

# MAKSIM ZHDANOV

email · website · github · google scholar · twitter

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

## EDUCATION

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**PhD in Machine Learning** 2023 – 2027

University of Amsterdam, AMLab

· Advisors: Max Welling & Jan-Willem van de Meent

**MSc in Computer Science** 2019 – 2022

TU Dresden

· GPA: 1.4 (excellent)

· Thesis: analyzing brain connectivity with generative modelling

**BSc in Physics** 2015 – 2019

Saint Petersburg State University

· GPA: 4.8/5.0 (with honours)

· Thesis: simulating skin with molecular dynamics

## WORK EXPERIENCE

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**Intern** Feb 2026 – May 2026

CuspAI, Amsterdam

· Agentic search for material discovery

**Research Assistant** Apr 2022 – Apr 2023

Helmholtz AI, Dresden

**Research Student** Sep 2020 – Apr 2022

Helmholtz AI, Dresden

**Research Student** May 2020 – Dec 2020

TU Dresden

## TEACHING

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**Machine Learning I** Sep 2023 – Dec 2023

University of Amsterdam, with Erik Bekkers

**Deep Learning II** Feb 2024 – May 2024

University of Amsterdam, with Erik Bekkers and Stratis Gavves

**Deep Learning II** Feb 2025 – May 2025

University of Amsterdam, with Erik Bekkers and Stratis Gavves

## TECHNICAL SKILLS

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**Code:** Python, C++, MATLAB

**ML:** JAX, PyTorch, Triton, HPC

## PUBLICATIONS

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

Pedro Curvo, Jan-Willem van de Meent, [Maksim Zhdanov](#)

CVPR 2026 [arxiv](#)

### **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

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### **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

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### **(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

## INVITED TALKS

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### **AI4Science Reading Group**

Mila, Quebec

Aug 2025

### **Triton & Flash Attention Workshop**

ELLIS' Deep Thinking Hour

Dec 2025