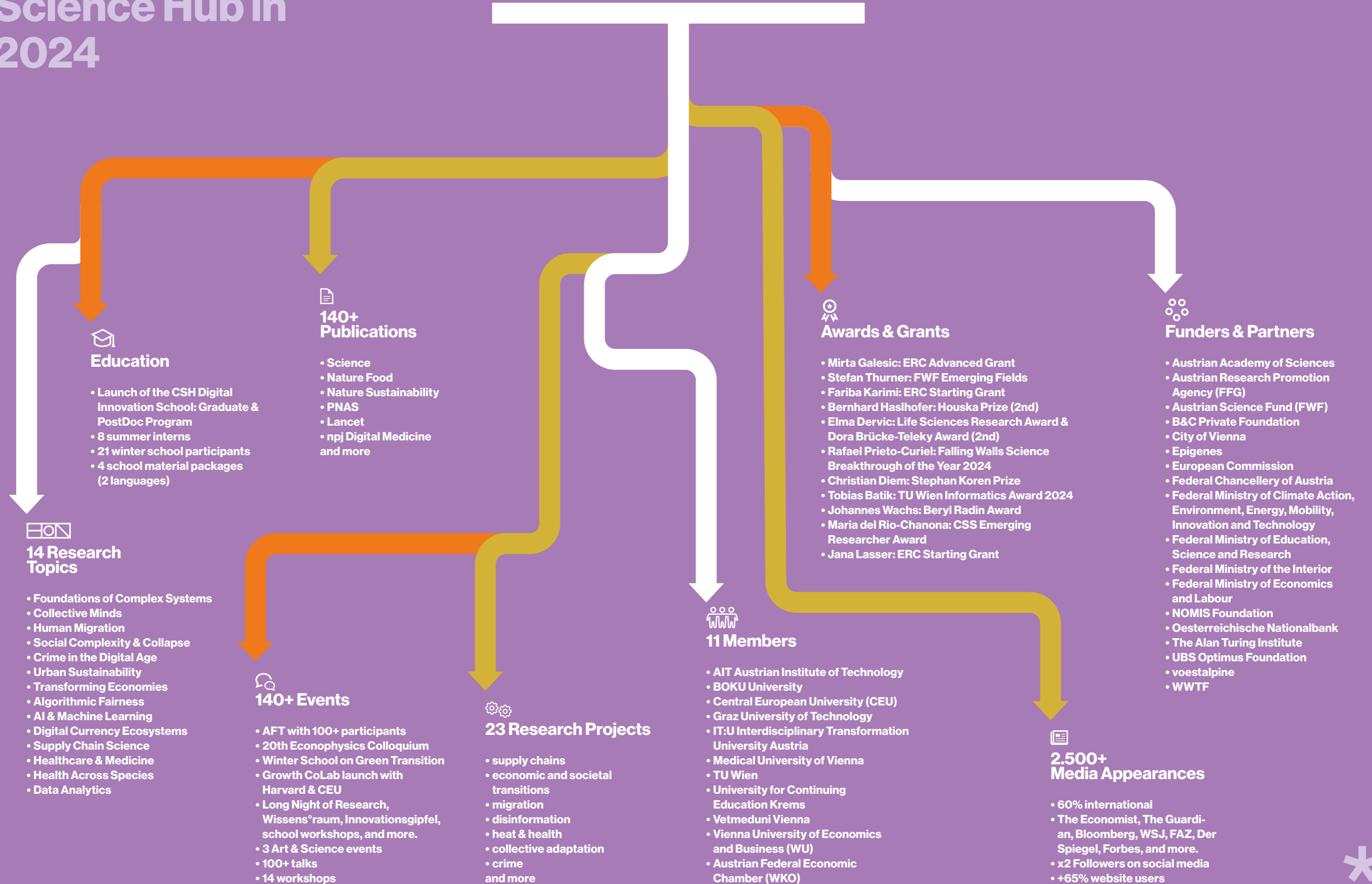


The Complexity Science Hub in 2024


75 Resident Scientists
 + 84 external, 40 associate and 80+ visitors

**32% women
68% men**

**23% Austrian
47% EU
30% other**



Education

- Launch of the CSH Digital Innovation School: Graduate & PostDoc Program
- 8 summer interns
- 21 winter school participants
- 4 school material packages (2 languages)

140+ Publications

- Science
- Nature Food
- Nature Sustainability
- PNAS
- Lancet
- npj Digital Medicine and more

Awards & Grants

- Mirta Galesic: ERC Advanced Grant
- Stefan Thurner: FWF Emerging Fields
- Fariba Karimi: ERC Starting Grant
- Bernhard Haslhofer: Houska Prize (2nd)
- Elma Dervic: Life Sciences Research Award & Dora Brücke-Teleky Award (2nd)
- Rafael Prieto-Curiel: Falling Walls Science Breakthrough of the Year 2024
- Christian Diem: Stephan Koren Prize
- Tobias Batik: TU Wien Informatics Award 2024
- Johannes Wachs: Beryl Radin Award
- Maria del Rio-Chanona: CSS Emerging Researcher Award
- Jana Lasser: ERC Starting Grant

Funders & Partners

- Austrian Academy of Sciences
- Austrian Research Promotion Agency (FFG)
- Austrian Science Fund (FWF)
- B&C Private Foundation
- City of Vienna
- Epigenes
- European Commission
- Federal Chancellery of Austria
- Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology
- Federal Ministry of Education, Science and Research
- Federal Ministry of the Interior
- Federal Ministry of Economics and Labour
- NOMIS Foundation
- Oesterreichische Nationalbank
- The Alan Turing Institute
- UBS Optimus Foundation
- voestalpine
- WWTF

14 Research Topics

- Foundations of Complex Systems
- Collective Minds
- Human Migration
- Social Complexity & Collapse
- Crime in the Digital Age
- Urban Sustainability
- Transforming Economies
- Algorithmic Fairness
- AI & Machine Learning
- Digital Currency Ecosystems
- Supply Chain Science
- Healthcare & Medicine
- Health Across Species
- Data Analytics

140+ Events

- AFT with 100+ participants
- 20th Econophysics Colloquium
- Winter School on Green Transition
- Growth CoLab launch with Harvard & CEU
- Long Night of Research, Wissensraum, Innovationsgipfel, school workshops, and more.
- 3 Art & Science events
- 100+ talks
- 14 workshops

23 Research Projects

- supply chains
- economic and societal transitions
- migration
- disinformation
- heat & health
- collective adaptation
- crime and more

11 Members

- AIT Austrian Institute of Technology
- BOKU University
- Central European University (CEU)
- Graz University of Technology
- IT:U Interdisciplinary Transformation University Austria
- Medical University of Vienna
- TU Wien
- University for Continuing Education Krems
- Vetmeduni Vienna
- Vienna University of Economics and Business (WU)
- Austrian Federal Economic Chamber (WKO)

2.500+ Media Appearances

- 60% international
- The Economist, The Guardian, Bloomberg, WSJ, FAZ, Der Spiegel, Forbes, and more.
- x2 Followers on social media
- +65% website users



Artificial Intelligence

AI's Rise and Its Economic Consequences

Anton Korinek is one of the leading experts on AI and its impact on the economy. He believes that the effects of AI will be far more significant than many currently assume.

What do you expect in the coming years?

I expect the economic impact of AI to grow rapidly as organizations learn to leverage these technologies more effectively. We're likely to see significant transformations in knowledge-intensive industries such as finance, consulting, and technology. Sectors like healthcare and education also have enormous potential for AI-driven productivity gains.

Will Europe be able to compete?

One of my concerns is that AI adoption in Austria, and across Europe more broadly, is lagging behind. In Europe, people are significantly more skeptical than in the US, for example. However, AI development is happening very quickly. This gap in adoption rates could lead to disparities in productivity gains and economic growth between regions.

How fast is 'very quickly'?

While I've been studying this field for a decade, the pace of advancement continues to surprise me. AI can now solve a problem at the push of a button that my doctoral students would normally spend an entire day working on. Friends in Silicon Valley tell me that AI could surpass human intelligence in all areas within the next three to five years.

What will be the greatest challenge in the coming years? In the economic realm, the greatest challenge will likely be managing the disruption to labor markets. As AI systems become capable of performing an increasing range of cognitive and physical tasks, we may see significant job displacement across industries. This could result in rising unemployment and income inequality.

Where do you see the greatest benefit of AI? In its potential to solve some of our most pressing global challenges. By overtaking human intelligence and creativity, AI could accelerate scientific discoveries, leading to breakthroughs in fields like medicine, clean energy, and environmental conservation.



Anton Korinek is a professor at the University of Virginia and the Darden School of Business, as well as a research associate at the National Bureau of Economic Research (NBER). He is currently spending a research year at CSH.

In November, Vox recognized him as one of the 2024 Future Perfect 50, honoring his role as a changemaker in the field of AI alignment.

New Approach for AI Risks

The EU's AI Act, introduced in July as the first comprehensive AI regulation by a major global authority, emphasizes risk assessment but lacks clarity on defining it, says CSH's Fariba Karimi. Together with Daniel Kondor, they propose a complex systems approach to better evaluate and mitigate AI risks by addressing the intricate relationship between technology and society.

Spotlights

New research projects

REMASS (funded by FWF) — This interdisciplinary pioneer project, involving multiple partners, explores the impacts of crises — such as global warming, pandemics, war, and more — on societal metabolism, including resource consumption, sustainability, inequality, and social well-being.

Collective Adaptation (funded by ERC) — This project, led by Mirta Galesic, aims to provide insights into why collectives — from families to entire societies — can become stuck in deadlocks over critical issues, such as resolving long-standing political conflicts. It seeks to uncover the core cognitive and social mechanisms behind collective adaptation.

Visualization is Key

Our vis team has tackled many exciting projects this year beyond the one on our cover. From a heatmap with musical vibes to the complexity of Chinese names, the best shapes for cities, and insights into global mobility — find it all at csh.ac.at/visuals.

New Address

We have officially said goodbye to Palais Strozzi and are now settled in at Palais Springer-Rothschild in Vienna's 3rd district — with plenty of space for great ideas.

Welcome IT:U

In December, IT:U joined CSH. Together, we will advance research in Computational Economics.

CSH Education

Education is the foundation of a thriving society, and with that in mind, CSH significantly expanded its training programs in 2024. A key addition was the CSH Digital Innovation School.

CSH Digital Innovation School

CSH Graduate Program — Students who join CSH for their PhD, supported by funding from BMBWF and BKA, have the opportunity to shape the future — whether it's supporting the green transition, combating crime and misinformation, or building more equitable economies.

CSH PostDoc Program — This program, funded by BMK, is tailored for postdoctoral researchers at both early and advanced stages of their careers — those ready to take on bold projects, lead their own research teams, leverage big data, and apply state-of-the-art methods to address pressing societal challenges and make a real-world impact.

CSH Winter School

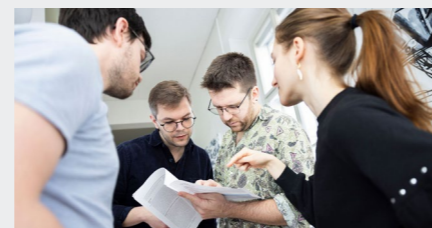
It's all about collaborative learning. CSH hosts an annual Winter School, where early-stage researchers immerse themselves in complexity science as applied to particular real-world issues together with an expert faculty.

CSH Internship Program

Every summer, CSH welcomes interns from universities around the world. The core of their experience is a hands-on research project, on which they work closely with their advisors and gain first-hand experience with complex systems science.

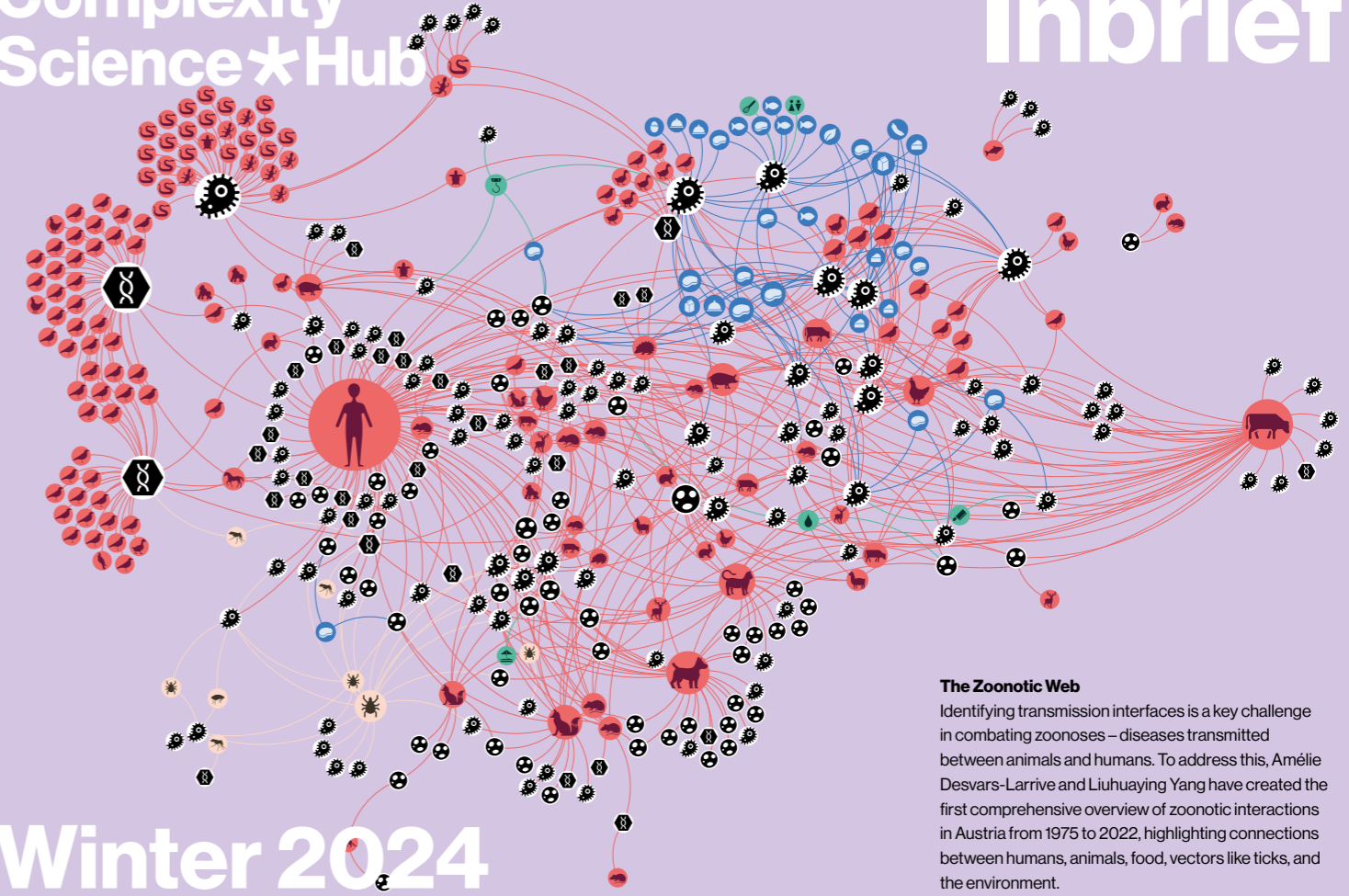
CSH Goes School

Through engaging worksheets, CSH Goes School introduces young minds to topics like supply chains and poverty maps. Currently, four modules are available in two languages, with new ones on mobility and health coming in 2025.



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Complexity Science * Hub



The Zoonotic Web

Identifying transmission interfaces is a key challenge in combating zoonoses — diseases transmitted between animals and humans. To address this, Amélie Desvars-Larrive and Liuhuaying Yang have created the first comprehensive overview of zoonotic interactions in Austria from 1975 to 2022, highlighting connections between humans, animals, food, vectors like ticks, and the environment.

Winter 2024

On New Tracks

Editorial

Stefan Thurner



Nearly ten years ago, when we started the idea of a research center for complexity science in Vienna, we envisioned a group of 30 people. Today, more than 80 people work at the CSH, and we are continuing to expand. This growth has made it necessary to massively transform CSH, so that everything can (seemingly) stay the same. In 2024, we almost completely redesigned the internal organization of the CSH and put ourselves on new tracks, three of which stand out as particularly transformative — and hopefully scalable.

With the launch of the CSH Digital Innovation School, two of these tracks focus on developing the next generation of talent: the CSH Graduate Program in Complexity Science and the CSH PostDoc Program. With the support of the Austrian government, we secure the training of young people for the challenges ahead. These early-career researchers will have the opportunity to acquire the scientific and digital skills necessary to address pressing issues, including supply chain resilience, health and network medicine, migration, and the green transition. They will not only engage with state-of-the-art research but also consider how it intersects with governance, administration, and the economy. The idea is that they become digital leaders capable of driving real change.

The third track is centered on expanding our research themes and teams. Just to mention a few highlights: at the beginning of the year, we started five new research projects and celebrated securing

FWF Emerging Fields funding, where we investigate the impacts of crises on societal metabolism together with our partners. Mirta Galesic was awarded an ERC Advanced Grant and is establishing a research group dedicated to collective adaptation. Fariba Karimi received an ERC Starting Grant for her work on algorithmic fairness, while Bernhard Haslhofer, our expert in digital currency ecosystems and cybercrime, won second place at the Houska Prize. We also saw Rafael Prieto-Curiel's research on mobility featured in *The Economist*, and he was awarded the Falling Walls Science Breakthrough of the Year 2024 in Social Sciences and Humanities.

To match this new structure and accommodate our growing team, we are undergoing a major physical transition with our move to Palais Springer-Rothschild in Vienna's third district, offering the space and environment to support our vision and mission. Alongside this physical transformation, we relaunched our visual appearance. Our new core colors — black and white — reflect our commitment to providing clear answers to complex questions. With our new website, we aim to make our research much more accessible to a broader audience.

For us, 2024 was a year of transformation — with lots of reinvention, movement, stress, and change. It was a good year because we now feel prepared for the next steps ahead.