

MAKSIM ZHDANOV

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research: hierarchical models, sub-quadratic architectures, weather modelling

EDUCATION

PhD in Machine Learning University of Amsterdam, AMLab · Advisors: Max Welling & Jan-Willem van de Meent	2023 – 2027
MSc in Computer Science TU Dresden · GPA: 1.4 (excellent) · Thesis: analyzing brain connectivity with generative modelling	2019 – 2022
BSc in Physics Saint Petersburg State University · GPA: 4.8/5.0 (with honours) · Thesis: simulating skin with molecular dynamics	2015 – 2019

WORK EXPERIENCE

Research Assistant Helmholtz AI, Dresden	Apr 2022 – Apr 2023
Research Student Helmholtz AI, Dresden	Sep 2020 – Apr 2022
Research Student TU Dresden	May 2020 – Dec 2020

TEACHING

Machine Learning I University of Amstedam, with Erik Bekkers	Sep 2023 – Dec 2023
Deep Learning II University of Amstedam, with Erik Bekkers and Stratis Gavves	Feb 2024 – May 2024
Deep Learning II University of Amstedam, with Erik Bekkers and Stratis Gavves	Feb 2025 – May 2025

TECHNICAL SKILLS

Code: Python, C++, MATLAB **ML:** JAX, PyTorch, Triton, HPC

PUBLICATIONS

AdS-GNN – a Conformally Equivariant Graph Neural Network

Maksim Zhdanov, Nabil Iqbal, Erik Bekkers, Patrick Forré

ICLR 2026

[arxiv](#) [code](#)

Erwin: A Tree-based Hierarchical Transformer for Large-scale Physical Systems

Maksim Zhdanov, Max Welling, Jan-Willem van de Meent

ICML 2025

[arxiv](#) [code](#) [blog](#)

Adaptive Mesh-Quantization for Neural PDE Solvers

Winfried van den Dool*, Maksim Zhdanov*, Yuki Asano, Max Welling

TMLR

[arxiv](#) [code](#)

Clifford Steerable Convolutional Neural Networks

Maksim Zhdanov, David Ruhe, Maurice Weiler, Ana Lucic, Johannes Brandstetter, Patrick Forré

ICML 2024

[arxiv](#) [code](#) [blog](#)

Implicit Convolutional Kernels for Steerable CNNs

Maksim Zhdanov, Nico Hoffmann, Gabriele Cesa

NeurIPS 2023

[arxiv](#) [code](#) [blog](#)

Investigating Brain Connectivity with Graph Neural Networks and GNNExplainer

Maksim Zhdanov, Saskia Steinmann, Nico Hoffmann

ICPR 2022 (Oral)

[arxiv](#) [code](#)

WORKSHOP SUBMISSIONS

Conditional Clifford-Steerable CNNs with Complete Kernel Basis for PDE Modeling

Bálint Szarvas and Maksim Zhdanov

AI4Science @ NeurIPS 2025 [arxiv](#) [code](#)

BSA: Ball Sparse Attention for Large-scale Geometries

Catalin E. Brita, Hieu Nguyen, Lohithsai Yadala Chanchu, Domonkos Nagy, Maksim Zhdanov

LCFM @ ICML 2025

[arxiv](#) [code](#)

Amortized Bayesian Inference of GISAXS Data with Normalizing Flows

Maksim Zhdanov, Lisa Randolph, Thomas Kluge, Motoaki Nakatsutsumi, Christian Gutt,

Marina Ganeva, Nico Hoffmann

ML4PS @ NeurIPS 2022

Learning Generative Factors of EEG Data with Variational Auto-Encoders

Maksim Zhdanov, Saskia Steinmann, Nico Hoffmann

DGM @ MICCAI 2022

PREPRINTS

(Sparse) Attention to the Details: Preserving Spectral Fidelity in ML-based Weather Forecasting Models

Maksim Zhdanov, Ana Lucic, Max Welling, Jan-Willem van de Meent

MSPT: Efficient Large-Scale Physical Modeling via Parallelized Multi-Scale Attention

Pedro Curvo, Jan-Willem van de Meent, Maksim Zhdanov

INVITED TALKS

AI4Science Reading Group

Aug 2025

Mila, Quebec

Triton & Flash Attention Workshop

Dec 2025

ELLIS' Deep Thinking Hour