of research results into sustainable applications. In the first stage, the lab will focus on innovations in green chemistry.

innovate! lab builds on the successful work of the Berlin network greenCHEM, which, under the leadership of TU Berlin, has gained important experience in technology transfer in recent years and has already achieved initial successes. Work is now continuing on a systematic basis to speed up the transfer of materials and technologies from cutting-edge research into practice. innovate! lab was made possible by the Joachim Herz Foundation, which is supporting the project with 5 million euros.

INTERNATIONAL

New Research Cooperation Between Berlin and São Paulo



Marco Antonio Zago, president of the São Paulo Research Foundation (FAPESP), and Verena Blechinger-Talcott (BUA) at the signing of the cooperation agreement

Researchers from Brazil and the BUA consortium of excellence will work more closely together in future. In September 2025, the Berlin University Alliance and the renowned São Paulo Research Foundation (FAPESP) signed an agreement aimed at deepening scientific cooperation in the long term.

The agreement builds on the BUA member institutions' long-standing partnerships with universities and research institutions in São Paulo, and establishes binding structures for joint research. As part of the agreement, seminars, workshops, and exchange programs are planned to provide new impetus and open up future fields of research. The BUA provides support through targeted funding for initiating research and innovation projects.

INFRASTRUCTURE

Connecting Islands – Digitally Networking Scientific Collections

Scientific collections are veritable treasure troves, but their potential remains untapped as long as they are decentralized or difficult to access. The Berlin University Collections project, funded by the Berlin University Alliance, aims to change this. Since 2021, the teaching and research collections of the four partner institutions have been systematically indexed and made available digitally. An online platform now offers centralized ac-



Scanning a terrain model with a mobile handheld 3D scanner

cess to over 100 collections, including 16 from TU Berlin, and enables interdisciplinary research by object type, subject, and institution. The project team is also running a number of cooperation projects. Together with the Center for 3D Technologies (ZE3D) at TU Berlin, objects from a wide range of disciplines are currently being digitized in 3D to test various methods and develop standards for the presentation of heterogeneous objects. .



Exploring the Importance of Water in Berlin

The ON WATER | WasserWissen program in Berlin brings together representatives from science, politics, art, and civil society to develop ideas for a resilient future for water

AUTHOR Barbara Halstenberg



Trockenpfütze 2025 (dried puddle on polyester film) by artist Mirja Busch featured in the exhibition at the Humboldt Forum

When the Spree Begins to Dry Up

What can be done if the water levels in the Spree fall significantly? Over the past year, the ON WATER program has provided Berlin's residents the chance to get involved in exciting and tangible research. One highlight of the project is the exhibition ON WATER. WasserWissen, which has been running in the Humboldt Labor in Berlin since 10 October 2025. The exhibition showcases current projects and artistic reflections on water, such as the work of artist Mirja Busch, which focuses on puddles. Together with TU hydrologist Thomas Nehls, she has developed a method for the 3D measurement of these small water ecosystems that reveal insights into humankind's influence.

Let's Talk About Water

The idea behind ON WATER | Dialogues, which was developed by the TD Lab at TU Berlin, is for water experts from research and industry to come together to find solutions for specific challenges. The dialogs are structured workshops that enable representatives from science, politics, business, and civil society to network. The goal is to share knowledge across disciplines and increase the visibility and effectiveness of Berlin's integrative space for research on water.



The first ON WATER dialogue event took place on the grounds of the Floating University, where experts from science and industry exchanged ideas on water-related topics.



Workshop with artists and scientists at the BODIES OF WATER festival on Berlin's Panke river

The City as a Water Lab

Rivers, canals, banks – Transforming Berlin's waterways into places of activity and discovery. The ON WATER | Parcours takes you to special places in the city, both urban spaces and museums and cultural institutions. Pursuing artistic and participatory formats, it opens up new perspectives, enabling the city to transform itself into a water lab where research becomes tangible and neighbors engage in dialog to develop ideas for a more conscious use of water. An example of this is provided by TU researcher Johannes Müller, who presented a device for extracting drinking water from the air using renewable energy.



PHOTO: Liam Schnell

Water Meets Art

Faced with the challenges of climate change, how can we better protect and use water? Professor Dr. Irina Engelhardt, a hydrogeologist at TU Berlin, has dedicated her research to answering this question. Her work earned her an award in the Berlin University Alliance's "Art Meets Science" ideas competition. She coordinates the SpreeWasser:N project, which is working on strategies to ensure sustainable water management and secure water availability for Berlin and Brandenburg.

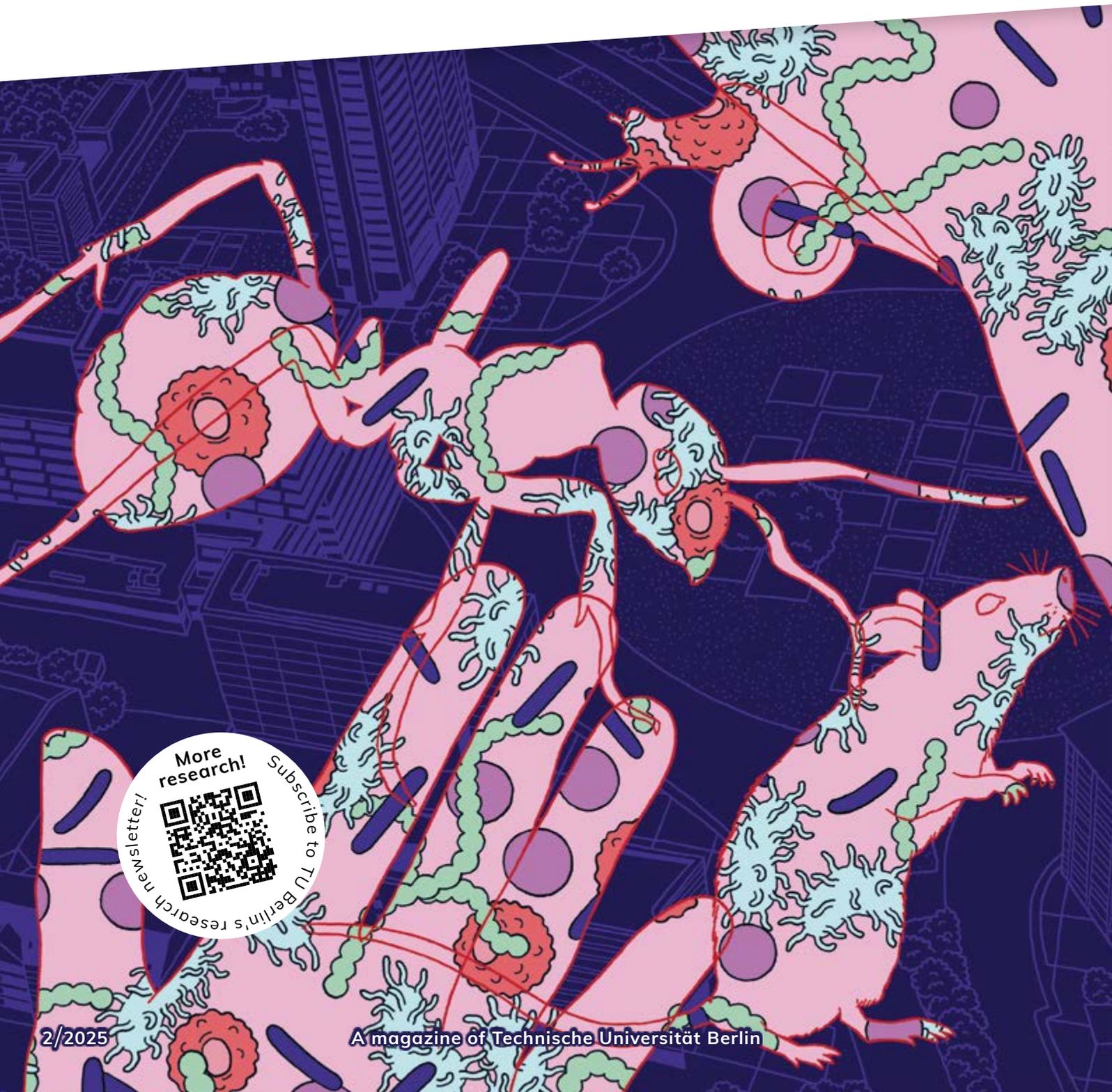
Her team is creating large-scale groundwater models that let us look deep underground and learn about our groundwater resources and their movements. The phase-out of lignite mining in the Lusatian region will significantly reduce water availability, particularly in the Spreewald and Branitz Park. Sustainable water resource management projects are planned for these areas from 2026 onwards. Engelhardt wants to take science out of the lab: "Water is something that concerns all of us." Together with artist

Liam Schnell, she created ROBI – a fantastical creature that merges various measuring instruments. At the same time, ROBI reminds us of a central question: How much water is there? (hal)

As part of the BUA's "OPEN LAB" campaign, posters promoting the hydrogeological all-round measuring device ROBI are being displayed across Berlin.

Artist: Liam Schnell

We've got the brains for the future.
For the benefit of society.



More research!
Subscribe to TU Berlin's research newsletter!

