ÖAW AUSTRIAN ACADEMY OF SCIENCES



Turning Electricity into Insight:
The ÖAW Machine Learning Platform
Bridging Disciplines, Accelerating Discovery

CLIP Symposium, 13.11.26

Claudius Krause (MLA²S)
13.11.2026

ÖAW ÖSTERREICHISCHE AKADEMIE DER WISSENSCHAFTEN

MLA²S

Machine Learning is Transforming Science

Many disciplines — one shared toolbox — two things needed to use it at scale

- **Particle physics**
- **Molecular biology**
- **Bioinformatics**
- **Acoustics**
- **Digital humanities**
- **Medieval studies**
- **Archaeology**
- *... and many more*

One ML toolbox

same methods, different data

- neural networks
- generative models
- language models (LLMs)
- computer vision & HTR
- anomaly detection, ...

People & expertise

MLA²S: network, meetings, lectures, shared know-how

+

Infrastructure

CLIP: GPUs, CPUs, storage — shared by all institutes

→ ML that is useful at scale: for many projects, in many institutes

ÖSTERREICHISCHE AKADEMIE DER WISSENSCHAFTEN

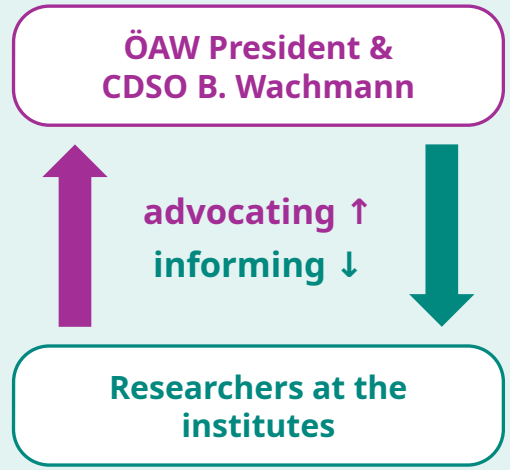
MLA²S – Machine Learning at the Austrian Academy of Sciences

Mission

- a catalyst of inter-institutional collaboration
- regarding scientific machine learning (Theory, Development, and Application)
- at the ÖAW and beyond

Activities

- educational events
- networking events
- support of (institute) initiatives (Conception, Organization, Budget)
- establishing a network of internal and external experts
- bridging researchers and ÖAW leadership



Initiated by

ISF & HEPHY INSTITUTE OF HIGH ENERGY PHYSICS

now coordinated with

IMAFO IGF

MLA²S · people

CLIP · infrastructure

ÖSTERREICHISCHE AKADEMIE DER WISSENSCHAFTEN

CLIP: The Infrastructure Backbone

Local & secure

All data stays on our own servers — nothing goes to external clouds. Good for research security.

Cost-efficient

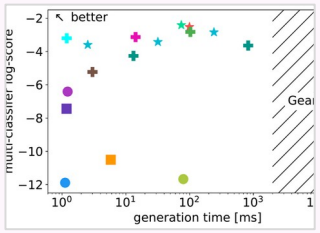
Shared infrastructure = shared savings. Less idle time than many small group clusters.

Easy access

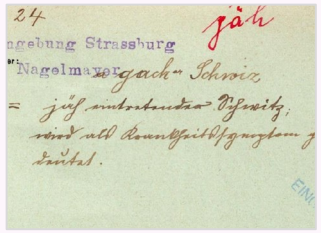
Account via a ticket, quick for ÖAW users. No application or compute proposal needed.

When the AI/ML wave came, CLIP was already there

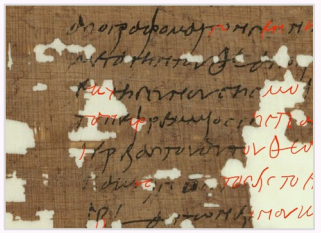
Groups with ideas — but no hardware of their own — could start right away. LLMs for the humanities, particle collisions, AlphaFold and HTR of old scripts run side by side.



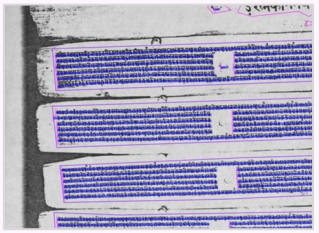
MBI



ACDH



ÖAI



IKGA

MLA²S · people

CLIP · infrastructure

ÖAW ÖSTERREICHISCHE AKADEMIE DER WISSENSCHAFTEN

MLA²S

CLIP Today: Impact in Numbers

3,456
CPU cores (AMD Zen 5)

144
GPUs: B200, A100, RTX 6000

1 PB
BeeGFS scratch @ 800 GB/s

400 Gbit/s
RDMA network fabric

605
users

98
research groups

14
institutes

Uptime
mostly amazing*
*summer heat waves aside

MARIETTA BLAU INSTITUTE FOR PARTICLE PHYSICS · ISF · ÖAW · Österreichisches Archäologisches Institut · Vienna BioCenter · RICAM · IWF Institut für Weltraumforschung · IGF · ESI · IMBA · IMP Research Institute of Molecular Pathology · GMI Gregor Mendel Institute of Molecular Plant Biology · IMAFO · IQI · IGA

Counts include only ÖAW and VBC institutes. Hardware: CBE.next as of Nov 2026.

MLA²S · people

CLIP · infrastructure

Enabled by CLIP: Selected Results (1/2)

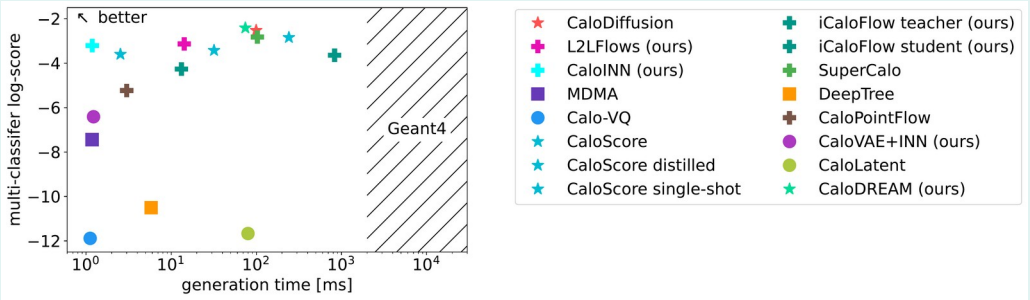
CaloChallenge · particle physics

MARIETTA BLAU INSTITUTE FOR PARTICLE PHYSICS



Large-scale community comparison of generative ML models for fast calorimeter simulation

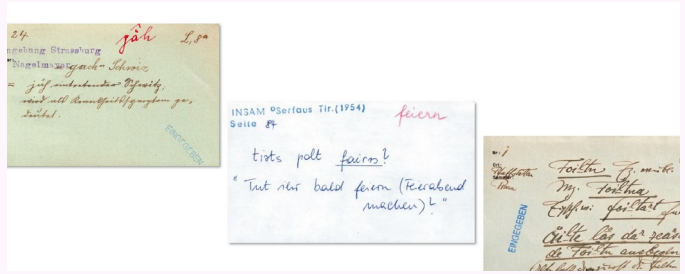
- **27k GPU-hours** on CLIP
- impossible on a local group cluster

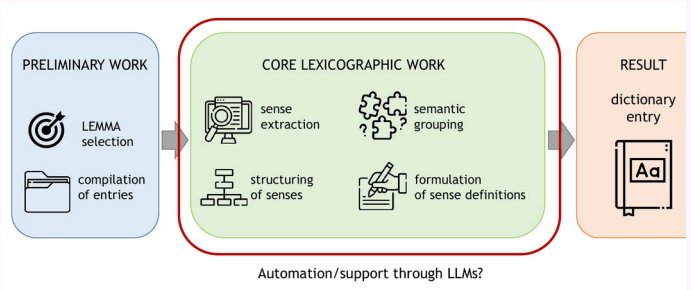


C. Krause et al., Rept. Prog. Phys. 88 (2025) 116201

Dialect lexicography with LLMs

ACDH: ca. 3 million paper slips → 2.4 million database entries → LLMs support the dictionary workflow





Austrian Centre for Digital Humanities (ACDH), ÖAW · MLA²S Network Seminar #7

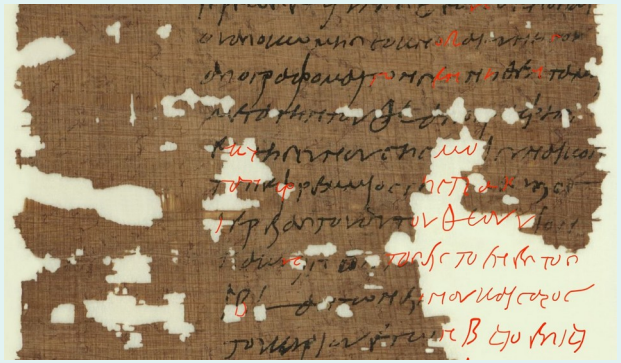
MLA²S · people **CLIP · infrastructure**

Enabled by CLIP: Selected Results (2/2)

Apollo · an LLM for Ancient Greek

Österreichisches Archäologisches Institut

World's first LLM for Ancient Greek — fills gaps in fragmentary papyri and inscriptions. **Now hosted on CLIP.**



~80 %
of masked passages restored correctly

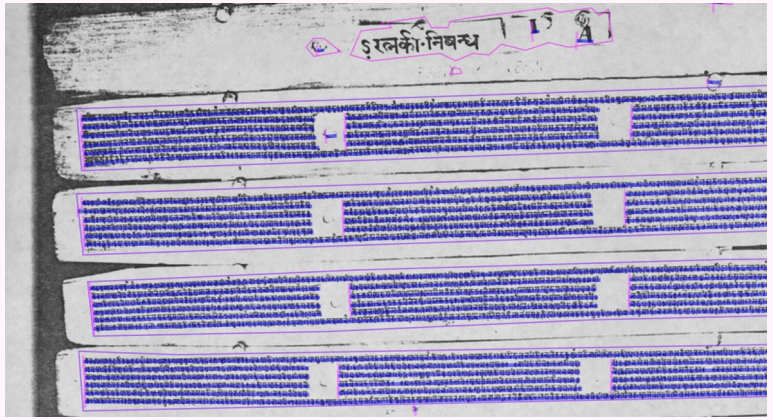
77 %
rated ≥ human experts in a blind study

Papyrus from Roman Egypt (149 CE), reconstructed by Apollo · image © ÖNB

Austrian Archaeological Institute (ÖAI), ÖAW, with Mistral AI & SAIL Reply
ÖAW press release, 23.09.2026

Handwritten text recognition

Palm-leaf manuscript, East India, ca. 12th c.: works of the Buddhist scholar Ratnakīrti, here his “Proof of an omniscient person”



Layout markup for HTR · image courtesy of P. McAllister

Institute for the Cultural and Intellectual History of Asia (IKGA), ÖAW
FWF project MASLOTS—Mapping Scribal Landscapes of Tibetan and Sanskrit

MLA²S · people

CLIP · infrastructure

ÖAW ÖSTERREICHISCHE AKADEMIE DER WISSENSCHAFTEN

MLA²S

What's Next

1 Closer collaboration

MLA²S × CLIP

Joining forces: ML expertise meets HPC know-how — in events, user support and planning.

2 Intro Days

1-day workshops

For researchers new to AI/ML — separately for Humanities & Social Sciences and for STEM.

3 New results

on CBE.next

New B200 GPUs: looking forward to new papers — and to hosting our own LLMs at the ÖAW.

Your idea + **MLA²S expertise** + **CLIP infrastructure** = **Insight**

MLA²S · people **CLIP · infrastructure**

ÖAW ÖSTERREICHISCHE AKADEMIE DER WISSENSCHAFTEN

MLA²S

Turning Electricity into Insight — Together

- via e-mail: https://lists.oeaw.ac.at/mailman/listinfo/mla2s

  — or — e-mail subject “subscribe” to mla2s-request@lists.oeaw.ac.at

- via website: https://www.oeaw.ac.at/mla2s/
- via bluesky: @mla2s-oeaw.bsky.social
- past and upcoming events: https://indico.global/category/958/
- general questions, ideas, concerns: mla2s-admin@oeaw.ac.at