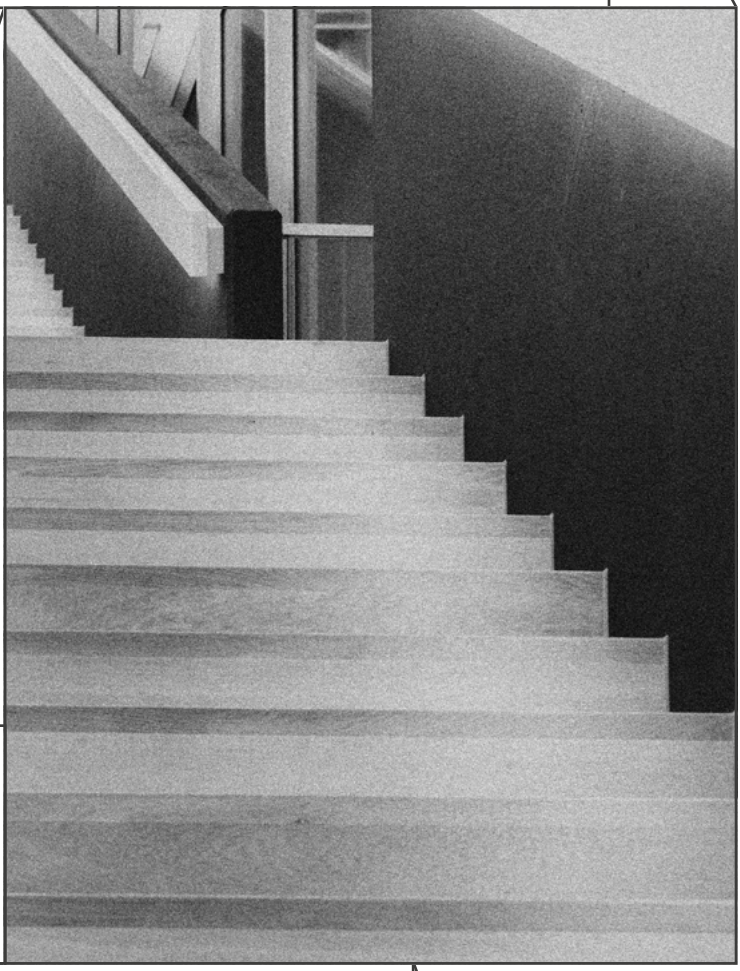
CISPA



CISPA HELMHOLTZ CENTER FOR INFORMATION SECURITY

ZINE 2

English Edition

DEAR READERS,

Our world is ever-changing. In these weeks and months, we are all, unfortunately, becoming painfully aware of this. But as frightening as some changes are, change is also the essence of progress and thus an opportunity – for more knowledge, more security, and more freedom. Turning things around requires people who think further than others, who tackle challenges and carry the vision of a better world in their hearts.

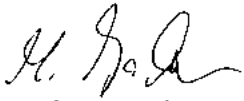
It makes me very proud that there are so many exceptional people working at *CISPA*, who deliver exactly this power of imagination and creativity. Their passion and intelligence are advancing cybersecurity research and equipping us for new threats. But they also create an extraordinary environment and new thinking spaces for young researchers from all over the world.

Prof. Dr. Dr. h. c. Michael Backes © Peter Kerkrath

And so it makes me just as proud that our first-generation tenure-track faculty, Katharina Krombholz, Ben Stock, Nils Ole Tippenhauer, Nico Döttling, and Sven Bugiel, have been able to successfully prove themselves and hold their own in this excellent environment over the past few years, enriching the high-caliber cadre of senior tenured scientists at *CISPA*.

However, a research center like *CISPA* does not live on scientists alone. It needs many capable staff members in a wide variety of positions, who share this vision and use their expertise to ensure that it can become a reality. In this issue of the Zine, some of them tell us about the paths that have opened up for them at *CISPA*.

Enjoy reading.



Prof. Dr. Dr. h. c. Michael Backes

FACTS ABOUT CISPA

There from the start

© Tobias Ebelshäuser

Bettina Balthasar
Director's Office Manager

Number of employees in research

31
Faculty at CISPA

8
Senior researchers and research group leaders at CISPA

26
Postdocs at CISPA

112
PhD students and scientific staff at CISPA

To get to the top of CISPA, you first have to conquer our 60 step staircase.

Information as of: 2022/04

EXCELLENT CAREER OPPORTUNITIES AT *CISPA*

For many researchers, embarking on an academic career means going from one temporary position to the next. With its tenure track, *CISPA* shows that this does not have to be the case: the first generation of our young researchers was appointed as senior scientists for life in December 2021 after a probationary period. Dr. Katharina Krombholz, Dr. Ben Stock, Dr. Sven Bugiel, Dr. Nils Ole Tippenhauer, and Dr. Nico Döttling were not gifted the coveted tenure. They have had to prove that they can hold their own in international competition over the past few years.

"For me, the tenured status is a nice recognition of my work and means that I can also contribute here in the long term," says Nils Ole Tippenhauer. Sven Bugiel adds: "But it also expresses recognition from colleagues. They believe in me having the vision and the skills to do good research in the long term." Nico Döttling is also happy about the added planning security: "I'm much more relaxed now and can start looking for a house for me and my family."

But what exactly does one have to accomplish to enjoy tenured status? "It involves many categories, such as success in research, mentoring students, or getting involved in *CISPA* committees and the scientific community. We have to score in all categories, although of course we all have individual strengths and weaknesses and are stronger in one category than in others," explains Ben Stock. Katharina Krombholz adds: "If you have good research ideas and a good research philosophy and approach the world with an open mind, the tenure track is not witchcraft. During this time, I did what I would have done anyway: write and publish papers, write proposals, and get involved in the community. If you have something to tell, it's not that difficult." Nils Ole Tippenhauer explains why the tenure track nevertheless brings pressure for many researchers: "The institution sets the standard for the quality to be delivered. And here at *CISPA*, every-one has high expectations of themselves."

The tenure track at *CISPA* is a career development program that opens up a long-term pers-

pective for aspiring scientists. “As first-generation tenure track, I can say: the program is already very good. What is particularly positive is that it is not comparative – each case is considered individually, and it is not a ‘survival of the fittest’,” says Stock. Sven Bugiel agrees: “We have a real support network here at *CISPA*, and the atmosphere among colleagues is great.”

At *CISPA*, the promotion of young talent begins with PhD students. They are comprehensively supervised and supported at *CISPA*, regardless of whether they want to stay in academia, switch to industry, or start a company. Sven Bugiel sums up *CISPA’s* recipe for success: “Very good research goes hand in hand with very good teaching and successful knowledge transfer to the industry and public.”

© Tobias Ebelshäuser

The newly tenured faculty: Ben Stock, Nico Döttling, Katharina Krombholz, Sven Bugiel, Nils Ole Tippenhauer (left to right)

“WE FINALLY WANT TO DIG UP THIS TREASURE OF DATA AND MAKE IT USABLE”

Things went pretty quickly for our faculty Dr. Nico Döttling in recent months. In December 2021, he became tenured faculty, the Cyberagentur *placed its first feasibility study in his hands in the same month, and the* European Research Council *(ERC) awarded him an* ERC Starting Grant *of 1.5 million euros for his research at the beginning of 2022. In this interview, Nico discusses these successful last months and what motivates him to keep on doing research in the future.*

Dr. Nico Döttling © Tobias Ebelshäuser

Congratulations on the ERC Grant, Nico. From the idea to the grant - what is the process like?

In principle, any researcher can apply for an *ERC Grant* at least two years after their PhD. This is the most sought-after research funding in Europe. The selection process is tough, and applications that are not thoroughly thought through will be subject to an application block of one to two years. Moreover, there is not one breakthrough idea at the beginning of this path. Rather, it is preceded by several years of work in which you must show that you can translate research approaches into influential publications and conduct independent research. Otherwise, you don’t stand a chance. The idea for such a large research project is not something you start from scratch. A lot of my preliminary work is already in a similar field. But of course, you need a new and inno-

vative approach or a new perspective to have a chance at an *ERC Grant*. You have to present this in a very detailed project proposal. I spent three and a half months writing and polishing it. Once it's submitted, it's a matter of waiting. Only about a third of the applicants make it through the first round of evaluation. Once you've successfully passed that, you have to give another very brief presentation to the awards committee about your plans and then face an interview. To be honest, that was pretty nerve-wracking. Ultimately, only about 10 percent of all applicants receive positive news.

What is the funded research project about?

Together with a team of three, which I will be putting together in the coming months, I want to develop techniques and methods in the "Laconic Cryptography" project that will, for example, pave the way for the secure use of machine learning processes in medicine. Valuable medical data has been collected worldwide for a long time, and its analysis could improve the diagnosis and treatment of diseases enormously. However, it is currently not possible to securely combine this data and evaluate it using data-intensive analysis methods, i. e., what is commonly referred to as artificial intelligence, because many cryptographic techniques have so far failed when processing large volumes of data. We want to finally dig up this treasure of data and make it usable without giving up data protection in the process.

The *Cyberagentur* awarded the contract for its first tendered out project to you. With your former doctoral supervisor Prof. Jörn Müller-Quade from KIT in Karlsruhe, you are leading a feasibility study on encrypted computing. What do you want to find out in this study?

Encrypted computing is a method of analyzing data without first decrypting it. In this way, particularly sensitive and security-critical information can remain secret and still be processed. The concept of fully homomorphic encryption is considered particularly promising. We want to find out how far along potential applications already are, which can then be used in the future in the area of internal and external security.

What else do you dream of as a researcher?

I still have a whole list of problems in my drawer that I want to solve, or rather: see solved. Because why do you become a researcher? Because somewhere in the world, there is still an annoying problem. A condition where our knowledge reaches its limits. Expanding these is what drives me. There's always plenty to do.

MORE GOOD NEWS

50 million euros in venture capital for *CISPA* startups! *Sustainable & Invest GmbH* is setting up a venture capital fund of this amount specifically for *CISPA*. The private-sector investment will enable the multitude of current and future *CISPA* startups to advance their visions, successfully transferring the excellent research at *CISPA* to industry and society on a large scale. "The establishment of a dedicated venture capital fund for CISPA in this remarkable amount impressively underlines the enormous economic and societal potential of our research," says Prof. Michael Backes.

Prof. Dr. Dr. h. c. Michael Backes
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Federal Research Minister Bettina Stark-Watzinger
© Tobias Ebelshäuser

Prominent visitors: very early in the year, we already had some important guests from the realm of politics. In January, we kicked off with Oliver Luksic, "Parlamentarischer Staatssekretär" to the Federal Minister for Transport and Digital Infrastructure. He had an exciting exchange with *CISPA* CEO and Founding Director Michael Backes. Thomas Sattelberger, "Parlamentarischer Staatssekretär" to the Federal Minister of Education and Research, dropped by in February, leaving visibly impressed by our work culture. Then in March, Federal Research Minister Bettina Stark-Watzinger convinced herself of our strengths and ambitions.

Finally, the time has come! The foundation stone for the new *CISPA* building has been laid, and the date at which we physically move closer together again, is on the horizon. This is only the prelude to a much larger growth process: in the coming years, an entire campus will be built around the *CISPA* main building; creating a unique research and working environment for all colleagues – both those who newly arrive month after month and those who have enriched the center from the very beginning.

Laying of the foundation stone of the new *CISPA* building
© Tobias Ebelshäuser

Prof. Dr. Thorsten Holz
© Tobias Ebelshäuser

Congratulations, Prof. Dr. Thorsten Holz. In March, the *European Research Council* (*ERC*) announced that it will fund the *CISPA* faculty's project *RS³* with a Consolidator Grant of around 2 million euros over the next five years. In his project, Holz aims to develop innovative methods to make software more robust against attacks in the long term. "An *ERC Grant* brings Europe-wide visibility to my research and the work here at *CISPA*. This is especially helpful in recruiting young researchers," Holz says.

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WHAT ARE YOU DOING AT CISPA?

Bettina Balthasar

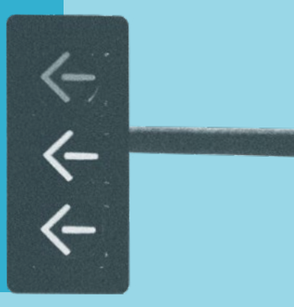
Age: 55
Function: Director's office manager

"Pretty much everything lands on my desk – from procurement orders to interview requests. I manage and coordinate Michael's office and support the company's management in the execution of their tasks. In coordination with my colleague Olga, travel is planned, tasks are coordinated and assigned to the individual departments at *CISPA*. Scheduling and time planning, appointment management, invitations, receiving guests, preparing meetings and conferences, monitoring deadlines and appointments are part of my daily work. At the same time, I am the interface between scientific and administrative management. I was already at *CISPA* when it didn't really exist in this form and was still part of Saarland University. In December 2005, a few months after Michael became the youngest professor in Germany to hold the Chair of Information Security and Cryptography at Saar University, I joined him as his secretary."

Nicolas Zapp

Age: 29
Function: Budget and Tax Officer

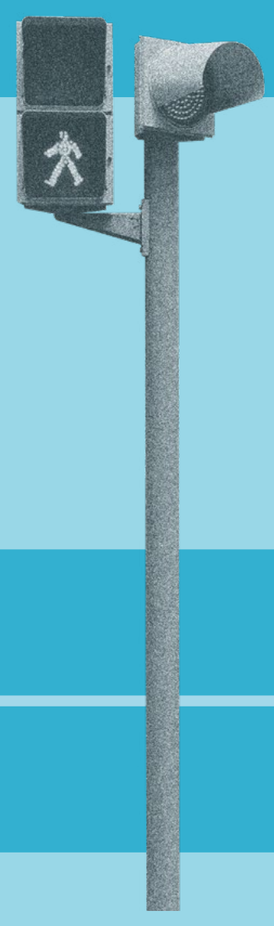
"I make sure that we at CISPA comply with the regulations that apply to us from a tax and budgetary perspective. Of course, I am not solely responsible for this. For example, I regularly work with the Procurement Office, Controlling, my colleagues from Travel, the Project Office, and the Legal Department. It's not so much the day-to-day cases that end up on my desk, but often fundamental issues. For example, recently, I had to resolve whether we, as an employer, are allowed to pay a subsidy for a job ticket and which funds can be used to grant this subsidy. This raises questions of tax law, in particular how this subsidy should be treated from a payroll tax perspective. In addition to the general legal regulations, there are also some guidelines and requirements of the Helmholtz Association that must be satisfied. Much of this is subject to interpretation and has to be adapted in daily work. I really like my work and colleagues here at *CISPA* and enjoy dealing with numbers and legal provisions."



Florian Fischer

Age: 35
Function: System-Administrator

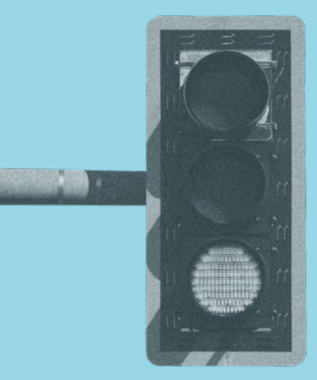
"I have been a system administrator at *CISPA* in the IT infrastructure team for five years and mainly deal with server-related work. In cooperation with my colleagues, I take care of the network infrastructure of existing and new locations, the maintenance of our server landscape, or the commissioning of new hardware. I also take care of our locking system at our different locations. Since last year, I've also been instructing our team's apprentice at our center, which I really enjoy and which is just as much fun as my daily work."



"Onboarding is very diverse, and our team does a little bit of everything: This includes things like recruiting and planning internal events. Our onboarding sessions, for example, are designed to ensure that new employees can easily settle in at *CISPA* and get to know our center and the departments. I've recently started conducting job interviews myself, which I find very exciting – before, I was always just on the other side of the interview table. My favorite part of the job is planning social activities. From city tours through game afternoons to a *CISPA* Round Table, which I hope will take place soon, I already have some ideas to get *CISPA* employees talking to each other and to make their start in Saarbrücken easier. Unfortunately, the pandemic is still giving me a hard time right now, but I hope for a better spring."

Nabila Luscher

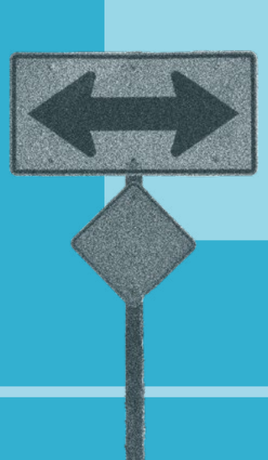
Age: 28
Function: Onboarding and Social Activities



Sascha Schäfer

Age: 37
Function: UX Designer on the Scientific Engineering team

"I'm a UX designer and work with my team on demonstrators that make some of *CISPA's* research results more understandable for the public. We are currently working on a demonstration of formal verification of security protocols. We want to show why this is important and how this method works. *CISPA* faculty Cas Cremers has already helped develop software – called Tamarin Prover – that can automate the verification process. In addition to the actual work on the demonstrator, we are helping to make the software even more user-friendly and functional. The new design and the software development are mainly based on findings from interviews with users of the Prover, which have shown us where we can further improve the software. This knowledge is also very useful for the construction of the demonstrator."



Dingfan Chen

Age: 26
Function: PhD student in the group of CISPA faculty Prof. Dr. Mario Fritz

"I am conducting research in Mario Fritz's group on privacy and deep learning, which is exciting and has great potential. In my research, I try to figure out vulnerabilities of deep learning models and propose solutions to mitigate them. To complete my PhD, some of my research papers need to be published at the top-tier conferences in our field, in which I have succeeded in the past. Before coming to *CISPA* in July 2019, I obtained my Bachelor's degree in Computer Science from *Eberhard Karls University* of Tübingen, and then transferred to the Graduate School of Computer Science at *Saarland University* for my Master's studies. There, I had the opportunity to work with Mario Fritz, whom I followed to *CISPA*."

Photos by Tobias Ebelshäuser