

# The Materiality of Heritage

Moving Image Preservation Training at HTW Berlin

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## Introduction

The Conservation and Restoration curriculum at *HTW – Hochschule für Technik und Wirtschaft* [University of Applied Sciences] Berlin, with audiovisual heritage as one of four dedicated specialization tracks, offers a hands-on and materials-science-based approach to education in moving image preservation. Here, the field is taught in a very broad, ‘classical’ conservation/restoration context. Teaching the entire breadth of audiovisual heritage preservation, including not only video, for instance, but also photography, provides strong synergy in ensuring an understanding of photographic materiality, chemistry and history of black and white and color imaging in general. Also, a substantial part of the fundamental training for students of audiovisual heritage in subjects such as cultural history, or training in relevant skills such as microscopy or cleaning techniques, is shared with students of parallel specialist education in preservation of archaeological/historic artefacts, industrial heritage/modern material, and field archaeology. Thus, where, for instance, the other two national film heritage programs in Potsdam and Frankfurt focus on “archiving, programming and presentation” (Frankfurt),<sup>1</sup> the focus of the HTW program is in the heritage objects’ materiality, whether in passive conservation, material treatment, study of historical traces, scientific investigation, manual restoration or more historically, visually and ethically faithful duplication and digitization.

Teaching is headed by individual specialist professors corresponding to and responsible for each of the four B.A. and three M.A. tracks<sup>2</sup> heralding from a professional and academic background in the respective fields of museum object conservation/restoration (or field archaeology) and moving image and sound preservation, as well as a science professor devoted to the relevant chemistry and analytical-scientific investigations. Also, as discussed further below, a number of associate lecturers contribute teaching to specialized subjects, resulting in a combination of shared and specific training for each of the tracks, considered fully competitive with specialized individual training programs.

The school offers a seven semester B.A. program and a subsequent three semester M.A. program. Given appropriate certified training, candidates with Bachelor’s degrees from other conservation/restoration programs are eligible for the Master’s degree, optionally by joining select bachelor classes as needed.

The HTW program and the audiovisual track, in particular, have a strong belief in the international nature and opportunities in cultural heritage preservation, thus international candidates interested in studying moving image preservation in Berlin, Germany are specifically encouraged to apply. Towards this end, the program aims for regular presence during international festivals and conferences (such as through presentations in the REEL THING Symposium or the Pordenone Silent Film

Festival's Collegium), and through work with such professional organizations as FIAF (through membership in the Technical Commission, which allows for maximum alignment between the technical interests of the film preservation community and the respective research focus at HTW).

### The Curriculum

The curriculum reflects both the shared foundations (culturally and ethically, technically and materially) of the different disciplines in classes taught for combined specializations, as well as their highly specialized nature. For instance, restoration ethics is taught for students of all fields together, reflecting how film restoration ethics is rooted in (or, sometimes, differs from) classical approaches, and includes reflections on texts ranging from the classics such as Riegl, Le Duc etc. to Benjamin, and Ray Edmondson's *Audiovisual Archiving Philosophy and Principles*<sup>3</sup>. Other classes are shared between the audiovisual preservation and modern materials/technical heritage tracks, since both share an interest in technology history of the 19<sup>th</sup> and 20<sup>th</sup> centuries or the chemistry of plastic materials.

In doing so, as one of the authors observed earlier

The charm of the interdisciplinary concept [...] is in essence its antagonism to an unfortunate separation of technical and philological aspects in restoration. The integration of archaeology furthermore counter-acts the unfortunate misconception that there is something inherently more modern about modern media than those records preserved on paper, paintings, and messages on clay tablets or stones. The shared basic training of all students fosters development of broad awareness for our culture, of which artefacts of audiovisual heritage do form specialized cases, albeit not free from their own presuppositions. (Koerber 2003, 62)

The cultural course topics for the audiovisual heritage students thus range from general cultural history of the 19<sup>th</sup> and 20<sup>th</sup> centuries to the specific history of film and photography. Science and restoration classes range from general materials science (general, inorganic and organic chemistry, history of metallurgy and of plastics, etc.) for stu-

dents from all tracks to, for instance, photographic chemistry for those in the audiovisual tracks, all of which provide a thorough grounding in, and awareness for, the material nature of images. Practical restoration classes ranging from manual photography restoration (dry and solvent cleaning and retouching) to digital moving image and sound processing acknowledge the imminent changes and opportunities owed to digitization as much than the history of more than a century of photo-chemical imaging. Training in collection surveys and passive conservation is shared with the students of archeological restoration, while the HTW's own media archive of GDR audiovisual training materials (see below) offers an opportunity to apply student's recently acquired methodologies to a relevant audiovisual collection in house. A number of group and individual projects throughout the seven semesters are an integral part of the bachelor and master curricula and theses. These can include work on individual objects from the university's collection, or objects on loan from partnering institutions. Notable recent projects include Sowon Choi's master thesis work on German Missionary Films Shot in Korea in 1925 (Choi, 2016) and the semester project by two students, Corinna Reinhard and Lea Frankenbach, on manually-chemically removing misguided historic china ink interventions, likely dating from the 1950s or 1960s, on emulsion-damaged areas in one reel of a vintage nitrate print (held by Bundesarchiv) of *Der Kampf ums Matterhorn* (Germany, 1928) for a 2016 digitization project by Deutsches Filminstitut – DIF.<sup>4</sup> These semester and thesis projects, as well as choice of classes, subjects of study assignments and thesis, and an external internship allow students to either enjoy relatively broad training in audiovisual heritage, or to pursue further specializations such as classical photography restoration, recorded sound, magnetic tape, and scientific means of studying the materiality of media. The recent revision of the bachelor and master curricula has aimed to further strengthen existing and emerging partnerships with other fields of restoration and field archeology. For instance, in recent years, a surprising kinship between digital archeology and digital restoration of audiovisual heritage has emerged, while the most important synergy remains the one with conservation science (in particular, analytical and materials chemistry).

### A brief history of the study program

Founded in 1993, the conservation and restoration curriculum emerged from a distance-learning program in restoration dating back to the GDR era. Officially having commenced in the winter semester 1993/94, the history of the degree course dates back substantially further, as outlined by Matthias Knaut in a retrospective essay (Knaut, 2003). Plans to establish this type of training date back both to initiatives in the German Democratic Republic in 1976, where distance learning for restorers had been established at Museum of German History in East Berlin, while an initiative of the National Museums to launch a restoration study program in the mid-1970s ultimately failed. Following the German re-unification, these initiatives effectively merged into a 1992 proposal to launch a dedicated restoration curriculum with a threefold focus on archaeological cultural heritage, technical heritage as well as photo, film and data carriers, while further integrating excavation technology (field archaeology) into the course. Finally, in winter 1993, the course commenced with two focus professors for archeological heritage and technical heritage, while the professorships in natural sciences and photo/film/data carriers were first filled in 2000 and 2003, respectively, the latter by the co-author Professor Koerber.

Both authors of this paper have been privileged to lead the audiovisual track of the program from 2003-2007, Professor Martin Koerber headed the specialization (then known as ‘photo/film/data carrier’). Professor Koerber’s return as head of the film archive to the Deutsche Kinemathek in 2007, combined with his ongoing commitment to and teaching as professor for the HTW program has resulted in an especially strong connection between the school and the Kinemathek. Opened in 1963 on the basis of director and archivist Gerhardt Lamprecht’s film collection, the institution is one of the most important German archives, renowned for a number of film reconstructions. The institution holds a collection of some 26,000 films as well as a host of non-film materials, and since 2000, has exhibited in the Filmmuseum at Potsdamer Platz, Berlin.<sup>5</sup> Projects for individual students or groups are now routinely conducted in the archive’s collections, as are preservation screenings of classic silent and sound films in the

screening room of the archive as part of the film history class. In including films which have been subject to restoration projects headed by Professor Koerber, these classes particularly reflect the intimate relationship between film history and the preservation of works forming it. The appointment of Professor Ruedel in 2015, originally an analytical chemist before becoming internationally active in film preservation in different positions and institutions, on Prof. Koerber’s former position further strengthened the scientific, material approach to moving image preservation.

### HTW’s heritage: the Media Archive

One of the more serendipitous opportunities afforded by the school is provided by its ‘media archive,’ a collection of films, magnetic tapes, as well as sets of slides and overhead transparencies, originating from IFBT – *Institut für Film, Bild und Ton* [Institute for Film, Image and Sound], an institution subordinate to the East German Department of Education, and materials dating back as far as the 1940s. Comprehensively documenting university didactics from about 1962 to the end of the German Democratic Republic, these archival materials offer research opportunities not only in audiovisual materials history, but also in film studies of non-theatrical film and the humanities. Effectively saved (and occasionally used for multimedia teaching exercises) by Professor Jürgen Sieck, of the former FHTW, the collection found its way to the conservation and restoration program, under the aegis of Prof. Koerber (Koerber 2003). While a fair share of the necessary work indicated by Koerber—most prominently, reorganizing of the materials in the HTW vaults and establishment of an online database—the latter during an extensive project initiated in 2008, work remains to be done in addition to ongoing monitoring (Koerber, 2003). For instance, it was only recently that the slide collection was investigated more deeply in a first student project, evidencing the film materials and duplicating chains known for cinema rather than still films in the collection of loan slides and master materials. This underlines the value of the collection not only as history of didactic, but indeed also of a repository of East German film, photo and audiovisual carrier materials.

### Present and future directions

The availability of two professors from the field of moving image restoration, preservation and archiving is a particular strength for that track, and the audiovisual heritage track at HTW's Conservation and Restoration program has always embraced a broad approach.

An indispensable asset to the curriculum adding very specialized strengths are the visiting scholars teaching specific classes in moving image and sound restoration. These currently include Nadja Wallaszkovits (Phonogrammarchiv - Austrian Academy of Sciences) on the preservation of sound, Fenna Yola Tykwer (Universalmuseum Joanneum) on video, Egbert Koppe (Bundesarchiv-Filmarchiv) on digital sound restoration, and Andrea Krämer (Arri) on digital image restoration, the latter a HTW graduate continuing the class and tradition established by Julia Wallmüller, also graduate of the then-FHTW program.

The current research, project, and education strategy, as reflected in the curricula and collaborative and research projects (which students participate in), pursues the following goals:

- Embracing and furthering a materials-based approach in moving image preservation through applying both classical, manual approaches (e.g. refined cleaning methods) as well as conservation chemical techniques (particularly, techniques of analytical chemistry/conservation science) to the field of moving image and sound.
- Scientifically studying the relationship between a moving image's visual impression and the materiality of its imaging layer (gelatin, grains, tinting and chromogenic dyes, metal and mordant tones etc.), in particular as regards the measurement, reproduction, recreation, and scientific documentation of moving image color through spectroscopy/colorimetry.
- Furthering the understanding of passive conservation strategies, the decay and possible chemical recovery mechanisms of moving image carrier materials such as cellulose nitrate—a daunting task and very long term goal to propose specific realistic milestones for, given that a sufficient understanding of the vinegar syndrome, or

that of paper acidification for that matter, has required decades of research, yet one that should be reflected in the breadth of topics for student projects and theses—i.e. the decay of the select few polymers relevant in the audiovisual field, offering obvious synergies with the expertise of plastics conservation pursued in the HTW sister track record focusing on modern industrial materials.

- Last, embracing the challenge of digitization and the emergence of born-digital media, while remaining aware of an inherent, important caveat expressed by Koerber in 2003, and still equally true more than a decade later: “We would be well advised to limit our activities to those media carrying encoded photographic, moving image and sound recordings. Data preservation in IT [...] has similar, but also vastly different problems and solutions, not quite immediately related to those of restoration and philology” (Koerber 2003, 63).

### Tools and Techniques

The interdisciplinarity of the conservation/restoration curriculum, the audiovisual track in particular, and the need for special equipment, demand and encourage that students find opportunities for external projects and internships. Consequently, archival work in the Berlin area, or elsewhere nationally or internationally, is as crucial for the moving image and sound restoration students as, for example, field trips for archeological excavations for the students of that specialization. That being said, dedicated working (and hands-on teaching) environments for the conservation and restoration are available at the school. In addition to restoration studios such as for photography work, these include a media-teaching laboratory with a variety of disc, audio and video playback machines, a digitization setup and a *Diamant Film Restoration Software* workstation to practice moving image restoration. Furthermore, a dedicated room is equipped and available for work with nitrate film elements. Moving image equipment available to students includes 16 and 35mm sound Steenbeck viewing tables, inspection benches and a synchronizer. The scientific working and teaching spaces include a microscopy room (including the instrumentation required for

preparing cross-sections of specimens) as well as a chemistry laboratory. An FT-IR (Fourier Transformation Infrared) Spectroscopy instrument allows for non-destructive analysis for *organic structure* towards, for instance, the determination of image carriers, adhesives, plastics, binders, etc., often in direct comparison with a library of relevant spectra. Complementing this, the technique of XRF (X Ray Fluorescence Spectroscopy), a non-destructive *elementary (atomic)* analysis, is especially powerful for the identification of chemical elements, such as the metals in colour toning or in early natural colour film systems. Reflecting a particular interest in early colour, a dedicated Konica-Minolta colorimeter/UV-Vis spectrophotometer has most recently been installed in 2017 in collaboration with the Clothing Technology degree course. Thus, analytical-chemical study of audiovisual plastic carriers, binding layers, image metals and organic dyes, as well as calculation of the colour impressions they provide are now all available for education and research in moving image preservation at HTW.

### **Internationalization, Outreach, Conferences**

Furthering collaborative projects with moving image archives, the program enjoys particularly fruitful and long-standing collaborations with *Stiftung Deutsche Kinemathek* and *Bundesarchiv*), nationally (such as the project with DIF – *Deutsches Filminstitut* regarding *Der Kampf ums Matterhorn* mentioned above, or, thus far, two separate projects focusing on the materiality and color of chromolithographic loops)—and internationally, remains crucial. Furthermore, a teaching collaboration with the Film Heritage masters program *Filmuniversität Babelsberg Konrad Wolf* is already informally underway, strengthening the connection between the materials/conservation/restoration aspects of the moving image heritage, and its historic study and contemporary dissemination, through exchange visits of students and teachers or in joint events during either program's annual field trip to the *Cinema Ritrovato*.

Internationalization is believed to be crucial for the future of moving image preservation, and this is also increasingly reflected in the student body. While teaching at the HTW program is in both German and English, past graduates have also included professionals both from Iceland and Korea, for example.<sup>6</sup> The school continues

to strongly encourage international candidates to apply, and maintain active ties to FIAF and FIAF's technical commission, to BFI, BFI's FoFA (Future of Film Archiving) group, to the Colour Group Great Britain, to the University of Zurich (ERC Advanced Grant FilmColors and SNF Film Colors. Technologies, Cultures, Institutions) and other international archives, professional groups, film preservation training programs and other players in the field of moving image preservation. Two conference endeavors associated with the HTW program add to the training, education and networking opportunities afforded to the students. Co-organized by the Conservation and Restoration program's *Modern Materials* track, the biannual *Plastics Heritage* conference deals with a subject of obvious relevance to the moving image and sound field. Although covering a substantially wider range of relevant polymers than those historically used for photography, film and tape carriers, it has been known to sport relevant sessions and contributions on the specific challenges of select plastic materials as image and sound carriers. The *International Conference, Colour in Film* has been established in 2016<sup>7</sup>. Co-organized by HTW and the Colour Group (GB), the conference was first held in London in early March 2016. Its return to London in late March 2017 marks the aspiration to establish it as a regular conference. *Colour in Film* is intended to foster and stimulate the interaction between the two vibrant, but still separate, colour film restoration and colour science circles. It is explicitly aimed at everyone, specialist or non-specialist alike, interested in colour in cinema, colour in cultural heritage, colour reproduction and restoration, and colour perception. The 2017 edition has been held in cooperation not only, as in 2016, with the British Film Institute (BFI), but also with both ERC Advanced Grant FilmColors (University of Zurich) and The Eastman Revolution project (University of Bristol), thus bringing in and together the two most relevant current colour film research projects. 2017 also marks the addition of student presentations, to help foster the next generation of interdisciplinary and internationally oriented film preservationist—a goal fully shared between the conference organizers and HTW's degree in audiovisual heritage.

## References

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## Endnotes

1 As translated from <https://www.uni-frankfurt.de/45978235/filmkultur>

2 Students of field archaeology can continue their studies towards a master's degree in a separate course in cooperation between HTW and FU Berlin.

3 Third Edition, 2016, <http://unesdoc.unesco.org/images/0024/002439/243973e.pdf>

4 Also see the respective report from Ger-

man regional television, embedded here <http://krg.hrw-berlin.de/studium/studienschwerpunkte/audio-visuelles-und-fotografisches-kulturgut-moderne-medien-avf/> or directly available at <https://www.youtube.com/watch?v=4tFBUTTYWcM>

5 <https://www.deutsche-kinemathek.de/en/about-us/history>

6 See, for instance, the study by Choi as an example of a project that only became possible through such a transnational approach.

7 Please visit [www.colour-in-film.net](http://www.colour-in-film.net) for information on upcoming editions.