

Plastics Associated with Photographic Materials

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Center for Creative Photography
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ABSTRACTS AND SPEAKER BIOGRAPHIES

Session I: History, Identification, and Materials Characterization of Transparent Film Supports

“The Evolution of Transparent Plastic Supports”

Session Chair: Fernanda Valverde, Amon Carter Museum of American Art

Abstract: This talk addresses the evolution of transparent plastic supports focusing on the periods of transition and overlapping of different materials and technologies. It highlights the challenges involved in the development and manufacture of the different types of flexible supports, and the advantages and disadvantages of each of these. The physical, mechanical, and chemical properties that were desirable in transparent supports are presented here, along with the methods introduced to achieve these properties.

Speaker biography: Fernanda Valverde is Conservator of Photographs at the Amon Carter Museum of American Art. She was Program Chair of the International Postgraduate Program in Photograph Conservacion at the Escuela Nacional de Conservación, Restauración y Museografía. She holds a MS from the Rochester Institute of Technology, and a BS in Conservation of Cultural Heritage. She was a Fellow of the Advanced Residency Program in Photograph Conservation.

“Is It Obvious? Not When We are Dealing with Cellulose Nitrate...”

Elia Roldão, A. J. Parola, A.M. Ramos, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa; João A. Lopes, Universidade de Lisboa; B. Lavédrine, Muséum National d’Histoire Naturelle

Abstract: Cellulose nitrate (CN) films were the first flexible films to be used in photography. The lightweight, flexibility, transparency and dimensional stability kept this semi-synthetic polymer for cinematographic and photographic use until the 1950s. However the chemical instability and high flammability of this material lead to its gradual replacement by Safety films (cellulose acetate).

Over time, CN films pose several conservation problems due to their chemical instability. At a first stage of degradation the films start to warp and the image oxidizes. Along the degradation process, the support loses transparency and shift from a yellow to brown hue. Other degradation signs such as the formation of brown spots and nitric acid odor become more intense along with the increasing of the degradation process. These signs reveal the

acidification of the film base, an autocatalytic process that leads to chemical and physical decay, resulting in the total loss of the film.

Besides the chemical instability, the popularity and remarkable properties of CN stand out as an enormous percentage in photographic collections. The survey of film collections reveal that the degradation process of CN films is not homogeneous. In some collections it is possible to find negatives from the same period that visually have no signs of degradation, and others that are completely degraded.

With the aim to understand the chemical and physical decay of CN films and to establish an early degradation detection methodology, four Portuguese photographic collections were selected. Samples were selected according to their conservation condition grade, formats and manufacturers.

172 CN film negatives were analyzed by micro-FTIR spectroscopy. Spectra were treated in order to detect different levels of degradation that could point out with accuracy the beginning of the degradation process. Spectra analysis was restricted to the νOH , $\nu\text{C=O}$, νNO_2 , $\nu\text{C-O-C}$ and νONO_2 absorption regions. Analysis of the νOH , νNO_2 and νONO_2 bands enabled to appraise the denitration of the polymer and the $\nu\text{C=O}$ band the plasticizer loss.

The FTIR data collected allowed to conclude that the first stages of degradation correspond to minor decreases of νNO_2 and νONO_2 bands and to plasticizer ($\nu\text{C=O}$ band) increase. This data is being correlated with a conservation condition grade chart.

Speaker biography: Élia Roldão is a Photograph Conservator. Since 2000 until 2010, she worked for Luis Pavão Ida. (LUPA). At the time she did conservation treatments, cataloguing, digitalization and preservation management of photographs collections in several Portuguese institutions. Since 2011, Élia is a PhD fellow at the Conservation and Restoration Department of FCT-UNL, doing a research on black and white film base negatives.

“Identification of Cellulose Nitrate Film for Conservation Purposes by Organic Elemental Analysis: X-ray Films”

Konstantina Konstantinidou, S. Strekopytov, E. Humphreys-Williams, Natural History Museum, London

Abstract: Radiographic imaging since it appeared in 1895 had to use as a recording media photographic materials available at the time. Any X-ray film produced before 1924 would be cellulose nitrate based while any X-ray film produced after 1933 would be based on cellulose acetate derivatives or, since around 1960 and until now, on polyethylene terephthalate (‘polyester’). The Natural History Museum (NHM), London has been using and developing X-ray films, as part of its scientific research, since the early 20th Century. This suggests that some of the X-ray plates have a cellulose nitrate rather than nitrate-free (often referred to as *Safety*) film base, however, no records are found regarding the actual material of the films in the NHM historical collections. Major parts of the film collection are undated. Only a few X-ray films were

found to be clearly identified by the “SAFETY” edge markings, however, no “NITRATE” marking was found on the likely pre-1933 material, therefore, the identification of cellulose nitrate film base using edge labels proved to be impossible for the NHM collections. During the initial survey of the X-ray collections typical methods for the identification of cellulose nitrate film have been used such as following the deterioration pattern, ‘float’ test in trichloroethylene and ATR-FTIR analysis. We suggest the determination of nitrogen content in the film by organic elemental analysis (also known as CN or CHN according to the chemical elements identified) as a reliable method for the identification of films (X-ray, still image or cinematographic) with a cellulose nitrate base. Though it is a destructive method, the sample size required (less than 1 mg) is by far smaller than for the ‘float’ test. CHN analysis does not require any sample preparation apart from weighing the samples into tin capsules and proved to be more accurate than the ‘float’ test and quicker and much more straightforward than the ATR-FTIR for film bases.

Speaker biography: Konstantina currently works as a Paper Conservator at The Natural History Museum. She has been employed there since 2013. Prior to that she has worked on several projects as a freelance book and paper conservator with National Trust, V&A, The National Archives, Dr. William’s Library, UCL, the Ashmolean Museum-Oxford, Oxford University College and with private conservators. She graduated from Camberwell College, UAL in 2009 and soon after that was awarded with one year internship at the British Library.

“Colorizing Maurice Tabard’s Test for the Film ‘Culte Vaudou,’ Exposition 1937 with Tinted Cellophane: Science not Voodoo”

Roberta Piantavigna, Chris McGlinchey, Lee Ann Daffner, The Museum of Modern Art

Abstract: Between the years 1936 and 1939 when Maurice Tabard (1897-1984) was most likely to have printed Test for the Film “Culte Vaudou” Exposition 1937 he would have had several options to produce an orange monotone effect but he chose to laminate his print with tinted cellophane. Cellophane is an important early modified biopolymer plastic derived from fibrous cellulose made soluble primarily via a xanthate moiety then precipitated back (regenerated) to pure cellulose and cast into thin transparent sheets (cellophane) or fibers (viscose). Cellophane was the first manmade substance that was lightweight, flexible and durable yet transparent like glass. Cellophane bridged the arts and sciences and served a variety of applications by capturing the imagination of engineers, designers and artists facilitating a whole new era of design and illustration. One of the most common uses was in product packaging but it was also used as a glass substitute in goods found in the home and workplace. By the mid-1930s it was ubiquitous and was used increasingly in the decorative arts and to some extent fashion industry and performing arts and publishing. Cole Porter included it in his 1934 song lyrics You’re the Top [...You’re the purple light of a summer night in Spain... /... You’re cellophane!] That year cellophane was a featured stage material at the debut performance of Virgil Thompson’s ground breaking opera Four Saints in Three Acts with libretto by Gertrude Stein. The opera was conceived in Paris and the set designed by Florine Stettheimer who previously used cellophane

in some of her preparatory sketches as collage elements. In Paris, Max Ernst and Francis Picabia also used cellophane in some of their work taking advantage of the material's transparency. In early cinema, film could be tinted or details picked out in color: for instance with *Phantom of the Opera* (1925) the mood is set by using color tinting for specific scenes by directly tinting the film, not using cellophane. The effect Tabard creates in his print could be related to an interest in mimicking how the film for the 1937 exposition was meant to be projected, similar to *Phantom of the Opera*, but using a different process for the paper based print. The condition of this early laminated print is very good. There is no evidence of mirroring and the attachment of the laminated film to the gelatin silver print is good. There are only minor losses to the film at the edge most likely when the print was trimmed. No adhesive was detected at the interface suggesting that the laminate was either applied directly to the print cold after rinsing before it was dry or a heated laminating press was used afterwards. Such presses were developed by the early 1930s and Tabard may have known about them given his involvement with the graphic design community. Cellophane was well known and popular; this example of its innovative use appears stable and is in remarkable condition. Careful consideration of preventive conservation measures will ensure its longevity.

Speaker biography: Roberta Piantavigna is the Andrew W. Mellon Fellow in Photographs Conservation at MoMA. Preceding this post, she was principal conservator in Studio Berselli di Silvia Berselli. She taught Photography Conservation at Brera Academy of Fine Arts and NABA. She received her bachelor and specialization degree in Conservation of Contemporary Art at Brera Academy of Fine Arts in Milan, Italy.

“Cellulose Acetate Based Chromogenic Reversal Films: The Case Study of Ângelo de Sousa’s Photographic Collection”

Joana Silva, A. M. Ramos, J.L. Ferreira, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa; B. Lavédrine, Muséum National d'Histoire Naturelle

Abstract: Ângelo de Sousa (1938-2011) was a prestigious contemporary Portuguese artist, known for an experimentalism that enabled him to achieve exceptional originality. He worked with different materials and since the 1960s produced a very interesting work in photography.

Interested and informed about colour theories and perception, Ângelo de Sousa made many works in which he explored the primary colours as a way to achieve the maximum effect with minimum resources. For a long period, he decided to privilege the primary additive colours, red, green and blue (RGB), using light as a source for image formation, as for instance in his work *Slides de Cavalete* (1978-1979), a diaporama composed of one hundred slides.

His photographic work is being studied in the context of a PhD thesis dedicated to his photographic and filmic collection, and specifically, to colour fading in the chromogenic reversal films. Prior to this research, no precise information about Ângelo de Sousa’s photographic and filmic collection had been collected and systematized.

After surveying the collection, which allowed to access the typology and global conservation condition based on visual examination, it is possible to say that the photographic collection is composed of circa 85600 images: 45% of the images are negatives, 40% are positive transparencies and 15% are prints. The most representative type of photographs are 35mm black and white negatives on cellulose acetate support (43.5 % of the collection), and 35 mm chromogenic reversal films on cellulose acetate (31 % of the collection).

Although at least 84% of the collection is composed of cellulose acetate based photographs, no vinegar syndrome was detected. The most alarming degradation observed was the colour shift in chromogenic materials, particularly in chromogenic reversal films.

Chromogenic films have multi-layer structure: a plastic support, three superimposed coloured gelatine based emulsions (cyan, magenta and yellow layers), among others. In the non-processed film only silver salts and colour couplers are present in each layer. The dyes are produced during processing, where a chemical reaction between the colour couplers (colourless) and the oxidized colour developer (after development of the silver salts) occurs. After processing, the residual silver is removed and only dye clouds are left.

Dyes are susceptible to degradation, some more than others, induced by relative humidity, temperature and/or light, although producing different degradation products. Residual colour couplers are also vulnerable to oxidation producing the yellowing of the image, and may interact with the dyes accelerating dye fading.

When the artistic intention relied unequivocally on the “plasticity” of colour, due to the abstract nature of the image, it is difficult to understand if dye fading and/or change in colour balance are occurring and, if so, to what extent. The loss of colour in this case may take particularly serious proportions, putting the artist intension at risk.

Therefore, in this study it is intended to develop a methodology to monitor the fading of chromogenic reversal films using non-invasive analytical techniques, such as spectrophotometry and colourimetry. UV/Visible Spectrophotometers which allow spectral and colorimetric analysis will be tested in order to assess the rate of degradation of the different dyes, by following the absorption spectra and CIELab coordinates.

Speaker biography: Joana Silva has completed the Master degree in Conservation and Restoration, with specialization in photography, in Faculdade de Ciências e Tecnologia, Universidade NOVA (Portugal) in 2009. She worked for Luís Pavão Lda. between 2009-2014 at the Art Library from Fundação Calouste Gulbenkian. Presently she is doing her Ph.D. in Conservation and Restoration of Cultural Heritage at the same University.

“Permanent Images: A Personal and Technical Conversation”

Peter Adelstein, Image Permanence Institute, Rochester Institute of Technology (retired)

Abstract: *Permanent Images: A Personal and Technical Memoir*, written by Dr. Peter Z. Adelstein (published 2012) is a look into the past of an accomplished research scientist who has been in the field of image permanence for over sixty-three years. There have been many changes in our understanding of image stability, in recording materials, and in the institutions that are concerned with permanence behavior during that period. In this presentation, as he did in his memoir, Dr. Adelstein will recount significant milestones over the past few decades especially related to photographic film bases. He will do so in conversation with his colleague and friend Jean-Louis Bigourdan, Research Scientist at the Image Permanence Institute.

Speaker biography: Dr. Peter Z. Adelstein retired from Eastman Kodak Company in 1986 as Unit Director of the Physical Performance Section and then joined the Image Permanence Institute as a senior research associate. He is an authority on photographic film base and its deterioration and has published over 80 papers about his research. For over 25 years he served as chairman of ANSI and ISO committees dealing with the permanence of imaging media. In 1998 he was awarded the Fuji Gold Medal by the Society of Motion Picture and Television Engineers, and in 2003 he was given a certificate of recognition by the International Imaging Industry Association for his contributions to international standards.

Session II: Preservation of Transparent Film Supports

“Preserving Film Collections for the Future: A Web Application”

Session Chair: Jean-Louis Bigourdan, Image Permanence Institute, Rochester Institute of Technology

Abstract: In 2012, the National Endowment for the Humanities (NEH) Division of Preservation and Access awarded an Education and Training Grant to the Image Permanence Institute (IPI), funding a project dealing with best practices for preserving film materials in museums, libraries and archives. The objective of the project was to create a web-based application called filmcare.org, a tool for self-education that will provide an easy-to-implement decision-making platform for preserving film materials. In essence, filmcare.org is designed to bridge the gap between what is known today about film stability and what can be done to make preservation efforts in any repositories a reality. This web application provides access to critical information in a concise format, and most noticeably guides preservationists through the process of making informed decisions on optimizing the longevity of film collections. A series of steps enables users to set priorities, evaluate material needs, program storage strategies, and implement and monitor the preservation of film collections. Through an interactive process, users are guided to identify the nature of film materials, to design and conduct condition surveys, to analyze survey results, to evaluate the benefits of any storage on film stability, to choose between alternative approaches, to implement the appropriate preservation strategy, and most importantly, to proactively monitor the collection’s state of preservation over time. Many otherwise tedious

tasks are facilitated by filmcare.org to make collection personnel self-reliant in their effort to preserve film materials. The application is a standalone tool that is available at no charge. The thrust of this paper is to present filmcare.org, discuss its origin, purpose, methodology and architecture in an attempt to foster film preservation efforts and sustain them over time.

Speaker biography: Jean-Louis Bigourdan is a senior research scientist at IPI. He has a background in Chemistry, photography and conservation. Since 1994, he has been active in the field of preservation research at IPI. He has been studying the effect of microenvironments on the stability of acetate film. He led the development of FilmCare.org. He has been investigating the effect of cycling environmental conditions on library and archives materials, and investigates the implementation of dynamic management of temperature and humidity control.

“Preserving Microfilm at the National Archives and Records Administration”

Sara Shpargel, National Archives and Records Administration

Abstract: Prior to digitization, microfilm was considered the primary method of copying, circulating and preserving historical records. The holdings of National Archives and Records Administration (NARA) include approximately 2 million reels of microfilm on both acetate and polyester film. Many records on microfilm are currently being digitized both through NARA and through digital partners working with NARA. As a result, a number of reels of acetate microfilm have come to the conservation lab for examination and treatment to remedy blocked film, poor quality splices, tape and labels obscuring textual information, surface dirt and tears. This paper will present examples of deterioration issues, treatment examples and preservation and digitization challenges from the conservator’s prospective as encountered with microfilm at NARA.

Speaker biography: Sara Shpargel has held the position of Senior Photograph Conservator at the National Archives and Records Administration since 2006. Prior to that, she was a conservator at the Library of Congress from 2003-2006. Sara received a B.A. in art conservation from the University of Delaware, an M.A. and Certificate of Advanced Study in art conservation with specialization in photographic materials and paper from the State University of New York College at Buffalo, and completion of the Advanced Residency Program in Photograph Conservation at the George Eastman House International Museum of Photography and Film.

“Letting Decay Have its Day: The Life, Death, and Rebirth of Celluloid Acetate Plastic Film”

Meghan Chandler, University of California, Irvine

Abstract: Upon its invention in the early nineteenth century, celluloid acetate plastic film was heralded as an indestructible imaging medium that could create lasting photographic and cinematic images. By the 1950s, however, this image would be cast into doubt by the discovery of acetate’s organic decay via “the Vinegar Syndrome.” Confirmation of acetate’s impermanence led to commercial doom: acetate media products were quickly replaced, first by

polyester-based film, and ultimately by digital formats. Yet, while acetate film products were hurdling towards obsolescence, their signs of material frailty would also become the source material for twentieth century avant-garde filmmakers as well as twenty-first century visual culture at large.

This paper considers how acetate decay informs the works of two materialist filmmakers: Owen Land's 1967 film, *Bardo Follies*, and Luther Price's 2013-15 series of motion picture slides, *Light Fractures* and *Light Windows*. In these works, acetate decay is not critically demonized nor used as evidence of its failure, but rather is celebrated as a spectacular aesthetic display worthy of being witnessed and even preserved. I further argue that Land and Price lay the foundations for an emergent cultural phenomena -- what I term "obsolescence fetishism" -- which manifests in contemporary obsessions with vintage aesthetics as well as editing technology that gives digital images an analog soul by recreating projection scratches, film burns, and the same blistering pockmarks once negatively associated with the Vinegar Syndrome. Ultimately, this paper makes a case for reconsidering the history of acetate plastics and nature of decay as not leading to market failure nor ending in material ruin, but rather as achieving a second afterlife thanks to a new value system that fetishizes decay and obsolescence.

Speaker biography: M.M. Chandler holds a Ph.D. in Visual Studies from the University of California, Irvine, and is currently an Adjunct Professor in Art History at Santa Monica College and Film Studies at Irvine Valley College. Her present work focuses on the death of Kodachrome film technology and its rebirth in contemporary visual culture, which will appear in the forthcoming anthology, *Analog Sunset: On the Impending Demise of Vanishing Media*.

“(More) Recent Developments in Using, Storing, and Transporting Cellulose Nitrate Still Picture Film”

Andrew Robb, Library of Congress

Abstract: Cellulose nitrate film is a hazardous material (Class 4.1 Flammable Solid) and its storage and use are described in National Fire Protection Association Standard Number 40. Up to 2001, NFPA 40 applied only to motion picture film – cellulose nitrate still picture film was explicitly excluded. Subsequent revisions explicitly include still picture film formats such as 35mm and 120 roll films, as well as 4x5, 5x7, 8x10, 11x14 and x-ray sheet films. It applies to “all facilities that are involved in the storage and handling of cellulose nitrate based film.” (NFPA 2001, 40-4) While only a standard, many building and fire codes, as well as insurance policies, require compliance with fire standards such as NFPA 40. Thus not following the standard may have legal ramifications. The presentation will include a summary of the most recent 2016 standard as well as some guidance regarding how to implement its requirements in a cultural institution.

Speaker biography: Andrew Robb has been at the Library of Congress since 1996 and currently is Head of Special Format Conservation in the Conservation Division. He is responsible for the Library's Preservation Emergency Response Team and serves on the Library's Emergency

Management Team. He also acts as the Library's point of contact for Federal emergency plans related to cultural resources. He has been a Co-Chair of the Emergency Committee of the American Institute for Conservation and is a member of the National Heritage Responders. Andrew received a M.S. in Art Conservation with a major in photograph conservation and a minor in paper conservation from the University of Delaware / Winterthur Art Conservation Program.

Session III: Plastics Associated with Photographic Prints

"Historical Review of Plastics used in Photographs"

Session Chair: Sylvie Pénichon, Department of Photography, Art institute of Chicago

Abstract: Plastics have pervaded every aspect of our lives and photographs are no exception. Since the early days of photography, plastics have been closely associated and used in photographs as binders, substrates, coatings, and now, image materials. This presentation will briefly survey the evolution of photographic materials and plastics associated with them, from the daguerreotype era to the digital age.

Speaker biography: Sylvie Pénichon is a conservator of photographs at the Art institute of Chicago. Sylvie has published and lectured extensively on the conservation and preservation of photographs in the US and abroad. She is the author of *Twentieth-Century Color Photographs: Identification and Care*, a comprehensive guide to understand processes, techniques, and materials used to produce color photographs during the last century. A graduate of New York University conservation program, Sylvie is a professional associate of the American Institute for Conservation of Historic and Artistic Works (AIC) and currently serves as Chair of its Photographic Materials Group.

"Evaluation of Hinge-adhesives for Display of Resin Coated (RC) and RC-type Photographic Materials at The Museum of Modern Art"

Roberta Piantavigna, Lee Ann Daffner, Chris McGlinchey, The Museum of Modern Art

Abstract: The display of resin coated (RC) photographs and digital prints on RC-type papers are increasingly commonplace at The Museum of Modern Art. Notable examples include the recent acquisition of Fluxus collection which includes more than 5,000 photographs, many identified as RC prints, contemporary color photographs and archival materials, all of which are in demand for exhibition. This material presents certain challenges because often they must be hinged on the verso, but this limited area of contact occurs on a surface that has a weak affinity for many adhesives. We are currently investigating a selection of adhesives and attachment systems for the display of early RC photographs and assessing new RC and RC-type papers contemporary artists and photographers are using.

RC papers were developed in the early 1960's and are now ubiquitous in photography and digital imaging supports. The dimensional stability of RC papers under high humidity is the physical quality that contributes to the paper's popularity. The polyethylene coating on the verso of the RC paper, however, is the problematic component that makes hinging difficult.

When photographs are overmatted for presentation, they are easily set into mats with photo-corners: this is the preferred preservation standard at MoMA. On the other hand, when a photograph needs to be "floated" in the window mat or presentation frame, concealed "v" hinges or some other system must be employed. Large unmounted photographs present further complications and are often attached to rigid supports with a modified strip lining when traditional hinges are deemed insufficient. There can be additional aesthetic factors which must be considered and each photograph is evaluated on a case-by-case basis.

Ten adhesives and eight proprietary films and tapes form the core set of materials in this study. These 18 materials are applied to two carriers under a variety of application techniques for a total of two sets of 36 samples. Each set is subjected to either shear or peel strength tests this presentation will review the results of hands-on workability evaluation, silver sensitivity (sodium azide test), and two 9-month natural aging studies of hinges under representative but high loading. Thorough review of testing available in the conservation literature will be touched on. A selection of samples will undergo further testing, including photographic activity test (PAT), artificial aging for evaluation of longer-term contact, and assessment by colleagues.

This study also involves the characterization of the verso of contemporary RC and RC-type photographic and digital papers using attenuated total reflectance (ATR) Fourier transform infrared (FTIR) spectroscopy, micro-raking light, differential interference contrast (DIC) imaging, ultraviolet (UV) examination, in-situ contact angle measurement, optical surface roughness and surface gloss characterization. ATR results indicate the papers vary in polarity ranging from highly olefinic (the type used in the adhesive studies above) to oxidized and more polar surfaces. Patents indicate one reason for increasing the verso surface polarity is to improve ink adherence but it will facilitate adhesion in general and will beneficially impact the strength of the hinge's bond. Simple ways to assess wetting of adhesives onto papers of unknown surface polarity will be discussed.

Speaker biography: Roberta Piantavigna is the Andrew W. Mellon Fellow in Photographs Conservation at MoMA. Preceding this post, she was principal conservator in Studio Berselli di Silvia Berselli. She taught Photography Conservation at Brera Academy of Fine Arts and NABA. She received her bachelor and specialization degree in Conservation of Contemporary Art at Brera Academy of Fine Arts in Milan, Italy.

“Photo-plastic and Thermo-plastic Inkjet Inks”

Pablo Ruiz, Andalucian Center for Photography

Abstract: The lecture is intended to address the new type of inks that are being used increasingly by artists to create their works.

The use of these materials, inks and supports, by artists is a good example of the influence of the industry on the photographic art. It is not difficult to understand this influence if we can use photo-sensitive inks for direct printing on any surface, that also allow us to avoid the use of adhesives, secondary supports, protective elements and hours of manipulation. Or we can use thermal-sensitive inks to print on flexible substrates (textiles) with lighter weight, easy handling and transportation, and also uncomplicated assembly. So, nowadays, we have first the advertising industry and art creation later, using these new materials to cover their various production needs.

In collaboration with the research laboratory of the department of restoration of the Universidad Complutense de Madrid we have been analyzing these new printing systems in terms of stability and durability. First, we studied the effect of all elements together and now we are researching on the independent parties.

Although, there are many different types of plastic inkjet inks for photographic printing, we will just focus on two of them; Thermo-plastic and Photo-plastic inks. We will explain how are produced their image formation processes and the resulting morphological structures of the inks. Also, we will analyze their physical and chemical qualities, their stability against fading, and their life expectancy. Besides, we will show and we will explain different types of photo creations that go beyond the two-dimensional image by creating new photographic objects.

Speaker biography: Pablo Ruiz specializes in conservation of contemporary photography. He ran an atelier in Málaga for ten years. He also participates in different digitalization projects as a technological advisor for digital image quality control. Since 2008, he has been a conservator of photographs at the Andalucian Center for Photography. He developed an active teaching labour from high specialize conferences, including workshops and masterclasses.

Session IV: Plastic Secondary Supports for Contemporary Photographs

“Off the Wall”

Session Chair: Alex Clarke, Jeff Wall Studio London

Abstract: This talk will provide insight into the processes involved in the installation of Jeff Wall’s artworks and some of the logistical problems it poses.

Large-scale light boxes, heavy black and white and face-mounted photographs present many different handling considerations. Understanding these complexities and having a solid

knowledge of materials form a key part in preventing damage and ensuring a successful installation and de-installation.

I will walk through the installation of a 'new style' light box giving insight into this delicate process, whilst also highlighting some of the refinements to crating. Further innovations and the introduction of transport bars have greatly reduced the frequency of breaks in plexi hanging bars. However, occasionally damages can occur, often due to careless transportation and handling, or poor and incorrect packing.

Referencing different case studies of breaks in both light box plexi's and face-mounted photographs, I will detail my approach to this type of repair showing before and after examples. I will discuss recommended materials and those best avoided as we search for the fail-safe packing solution.

Speaker biography: Alex Clarke started working with Jeff Wall in 2002 following his time at the Anthony d'Offay Gallery, where he worked closely with artists such as Bill Viola, Howard Hodgkin and Ron Mueck. He has 20 years of experience working with fine art and specializes in the fabrication, installation and restoration of light boxes and face-mounted photographs. Based in London, he works with leading museums, galleries, foundations and private collectors all over the world.

"Effects of Cleaning Experiments on Face-mounted Photographs"

Clara von Waldthausen and Bill Wei, University of Amsterdam

Abstract: For the past twenty-five years, face-mounted photographs form a large part of contemporary photographic collections. Due to the electrostatic charge of the PMMA, these photographs can accumulate dust and soil while on exhibition, during transport and even in storage.

Cleaning tests were performed as part of the International Face-mounting Initiative to learn more about the nature of dust accumulation on face-mounted photographs and the mid-term effects of cleaning on the PMMA surface. Various methods were looked at including mechanical cleaning using dust clothes, compressed air combined with an "ion gun", as well as the by artists commonly used AMS Cleaning System.

A second part of the research studied the electrostatic charge build-up on the PMMA surface as a result of cleaning. Which methods caused the most build-up and how long did the electrostatic charge on the surface last? This paper aims to examine the outcomes of cleaning tests and discuss some tips on cleaning strategies.

Speaker biography: In 2001, Clara von Waldthausen established the Fotorestauroatie Atelier VOF, conservation lab for photograph conservation and digitization of fragile materials of which she is Director. Waldthausen is currently working in private practice, and at the University of Amsterdam where she established a MA Program for Photograph Conservation at the

University of Amsterdam. She is coordinator and lecturer of the programme which started in September 2015.

“Face Lifts for Face-Mounting: Fill Materials and Methods for Scratch Repair on Poly(methylmethacrylate) Used in Face-Mounted Photographs”

Kaslyne O’Connor, Department of Photography, Art Institute of Chicago

Abstract: A primary conservation issue for the sustained use of face-mounted photographs is the inherent susceptibility of the acrylic sheet surface to abrasions. Scratches disfigure the entire surface of the poly (methyl methacrylate) (PMMA) sheet by changing the surface topography and distracting the viewer from the photograph. These disfigurements can be the result of improper handling, storage, or routine cleaning, and can range from micrometers to centimeters in size. The primary goal of this study was to gain an overview of the current care of face-mounted photographs and to further understand the necessary quality for scratch repairs on the acrylic surface. Experimental samples were abraded and repair was attempted through the use of scratch reduction techniques and fillers. The fill materials (Paraloid B-72, Dymax 4-20638, and Hxtal NYL-1) are products with refractive indices similar to PMMA, low viscosities, a resistance to yellowing, and favourable working times. Scratch reduction techniques attempted to decrease the amount of light refraction by the scratch ridges. All samples were subjected to accelerated thermal and light ageing, and analytical tests of the PMMA surface to detect any immediate or long-term negative effects on the acrylic caused by the application of these scratch fillers.

Speaker biography: Kaslyne received her MA in Conservation from Queen’s University and her BA from the University of Guelph. She has held internships at the Royal British Columbia Museum and at the Library and Archives of Canada Preservation Centre, and is currently the FAIC/Samuel H. Kress Conservation Fellow in the Department of Photography at the Art Institute of Chicago.

“Evaluating the Light Stability of the Face-mounted Photograph Collection at The Hirshhorn Museum and Sculpture Garden”

Shannon Brogdon-Grantham, Stephanie Lussier, Dr. Molly McGath, Smithsonian Institution Hirshhorn Museum and Sculpture Garden

Abstract: Face-mounted photographs have presented handling, storage, exhibition, and treatment challenges for conservators and collections care specialists since their inception. This technique for mounting photographs was patented under the name Diasec® in 1971 by Heinz Sovilla-Brulhart and it has become increasingly popular since its commercial release. These types of photographs possess a complex laminate structure and it is understood that each component of their structure, as well as the way these materials interact, can impact the long-term stability of the photographic image. Despite this knowledge, well-defined display and

storage guidelines based on the light sensitivity of these composite materials have not been developed.

There are several published studies on the light stability of face-mounted and laminated color photographs using accelerated light fading tests (Pénichon et al 2002, Zorn et al 2011). Both studies also undertook additional analysis to determine the impact of other components (e.g. adhesives and sealants) on the stability of the photographic image material. The results of these studies suggest that all components have an impact on the light stability of the photographic print and indicate more research is necessary to determine the parameters for which these materials should be exhibited and stored.

The proposed talk presents research carried out during a 2015-16 Smithsonian Postgraduate Fellowship in the Conservation of Museum Collections at the Hirshhorn Museum and Sculpture Garden. Since the project is in-progress, results to-date will be presented. The focus of the research is to better understand the overall light stability of the Museum's collection of color and face-mounted photographs to guide exhibition practices. The primary research activities include a microfade testing (MFT) study to determine the light stability of the color and face-mounted photographs in the collection and a selective object-level survey. The ultimate goal of the primary research is the development of general guidelines for exhibition and storage, based on the results of MFT, colorimetry, and other applicable analytical techniques to analyze the composition of face-mounting adhesives and sealants. Along with the primary research goal of developing exhibition and storage guidelines, the results of this study will further elucidate any potential interactions affecting the photographs' light stability. Collaboration with conservation scientists at the Smithsonian Institution Museum Conservation Institute (MCI), National Gallery of Art (NGA), and external consultation with other individuals in the field who have conducted similar studies is an essential part of the project.

This present study was conducted on analogue and digital photographic and print processes and since none of the aforementioned studies were conducted on digitally output face-mounted photographs, analysis on these materials is a novel area of inquiry. In order to have known comparisons for analysis, representative test samples of both types of processes were created. Additionally, in keeping with the Hirshhorn Museum's artist-interview tradition, the project aimed to inform collections knowledge by interviewing select artists on their working practice, and material choices, relative to display preferences and long-term preservation issues.

This research seeks to inform the conservation community on the use of MFT on color and face-mounted photographs and will contribute to the existing scholarship surrounding the care and conservation of these types of materials.

Speaker biographies: Shannon A. Brogdon-Grantham is a Postgraduate Fellow in Photograph Conservation at the Hirshhorn Museum and Sculpture Garden. She is a recent graduate of the Winterthur/University of Delaware Program in Art Conservation. She has held internships at the Center for Creative Photography, Paul Messier, LLC Conservation of Photographs and Works on Paper, and the Smithsonian National Museum of the American Indian.

Stephanie M. Lussier is a paper conservator at the Hirshhorn Museum and Sculpture Garden. Stephanie has taught paper conservation treatment and connoisseurship topics at the graduate level, has mentored pre-program and graduate interns, and has led hands-on workshops for allied professionals on topics including storage and handling, and best display practices. Stephanie holds an M.A. with a Certificate of Advanced Study in Art Conservation, with a specialization in paper conservation, awarded by Buffalo State College, and a B.F.A. in Art History and Printmaking awarded by Massachusetts College of Art and Design.

“In the Force Field of Contemporary Photography – Caring for Large-Format Photographs at the Kunstsammlung Nordrhein-Westfalen in Düsseldorf”

Nina Quabeck, University of Glasgow

Abstract: Among performance and video artists, photographers such as Juergen Klauke or Katharina Sieverding started to emerge from the lively art scenes of Cologne and Duesseldorf in the 1970s. Sieverding especially began pushing the boundaries of the format of the medium. From 1976 onwards, Bernd and Hilla Becher were hugely influential as teachers at the Kunstakademie in Duesseldorf. Studying with them were Thomas Struth, Candida Höfer, Axel Hütte, Thomas Ruff and Andreas Gursky and the school became the beating heart of the „Düsseldorfer Photoschule“, also known as the „Becher Class“. When Jeff Wall presented his large-format photographs in Cologne in the mid1980s, they were received enthusiastically by the local scene. This group of photographers kept a keen eye on the work of their American colleagues and set forth to advance photography in technique and scale previously unknown in the artworld. Making use of the technological advances was possible for these artists because they were able to work with the local imaging lab Grieger, a pioneer in face-mounting and large-scale printing.

The Kunstsammlung Nordrhein-Westfalen recognized this and with the show “Aus der Distanz”, presented the works by the Becher Class in a prominent way as early as 1991 and from the 1990s onwards, large-format photography found its way into the collection of the Kunstsammlung in no small numbers. Today, the collection comprises the “Stauffenberg-Block” by Katharina Sieverding, six „Typologies“ by Bernd and Hilla Becher, twenty six face-mounted chromogenic prints by Thomas Demand, Andreas Gursky, Thomas Ruff and Thomas Struth, several unmounted prints by Candida Höfer and Axel Hütte, and three light-boxes by Jeff Wall. Most of these artists produce at least part of their works locally. Thus, working with contemporary photographs in Düsseldorf offers a unique opportunity to the conservator: intimate insight into the production of the works and the technological development of the field.

Yet, preserving and maintaining these works can pose complex challenges. Also, as these works age, the medium’s reproducibility comes into play and raises further questions. How do technological advances influence the works that are already part of our collection? How do they influence future acquisitions?

Speaker biography: Nina Quabeck is a conservator specializing in modern and contemporary works on paper and photographs. A graduate of Camberwell College of Art, she joined the team of the Kunstsammlung Nordrhein-Westfalen in 2003. In 2007/2008, she was a Samuel H. Kress Fellow in Paper Conservation at the Fine Arts Museums of San Francisco. She is currently pursuing a doctoral degree at the University of Glasgow within the research program “New Approaches in the Conservation of Contemporary Art” (NACCA), a Marie Skłodowska-Curie Innovative Training Network funded by the European Commission. Her research interests include artists’ original presentation formats and perceptions of integrity and authenticity in modern and contemporary works of art.