COLOURS External Pilots Open Call Terms and Conditions

Version 1 - 26/11/2026

Welcome to the **COLOURS Open Call Terms and Conditions** (also Terms or Guide). This document outlines the rules for participation in the COLOURS External Pilots Open Call, including eligibility criteria, maximum grant amount, timeline, submission rules, and the evaluation process.

Please take a moment to read this document carefully to understand the requirements and process.

For any questions, please contact us at colours.help@fundingbox.com.

Funded by the European Union under Horizon Europe Framework Programme, paving the way for advanced tools for digital restoration and conservation of coloured cultural heritage collections. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the European Commission can be held responsible for them. COLOURS project has received funding from the Horizon Europe Framework Programme under grant agreement no 101233413.

Document History

Version	Published	Summary of changes
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Open Call Basic Conditions

Section	Description
Call opening date	26 November 2026 at 09:00h (Brussels time)
Call deadline	27 January 2027 at 17:00h (Brussels time)
Project scope - type of activities that can be funded	COLOURS aims to fund External Pilots to test, populate and validate the COLOURS suite of digital tools for colour analysis and restoration tailored to diverse artefacts, including polychrome sculptures, paintings, frescoes, textiles, and historic films and photographs. The objective is to assess the practical usability, efficiency and accuracy of the digital tools for the study, conservation and restoration of heritage objects and evaluate their use together with the technology that will be available under ECCCH/ECHOES cloud/platform. Proposed projects must focus on sensitive **coloured cultural heritage artefacts** facing challenges such as pigment alteration, gradual fading, darkening, greening defects, varnish degradation, physical fragmentation or multi complex multi-layer stratigraphy. Eligible collection types include but are not limited to: • Polychrome sculptures (wood, stone, terracotta). • Easel paintings and canvas artworks. • Wall paintings, frescoes, and murals. • Historical textiles and coloured fabrics. • Early colour photography. • Historical film frames and motion pictures. • Illuminated and coloured historical manuscripts. • Architectural surfaces, bas-reliefs, and decorative elements These activities must be executed by using the advanced digital tools developed by the COLOURS project. Applicants can propose a project addressing one specific scenario or combine elements across several scenarios: **Scenario #1.** Collaborative decision-making for the restoration of cultural heritage artefacts (creating a hybrid collaborative environment to support interdisciplinary decision-making in conservation and digital restoration on colour-sensitive artefacts). **Scenario #2**. Simulation and predictive restoration technologies on colour-sensitive artefacts. **Scenario #3.** Advanced tools for restoration (providing advanced digital tools for assisting, training and supporting physical restorations, with a focus on colour-sensitive artefacts).

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	Scenario #4. Enhancing public engagement with restored colours. **The use of the Colours suite of tools for developing the External Pilots is compulsory**. For a more detailed description and example of the ideal project, please check Annex I. Moreover, all developed and used/third-party software and components will be open source, licensed under a CC0 public domain dedication or under an open-source licence as recommended by the Free Software Foundation and the Open-Source Initiative. If this is not the case, justification has to be provided and a software development plan that demonstrates that the tool will be agnostic to vendor-specific technologies and support open-source equivalents. A full user license free of charge for an unlimited period of time will be granted to the consortium responsible for the ECCCH and all its users. Applicants are required to identify the target artefact(s), secure access to them and relevant data (or a plan to produce new data by month 3), and agree to data sharing. Projects failing to meet any of these mandatory requirements will be ineligible and excluded.
Max. grant amount	The max. Grant amount is: • up to **EUR 60.000** per External Pilot implemented by single applicant • up to **EUR 100 000** per External Pilot, implemented by consortia, only if it requires significant investment in restoration techniques or advanced services. In these cases, the maximum funding per entity is up to EUR 60 000. The Project budget is part of the application form. The total amount you list will be fixed and will determine the maximum grant you'll receive. The funding rate is 100% of the budget included in your application form. The grant will be paid as a lump sum.
How to apply?	Submit your proposal via our online form at https://opportunities.getonepass.eu/open-opportunities/colours within the deadline. Your application must be in English, and all mandatory sections must be completed. Proposals can be modified after submission, but only until the open call deadline. Multiple submissions (up to 2) are allowed if they address different scenarios. If more than one proposal is submitted, only the highest-

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	scoring proposal will be considered for funding and maximum funding per entity rules will apply.
Who can apply?	• Single legal entities (must be Cultural Heritage Institutions[1], that possess capacities to act both as end-users and conservation specialists) or • Consortia, composed of 2 (two) legal entities: a Cultural Heritage Institution[2] as end-user, and a Cultural and Creative Industries/Professionals[3] specialised in conservation and restoration techniques to support the Cultural Heritage Entity in taking up and testing the COLOURS tools. Applicants must be legally registered in EU Member States, its Overseas Countries and Territories (OCT) or Horizon Europe Associated countries[4].
Additional conditions related to who can apply?	The consortium cannot include entities linked to each other by capital or operational control. Applicants under EU restrictive measures are ineligible. COLOURS partners and affiliates and employees cannot apply due to the conflict of interest. Museums under the supervision of Ministero della Cultura (MIC) can apply in the open call and participate in the support programme, while MIC is excluded from the selection and evaluation process of proposals/projects at any stage
Number of grants and total funding available	We will support 6 to 10 Projects in this Open call. The total budget available for this Open call is up to EUR 599 850.
Duration of the Support Programme	The grant is offered together with the COLOURS Support Programme. Our Programme lasts up to 9 months.

[1] Cultural Heritage Institution means an entity whose main purpose is the protection and promotion of cultural heritage, specifically a publicly accessible library, museum, gallery, an archive or a film or audio heritage institution (source: Directive of the European parliament and of the Council on copyright in the Digital Single Market, Brussels, 14.9.2016 COM(2016) 593 final (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016PC0593)

[2] Cultural Heritage Institution as described above

[3] Cultural and Creative Industries Cultural and creative sectors are comprised of all sectors whose activities are based on cultural values, or other artistic individual or collective creative expressions and are defined in the legal basis of the Creative Europe Programme. Source: Creative Europe Programme" https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2018%3A366%3AFIN

[4] List of eligible associated countries: Albania, Armenia, Bosnia and Herzegovina, Canada, Faroe Islands, Georgia, Israel, Iceland, Kosovo, Moldova, Montenegro, New Zealand, North Macedonia, Norway, Serbia, Tunisia, Türkiye, Ukraine, United Kingdom.

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Support Programme	Our Support Programme covers testing, validating, and deploying digital tools for conservation, restoration and communication of coloured heritage objects in real-world scenarios. The Support Programme is divided into 3 main stages over the 9 months. Third-party projects will receive their grant in instalments upon the successful completion of each stage. For more details on the exact payment schedule and how each project's progress will be evaluated, please refer to the 'Payment conditions' and 'Progress evaluation chapters.
Ground rules and formal requirements	When applying to the COLOURS open call, please also note that the following conditions will be checked: • **Submission deadline:** Only proposals submitted through the online form at https://opportunities.getonepass.eu/open-opportunities/colours before the deadline will be considered. • **Language requirement:** Proposals must be written in English. If mandatory sections are in another language, the proposal will be rejected. Non-mandatory sections in another language will not be evaluated, but the proposal will remain valid. • **Data accuracy:** All provided information must be accurate and complete to allow proper evaluation. Any extra material you provide, which was not requested in the form, will not be considered. However, we may use other resources to verify the accuracy of the data you provide. • **Completeness:** Make sure you fill in all the required fields. You can edit your submission until the deadline, but no changes will be permitted after this point. • **European dimension:** Your proposal should be aligned with EU goals and contribute to creating a positive impact within the EU. You should demonstrate a strategy to foster interdisciplinary collaboration and build lasting cross-sectoral professional linkages within the European Cultural Heritage ecosystem. • **Conflicts of interest:** We will check for any conflicts of interest between applicants and COLOURS Consortium partners. Partners, their affiliated entities, and their employees cannot participate. Each conflict of interest will be reviewed on a case-by-case basis. • **Financial stability:** Entities under liquidation, in financial difficulty, or excluded from receiving EU funding are not eligible. Companies in bankruptcy are also excluded. • **Original work:** The execution of your project must not violate the intellectual property rights (IPR) of third parties. It must

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	either be based on your own intellectual property, or you must have the necessary permissions to use third-party rights. The IPR relating to the project must not be the subject of any dispute. • **AI content:** The use of AI tools to improve clarity and structure is permitted, provided the content remains accurate and fact-based. Applications may be rejected if they are found to be AI-generated and lacking a factual foundation. All submissions must be authentic reflections of the project, and the applicant team must evidence the technical and operational capacity required for implementation. Providing unverifiable or non-authentic information is grounds for immediate rejection. • **Gender Equality Plan (GEP):** Public bodies, universities, and research organizations from EU or Associated countries must have a GEP. • **Acceptance of rules:** By applying, you agree to the Open call Terms and Conditions outlined in this document.
More info about COLOURS	You can find more information about COLOURS Project on https://colours-project.eu. COLOURS External Pilots Open call is managed by FundingBox Accelerator sp. z o.o., and organised by the COLOURS Consortium partners (CNR, FhG, FORTH, NTNU, FBA, FBC, ECE, MIC, BRC, BCS, ZVKDS). All documents - including the template of the Sub-grant Agreement can be found on the open call website: https://opportunities.getonepass.eu/open-opportunities/colours.

Only proposals submitted through the online form at https://opportunities.getonepass.eu/open-opportunities/colours before the call deadline will be considered. You will receive an email confirmation if the form is submitted correctly. If not, contact us immediately.

Our evaluation process is transparent, fair and equal to all participants. We will evaluate your project in a few phases described below. We will inform you about the results of the evaluation as soon as they become available.

Initial Check

After the closure of the open call, the system will review your proposal to ensure it meets the Call Terms and Conditions (ground rules and formal requirements). This check will be based on the declarations in your proposal.

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Pre-scoring (if applicable)

If more than 50 proposals pass the initial check stage, an automated pre-scoring system will be implemented. Proposals will be automatically scored based on specific criteria:

- Project Excellence (up to 29 points, scoring object relevance, scenario alignment, and object and data alignment),
- Project Impact (up to 30 points, scoring impact scale, COLOURS tools adoption and sustainability), and
- Project Implementation (up to 41 points, scoring team expertise, technical experience, and object and data access).

As the applicant, you should choose the option that best describes your project for each criterion and confirm that all of your statements are true. These will be checked during the next phases. If we identify any false information, we may reject your proposal.

Your project can earn up to 100 points. The top 50 applications will move on to the next phase.

Ties will be solved according to the following criteria, in order of priority:

- The highest score obtained in Technical Experience
- The highest score obtained in Impact Scale
- Submission time (proposal submitted earlier will be prioritised)

Independent Individual Evaluation

Eligible proposals will be evaluated by 2 independent experts appointed from the pool of Partners' Experts using predefined award criteria:

(1). EXCELLENCE will evaluate:

- **Ambition.** External Pilots' relevance to the call objectives and expected results. The applicants have to demonstrate to what extent the External Pilot or third-party project contributes to the **COLOURS project scope**, has a **European dimension** and is beyond the **State of the Art.**
- **Innovation:** applicants should provide information about the level of **innovation** that the External Pilot will introduce in their field and the degree of **differentiation** that will bring.
- **Soundness of the approach** and credibility of the proposed methodology.

(2). IMPACT will analyse:

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- **Market opportunity**: Applicants must demonstrate a clear idea of what they want to achieve and its potential for uptake by addressing a specific problem their project solves for the target users.
- **Relevance:** The applicants have to provide information about how the proposed Pilots expand the demonstration of the suite of advanced digital tools developed within COLOURS. Applicants have to demonstrate how the External Pilots will foster the COLOURS Tools reusability by different users.
- **Collaboration and Networking Potential:** The applicants must demonstrate their strategy to foster interdisciplinary collaboration and build lasting cross-sectoral professional linkages within the European Cultural Heritage ecosystem.
- **Environmental and social impact**: The applicants have to demonstrate the project contribution towards environmental, social and economic impacts to contribute to sustainable development, Green Deal and other European policies.

(3). IMPLEMENTATION will consider:

- **Team:** The applicants have to demonstrate their management and leadership qualities, their ability to take a concept from ideas to market, their capacity to carry through their ideas and understand the dynamics of the market they are trying to tap into. The team should be a cross-functional team, with a strong background and skills base and taking into account its gender balance.
- **Resources**. Demonstrate the quality and effectiveness of the resources assigned in order to get the objectives/work plan/deliverables proposed.
- **Gender dimension.** Entities having a Gender Action Plan or equivalent plan/strategy under implementation or already in place will be taken into account when scoring Implementation criteria

Each evaluator will score from 0 to 5 each criterion and will produce an **Individual Evaluation Report.**

If there is a significant divergence in the evaluations and scores provided by two experts, a third expert evaluator will be assigned.

Once the Individual Evaluation Reports are submitted, **the final score for each individual criterion** will be calculated as the average of the scores provided by each evaluator.

The **final score per application** will be calculated as the sum of the score for each individual criterion.

The *threshold* for individual criteria will be 3. The *overall threshold,* applying to the sum of the three individual scores, is 10 points.

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Once there is an initial ranking, ties (if any) will be solved using the following criteria in order of priority:

- Highest score in the Impact Section.
- Gender balance among the staff responsible for performing the activities.
- Submission date (proposals submitted earlier will be prioritised)

As a result of this step, a Ranking List will be produced.

Online Interview

Up to 12 to 20 highest-scoring applications will be invited to an online interview, where they will present the project, team, and vision in front of the Selection Committee with the support of two independent experts and reply to their questions. Finalists will be ranked based on the following Awarding Criteria:

- Vision, capacity and attitude of the Team
- Conceptual alignment with the application submitted
- High potential impact on the project's goals in the cultural heritage domain
- Relevance and use of the COLOURS Tools.

The expected date of the online interviews is 15 to 19 February 2027. Participation of at least one representative is mandatory.

Consensus Meeting

The Selection Committee, composed of consortium partners and independent experts, will review and discuss the results of the experts' evaluations and online interviews. They will reach a consensus or majority of 2/3 votes on the list of proposals to be selected. The final decision will be made based on the interview and evaluation results. Applicants will be notified after the Consensus Meeting about their status.

Keep in mind that although the highest-scoring proposals are usually chosen for funding, the Selection Committee can reject a candidate for valid reasons, such as not fitting COLOURS goals and scope, limited potential impact, commercial competition issues, serious ethical concerns, or possible conflicts of interest. The exact number of proposals approved will be decided based on the overall quality of the proposals.

Formal check & Agreement signature

Finalists will undergo a **formal check** to confirm their legal status. Therefore, we will ask you to provide documents to confirm all the details (these will be - but this is not an exhaustive list: current extract form the relevant public register, establishment decision issued by a competent authority, Non Profit organisation registration certificates, document confirming tax ID or VAT number, approved financial statements, Bank Identification Form). Documents must be

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provided within the given deadline. If you don't deliver the requested documents on time, without a clear and reasonable justification, we will have to exclude you from further formal assessment.

After passing this check, we will invite you to sign the Sub-grant Agreement with the COLOURS consortium to officially participate in the programme.

All selected third-party projects will go through an ethics assessment, after the Formal Check. It will be done by external ethics experts according to the ethical guidelines of Horizon EU.

After Sub-Grant Agreement signature

Payment conditions

The Grant will be paid as a lump sum. Payments depend on the successful and timely completion of each stage of the work planned and outlined in the Individual Mentoring Plan developed at the beginning of the Support Programme. Payments are scheduled in tranches as follows:

Stage 1: Individual Mentoring Plan: Up to 10% of the Grant Amount (phase duration 1 month)

Stage 2: External Pilot preparation: Up to 45% of the Grant Amount (phase duration 4 months)

Stage 3: External Pilot testing & reporting: Up to 45% of the Grant Amount (phase duration 4 months)

A delayed payment mechanism will be applied to all payments. 15% of each tranche will be paid once the whole COLOURS Project is completed. This should happen approximately 9 months after the end of the COLOURS Project. The expected end of the COLOURS Project is 30 September 2028. Relevant provisions will be included in the Sub-grant Agreement. Please consider that the COLOURS Project might be extended.

Progress evaluation

We pay upon the delivery of the agreed results - not upon delivery of certain receipts. Therefore, Consortium Partners, gathered in the Selection Committee, will evaluate your progress regularly.

Stage	Explanation
Individual Mentoring Plan (IMP)	Within the first month of the Support Programme you will prepare an Individual Mentoring Plan (IMP), outlining the final budget, KPIs, and deliverables for performance assessment. It

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	will also cover any specific Ethics Assessment requirements (if applicable). The IMP will be evaluated by the Selection Committee taking into account Deliverables quality (90%) and Deadline compliance (10%).
Milestones' review	Before each payment, the Selection Committee will review your progress. Performance will be evaluated by Technical Partners based on: • Deliverables quality (30%) • Technical KPIs (60%) • Deadline compliance (10%) Each criterion will be scored from **0 to 10**, and the final score will be calculated based on the weights indicated. A score of **7 points** or more is required to continue in the program. If your project falls below this threshold, the Selection Committee considers individual situations and will make the final decision whether the project should be removed from the support programme without the corresponding payment or whether the project should get additional time for completion or whether it should receive a reduced grant payment. For more details, please check the template of the Sub-grant Agreement.

Contact us

If you have any questions about our application process, feel free to reach out to our helpdesk colours.help@fundingbox.com

Please note that responses are given individually and do not change these Terms, they are provided for informational purposes only.

In case of any technical issues or problems, please include the following information in your message:

- your username, phone number and email address;
- details of the specific problem (e.g. error messages you encountered, bug description, i.e. if a dropdown list isn't working, etc.); and
- screenshots of the problem.

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Complaints

If you believe there was an error in one of the evaluation phases, you may submit a complaint within three (3) calendar days after sending the results to you. Send it to colours.help@fundingbox.com in English and include:

- your contact details (including email),
- the subject of your complaint,
- evidence of the specific issue.

Please note that we will review only complaints related to:

- errors in the process caused by our staff,
- technical issues beyond the applicant's control,
- clear human or mechanical errors made by our staff,
- incorrectly marked statements, minor clerical errors, and obvious typographical mistakes.

Please note that we will not review complaints related to the content of the expert evaluations.

Complaints will be reviewed within seven (7) calendar days. If more time is needed, we will inform you via email. Anonymous complaints or those with incomplete information will not be considered.

Last but not least - final provisions

Any issues not covered by these Terms and Conditions are governed by Polish law, Horizon Europe Programme rules, and EU grant regulations.

We make our best effort to keep all provided data confidential; however, for the avoidance of doubt, you are solely responsible for indicating your confidential or sensitive information as such. Please be aware that your application form will be shared with the independent evaluators and COLOURS Consortium partners.

You retain ownership of your intellectual property rights (IPR).

The signature of the Sub-grant Agreement is the initial condition to establish any obligations among applicants and any Consortium partners (with respect to the obligation of confidentiality of the application). The Sub-grant Agreement will include a set of obligations towards the European Commission (for example: promoting the project and giving visibility to the EU funding, maintaining confidentiality, and understanding potential controls by the EC/ECA, EPPO, and OLAF).

Please be aware that eligibility criteria will be checked throughout the process, including a final review and support programme.

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In the event of any discrepancies between these Terms and their Annexes, the Terms shall prevail.

The COLOURS Consortium reserves the right to cancel or modify the call at any time, informing applicants accordingly.

Need more help? Contact us at colours.help@fundingbox.com, and we'll be happy to assist.

Glossary

CHI – (Cultural Heritage Institution): An entity whose main purpose is the protection and promotion of cultural heritage, specifically a publicly accessible library, museum, gallery, an archive or a film or audio heritage institution.[5]

KPI (Key Performance Indicator): A quantifiable metric used to measure and evaluate how successfully a project, work package, or external pilot achieves its strategic objectives and targets.

Deliverable: A distinct, verifiable output (such as a report, document, prototype, or dataset) that must be submitted at a specified milestone or reporting period during the project lifecycle.

Work plan: A structured operational roadmap that organises the project into Work Packages (WPs), detailing the specific tasks, timelines, lead participating entities, and resources required to execute the project successfully.

[5] source: Directive of the European parliament and of the Council on copyright in the Digital Single Market, Brussels, 14.9.2016 COM(2016) 593 final (https://eur-lex.europa.eu/legal- content/EN/TXT/PDF/?uri=CELEX:52016PC0593)

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Annex I - Technical Description

COLOURS (**C**ollaborative **O**n-cloud **L**ab for the conservation and digital restoration of Col**OU**red he**R**itage collection**S**) places colour at the centre of cultural heritage preservation by developing AI-powered analysis, predictive modelling, and simulation tools integrated into the European Collaborative Cloud for Cultural Heritage (ECCCH). Through hybrid collaborative environments for real-time work with digital twins and mixed-reality storytelling, the project gives cultural institutions of all sizes and resources access to state-of-the-art, cost-efficient digital tools to safeguard colour-sensitive artefacts and drive widespread adoption across the cultural heritage sector.

The COLOURS Open Call invites applications to External Pilots to test, populate, and validate the project's digital toolset across one or more of the four core project scenarios:

1. Collaborative Decision-Making
2. Predictive Restoration Technologies
3. Advanced Tools for Restoration & Conservation
4. Enhancing Public Engagement with Restored Colours

These scenarios cover the entire lifecycle of colour-sensitive cultural heritage restoration—from initial expert decision-making to predictive analysis, hands-on intervention support, and public outreach. The external pilots serve as the primary validation mechanism to ensure that the tools are robust, interoperable, and capable of operating across diverse cultural heritage materials and institutional settings across Europe.

Applicants can propose pilots focusing on colour-sensitive heritage collections, including (but not limited to):

- Polychrome sculptures (wood, stone, terracotta).
- Easel paintings and canvas artworks.
- Wall paintings, frescoes, and murals.
- Historical textiles and coloured fabrics.
- Early colour photography.
- Historical film frames and motion pictures.
- Illuminated and coloured historical manuscripts.
- Architectural surfaces, bas-reliefs, and decorative elements

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Each **pilot must address at least one—or combine elements across multiple—of the four scenarios**, using the digital tools from the COLOURS Toolkit.

Scenario	Focus	How it works
1. Collaborative Decision-Making	Creating a hybrid virtual/XR collaborative environment that allows interdisciplinary teams (curators, conservators, heritage scientists, and decision-makers) to inspect and evaluate restoration options together in real time.	Experts interact remotely within shared 3D spaces containing high-fidelity Heritage Digital Twins. They can view co-registered diagnostic layers (e.g., UV, infrared, XRF) and test restoration hypotheses simultaneously without needing to travel.
2. Predictive Restoration Technologies	Forecasting and simulating the long-term visual, chemical, and physical effects of restoration decisions before any irreversible physical intervention takes place.	Pilots use AI-driven predictive models to simulate outcomes like varnish removal, pigment fading, or lighting impact over 5, 20, or 50 years. This helps prevent controversies or unintended aesthetic changes (such as those historically seen in major fresco restorations).
3. Advanced Tools for Restoration & Conservation	Providing specialized digital tools to directly assist, document, and optimize hands-on physical restoration workflows for artefacts suffering from gradual degradation or sudden damage.	Pilots apply advanced digital twins, 3D segmentation, and AI restoration services to address complex material challenges—such as digital colour reconstruction of lenticular film formats, de-greening autochrome plates, or digitally recomposing fragmented polychrome sculptures.

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4. Enhancing Public Engagement with Restored Colours	Bridging the gap between technical restoration work and public appreciation through the codesign of immersive storytelling, mixed reality (AR/ VR), and hybrid interactive experiences.	Cultural institutions and professionals design exhibits that include ways to enhance authenticity of colour simulation and public engagement with coloured collections, strengthening the sense of care towards their fragility. Ideally the scenario starts, for the institution, with the acquired know-how on the original colours. Interpretation is supported by COLOURS tools. Public engagement preparation follows with case study preparation, codesign tasks and exhibition prototyping.

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Tools Descriptions

1. MuLaX

SHORT DESCRIPTION: A Web3D/WebXR tool for exploring cultural heritage artworks through multi-layered analytical and imaging data, enabling visual overlays, comparisons, annotations, and cloud-based layer discovery.

TECHNICAL SPECS: Open-source (GPL v3) web-app accessible via standard web browser on desktop, mobile, and XR devices, without any installation required; built as a plug&play app on top of the ATON framework; supports multi-item cloud collections, POIs, interactive 2D plots, split-screen lens, and AR/VR spatial UI.

2. CHROMADES

SHORT DESCRIPTION: CHROMADES is an open-source Web3D/WebXR collaborative environment based on the ATON framework, where teams meet to plan, document, reason and discuss artworks together in multiple spaces to accelerate decision-making.

TECHNICAL SPECS: Open-source (GPLv3) Web3D/WebXR app; liquid presentation adapting to mobile/desktop/XR, accessible via standard web browsers without any installation required; hybrid collaboration model (bichronous) over cloud 2D/3D artwork collections; built as a plug&play app on top of ATON framework; includes Hathor front-end and the no-code online scene editor based on ATON; communicates with other COLOURS tools/services.

3. Colour Knowledge Repository (CKR)

SHORT DESCRIPTION: An open, scalable FAIR research data management platform for sharing, preserving, and exploring colour-related resources in art and heritage collections.

TECHNICAL SPECS: Built with Invenio RDM; this is a web-accessible service with a REST API and a SPARQL endpoint for knowledge graph semantic queries. It supports over 60 distinct resource types, federated dataset linking, utilizes CIDOC-CRM ontologies, ORCID authentication, and semi-automated metadata upload pipelines.

4. Neg2Pos

SHORT DESCRIPTION: A calibrated transformation framework designed to invert scans of colour negatives to faithful positive renderings while accurately preserving analog photographic aesthetics.

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TECHNICAL SPECS: Tool supporting high-bit-depth image formats and batch sequence import; optional special RGBW LED light source; preserves original capture metadata and film specifications, achieving an 80% reduction in manual grading time.

5. CoDesign Tool and Caring Prototype

SHORT DESCRIPTION: With the CoDesign tool, collaboratively design interactive heritage experiences, remotely or in person, with up to 7 teams bringing different areas of expertise. Define audiences and goals, prepare a design brief, generate ideas, select technologies and engagement strategies, address challenges and risks, develop exhibition concepts and storyboard the visitor experience. Keep users at the centre while turning knowledge about colour into stories. Work collaboratively and iteratively to develop clearer concepts and visualise ideas early in the exhibition design process. Prepare your ideas for Caring Prototype.

TECHNICAL SPECS: The printable kit is available on Zenodo, and the digital version is available as a ready-to-use web app. The tool supports the design of exhibitions that foster a sense of care for heritage and explore authenticity in relation to colour, using the "Caring Prototype" as design strategy.

Based on the Caring Theory (Veggi et al 2026), the Caring Prototype provides an exhibition framework to foster visitors' sense of care. It combines storytelling, information, and technological solutions across 4 stages: 1) Wonder and loss: emotional intro highlighting significance and vulnerability; 2) Bridging the knowledge gap: accessible interpretation that builds understanding; 3) Deeper knowledge through action: interactive, tangible experiences that invite visitors to explore as scientists; 4) Caring reward: finale revealing outcomes of conservation and colour reconstruction, making the evidence, uncertainties and interpretive choices transparent.

6. Light Damage Estimator (LDE)

SHORT DESCRIPTION: A software decision-support tool that predicts and visualises long-term, light-induced colour change in paintings and works on paper, at the pigment level. Based on a published, validated photodegradation model that takes into account the spectrum of the light source, it enables users to compare lighting setups and display durations before an object goes on display, and to track the predicted colour change over defined periods.

TECHNICAL SPECS: A GPLv3 software tool, it requires spectral or hyperspectral imaging data and XRF maps as input; and uses Beer-Lambert transmittance corrections for varnish. It uses CKR for data storage and retrieval.

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The open-source web tool is integrated into the COLOURS platform and is accessible through a standard web browser, without the need for installation. Inputs:

- a colour-calibrated sRGB image of the artwork (baseline), or, optionally, a hyperspectral reflectance cube (ENVI format, covering at least 405 to 695 nm) for higher accuracy;
- XRF elemental maps or other pigment distribution maps, minimum one black-and-white mask per pigment

Light sources are selected from a built-in library (halogen, LED), and predictions are expressed in CIELAB (1976). The following are in development:

- Pigment mixtures with white pigments;
- data storage and retrieval through the Colour Knowledge Repository (CKR).

7. De-greening Tool

SHORT DESCRIPTION: A deep learning service that digitally identifies and removes greening defects from historical autochrome photographs without damaging physical source materials.

TECHNICAL SPECS: Deployed via PERCEIVE platform or Hugging Face; requires GPU infrastructure for inferencing; open-source (GPLv3); uses deep learning on synthetic defect data for autochrome greening removal.

8. StyleShade 3D

SHORT DESCRIPTION: An AI software tool generating interactive colour-data atlases from 3D geometry using multi-view rendering, path planning, and segmentation models for monolithic meshes.

TECHNICAL SPECS: Server-hosted application requiring GPU resources; open-source (GPLv3); designed for 3D monolithic mesh segmentation and annotation using multi-view rendering, path planning, and semi-automatic refinement.

9. doLCE 2.0

SHORT DESCRIPTION: An AI-powered software platform that digitally reconstructs original colour from historical Kodacolor lenticular black-and-white films using computer vision and deep learning.

TECHNICAL SPECS: Standalone software with graphical user interface; requires standard workstation with image processing capabilities or GPU; processes high-resolution scans of Kodacolor film at ~5 seconds per frame.

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10. VarnishLab

SHORT DESCRIPTION: A non-invasive computational pre-visualization tool using physics-based models to simulate both aged varnish removal (virtual cleaning) and new varnish application (virtual re-varnishing).

TECHNICAL SPECS: Physics-based optical simulation of light interaction between varnish and paint layers, reducing physical solvent tests by 30-50%; requires color-accurate RGB reproduction imaging or hyperspectral imaging (HSI) data and point-based spectrophotometer data.

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