



HEIBRIDS

HELMHOLTZ International Berlin
Research School in Data Science

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NEWS

Highlights of the Year

New HEIBRIDS Doctoral Researchers

We were delighted to welcome our new cohort of HEIBRIDS doctoral researchers, who joined the program in February-April 2025, bringing exciting interdisciplinary expertise across AI, molecular biology, climate science, quantum chemistry, and geosciences:

“Wishing you festive moments,
low error rates, and algorithms
that run on the first try.
Happy Holidays! 🌱🇺🇸👉”

- ChatGPT 5.1



- **Hannes Drobek** – *Mapping Molecular Landscapes of Organelles and Cells in CryoET Data by Molecular Simulations and AI*; supervised by Prof. Dr. Mikhail Kudryashev (MDC) and Prof. Dr. Cecilia Clementi (FU).
- **Lauren Jaye Gerber** – *Understanding Host-Microbiome Interactions (HMIs) Using Deep Learning Models (DLMs) and Explainable AI (XAI)*; supervised by Prof. Dr. Sofia K. Forslund-Startceva (MDC, ECRC) and Prof. Dr. Wojciech Samek (HHI).
- **Zixin Hu** – *FloodChat – Global assessment of flood adaptation and risk through large language models and global open data*; supervised by PD Dr. Heidi Kreibich (GFZ) and Prof. Dr. Andrea Cominola (TU Berlin).
- **Henrik Junkawitsch** – *Explainable Artificial Intelligence for Quantum Chemistry and Spectroscopy*; supervised by Prof. Dr. Ulf Leser (HU) and Prof. Dr. Annika Bande (Helmholtz).
- **Saran Rajendran Sari** – *Unsupervised Geo-Dynamic Separation*; supervised by Dr. Jan Saynisch-Wagner (GFZ) and Prof. Dr. Jürgen Kurths (HU).
- **Karen Schmieder** – *Metabolic Reprogramming of Immune Cells During Age-Dependent Immune Responses: A Multi-Modal Data Analysis*; supervised by Prof. Dr. Jana Wolf (MDC) and Prof. Dr. Birgit Sawitzki (BIH/Charité).
- **Carl Stadie** – *Capturing the Arctic Driftwood Carbon Pool with Remote Sensing Based Deep Learning and Foundation Models*; supervised by Prof. Dr. Guido Grosse (AWI) and Prof. Dr. Begüm Demir (TU Berlin).
- **Yifan Tian** – *Data Stream Processing for Transient Detection in Gamma-Ray Observatories*; supervised by Prof. Dr. Matthias Weidlich (HU) and Prof. Dr. David Berge (DESY).
- **Emma Vinson** – *Reconstructing spatial climate variability patterns using Bayesian hierarchical models*; supervised by Prof. Dr. Thomas Laepple (AWI), Prof. Dr. Nadja Klein (HU), and Prof. Dr. Tobias Krüger (HU).
- **Piet Lennart Wagner** – *Harnessing Language Models for Knowledge Discovery in Specialized Scientific Domains*; supervised by Prof. Dr. Alan Akbik (HU) and Dr. Thomas Unold (HZB).

We are excited to continue supporting them on their research paths at HEIBRIDS!

New spokesperson

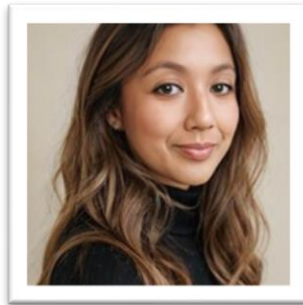
As HEIBRiDS entered its new permanent phase in January 2025, **BIFOLD** (Berlin Institute for the Foundations of Learning and Data) officially replaced **ECDF** as the university partner of the graduate school. We once again extend our sincere appreciation to ECDF for the successful collaboration since 2018, and in particular to **Prof. Guillermo Gallego** and **Sandra Pravica** for their dedicated contributions as spokesperson and program coordinator on behalf of the university partners.

With the start of this new phase, we were pleased to have **Prof. Wojciech Samek** join **Prof. Jana Wolf** as a **HEIBRiDS spokesperson**, strengthening the leadership team and representing both Helmholtz and university partners as we continue to advance excellence in interdisciplinary data science training.



Prof. Dr. Wojciech Samek is a professor in the Department of Electrical Engineering and Computer Science at Technische Universität Berlin and Head of the Artificial Intelligence Department at Fraunhofer Heinrich Hertz Institute (HHI). He is a Fellow at BIFOLD, and his research focuses on deep learning, interpretable and explainable AI, model compression, and distributed learning. He received his PhD in machine learning from TU Berlin in 2014 and has co-authored more than 150 peer-reviewed publications, including several highly cited papers in top machine learning journals and conferences. Prof. Samek also serves on editorial boards of leading journals and has received multiple best paper awards for his work in explainable AI.

New coordinator



On 1st October, **Koliane Ouk** joined HEIBRiDS as the new coordinator. Koliane holds a PhD in Neuroscience (University of Lyon, France) and conducted postdoctoral research at the University of Cambridge (UK), then at the Charité – Universitätsmedizin Berlin, working at the interface of biomedical science and data-driven research. She will graduate with her Executive MBA in February 2026. In her role as coordinator, Koliane supports the HEIBRiDS doctoral researchers, fosters collaboration across partner institutions, and helps further develop the school's interdisciplinary training environment. She is very much looking forward to working with the entire HEIBRiDS community!

New HEIBRiDS-associated doctoral researchers

In Q1 2025, GueHo Jang and Dang-Khoa Do have joined as new associated HEIBRiDS doctoral researchers. **GueHo Jang** is working on the project “Lifestyle to neurodegeneration through chronic inflammation: a network analysis”, supervised by PD. Dr. Chotima Böttcher (Charité–ECRC). **Dang-Khoa Do** is working on the project “Assessment of the clinical utility of machine learning models for the prediction of sepsis”, supervised by Prof. Felix Balzer (Institute of Medical Informatics, Charité).

In Q4 2025, Anna Buch and Gelsomina Kaufhold have joined as new associated HEIBRiDS doctoral researchers. **Anna Buch** is working on the project “Assessing the societal and economical impacts of climate-related infrastructure failures through natural language processing”, supervised by Prof. Andrea Cominola (TU Berlin) and PD Dr. Heidi Kreibich (GFZ). **Mina Kaufhold** is working on the project “Integrative Multi-Omics and Machine Learning for Predicting Cardiometabolic Intervention Responses: Towards Sustainable and Personalized Medicine”, supervised by Prof. Dominik N. Müller (MDC Berlin, ECRC), Prof. Dr. Lisa Bauer (Charité) and Dr. Hendrik Bartolomaeus (MDC, University Hospital Würzburg).

Welcome to HEIBRiDS - GueHo, Dang-Khoa, Anna and Mina!

Publications

- [E. Celikkan](#), T. Kunzmann, Y. Yeskaliyev, S. Itzerott, N. Klein, and M. Herold (2025). **WeedsGalore: A Multispectral and Multitemporal UAV-Based Dataset for Crop and Weed Segmentation in Agricultural Maize Fields**. Proceedings of the Winter Conference on Applications of Computer Vision (WACV), pp. 4767–4777. DOI: 10.1109/WACV61041.2025.00467 [KITopen](#)
- [D. Collin](#), Y. Shprits, S.J. Hofmeister, S. Bianco, and G. Gallego (2025). **Forecasting High-Speed Solar Wind Streams from Solar Images**. Space Weather. <https://doi.org/10.1029/2024SW004125> [arXiv](#)
- [T.M. Pentimalli](#), S. Schallenberg, [D. León-Periñán](#), ..., F. Klauschen, and N. Rajewsky (2025). **Combining spatial transcriptomics and ECM imaging in 3D for mapping cellular interactions in the tumor microenvironment**. Cell Systems. <https://doi.org/10.1016/j.cels.2025.101261>
- [A. Mehta](#), D. Parsons, T. L. Holch, D. Berge, and M. Weidlich (2025). **Convolution and graph-based deep learning approaches for gamma/hadron separation in imaging atmospheric Cherenkov telescopes**. In *Proceedings of Science* (Vol. 501). 39th International Cosmic Ray Conference (ICRC2025).
- D. Kostunin, V. Sotnikov, S. Golovachev, [A. Mehta](#), T. L. Holch, and E. Jones (2025). **Agent-based code generation for the Gammapy framework**. arXiv.
- I. Sekulic, [J. Schaible](#), G. Müller, M. Plock, S. Burger, V. J. Martínez-Lahuerta, N. Gaaloul, and P.-I. Schneider (2025). **Physics-informed Bayesian optimization of expensive-to-evaluate black-box functions**. Machine Learning: Science and Technology, 6(4), IOP Publishing. <https://doi.org/10.1088/2632-2153/ae1f5f>

Conferences

- D. Collin, Y. Shprits, L. Chiarabini, S. Hofmeister, S. Bianco, N. Klein, and G. Gallego. **Forecasting Solar Wind Speed From Solar Images Using Distributional Regression**. (Oral presentation), Machine Learning and Computer Vision in Heliophysics, Sofia, Bulgaria, 7–9 Apr 2025.
- D. Collin, Y. Shprits, L. Chiarabini, S. Hofmeister, S. Bianco, N. Klein, and G. Gallego. **Solar Wind Speed Forecasting From Solar Images Using Distributional Regression**. (Oral presentation), EGU General Assembly, Vienna, Austria, 27 Apr–2 May 2025. <https://doi.org/10.5194/egusphere-egu25-11587>
- D. Collin, Y. Shprits, L. Chiarabini, S. Hofmeister, N. Klein, and G. Gallego. **Probabilistic Solar Wind Speed Forecasting Using Deep Distributional Regression**. (Oral and poster presentation), European Space Weather Week, Umeå, Sweden, 27–31 Oct 2025.
- A. Mehta, D. Berge, M. Weidlich, D. Parsons, T.L. Holch. **CNN–GNN-based gamma/hadron classifiers for the H.E.S.S. experiment**. (Oral presentation), H.E.S.S. Collaboration Meeting, Obergurgl, Austria, 30 Mar–3 Apr 2025.
- A. Mehta, D. Parsons, T. L. Holch, D. Berge and M. Weidlich. **Deep Learning for Ground-based Gamma-ray Astronomy**. (Oral presentation), International Cosmic Ray Conference (ICRC2025), Geneva, Switzerland, 15–24 Jul 2025.
- J. Schaible, M. Götz, S. Burger, C. Becker, and K. Jäger. **A New Algorithm to Design PV with Arbitrary Color**. (Oral presentation), European Photovoltaic Solar Energy Conference and Exhibition (EUPVSEC), Bilbao, Spain, 22–26 Sep 2025.
- J. Schaible, H. Winarto, D. Yoo, L. Zimmermann, A. Wessels, K. Jäger, I. Sekulic, P.-I. Schneider, B. Bläsi, S. Burger, and C. Becker. **Optimization strategies for colorful thin film solar cells**. (Oral presentation), SPIE Photonics West, San Francisco, USA, 27–31 Jan 2025.

PhD Dissertations

This year, three HEIBRiDS doctoral researchers successfully defended their PhD projects:

- **Brian Groenke** defended his dissertation entitled *“Quantifying and Constraining Uncertainty in Modeling Permafrost under a Warming Climate”*, supervised by Prof. Dr. Guillermo Gallego (TU Berlin) and Prof. Dr. Julia Boike (AWI), on **22 May**.
- **Sergey Redyuk** defended his dissertation entitled *“Assisted Design of End-to-End Data Science Pipelines”*, supervised by Prof. Dr. Volker Markl (TU Berlin) and Prof. Dr. Uwe Ohler (MDC), on **10 June**.
- **Nadja Veigel** defended her dissertation entitled *“Data Mining Dynamic Human Behaviors for Flood Risk Assessment in Coupled Human-Environment Systems”*, supervised by Prof. Dr. Andrea Cominola (TU Berlin) and Prof. Dr. Heidi Kreibich (GFZ), on **19 October**.

Congratulations to all three graduates - we wish them every success in their future careers!

Awards

We warmly congratulate **Dana Wehner** on receiving the **Agilent Young Scientists Award** for the *best talk* at the **5th DGMS Young Scientists Fall Meeting**. Dana was recognized for her excellent presentation on acid-modulated glycosylation and the structure of glycosyl cations, combining ion mobility–mass spectrometry (IM-MS) and density functional theory (DFT).

HEIBRiDS PhD Retreat

This year's HEIBRiDS PhD Retreat in Potsdam (16-17 October) brought together more than 20 doctoral researchers, PIs, and guests for two days of scientific exchange, networking, and skill-building. The new cohort opened the event with 5-minute flash talks, followed by presentations from third-year students working across medicine, climate research, systems biology, and other domains. A keynote by Prof. Wojciech Samek offered insights into Explainable AI and the importance of transparency in machine learning. In addition, a hands-on workshop by Francesco Campi and Serena Sritharan (Helmholtz AI) introduced participants to practical applications of transformer models in scientific research. The retreat also provided valuable opportunities for informal dialogue, including the first meet-up with our new coordinator, Koliane Ouk, who led a plenary session to help shape the future of the program. We thank all participants for their contributions and look forward to seeing these research projects continue to grow.



Photo credit: © Mateo Walschburger

Announcements

HEIBRiDS mailing lists

As a reminder, if you want to share information with the HEIBRiDS community, you can do so via these two moderated lists:

- PhD researchers: hebridsphd@list.mdc-berlin.de
- HEIBRiDS PIs: hebridspi@list.mdc-berlin.de

If you would like news (e.g. an award or a new publication) to be shared in the next newsletter, please contact koliane.ouk@mdc-berlin.de or HEIBRiDS@mdc-berlin.de.

HEIBRiDS PhD Seminar

Since January 2025, the HEIBRiDS PhD Seminar is being held at MDC-Mitte (aka BIMS, Hannoversche Str. 28). For the first part of the winter semester, we had nice and engaging talks from Dana Wehner, Daniel Collin and Daniel Leon Perinán. Our next speaker will be Abhay Mehta on 21.01.2026.

After each PhD Seminar, we share a short interview with the speaker (on a voluntary basis) on our LinkedIn page. You can read them here:

<https://www.linkedin.com/company/heibrlds-helmholtz-einstein-international-berlin-research-school-in-data-science/>

HEIBRiDS Lecture Series

The HEIBRiDS Lecture Series is currently paused, but a new program is being prepared for Spring 2025. In the meantime, PhD students are invited to attend the Systems Biology Lecture Series 2025/2026: AI for Systems Medicine, organized by MDC-BIMS, as well as events organized by BIFOLD (Colloquium, Lunch Talks, and the “AI in Medicine” Workshop).

Program Committee Meeting

A Program Committee meeting will be scheduled for **Q1 2026** to discuss the upcoming HEIBRiDS PhD recruitment. As we prepare for the next cohort, it would be ideal to maintain a timeline similar to the one used in 2024 with the Call for Project mid-April 2026. This meeting will allow us to align on recruitment strategy, outreach, evaluation procedures, and key deadlines to ensure a smooth and coordinated process.