

COST ACTION CA21161 · 2022 – 2026

EarlyMuse

A New Ecosystem of Early Music Studies

Stakes of the Action · Why Data Science, Heritage Science and AI matter in the European frame · Our positioning

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CNRS · Chair EarlyMuse CA21161 (2023–2026)

From a fragmented disciplinary landscape to a coherent European posture for early music research.



The stakes of EarlyMuse

What the Action confronts: scientific, educational, professional, structural, economic challenges in early music studies across 36 countries.



Why Data Science, Heritage Science and AI — in the European frame

How the EU research infrastructure ecosystem (EOSC, ECCCH, E-RIHS, DARIAH, Common Data Space) reshapes what we can — and must — do.



Our positioning

Publications on ZENODO

PART I

The stakes of EarlyMuse

A discipline asked to rethink itself — without losing what makes it singular.



A networked research community, not a project

COST (European Cooperation in Science & Technology) funds bottom-up, open, interdisciplinary networks.

325

scholars in the network

36

countries

€ 750k

budget · 2022–2026

5

working groups

Working groups

Education

Sources

Publications

Performance

Policy

Mission, in one sentence

Chart new paths that will strengthen the unique place of early music musicology (or historical musicology) in Europe — in our intellectual and cultural practices, and in its global appeal.

Five intertwined challenges

EarlyMuse confronts early music studies from five angles that cannot be separated.

01

Scientific

New questions, new sources, new methods — but inherited disciplinary boundaries.

02

Educational

Fragmented training across PhD, Dr. Artium, DMus, DLA, professional doctorates.

03

Professional

Scarce permanent positions; embodied knowledge insufficiently recognised.

04

Structural

Marginal place inside European research infrastructures and data spaces.

05

Economic & societal

Music = 3rd-largest employer in EU cultural & creative industries — yet underrepresented.

Fragmentation — measured

A survey of doctoral training in early music across 33 European countries reveals striking incoherences.

~100

institutions surveyed

33 countries · PhD · Dr. Artium · DMus · DLA ·
Professional doctorate

15K → 80K

written-thesis range (words)

Leeds 15,000 · Cardiff/Hull 50–80,000 · mdw
Vienna: individual basis

51.8% → 15.4%

share of musicology PhDs (France)

collapse between 2015 and 2022 — fewer
supervisors, examiners, advocates

SYMPTOMS

EQF asymmetries · mobility barriers · unequal access to ERC & MSCA · scarce permanent positions · supervision dependency

Two knowledge systems — one productive tension

Early music research lives between embodied practice and propositional scholarship. Neither is sufficient alone.

EMBODIED

Non-textual

- Performance
- Organology
- Source interpretation
- Experimentation

Practiced at the Orpheus Institute, docARTES, ESMAE, mdw, conservatoires.

PROPOSITIONAL

Textual · citable

- Archival research
- Critical analysis
- Historical musicology
- Academic discourse

Indexed in Scopus, WoS, Google Scholar — the established academic currency.

The urgent problem: artistic-research outputs (Research Catalogue, etc.) are not indexed by Scopus / WoS / Google Scholar. A dual strategy is required.

From scholar to community



It requires a change of perspective — from that of a lone scholar working in a sharply defined field to a vibrant community who transforms scholarship into a living practice, attending to the past while looking toward the future.

— Musicology as Data Science and Heritage Science, 2025

What that means concretely

Sources

No longer the property of the lone scholar — they live in shared, citable, interoperable corpora.

Methods

No longer purely interpretive — they coexist with computational, probabilistic, multimodal approaches.

Outputs

No longer only books and articles — editions, datasets, performances, software, public engagement.

Recognition

No longer national — built into European frameworks (ERICs, EOSC, Data Space, Horizon Europe).



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A New Ecosystem of
Early Music Studies



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MAPPING MUSICOLOGY IN EUROPEAN HIGHER EDUCATION AND RESEARCH INSTITUTIONS

Edited by **Philippe Vendrix & Rebekah Ahrendt**

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— COST Action CA 21161, Earlymuse

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Abstract:

This report examines the position of musicology within European higher education and research, treating the field as an economic and professional sector that spans universities, research institutes, and Higher Music Education Institutions (HMEIs). It first highlights the lack of granular, discipline-specific data in major international statistics and national databases, which complicates any systematic assessment of musicology's workforce, degree production, and funding. Drawing on questionnaires, desk-based research, and collaborative data collection across COST countries, the study maps institutional structures, staff profiles, and doctoral activity in historical musicology since 2015. It shows that musicology occupies a structurally heterogeneous but widely recognised place across Europe, with great disparities in permanent posts, career pathways, and access to research funding. A substantial section analyses historical musicology within HMEIs, detailing diverse institutional models, curriculum designs, and research configurations, and clarifying how performance-focused environments integrate scholarly work. The report also investigates evolving relationships between universities and HMEIs, especially through artistic or practice-based research and new third-cycle programmes. Case studies from several national contexts illustrate the impact of governance, qualification requirements, and policy frameworks on musicological careers and teaching. Overall, the findings underscore both the vitality and vulnerability of musicology in Europe and argue for better data, stronger coordination, and targeted advocacy to secure the field's long-term sustainability.

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MUSICOLOGY AS DATA SCIENCE AND HERITAGE SCIENCE

Edited by **Philippe Vendrix & Rebekah Ahrendt**

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Abstract:

This collective guide explores the transformative intersections of musicology with data science and heritage science in the European context. It positions musicological research as both a model for and contributor to broader cultural heritage, analyzing its tangible and intangible dimensions. The report reviews advances in research infrastructures, including the European Open Science Cloud, ECHES, and E-ribe, highlighting challenges and opportunities for integrating music into transnational heritage frameworks. It surveys the complexity of music data—notation, audio, metadata, and visual sources—and emphasizes standardised methods for cataloguing and preservation. The text critically assesses legal, policy, and technical barriers to digitising and reusing musical materials, advocating for legal reforms and open science principles. New publication paradigms are proposed, leveraging digital tools to expand access and impact. The role of musicologists in public engagement, education, and fostering research communities is underscored as crucial for sustainability. Best practices and collaborative models link musicological data to broader digital humanities and preservation strategies. Ultimately, the guide calls for active participation in European policy and research networks to enhance musicology's role in shaping and disseminating cultural heritage for future generations.

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MUSICOLOGY AND ARTIFICIAL INTELLIGENCE

Edited by **Philippe Vendrix & Rebekah Ahrendt**

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Abstract:

This report provides an overview of Artificial Intelligence in European musicological research, addressed to musicologists, librarians, archivists, curators, educators, research-policy officers, infrastructure coordinators, and tool developers. Moving from conceptual foundations to institutional implications, it maps the affordances and limitations of AI-based models and tools for the discipline, while situating them within the European normative landscape defined by the ALLEA European Code of Conduct for Research Integrity, the EU Artificial Intelligence Act, and the UNESCO Recommendation on the Ethics of Artificial Intelligence.

The six complementary sections successively address: (1) methodological foundations, clarifying notions of model, tool, and critical posture, and surveying audio-, image-, encoding-, and language-model-based applications such as automatic music transcription, optical music recognition, score-audio alignment, automated analysis, reconstruction, and LLM prompting; (2) data infrastructure, covering FAIR/CARE governance, ontologies and persistent identifiers, European federated infrastructures, auditory digital twins, and risks of fragmentation, representational bias, quality variability, and copyright; (3) a continuation of the disciplinary stakes involved in source and corpus processing; (4) musicological education in the age of AI, including curricular redesign, AI literacy, and design models such as the Two-Lane Approach; (5) professional practices and responsibilities, examining scholarly credibility, intellectual property, academic integrity frameworks, cultural and creative industry collaborations, institutional and legal risks, gender equality, and lessons from organised labour; and (6) best practices, articulating methodological pluralism against technological determinism and formalising principles of ethical reflexivity, human oversight, explainability, reproducibility, and accountability.

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Historical Musicology and European Research Infrastructures and Initiatives: A Practical and Strategic Integration Framework

Edited by Philippe Vendrix (chair) & Rebekah Ahrendt (vice-chair)

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Preamble: Scope and Audience

This document addresses a structural challenge in contemporary historical musicology: the discipline possesses a deep body of primary sources, interpretive traditions, and scholarly methodologies accumulated over two centuries, yet it remains incompletely integrated into the European research infrastructure ecosystem that now governs access to data, funding, computational tools, and cross-disciplinary collaboration. More specifically, five major European research infrastructures and initiatives can collectively provide musicologists with transformative capacities in digitisation, encoding, analysis, data sharing, and long-term preservation:

- EOSC (European Open Science Cloud)
- ECCCH (European Collaborative Cloud for Cultural Heritage) / ECHOES (European Cloud for Heritage OpEn Science)
- The Common European Data Space for Cultural Heritage

PART II

Why Data Science, Heritage Science & AI — in the European frame

A policy environment that has redrawn the map of research — and where music has been, until now, mostly absent.



Music is essential to Europe — and largely absent from its research infrastructures

Why music matters

- Music: third-largest employer in EU Cultural & Creative Industries.
- Dynamic SME-based sector with high growth potential (European Commission).
- Heritage that is both tangible (manuscripts, instruments, prints) and intangible (sound, practice).

The structural gap

- Music is underrepresented in policy and heritage-science infrastructures.
- Funders increasingly require data, FAIR principles, interoperability — capacities the field has unevenly built.
- Risk: musicology becomes peripheral to the very infrastructures shaping European research.

The opportunity

- Music is both a test case and a model for other heritage domains.
- Versatility of musicology = strength: history, theory, practice, technology, performance.
- Existing assets: RISM, MEI, LinkedMusic, OMR tools, encoded corpora.

Six European environments that now govern access to data, funding and tools

Research is no longer framed solely around the individual scholar — it is framed in relation to shared environments, common standards, and data-related requirements.

EOSC

European Open Science Cloud

ECCCH / ECHOES

European Cloud for Cultural Heritage

E-RIHS ERIC

European Research Infrastructure for Heritage Science

DARIAH ERIC

Digital Research Infrastructure for the Arts & Humanities

Common Data Space

European Data Space for Cultural Heritage ·
Europeana

Horizon Europe + EIT

Funding · Cultural & Creative Industries · 2021–2034

Musical heritage as data — musicological data as heritage

Music data is never raw. It is always an encoding of a temporal physical experience — mediated by humans or machines.

What counts as music data

Notated sources	Manuscripts, prints, fragments, theoretical texts, scholarly editions.
Visual materials	Iconography of music, instruments and musical life — paintings, reliefs, photographs.
Textual materials	Letters, diaries, criticism, programmes — and musicological literature itself.
Recordings	Wax cylinders, piano rolls, tapes, vinyl, CDs, born-digital audio and video.
Instruments	Tangible evidence of construction practices and regional sound worlds.

What data science adds

- Structured encoding — MEI, MusicXML — turning scores into queryable, comparable, computable objects.
- Metadata and ontologies — CIDOC-CRM, IFLA LRM, RISM authorities — connecting music to the wider heritage graph.
- Linked Open Data — LinkedMusic, persistent identifiers — making music traceable across borders and institutions.
- Scale and distant reading — corpora analysed beyond what any single scholar could read in a lifetime.
- Reuse and resilience — FAIR data, trusted repositories, long-term preservation.

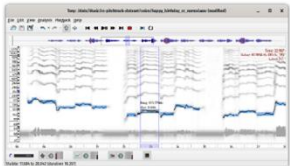
What musicologists already do — and what changes at scale

MIR (Music Information Retrieval), symbolic analysis, audio visualisation, network analysis. The tools exist — what changes is scale, reproducibility and interoperability.

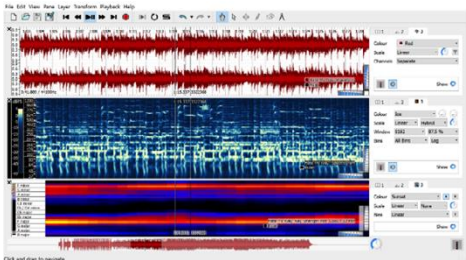
SONIC VISUALISER

NEWS DOWNLOAD DOCUMENTATION VIDEOS PLUGINS

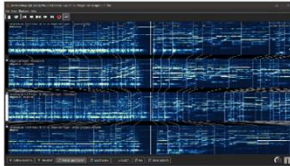
Visualisation, analysis, and annotation of music audio recordings



Tony



Sonic Visualiser



Sonic Lineup

Sonic Visualiser is a free, open-source application for Windows, Linux, and Mac, designed to be the first program you reach for when want to study a music recording closely. It's designed for musicologists, archivists, signal-processing researchers, and anyone else looking for a friendly way to look at what lies inside the audio file.

Sonic Visualiser version 5.2 was released on 7 March 2025. [Download it here!](#)

Symbolic analysis

music21, Humdrum, Musif — corpus-wide queries on encoded scores.

Audio analysis

Librosa, Essentia — feature extraction across thousands of recordings.

Pattern discovery

jSymbolic, MIDIttoolbox, MiningSuite — motifs, cadences, quotations.

Network & corpus studies

CRIM, Josquin Research Project, 1520s Project — borrowings at scale.

Sonic Visualizer — desktop-grade audio analysis available to any musicologist (Vol. I, p. 60).

Encoding formats are not interchangeable — they encode different epistemes

A digital edition is a research artefact. The format chosen carries assumptions about what counts as music and what can be queried.

INTERCHANGE

MusicXML

De-facto exchange standard between notation software. Strong for engraving, weaker for editorial variants.

SCHOLARLY

MEI

Music Encoding Initiative — TEI-style. Built for critical editions, variants, layers, source links.

ANALYTICAL

Humdrum

Designed for statistical and computational analysis — tabular, transparent, queryable.

IMAGE-ANCHORED

IIIF + MEI Neumes

For manuscript work: notation tied to canvas regions, IIIF zoom and citation built in.

Studying the material life of music — paper, parchment, ink, wood, metal, sound

Heritage science brings the methods of physics, chemistry, conservation and engineering to bear on the objects musicology has always studied.

What E-RIHS ERIC offers

- Non-invasive imaging and spectroscopy on manuscripts, prints, instruments.
- Material analysis of papers, inks, parchments, lacquers — to date, attribute, conserve.
- Acoustic and architectural analysis of performance spaces.
- Access via the European Call for Access model — open to musicologists.

Why this matters for musicology

- Music heritage is simultaneously tangible (sources, instruments) and intangible (sound, practice).
- It demands cross-disciplinary methods — and a vocabulary that musicology rarely shares with curators, restorers, conservators.
- Heritage science is the bridge: it gives musicology a seat at the European heritage table.
- It also reframes musicology as a science of preservation — not only of interpretation.

Music data has a body — paper, parchment, ink, wood, metal, sound

A datum is always materially situated. The matter of music shapes what we can know about its making, its circulation, its survival.

Manuscripts & prints

Paper composition, watermarks, ink chemistry — dating, attribution, workshop identification.

Notation as image

Layout, scribal hand, ligatures — pre-OMR analysis demands a visual epistemology of the source.

Instruments

Construction practices, wood species, varnish, metallurgy — the timbre of a tradition is materially encoded.

Performance spaces

Acoustic and architectural analysis — how a building shapes what music can be heard as.

Recordings as artefacts

Wax cylinders, lacquer discs, magnetic tape — fragile carriers whose chemistry decays.

Sound itself

Intangible heritage — the embodied gesture of performance, captured only partially in any encoding.

E-RIHS, in concrete terms — four labs musicologists can already use

E-RIHS ERIC operates a pan-European, distributed infrastructure organised in four service families. Access is via the European Call for Access — open to musicologists.

ARCHLAB	FIXLAB	MOLAB	DIGILAB
Access to scientific archives of European museums, galleries and research institutions — analytical reports, technical photography, historical documentation.	Large fixed instruments for advanced diagnostics — synchrotron, ion beam, neutron facilities — for material analysis of instruments, parchment, ink.	Mobile, non-invasive labs deployed on-site — for manuscripts and instruments that cannot leave their conservation environment.	Digital infrastructure for heritage-science data — FAIR-aligned, integrating into EOSC and the Common European Data Space for Cultural Heritage.

Memorandum of Understanding 2024: E-RIHS · ARCHE · JPI Cultural Heritage. The HS Academy offers training for cultural-heritage practitioners — and now for musicologists.

A landscape — not a single technology

AI does not replace musicology. It transforms input data into other types of data — opening new questions, demanding new evaluation.

Input data	AI tools	Output	Musicological research question
Document images	HTR / OCR	Transcribed text	History of musical life (archival studies)
Texts	NER	Persons, places, dates	Archival prosopography
Paintings, illustrations	Computer vision	Iconographic database	Music iconography
Music-notation images	OMR (Aruspix, MuRET, OMMR4all...)	Music encoding (MEI)	Music analysis, history of styles
Music encodings	Music analysis libraries	Statistical data	Style analysis, philology
Audio recordings	Audio transcription, source separation, alignment	Encodings + statistics	Performance studies, history of styles
Performance spaces	3D scanning, acoustic modelling	3D / acoustic models	History of musical life

Most AI tools share the same function: transform one type of data into another. The musicological question is what you ask of the output.

OMR — sixty years of intermittent progress, transformed by machine learning

OMR converts notation documents into machine-readable formats. For early music, the editorial stakes are higher than the technical ones: variability is the rule.

Why early music is hard for OMR

- Non-diastematic neumes — pitch encoded by scribal gesture, not staff position.
- Mensural notation — rhythm implicit in ligatures, proportions and context.
- Tablatures — diverse, region-specific graphic systems (15th–18th c.).
- Physical degradation — ink fading, holes, abrasion: AI cannot invent what is gone.
- Heterogeneous digitisation — equipment, lighting, IIF coverage uneven.

“Correct” — for whom?

Retrieval & search

Robust melodic contour is enough.

Critical editions

Beaming, slurs, articulations, variant readings — every micro-feature counts.

Performance tools

Rhythm, pitch, basic dynamics must be reliable; engraving negotiable.

A specialised tool ecosystem — not a single system

Each formula of early notation has driven a dedicated tool. MEI is the shared output that makes them interoperable downstream.

Aruspix

Pioneer for mensural prints — symbol recognition + alignment of variant copies.

MuRET

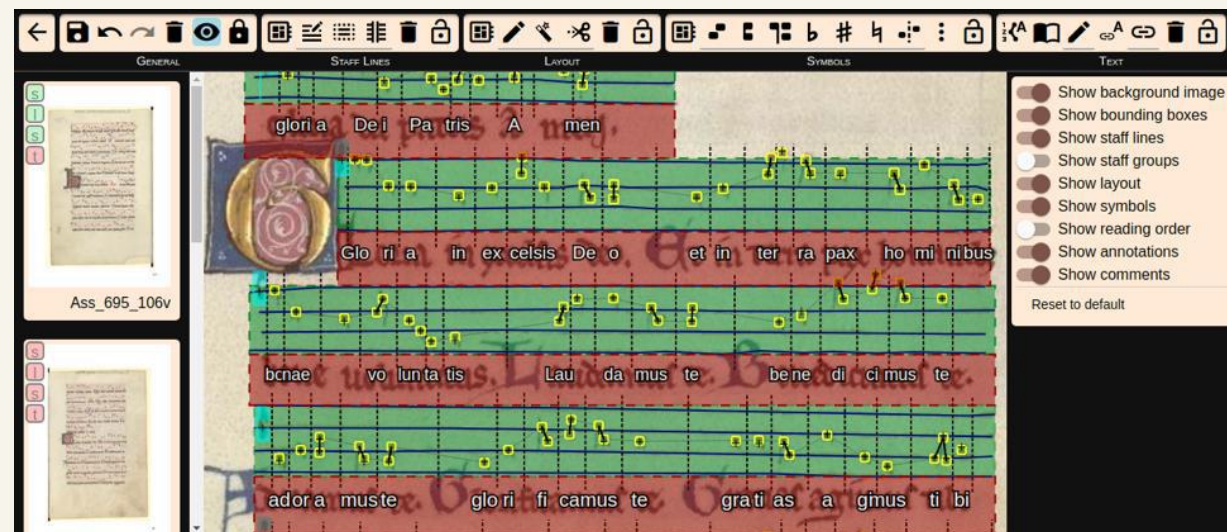
Mensural notation with deep learning. Workflow includes preprocessing, layout, symbol detection, MEI export.

OMMR4all

Medieval neumes (square, Hufnagel, rhombic) — staff + symbol detection, lyric processing, MEI Neumes export.

DeNotEM

YOLO object detection + Kraken HTR — structured information extraction from mensural manuscripts (13th–15th c.).



OMMR4all interface — staff + symbol detection on a medieval neume source (Wick & Puppe 2019).

Each tool is notation-specific. A unified pipeline is not the goal — MEI interoperability is.

Transcription, form, and the large-scale detection of stylistic influence

AI extends musicological inquiry across modalities (audio, symbolic, image) and scales (single piece → 600+ works).

Audio → score (AMT)

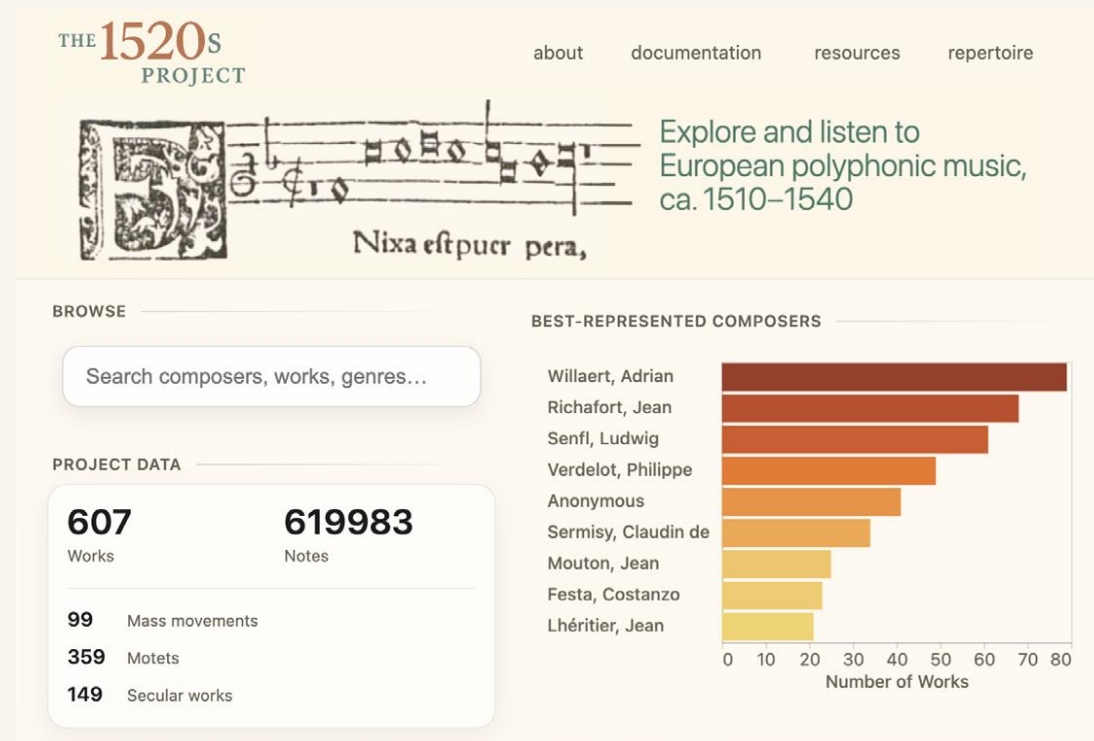
Modular pipelines: onset/offset detection, pitch spelling, voice separation, dynamics.
Hybrid ML + signal processing remains state of the art.

Form & pattern analysis

Graph neural networks for boundary detection (Buisson et al. 2024); Schenker-style parsing (Foscarin et al. 2023); HarmTrace for harmony.

Stylistic influence at scale

CRIM, Josquin Research Project, The 1520s Project — networks of borrowings impossible to detect manually.



The 1520s Project (Benjamin Ory) — 607 works, 619,983 notes encoded, queryable as a corpus.

Human-in-the-loop — error becomes a site of knowledge

Saliency maps, uncertainty estimates and competing hypotheses signal where the model is unsure. Disagreement is treated as evidence, not noise.

Example of scored-up OMRed piece in the MP Editor with DF

Region to look at for an error

1st orange label

Cadence does not line up; alto is a minim too long

Corrected piece (note changes in vertical sonorities)

Region where the error was found

Cadence lining up

The red note was shortened by a minim (see previous image)

Now all labels are legal (blue)

Three editorial principles

01

Tool-mode vs. modelling-mode

Trust performance for routine tasks; treat failures as insight.

02

Justify, do not just produce

A transcription must defend itself against alternative readings.

03

Iterative, not one-shot

Workflow alternates AI proposal and scholarly correction.

OMR opened in MP Editor with the Humlib Dissonance Filter — orange labels flag illegal dissonances; a human resolves the editorial ambiguity (Thomae et al., ISMIR 2022).

Working with AI in Europe means working inside a normative landscape

Four reference instruments orient every responsible use of AI in research.

EU AI Act

In force since August 2024 — final provisions August 2027. Applies to universities; requires a baseline AI literacy for staff and students.

ALLEA Code of Conduct (2023)

Reference standard for EU-funded research. Pillars: reliability, honesty, respect, accountability.

UNESCO Recommendation (2021)

Transparency, accountability, human oversight, protection of cultural diversity as foundational principles.

European Framework for Trustworthy AI (2019)

Seven requirements: human agency, robustness, privacy & data governance (FAIR/CARE), transparency, fairness, well-being, accountability.

Two barriers between musicology and the European frame

01

Awareness

Many musicologists are unaware that they should — and can — respond to European calls even when “music” is not in the title. Insecurity about which projects fit dominates.

Consequence

Music remains invisible inside infrastructures whose design will, in turn, define what counts as research.

02

Legal, policy & standards

Copyright fragmentation, uneven national rules, lack of music-domain authorities, and the absence of shared standards block aggregation, reuse and circulation.

Consequence

Excellent local resources cannot connect, scale, or feed into European data spaces.

PART III

Our positioning

Published reports, a method, four principles, and four levels of action.



Three companion reports

EarlyMuse formalises its positioning across three open-access publications, deposited on Zenodo, edited by Vendrix & Ahrendt.

VOLUME I · 2025

Musicology as Data Science and Heritage Science

A field guide: from European infrastructures (EOSC, ECCCH, E-RIHS, DARIAH, Common Data Space) to the materiality of musical data, praxis, legal questions, new publishing models, communities, and public engagement.

VOLUME II · 2026

Historical Musicology and European Research Infrastructures

A practical and strategic integration framework, with 13 use cases — from researcher to journalist, curator, policymaker — and a strategy by research-workflow stage, ending on a 2030 horizon.

VOLUME III · 2026

Musicology and Artificial Intelligence

A critical overview of AI for musicology: methodological foundations, data infrastructure (FAIR/CARE), OMR, education (Two-Lane Approach), professional responsibilities, and best practices.

The Two-Lane Approach — AI literacy without methodological surrender

Vol. III, §4 proposes a teaching model that protects critical, philological and historical competence while building genuine AI fluency.

LANE 1

Foundational musicology

- Source criticism and palaeography
- Critical editing and philology
- Historical context and repertoire
- Performance practice
- Music theory and analysis

LANE 2

AI & data literacy

- Encoding standards (MEI, MusicXML, Humdrum)
- Corpus building, querying, evaluation
- AI tool literacy — what models can and cannot do
- FAIR / CARE in research practice
- Ethical and legal stewardship

Musicological data as heritage — heritage as data

We refuse the choice between Musical Heritage as Data and Musicological Data as Heritage. EarlyMuse treats them as two facets of the same project.

PRINCIPLE 01

Interoperability first

Linked Open Data, CIDOC-CRM, IFLA LRM, MEI / MusicXML, persistent identifiers. Music must be reachable from the wider heritage graph — not a silo.

PRINCIPLE 02

Authorities matter

RISM as the cross-border backbone for sources; develop music-domain authorities for persons, instruments, works.

PRINCIPLE 03

Resilience is editorial

Digitisation strategies, trusted repositories, long-term preservation — the editorial choices of the next decade.

Music as a test case — and a model — for heritage

Music sits at the intersection of tangible and intangible heritage. That makes it strategically valuable for the broader European heritage ecosystem.

FROM heritage science

What we draw in

- Non-invasive imaging of manuscripts and prints.
- Material analysis of inks, parchments, papers, lacquers.
- Organological study of instruments — fingerprinting construction practices.
- Acoustic and architectural analysis of performance spaces.
- Open access to E-RIHS via the European Call for Access.

TO heritage science

What we bring back

- A two-centuries-long tradition of source criticism and editorial practice.
- A model for tangible + intangible heritage applicable to other fields.
- Sustained engagement with performance — a living, embodied practice.
- A bridge to the Cultural and Creative Industries — the EU's third-largest CCI employer.
- Validated cross-border authority resources (RISM and beyond).

Methodological pluralism against technological determinism

“The use of AI should always remain a choice, not a mandate.”

— Musicology and Artificial Intelligence, 2026

01

Ethical reflexivity

Interrogate which AI is at stake — generative, agentic, analytic — and the biases it inherits.

02

Human oversight

Responsibility for AI-mediated outputs remains with human researchers and their institutions.

03

Explainability

Demand transparency, traceability, provenance of training data and models.

04

Reproducibility

Reject the “neutral tool” narrative. Document, version, and share — including failure modes.

FAIR and CARE

FAIR makes data usable. CARE makes it responsible. EarlyMuse adopts both as non-negotiable.

FAIR

Data principles

F — Findable	Persistent identifiers, rich metadata, indexed in searchable resources.
A — Accessible	Retrievable by standard protocols; metadata persists even when data restricted.
I — Interoperable	Formal, accessible, shared vocabularies — MEI, MusicXML, CIDOC-CRM, IFLA LRM.
R — Reusable	Clear licensing, provenance, domain-relevant community standards.

CARE

Governance principles

C — Collective benefit	Data ecosystems must benefit the communities they describe.
A — Authority to control	Recognise the right of communities to govern their own heritage.
R — Responsibility	Those working with data carry obligations to the source communities.
E — Ethics	Ethical concerns guide every stage — including labour and credit.

Beyond the printed page — interactive, data-driven musicological publication

Vol. I, §6: traditional formats (monograph, article) cannot carry sound, encoded scores, performances, or reproducible analyses. New formats are needed.

From

To

Linear text

→ Non-linear, navigable structures

Score as image

→ Encoded, playable, queryable MEI

Single-author monograph

→ Co-authored, multi-role, credited contributions

Citation of books and articles

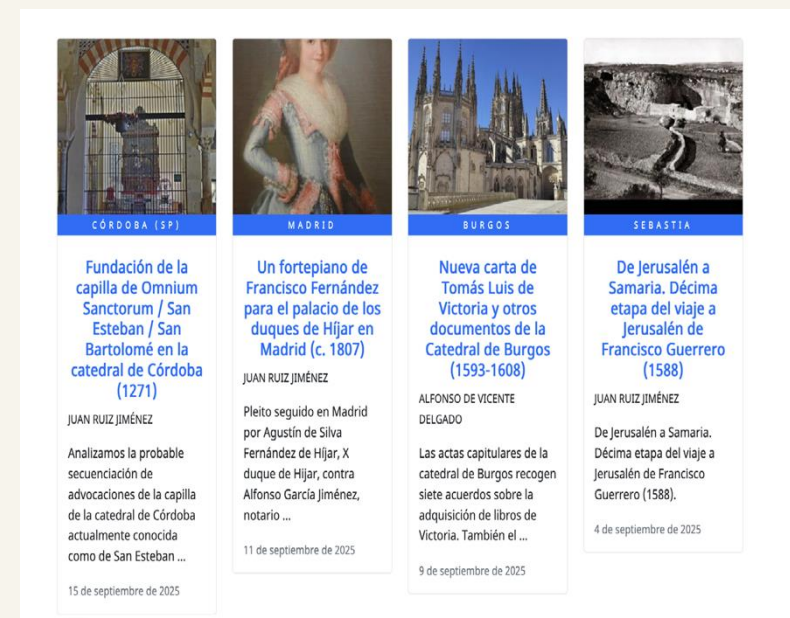
→ Citation of datasets, software, persistent IDs

Printed engraving

→ Audio, video, sonification, visualisation embedded

Specialist readers only

→ Layered access — scholar, professional, public



Opera Buffa Outside Italy (Knaus) — network analysis of singer circulation as a publication form.

Also: Moravian Soundscapes, Paisajes Sonoros Históricos, PerformArt, MULTISCORE.

Toward coherence — four levels of coordinated action

No single actor solves fragmentation. EarlyMuse proposes a layered response — and is already enacting parts of it.

INDIVIDUAL	DISCIPLINARY	INSTITUTIONAL	NATIONAL
Dual fluency Researchers who can move between embodied and propositional knowledge — performer ↔ writer. distinctive strength	Peer review Adapt peer review and indexing protocols for non-textual outputs (Research Catalogue, datasets, editions). data space · cloud · ERICs	Co-supervision Equal funding access; recognise HMEIs as universities; co-supervision (docARTES, Glarean, SCB) as standard. recognition	Harmonisation AR doctorate = PhD legally. Equal rights in hiring, funding, supervision. Funding bodies aligned (DFG, ANR, AHRC). policy levers

A transformed research environment — and a new musicologist

The environment by 2030

- EOSC, ECCCH and the Data Space for Heritage operational and federated.
- AI tools embedded across discovery, OMR, alignment, analysis and metadata.
- FAIR/CARE compliance routine for any EU-funded musicological output.
- Encoded corpora large enough to train domain-specific musical models.
- Publication moving beyond the printed page — datasets, interactive editions, performances.

The new musicologist

- Dual fluency — historical / computational, textual / embodied.
- AI literacy as a baseline competence, not a specialism.
- Comfortable in interdisciplinary consortia — with curators, computer scientists, conservators, performers.
- Author of editions, datasets, software, performances — not only of monographs.
- Engaged with the public, with CCI, with policy — by design, not as an add-on.

Risks we take seriously

A responsible positioning names what could go wrong — not only what could go right.



Technological determinism

Letting tools dictate questions — collapsing methodological pluralism into whatever is currently computable.



Canonical bias

Training corpora dominated by Western notation; underrepresented repertoires further marginalised.



Loss of explainability

Opaque deep models that produce results no scholar can audit, reproduce or contest.



Deskilling

Erosion of fundamental palaeographic, philological and analytical competencies.



Fragmentation & silos

National/sectoral databases that cannot speak to each other — even when funded by the same union.



Environmental footprint

Computational costs of large models — to be weighed against research benefit.

What we are asking of each actor

Researchers

Adopt FAIR/CARE from the proposal stage. Publish editions and datasets as primary outputs, not by-products.

Institutions

Recognise non-textual outputs in hiring and promotion. Build co-supervision with conservatoires and HMEIs.

Infrastructure providers

Open music-domain entry points in EOSC, ECCCH, E-RIHS, Data Space. Co-design with musicologists.

Funders

Align ANR · DFG · AHRC · ERC instruments. Recognise AR doctorate = PhD. Fund cross-border authority work.

Polymakers

Treat music as a strategic CCI sector and a model heritage domain — not a residual category.

Five takeaways

01 Early music is a small, internationalised community with disproportionate intellectual richness — and uneven infrastructural literacy.

02 The European frame (EOSC, ECCCH, E-RIHS, DARIAH, Data Space) has already redrawn what research means. Music cannot afford to remain marginal.

03 Data science, heritage science and AI are not three rivals — they are three angles on the same question: how musical heritage becomes legible to the next century.

04 Our positioning: musical heritage as data, musicological data as heritage; FAIR and CARE; methodological pluralism over determinism; human oversight as non-negotiable.

05 Coherence is built at four levels — individual, disciplinary, institutional, national — and requires action now, while the European architecture is still being designed.

THANK YOU

A New Ecosystem of Early Music Studies

Resources

EarlyMuse on Zenodo (all volumes, open access)

<https://zenodo.org/communities/earlymuse>

COST Action CA21161

<https://www.cost.eu/actions/CA21161>

Contact

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