AI in Research: Predictive Practices

Final Conference of the Research Group: How is Artificial Intelligence Changing Science?
Research in the Era of Learning Algorithms

University of Bonn, Department of Media Studies, March 25-27, 2026
Lennéstraße 6, 4th floor, Room 4.001, D - 53113 Bonn

Day 1: March 25, 2026

Time	Event
2:00 PM - 3:00 PM	**Welcome and Introduction**
3:00 PM - 3:30 PM	**AI demo: animAR - Turning Pictures into Conversations** *Robin von Hardenberg* animAR turns real images into conversation partners: photos, paintings or book covers are "brought to life" on the spot and take on voice and shape in space through augmented reality. This creates a new intersection between the physical and the digital world. For example, you can ask a character in a painting about their story or let an author explain their book to you, as you hold it in your hands. In this live demo, I will shortly conduct open interviews with multiple personalities, like J.R.R. Tolkien, Virginia Woolf and Albert Einstein. It will become tangible, how convincingly AI can emulate the sound, language and style of thinking of specific people and how knowledge becomes much more vivid, when told through the prism of an interesting persona. Another specialty is that the avatars are not just answering questions, they are autonomously using tools to generate background images or searching for matching 3D-models to integrate into the AR-world. This creates the experience of a conversation that illustrates itself: as if Tolkien himself rolls out the map of Middle-Earth on the table right in front of you, as he talks. This demo is a look towards a future, where it will be entirely natural to use dialogic AI-interfaces for conveying knowledge. **Bio:**

Robin von Hardenberg entwickelt Augmented-Reality-Formate, die reale Bilder und Orte zu interaktiven Interfaces machen. 2014 schuf er die Timetraveler-App für die Bernauer Straße, die geglückte Fluchten entlang der Berliner Mauer als Vor-Ort-Erlebnis aus der Perspektive von Zeitzeugen erfahrbar machte. Mit animAR (IGP-gefördert) baut er diese Idee weiter aus: Eine Plattform, die Fotos, Gemälde und Buchcover in AR „zum Leben erweckt" und als dialogische Avatare zugänglich macht. An animAR arbeitet er gemeinsam mit Ryan Henderson und Federico Ramos.

Sein Hintergrund liegt in Philosophie und Sprachen (Oxford, Lady Margaret Hall) sowie Regie (DFFB). Nach der Mitgründung der Filmproduktion Fat Lady realisierte er über viele Jahre preisgekrönte Fernsehwerbungen für Kunden wie Mercedes Benz, Trivago und Volkswagen.

| 3:30 PM - 4:30 PM | **First Keynote: Experimenting with Predictive AI Architectures in Science** *Gabriele Gramelsberger, RWTH Aachen University* |

The term "AI" obscures the fact that artificial intelligence is a potpourri of different methods. Machine learning algorithms in particular are based on a wealth of different architectures of artificial neural networks. There are over thirty different ANN architectures known, all of which have different functionalities and capabilities such as the famous Convolutional Neural Networks (CNNs), Generative Adversarial Networks (GANs) or Kohonen Networks (KNs). Researching with ML algorithms therefore means experimenting with predictive AI architectures in the sciences. Using the example of materials science, the paper analyses this new form of scientific experimentation and draws comparisons with conventional forms of experimentation—computational as well as lab-based ones. The paper also questions the goal of materials science to fully automate research with the support of AI. Furthermore, the question is posed as to what role predictions actually play in this context. The aim is to update philosophy of computational sciences beyond computer-based simulations by incorporating AI methods.

Bio:

Gabriele Gramelsberger holds the Chair for Theory of Science and Technology at the RWTH Aachen University, Germany. Her research focusses on the digitalization of science. She is Director of the Käte Hamburger Kolleg "Cultures of Research", an international centre for advanced studies in history, philosophy, and sociology of science and technology funded by the German Federal Ministry of Research. She is a member of the North Rhine-Westphalian Academy of Science. For her longstanding and substantial research to areas relevant to philosophy and computing she received K. Jon Barwise Prize from the American Philosophical Association in 2023. Recent publications are the edited volume Philosophy of Artificial Intelligence. Optimistic and Pessimistic Views (Springer Nature 2025, together with Markus Pantsar, Frederik Stjernfelt, and Alin Olteanu) and her monograph on Philosophie des Digitalen zur Einführung (Philosophy of the Digital, second edition Junius 2024).

| 4:30 PM - 5:00 PM | **Coffee Break** |

| 5:00 PM - 6:00 PM | **Two Lectures** |

1. **Large Language Models as Simulative Manifestations of Structuralist Linguistics**
Martin Warnke, Leuphana University Lüneburg

The history of Large Language Models (LLM) shows that their scientific background is linguistics, not neurophysiology, although Rosenblatt's *Perceptron* started the neural net technology with a biological metaphor which is still common in the field. The discovery by Geoffrey Hinton et al. that it is possible to train any kind of neural net to implement any kind of model made it possible that LLM nowadays process all text that there is to produce new text. The accessibility, not to call it bluntly *theft*, of massive amounts of data along with gigantic computing power brought very capable LLM finally to reality.

Indeed, there is a linguistic theory that shares the methodological assumptions of LLM, claiming that human speech and writing could be expressed by structures upon statistical patterns, as »the departures from equiprobability«. Zellig Harris, the American structuralist linguist and doctoral supervisor of Noam Chomsky, stated this already in the 1950s. Also the meaning of words follows from its distribution within a corpus, an insight which gave rise to the statistical approach of LLM in the 2010s. Harris even predicted anomalies that are nowadays called »hallucinations« occurring in the LLM. I claim: these are not beginners problems but characteristics *by design* which won't go away easily.

LLM are an example of theory building based on computer simulation, they are simulative manifestations of linguistic theory. They are operational grammars that also generate semantics, giving rise to all sorts of wonders and of problems.

Bio:

Martin Warnke, born in 1955, studied in Berlin and Hamburg, obtained his doctorate in theoretical physics in 1984, and has since been at Leuphana University in Lüneburg, where he was head of the Computing and Media Centre. He habilitated in 2008, became a professor at the Institute for Culture and Aesthetics of Digital Media, director of the DFG Institute for Advanced Study "Media Cultures of Computer Simulation" (mecs), co-founder of the "HyperKult" workshop series, and in 2024 Senior Fellow at the International Research Centre for Cultural Studies (ifk) in Vienna. He is Chairman of the Springhornhof Arts Club and lives in Lüneburg.

2. VIAN 1.0: Bridging Human Annotation and AI in Audiovisual Analysis
Josephine Diecke & Simon Spiegel, University of Zurich

Audiovisual media pose persistent methodological challenges in the digital humanities due to their multimodal nature (Bateman and Schmidt 2012; Heftberger 2018). While AI-driven approaches enable (semi-)automated temporal segmentation, audio transcription, feature extraction, and concept detection (Arnold and Tilton 2023; Burghardt et al. 2024), existing tool ecosystems rarely support workflows that are both interpretable and sensitive to disciplinary research practices. Fully automated systems often require extensive correction, making critical verification indispensable. Current debates on algorithmic seeing and machine vision underscore the epistemological stakes of computational audiovisual analysis (Chávez Heras 2024; Scherer 2025). Addressing these limitations therefore requires reconsidering where interpretive control enters the analytical process. Manual annotation, understood as an epistemic practice rather than a preparatory task, offers a way to foreground epistemic foundations of meaning while remaining compatible with computational approaches (Hielscher 2020; Bakels et al. 2023).

Against this background, this presentation introduces VIAN 1.0 (Diecke and Spiegel 2024) as a human-centered response to a missing link in current AI pipelines: hybrid workflows connecting

close viewing and distant viewing in epistemically transparent ways. VIAN 1.0 succeeds the original VIAN tool focused on film color analysis (Halter et al. 2019; Flueckiger and Halter 2020) and deliberately eschews embedded AI features. Instead, it emphasizes an easy-to-use interface and a reduced, stable feature set for manual video annotation. Available as a web-based and desktop application, VIAN 1.0 is designed for interoperability with AI-based platforms such as TIB AV Analytics (Springstein et al. 2023), enabling automatically generated annotations to be integrated and contextualized within human-driven workflows.

Bio:

Josephine Diecke is Assistant Professor of Film Studies at the University of Zurich (UZH). Her research is situated at the intersection of film and media studies, digital humanities, and critical data studies, with a focus on computer-assisted audiovisual analysis, audiovisual heritage, film historiography, and digital methods. Diecke is a member of the NECS Steering Committee and convenor of the DHd working group Film and Video. Her monograph on the discursive construction of Agfacolor and Orwocolor was published in 2025 as Farbfilm aus Wolfen: Agfa, ORWO und das Versprechen von Qualität (1936–1990) (oa books). Her work has also appeared in the Journal of Film Preservation, the Journal of Cultural Analytics, NECSUS. European Journal of Media Studies, and several edited volumes, including Doing Digital Film History (Dang et al. 2025) and Science Discourses in Cold War European Research Institutions, Cinemas and Media (Scholz and Ivanova 2024).

6:00 PM - 7:00 PM   **Second Keynote: Will We Need Scientists in 2050?**
Alexander Waibel, Carnegie Mellon University/KIT

Artificial Intelligence, a science that had previously gone through booms of false promises and busts and disappointments, has recently taken off explosively and now dominates the public discourse, from politics, to economics, labor markets and our daily lives. Our academic processes and science education have also already seen transformative changes.
At the conclusion of our joint project "How AI is changing Science", we should reflect on where we are and what lies ahead. My Talk will address several questions:

- Where are we, what technical capabilities have been achieved? Is AI driven purely by scaling in compute, or are there limitations in our current algorithmic approaches?
- What are some of the technical milestones we have achieved in this project?
- What are the societal and moral challenges with the continuing rise of AI?
- Will AI do better science? What will it mean for the scientific enterprise?

I will discuss some of our own research on continual learning and "Sleep AI" and propose directions for a beneficial and benevolent future *with* AI as opposed to a struggle *against* AI.

Bio:

Alexander Waibel is Professor of Computer Science at Carnegie Mellon University (USA) and at the Karlsruhe Institute of Technology (Germany). He is director of the International Center for Advanced Communication Technologies. Waibel proposed early Neural Network based Speech and Language systems, including in 1987 the TDNN, the first shift-invariant ("Convolutional") Neural Network, and early Neural Speech and Language systems. Based on advances in ML, he and his team developed early ('93-'98) multimodal interfaces including the first emotion recognizer, face tracker, lipreader, error repair system, a meeting browser, support for smart rooms and human-robot collaboration. He pioneered many cross-lingual communication systems that now

overcome language barriers via speech and image interpretation: first consecutive (1992) and simultaneous (2005) speech translation systems, road sign translator, heads-up display translation goggles, face/lip and EMG translators.

Waibel founded & co-founded more than 10 companies and various non-profit services to transition results from academic work to practical deployment. This included "Jibbigo LLC" (2009), the first speech translator on a phone (acquired by Facebook 2013), "M*Modal" medical transcription and reporting (acquired by Medquist and 3M), "Kites" interpreting services for subtitling and video conferencing (acquired by Zoom in 2021), "Lecture Translator", the first automatic simultaneous translation service (2012) at Universities and European Parliament, and STS services for medical missions/disaster relief.

He is a member of the National Academy of Sciences of Germany, member of the research group of AI of the German Science and Humanities Council (Wissenschaftsrat), a Life-Fellow of the IEEE, a Fellow of ISCA, and a Research Fellow of Zoom.

8:00 PM	**Dinner**

Day 2: March 26, 2026

Time	Event
9:30 AM - 10:15 AM	**HiAICS Presentation 1: The AI Co-Ethnographer: How Far Can Automation Take Qualitative Research?** *Fabian Retkowski, KIT* Qualitative research often involves labor-intensive processes that are difficult to scale while preserving analytical depth. In this talk, we will present the AI Co-Ethnographer (AICoE), a novel end-to-end pipeline developed for qualitative research and designed to move beyond the limitations of simply automating code assignments, offering a more integrated approach. AICoE organizes the entire process, encompassing open coding, code consolidation, code application, and even pattern discovery, leading to a comprehensive analysis of qualitative data.
10:15 AM - 10:45 AM	**Coffee Break**
10:45 AM - 11:30 AM	**HiAICS Presentation 2: The World Integrated Model and the Solutionist Promise of Artificial Intelligence** *Anna Echterhölter & Markus Ramsauer, University of Vienna* The predictive abilities of Artificial Intelligence tools fundamentally depend on quantification most prominently in the form of models and data. The history of science group historicized these crucial elements separately. In a first part Markus Ramsauer investigates the promises of contemporary AI-powered socio-economic forecasting by comparing them with the Global Modeling efforts of the 1970s. Special attention is devoted to Mihajlo Mesarovic and Eduard Pestel's "World Integrated Model," the analytical basis for Mankind at the Turning Point: The Second Report to the Club of Rome. In light of the socio-political ruptures of the "long 1970s," this complex model was presented to officials as a vital instrument for rational and realistic decision-making. Both then and now, automated calculation—whether styled as the "Electronic Brain" or "Artificial Intelligence"—promises a future vision of inherent manageability. Within this rationale, however, technical solvability often serves as a substitute for substantive political discourse. Furthermore, the default settings and internal parameters of these instruments essentially preconfigure possible policy pathways and interventions, narrowing the scope of governance before deliberation begins. **World Resource Databases and the Preparedness Promise at UNEP** Predictive practices rely on more than models, simulations, or pattern recognition, they feed on data and databases. As beacons of global data collection, the UN statistical endeavors serve as main example. Their database politics mirror the development in cultures of prediction over time. In 2022 the UN World Environmental Programme UNEP launched the "World Environment Situation Room" (WESR), to integrate environmental statistics and various new forms of Alt Data with AI tools---for instance international Event-Speech-Recognition (Adamczyk 2024; Yang at al. 2026). The title of the platform implies that this information is crucial, that crisis is imminent, and it promises strikes with surgical precision and that data were transformed into a planetary experimental setup (Mitchell, Halpern, Schmidgen 2026). In post-war foundational moments, to the contrary, monitoring of planetary resources was overwhelmingly presented as a valuable contribution to peace (Heymann 2020, Jundt 2018). With our focus on databases (Codd 1970;

Manovich 2001; Gugerli 2007; Burkhardt 2015; Wickberg / Gärdebo 2023), we investigate the respective status of indexicality in different periods, as data's most essential but easily dilutable promise.

11:30 AM - 12:15 PM   **HiAICS Presentation 3: Using AI to Study AI. Epistemic Media, Recursive Observers, and the Politics of Prediction**
Andreas Sudmann & Jens Schröter, University of Bonn

Our talk develops a conceptual framework for using AI to study AI, with a focus on how predictive practices reorganize knowledge production in and through LLMs. First, we explicate our concept of epistemic media (Sudmann 2024; Schröter/Sudmann 2024; Retkowski/Sudmann/Waibel 2025) as socio- technical conditions that do not simply circulate knowledge but actively format what can count as evidence, explanation, and method, and thus open a critical perspective on mediation as an epistemic operation. Second, we introduce our concept of recursive observers to analyze AI infrastructures in the academic context that render observation observable and actionable by feeding traces back into practice via logging, benchmarking, evaluation rubrics etc. Both concepts are helpful to describe the politics of prediction as a conflict over how futures are produced as operational objects, how uncertainty is addressed and translated into specific categories, and how normative decisions are stabilized as prima facie technical criteria. Third, we draw on our LLM experiments as a case study, treating structured LLM-to-LLM discussions as an explicitly designed research arena in which recursive observation can be examined within the medium itself.

12:15 PM - 2:00 PM   **Lunch**

2:00 PM - 3:30 PM   **Three Lectures**

   1.   Simulating Results: On the Practices of Tying Scientific Meaning to Vector Spaces
Tobias Matzner, University of Paderborn

Using artificial neural networks (ANNs) entails a mapping of a task to the numerical space in which ANNs operate. Leading contemporary forms of ANNs, so called transformers, operationalize this mapping by way of a vector space. The input data is projected into that space; the operations of the model are performed on vectors and only the resulting vector is translated back into the domain of scientific knowledge. While a lot of excellent work has been done on the operations of the ANNs on such vector spaces themselves, this talk argues that the mediation steps between real-world data and vectors that come before and after the processing of vectors are essential for understanding the epistemic qualities of transformer models. The talk examines particularly the transformation of vectors back into meaningful scientific results. It shows that all entail a discretization of the continuous vector space into units such as linguistic tokens, genome sequences or pixels of an image. Yet, depending on the respective domain, these practices differ significantly, introducing a decisive element of particularity in the claimed universal applicability of transformer models. Furthermore, it shows that these practices are not determinate, but employ various forms of approximation, for example diffusion processes. These practices reduce a potential for different outcomes to one defined result. In this regard, these approximation practices share important epistemic qualities with simulations. In consequence, the talk will

inquire to which extend it makes sense to claim that transformer models only ever simulate their results.

Bio:

Tobias Matzner is professor for digital cultures/digital humanities in Paderborn. His research combines theories of (digital) media and technologies with approaches from political philosophy, cultural studies, and social theory. Tobias Matzner has studied computer science and philosophy and holds a PhD in philosophy, both at the Karlsruhe Institute of Technology. Before joining Paderborn University he has been working at the Internatial Centre for Ethics in the Sciences and Humanities in Tübingen and at the department of philosophy at the New School for Social Research in New York as a Feodor Lynen Fellow of the Humboldt-Foundation.

2. **Generative AI Voting: Fair Collective Choice is Resilient to LLM Biases and Inconsistencies**

Evangelos Pournaras, University of Leeds

Scaling up deliberative and voting participation is a longstanding endeavor – a cornerstone for direct democracy and legitimate collective choice. Recent breakthroughs in generative artificial intelligence (AI) and large language models (LLMs) unravel new capabilities for AI personal assistants to overcome cognitive bandwidth limitations of humans, providing decision support or even direct representation of abstained human voters at large scale. However, the quality of this representation and what underlying biases manifest when delegating collective decision making to LLMs is an alarming and timely challenge to tackle. By rigorously emulating with high realism more than >50K LLM voting personas in 306 real- world voting elections, we disentangle the nature of different biases in LLMs. Complex preferential ballot formats exhibit significant inconsistencies compared to simpler majoritarian elections that show higher consistency. Strikingly though, fair ballot aggregation methods, such as equal shares, prove to be a win- win: fairer voting outcomes for humans with fairer AI representation, especially for voters who are likely to abstain. This novel underlying relationship proves paramount for democratic resilience in progressive scenarios with low voters turnout by voter fatigue supported using AI representatives: abstained voters are mitigated by recovering highly representative voting outcomes that are fairer. These interdisciplinary insights provide remarkable foundations for science, policymakers and citizens to develop safeguards and resilience for AI risks in democratic innovations.

Bio:

Dr. Evangelos Pournaras is Professor of Trustworthy Distributed Intelligence in the School of Computer Science at University of Leeds. He is also a UKRI Future Leaders Fellow (£1.4M) a Research Associate at the UCL Center of Blockchain Technologies and has also been an Alan Turing Fellow. Evangelos has more than 5 years of research experience at ETH Zurich after having completed his PhD studies at Delft University of Technology. Evangelos has also been a visiting researcher at EPFL and has industry experience at IBM T.J. Watson Research Center. Evangelos has won the Augmented Democracy Prize the 1st prize at ETH Policy Challenge as well as 5 paper awards and honors including the listing of two of his project within UNESCO IRCAI Global Top-100 as `outstanding' and `promising'. He has published more than 100 peer-reviewed papers in high

impact journals and conferences. Evangelos has extensive leadership experience and raised funding for national and EU projects such as H2OforAll ASSET and SoBigData.

3. Building AI Tools for Scientific Research in Under-Represented Languages
Valentina Fedchenko, National Institute for Oriental Languages and Civilizations Paris

The ClingS (Cross-lingual Information Retrieval for Scientific Datasets in Less-Resourced Languages) project addresses the urgent need for AI tools that support scientific research in under-represented languages. Despite the central role of language in shaping scientific thought, many minoritized and diasporic languages have limited access to scientific corpora, language-specific models, and terminological resources. ClingS seeks to bridge this gap by developing multilingual AI tools for seven diverse languages—Belarusian, Estonian, Punjabi, Slovak, Taiwanese (Tâigí), Ukrainian, and Yiddish—spanning multiple linguistic families and sociolinguistic contexts. Our project focuses on the conceptual framework for constructing comparable corpora across selected scientific domains, fine-tuning language-specific models for scientific discourse, and aligning these models into a shared multilingual embedding space. Through retrieval-augmented generation (graph-RAG) and multi-agent architectures, our system will enable cross-lingual access, interpretation, and structured exploration of scientific knowledge, supporting both research and education in historically marginalized linguistic communities.

This presentation will highlight the early stages of our work, emphasizing methodological considerations, design principles, and ongoing reflections rather than final results. We will discuss the challenges inherent in representing scientific terminology and conceptual frameworks across diverse languages, including handling domain-specific neologisms and culturally specific knowledge. The talk will also explore the broader intellectual implications of enabling scientific self-representation in minoritized languages, contributing to linguistic standardization, knowledge diffusion, and cross-cultural historiography of science. By providing open-access tools, curated datasets, and multilingual AI models, ClingS aims to lay the groundwork for a more inclusive and linguistically diverse scientific ecosystem, demonstrating how AI can empower communities historically excluded from global scholarly discourse.

3:30 PM - 4:00 PM   **Coffee Break**

4:00 PM - 5:00 PM   **Two Lectures**

1. How AI Affects the Replicability and Reproducibility of Scientific Research
Johannes Breuer, Center for Advanced Internet Studies (CAIS) & University of Duisburg-Essen

For science to function as a cumulative and self-correcting endeavor, the ability to reproduce and replicate empirical findings is essential. While there are different definitions of the terms, reproducibility is typically defined as arriving at the same results using the same data and (analysis) methods, while replicability refers to getting the same (or very similar) results using the same method but different data. The replication crisis originating in psychology in the early 2010s has led to numerous systematic investigations revealing issues with regard to the reproducibility and replicability of research across scientific disciplines.

The rise of large language models (LLMs) and generative AI (genAI) has impacted scientific research across all phases in the research cycle. This also has implications for reproducibility and

replicability. Given that most LLMs and genAI models are not fully open, their use is typically associated with reduced transparency. If used for generating, processing, or analyzing data, the inherently probabilistic nature of these models further complicates reproducibility. Besides that, the resources required for using AI (technical and/or financial) limit who can reproduce or replicate work that makes use of them. Despite these (additional) challenges that the use of AI brings for reproducibility and replicability, it can also be used to increase both, e.g., through automating reproducibility checks and suggesting fixes or improvements. Building on work from two current research projects, this presentation will discuss both perspectives: AI as a challenge for reproducibility and replicability as well as AI as a tool for potential improvement in these areas.

Bio:

Johannes Breuer is professor of "Digital Social Science" at the University of Duisburg-Essen, Institute of Political Science and head of the team "Research Data & Methods" at the Center for Advanced Internet Studies (CAIS) in Bochum, Germany. His main research interests are the use and effects of digital media, computational methods, digital trace data, open science, and meta-science. He frequently teaches workshops on the use of AI tools for research and has published several articles on the question of how the use of AI changes research practices in the social and behavioral sciences.

2. **DeepResearch: Recursive Agentic Workflows for Complex Scientific Question Answering and LLM-as-a-Judge Quality Feedback in the Absence of Gold Standards**
Jennifer D'Souza, TIB Hannover

Recent advances in large language models have enabled agentic workflows for scientific search and synthesis at scale, yet evaluation remains hard—especially for open-ended questions without a single gold-standard answer. This talk introduces DeepResearch, a recursive agentic workflow for complex scientific question answering that explicitly controls breadth (evidence diversity) and depth (analytical and mechanistic reasoning) during literature exploration. Unlike feed-forward RAG pipelines, DeepResearch uses recursive query reformulation, intermediate "learnings," and follow-up questions to produce transparent, traceable syntheses that can be tuned from broad surveys to expert-level integration. Results in ecology show that higher depth and breadth substantially increase evidence integration and information density without proportional increases in verbosity.

The second focus is LLM-as-a-judge quality feedback without gold standards, inspired by cognitive science and human judgment. I present a multidimensional framework that assesses synthesis quality along axes such as analytical depth, evidence breadth, scientific rigor, innovation capacity, and information density, using observable linguistic and structural signals rather than exact answer matching. I conclude by discussing how these evaluation paradigms support human-aligned assessment across domains—enabling principled comparison, parameter tuning, and trust calibration for scientific AI assistants.

Bio:

Jennifer D'Souza's research develops neuro-symbolic methods for information extraction and knowledge representation that transform scientific literature into AI-ready knowledge graphs. Her work spans scientific schema and ontology engineering, combining large language models with formal semantic representations to enable reproducible, machine-actionable science. She contributes to evaluation and knowledge organization through benchmark design and community leadership, including co-founding and organizing shared tasks on LLM-based ontology learning (LLMs4OL at ISWC) and automated subject indexing (LLMs4Subjects at SemEval and GermEval).

She also builds open-source tools and evaluation frameworks—such as schema-miner, OntoLearner, and OntoAligner—to support structured extraction, alignment, and synthesis, with a focus on human-in-the-loop workflows and rigorous evaluation bridging NLP, generative AI, and Semantic Web technologies.

5:00 PM - 7:00 PM   **Podium Discussion: Expert Round**

Participants
- Alexander Winkler, Climatology, University of Jena
- Christian Djefall, Law, Technical University of Munich
- Gabriele Schabacher, Media Studies, University of Mainz
- Orit Halpern, History of Science/Media Studies, Dresden University of Technology
- Anne Dippel, Cultural Anthropology/History, Braunschweig University of Art
- Christian Bauckhage, Computer Science, University of Bonn

8:00 PM   **Dinner**

Day 3: March 27, 2026

Time	Event

9:30 AM - 10:30 AM **Two Lectures**

1. Rethinking Mathematical Intuition in the Age of AI

Michael Friedman, University of Bonn

The integration of artificial intelligence (AI) into mathematical practice raises profound questions about the nature of intuition in mathematical discovery and research. This talk aims to examine the epistemological shifts induced by AI-based programs and tools and to explore how they challenge traditional notions of mathematical intuition and reasoning. By examining historical precedents, from Leibniz's vision of mechanized calculation in the 17th century to the various conceptions of mathematical intuition in the 19th century and computer-assisted proofs in the 20th century, I aim to contextualize contemporary developments within the longer trajectory of thinking on mathematical intuition. The talk underlines that the usage of AI-based programs as well as the emergence of AI-based proofs, as seen with, for example, programs such as *AlphaGeometry* or *FunSearch*, which involve and produce non-obvious constructions that elude human heuristic methods, necessitate a reconsideration of the concept of intuition in mathematical practice. Ultimately, I argue that AI-based programs – even if not (yet) so powerful or not (yet) producing highly non-intuitive results as sometimes described by various protagonists – are not merely new computational aids or tools but rather a transformative epistemic force that reconfigures what it means to "do mathematics" in the 21st century.

Bio:

Michael Friedman is a research associate at the Mathematics department at the University of Bonn. The focus of his research is on how material, visual and mathematical knowledge interact with each other. In this context, he looks into the material practices of mathematics (folding, weaving, braiding, knotting, as well as 3D models) and how symbolical-mathematical knowledge was prompted by them. He also researches how the usage of AI-based programs reshapes the notion of (mathematical) intuition in the 21st century. Latest publications: "On Joachim Jungius' *Texturæ Contemplatio*. Texture, Weaving and Natural Philosophy in the 17th Century" (Springer, 2023).

2. From Governing the Global Biosphere to Automating Reflexivity: The Last Utopias of Anticipatory Governance?

Egle Rindzeviciute, Kingston University

In this talk I will draw on my recent book *The Will to Predict: Orchestrating the Future through Science* (Cornell University Press, 2023) to discuss the impact of system-cybernetic sciences on anticipatory governance during the Cold War as these developments form a key precursor for the current AI debate. Since the 1950s cybernetics was promoted as a form of decision science and a component of computer-based control engineering systems to empower Western and communist military-industrial complexes as part of Cold War competition. However, at the same time a distinct community of East-West scientists emerged and used global computer models to critique the industrial modernity as it was unravelling the very living milieu of humankind. Furthermore, the cybernetic models of behaviour led to the redefinition of cognitive and behavioural systems

that informed what at that time was nascent AI research as well as what later were termed a post- and more-than-human epistemologies. In the context of the ongoing international political schisms, challenges to the twentieth century's models of science diplomacy and the rise of AI, this talk revisits these Cold War episodes to discuss institutional, conceptual and social genealogy of anticipatory and predictive policy with a particular focus on the idea of non-governability.

Bio:

Dr Eglė Rindzevičiūtė is a Professor of Criminology and Sociology at Kingston University London. She has a long-standing research interest in the historical development of evidence-based public policy, particularly the wider political impacts of scientific expertise. Much of her work has focused on the transnational organisation of knowledge during the Cold War, where, she argued, the system-cybernetic approach and computer-based modelling served as a bridge between East and West, whereas inside the Soviet Union these approaches had a strong political and social impact that liberalised forms of the authoritarian governance. Among key legacies of this development are global climate change science as well as cybernetic and digital approaches to the study and governance of individual and collective behaviour. This argument was presented in her book *The Power of Systems: How Policy Sciences Opened Up the Cold War World* (Cornell University Press, 2016). More recently Eglė delved in the problem of scientific prediction, as policy makers are increasingly expected to use not only diagnostic evidence about the past, but also prognostic knowledge about the future, explored in her most recent book *The Will to Predict: Orchestrating the Future through Science* (Cornell University Press, 2023), Eglė received a PhD in Culture Studies from Linköping University in 2008, which was followed by postdoctoral research at the Gothenburg Research Institute, Linköping University and Sciences Po in Paris, before she moved to Kingston University London in 2015.

10:30 AM - 11:00 AM   **Coffee Break**

11:00 AM - 12:00 PM   **Two Lectures**

1. **GenAI in the Qualitative Social Sciences and Humanities: Enduring Ambivalence in Hybrid Epistemic Practices**
Lukas Griessl, University of Tübingen

The rise of generative AI (GenAI) tools like OpenAI's ChatGPT in various aspects of academic life has set in motion profound transformations of many everyday academic practices. Some practices particularly affected by GenAI are the ways we explore knowledge and engage with academic literature, write and transform text, and develop ideas for research and writing. Drawing on empirical data collected within the project "Hybrid Epistemic Practices," which ethnographically examines how the introduction of GenAI is transforming the qualitative social sciences and humanities (QSSH), this presentation explores how students and researcher navigate the experience coexistence of contradictory evaluations of GenAI's epistemic capacities. Building on what we term "epistemic messiness", encapsulating how GenAI is as useful as it is problematic for epistemic practices, this presentation suggest notion of "epistemic ambivalence", contributing conceptually and empirically to a better understanding of how contradictory epistemic evaluations of GenAI are endured rather than resolved in everyday academic practice. The material is based on a large set of ethnographic interviews and AI-based media diaries in which students and staff shared their concrete practices, feelings, and reflections on how generative AI reshapes everyday academic life at the University of Tübingen.

Bio:

Lukas Griessl is a postdoctoral researcher at the Ludwig Uhland Institute of Historical and Cultural Anthropology at the University of Tübingen. His current research interests span science and technology studies, the philosophy and sociology of science, and digital anthropology, focusing on how GenAI is transforming the qualitative social sciences and humanities. This research is part of a project on "hybrid epistemic practices", within which he is conducting an ethnographic study at the University of Tübingen. He received his PhD in Sociology from the University of Essex, where his research focused on the history and sociology of survey research and public opinion polling. Prior to his doctoral studies, he developed an interdisciplinary academic background in sociology, philosophy, and political science.

2. Automated Machine Learning for Science
Jan N. van Rijn, Leiden University

Automated Machine Learning (AutoML) is a relatively young research area aiming at making high-performance machine learning techniques accessible to a broad set of users. This is achieved by identifying all design choices in creating a machine-learning model and addressing them automatically to generate performance-optimised models. We provide an overview of the past and present, as well as future perspectives of AutoML, and how this can be applied to further advance science.

Bio:

Jan N. van Rijn holds a tenured position as assistant professor at Leiden University, where he co-leads the Automated Design of Algorithms group (ADA) within the Leiden Institute of Advanced Computer Science (LIACS). He researches and develops methods and evaluation methodologies that democratise the use of artificial intelligence.

The specific expertise that he brings in is towards problem settings that require working with limited data availability, for which he has developed meta-learning and transfer learning techniques, as well as multi-objective evaluation criteria, typically combining robustness and predictive performance.

12:00 PM - 1:00 PM	**Keynote 4: Markus Gabriel, University of Bonn**
1:00 PM	**Closing Remarks and Farewell**
1:15 PM	**End of Conference**