SUSTAINABILITY GROUP

Icon Sustainability Group Conference 2024

AGENTS OF CHANGE: HERITAGE PROFESSIONALS ADAPTING AND INNOVATING SUSTAINABLE SOLUTIONS

Virtual | Nov 19, 2024 10:00 to 14:00 GMT | Nov 20, 2024 13:00 to 16:00 GMT

PROGRAMME

NOVEMBER 19

10:00 Opening Remarks

10:10 Key Note: Lorraine Finch

10:30 Changing a Mindset: Environmental Control at the Mary Rose

11:00 Introducing the UK Museums and Heritage Sustainable Packing Group

11:30 The Cost of Control

12:00 Sustainable Packing for Storage, Display, and Transport of Works of Art on Paper and Photographs

12:30 Collection Risk Analysis for Enhanced Sustainability

NOVEMBER 20

13:00 Recap of Previous Day

13:15 Jaisalmer Fort Palace Museum: Community Outreach Through Sustainable Conservation Practices

13:45 Implementation of Environmental Sustainability Initiative in the National Library of New Zealand

14:15 Creating Microclimates to Deal with Loans in Unstable Gallery Environments

14:45 Modular and Reusable Book Cradles for More Sustainable Exhibits

15:15 Impacts from Sustainability in Conservation's Solvent Use Survey – The Results

15:45 Closing Remarks

Virtual Conference | All times are in GMT
Short beaks will be taken between presenters.
Recordings will be available to conference participants.

ABSTRACTS

Sarah Coggins | Conservation Engineer | Mary Rose Trust

CHANGING A MINDSET: ENVIRONMENTAL CONTROL AT THE MARY ROSE

November 19, 2024 10:30 AM

Abstract

An exhibition for nine months was proposed to include loans from multiple regional, national and international institutes at the Whitworth Art Gallery in June 2023. The exhibition space has an ambient environment, with all air handling units (AHU) removed during the 2014 redevelopment to reduce the overall carbon footprint of the art gallery by 10% despite the building area increasing by over 30%.

To deal with vulnerable organic and inorganic objects dating from the late 15th century and the lenders requirements it was decided to create a suite of cases for the exhibition, which could also be used for future exhibitions. These cases were designed and built in-house with consultation across the Whitworth's conservation and technical team, to create a buffering microclimate to protect the objects by meeting GIS standards for security and environment. This talk highlight the processes, construction and results of the microclimates created for the exhibition.

Presenter Bio

Sarah holds a Postgraduate Diploma in paper conservation from the University of the Arts London and an MA Conservation from London Metropolitan university. She started her career in preventive conservation for historic houses, working for the National Trust, Historic Royal Palaces and English Heritage in London. She worked for the Science Museum Group and since taking up a position at the National Gallery as a Preventive Conservation Engineer has focused on environmental and physical monitoring in preventive conservation.

Sarah became an accredited member of ICON in 2020. She currently works at the Mary Rose Trust as a Conservation Engineer, closely monitoring the environment and movement of the Tudor ship's hull.

ABSTRACTS

Alice Tate-Harte | Collections Conservator | English Heritage

INTRODUCING THE UK MUSEUMS AND HERITAGE SUSTAINABLE PACKING GROUP

November 19, 2024 11:00am

Abstract

The UK Museums and Heritage Sustainable Packing Group was established in September 2021. We now have 37 members from 11 national museums and heritage organisations. Guided by the three pillars of sustainability (the economy, society and the environment) we are investigating sustainability and waste management issues for packing materials

Our Mission:

- To investigate more sustainable approaches to packing artworks for UK Museums and Heritage Organisations that comply with conservation standards.
- To work collaboratively and efficiently by pooling resources and expertise across UK institutions and working with external partners.
- To examine the materials we currently use as well as alternative materials and approaches to packing to find combinations that reduce waste and allow reuse, repurposing and recycling.
- To publish the results of our research and findings to make them accessible to the wider museum and heritage sector.

Our Vision:

- To contribute to new, sustainable standards for packing and transporting artworks to support loans, exhibitions and collection movement by being as sustainable as possible.
- Our primary focus is on paintings but we are linking with other groups to include other object types.

Network members are involved in two sub-groups:

- Soft-wrapping group - protecting artworks for local/national transport, often for short term use.
- Packing case group - insulated cases and transit frames for national and international transport, storage and for use both short and long term.

This presentation will introduce the group and highlight our current research results, with a call to delegates to join us.

Presenter Bio

Alice Tate-Harte ACR is Collections Conservator (fine art) at English Heritage. She specialises in technical art history and has a PG Dip. Conservation of Easel Paintings from the Courtauld Institute of Art. She has a strong interest in environmental sustainability and works for ICON's Sustainability Network and other local groups campaigning for climate action.

ABSTRACTS

SUSTAINABILITY GROUP

Alison Hopper-Bishop, Sarah Klopf and Paul McLaren | Conservation and Support Services Manager, Senior Conservator, and M & E Consultant | Royal Albert Memorial Museum

THE COST OF CONTROL

November 19, 2024 11:30 am

Abstract

The Royal Albert Memorial Museum (RAMM) has a track record from the mid-1990s for delivering sustainable solutions for its improvements and gallery developments. The museum underwent a complete redevelopment during the period 2006-2011, including as an enabling project, the construction of a purpose built high thermal mass object store, providing 1000 square metres of sustainable storage for RAMM's collections. At the same time, the project brief for the museum development included a requirement for exceptionally tightly controlled environmental conditions in temporary exhibition spaces (to meet the City Council's aspiration to attract high calibre national and international loans and exhibitions to the city).The resultant air-conditioning installation has delivered the tight control demanded; at a cost.

Over the past year, RAMM has been working with an M&E consultant to look at every aspect of the installation including current condition, expected lifespan, efficiency of operation and maintenance.

More importantly, we have taken a hard look at the benefits of 'tight control'. Does it really affect our ability to borrow from national collections? We decided that tight control should mean alignment with standard GIS conditions.

Since May 2023, we have been actively examining programming, troubleshooting to improve system performance, insulating and improving the historic fabric of the building and experimenting with turning off local controls during the day and air handling units overnight. In just 6 months this has delivered savings which cover the cost of the M&E consultant, savings against RAMM's 'bottom line' and a significant reduction in our carbon footprint.

Presenter Bios
Continued on Following Page

Alison Hopper Bishop ACR: Alison has spent most of her professional career at RAMM where she is now one of the Co-Leadership Team. She originally trained in conservation at Lincoln College of Art (now Lincoln University) and UCLs Institute of Archaeology. In the 1990s she was one of the founders and the first Chair of 'Conservators of Ethnographic Artefacts' which later became ICON's Ethnography group and later spent some years on the editorial committee for the Journal of Conservation. She has a particular interest in developing workable, sustainable solutions for museums' collections storage and display

ABSTRACTS

SUSTAINABILITY GROUP

Alison Hopper-Bishop, Sarah Klopf and Paul McLaren | Conservation and Support Services Manager, Senior Conservator, and M & E Consultant | Royal Albert Memorial Museum

THE COST OF CONTROL

November 19, 2024 11:30 am

Presenter Bios Continued

Sarah Klopf ACR: Sarah is senior conservator at RAMM working on a wide variety of materials including archaeological objects, Natural History specimens and ethnographic objects. She is responsible for collections care and supports the museum's busy schedule of exhibitions and loans. She graduated in conservation from the University of Applied Sciences Erfurt, Germany, in 2011. After briefly working as an archaeological conservator for the Landesamt für Denkmalpflege Baden-Württemberg in Germany, she started her current role at RAMM in 2013. Sarah developed an interest in sustainable conservation during the Covid lockdown and is keen to introduce more sustainable ways of working into her own practice, but also across RAMM.

Paul's current role is Principal Mechanical and Electrical Engineer for McLaren Design Services Ltd, where he provides M&E engineering technical support to The Royal Albert Memorial Museum. He has delivered significant energy reductions through system evaluation, optimization, and improvements.

Paul has provided M&E guidance for an Exeter City Council public sector decarbonization project and is conducting technical evaluations for Riverside Leisure Centre, aiming to reduce energy consumption and achieve sustainable operation.

Previous roles with Plymouth City Council included providing asset management and maintenance delivery, energy and condition audits and delivering efficiency improvements.

Paul also works with a range of private sector clients, delivering projects such as the refurbishment of a 17th Century Grade II listed manor house and Phase 1 electrical services to The Green, Cornwall, a wedding venue and multi-unit holiday complex which embraced ground source heat pumps, underfloor heating and smart control.

ABSTRACTS

Vivian Yip and Finlay Brannan | Loans-out Paper Conservator and the Exhibition and Display Paper Conservator and Senior Paper Conservation Technician for International Partnerships | Tate

SUSTAINABLE PACKAGING FOR STORAGE, DISPLAY, AND TRANSPORT OF WORKS OF ART ON PAPER AND PHOTOGRAPHS

November 19, 2024 12:00 pm

Abstract

This talk is in two parts. Part one describes an investigation into reusable cases for the transport of framed works on paper. Part two describes the work of the Paper Conservation Technician team, and their approach to sustainable materials for display and packing.

Part One

Bespoke crates are made when works of art on loan need to be transported to international venues and are disposed of once the works are returned. Tate's Collection Care Sustainability Group has been investigating reusable alternatives, with a focus on transporting framed works of art on paper. This talk will consider the degrees of protection that different cases afford transported works, the lifecycle of the cases, and their usability and security. It will also describe an ongoing experiment to benchmark a commercially available, reusable case against a bespoke Tate case.

Part Two

The Paper Conservation Technician team is developing a sustainable approach to the presentation and display of works of art on paper, as well as library and archive materials.This talk will detail efforts to reduce our use of materials, which range from the design of cradles and boxes through trigonometry, and their production with a computerized mount cutter, to our efforts to re-purpose offcuts.The talk will also reference work with our Visitor Experience department to improve the presentation of library and archive material for wheelchair users, with due consideration for sustainability and manufacturing time.

Presenter Bios on Following Page

ABSTRACTS

Vivian Yip and Finlay Brannan | Loans-out Paper Conservator and the Exhibition and Display Paper Conservator and Senior Paper Conservation Technician for International Partnerships | Tate

SUSTAINABLE PACKAGING FOR STORAGE, DISPLAY, AND TRANSPORT OF WORKS OF ART ON PAPER AND PHOTOGRAPHS

November 19, 2024 12:00 pm

Presenter Bios

Vivian Yip has been working as the Tate Loans-out Paper Conservator and the Exhibition and Display Paper Conservator for Tate St Ives for the past four years. She is a member of the Light Policy Working Group and Collection Care Sustainability Group and was recently trained to operate Tate's microfadeometer. With a background in fine art, Vivian previously completed an MA in Administration at UNSW, Sydney, and has worked in non-profit art organisations and curated small shows in artist run spaces. After moving to London and graduating with an MA in Conservation with Distinction, majoring in works on paper, she worked in UCL Special Collection and freelanced with a private paper studio before joining Tate. Her other areas of interest are hydrogels and oil on paper.

Finlay Brannan is Senior Paper Conservation Technician for International Partnerships and has been working at Tate for two years. He has a background in antiques and decorative arts and graduated with a BA(Hons) in Fine Art Photography from Glasgow School of Art. His areas of interest include darkroom printmaking and soundscape ecology.

ABSTRACTS

Robert Waller and Moya Dumville | Senior Risk Analyst and Risk Analysis Advisor | Protect Heritage Corporation

COLLECTION RISK ANALYSIS FOR ENHANCED SUSTAINABILITY

November 19, 2024 12:30 pm

Abstract

Investing resources to address concerns that will not benefit society is antithetical to sustainability. Is it possible to identify examples of collection care initiatives that are either useless or in-efficacious? If yes, then eliminating those investments would seem to represent low hanging fruit for improving sustainability. The application of risk assessment to collection care has demonstrated that many of the plausible risks to collections that we apply resources to further mitigating are not quantitatively significant. Those resources, whether financial, energy, political capital, emotional reserves, or other, could all be saved for more useful endeavors.

Fortunately, collection preservation risk data can guide us to considerable resource savings through optimization of preservation investments. By engaging seriously and effectively in that work, resource-effectiveness gains can be so great as to forestall the need for sub-optimizing the preservation goal to a broader sustainability goal by decades. However, optimizing resource allocation for preservation, that is collection risk management, requires decisions that run counter to intuitive senses of professional responsibilities.

This paper demonstrates how cultural property risk analysis data can guide resource allocation redistribution to enhance both preservation and sustainability goals and explores the cognitive heuristics and biases that forestall commitment to structured, evidence-based decisions.

Presenter Bios

Robert Waller is President and Senior Risk Analyst with Protect Heritage Corp., a firm dedicated to helping institutions and organizations improve heritage management. His career included 33 years with the Canadian Museum of Nature. He holds a Ph.D. in Cultural Property Risk Analysis from Göteborg University. Robert Waller has taught, lectured, and served as a consultant at museums and universities throughout North and South America, Europe, Asia, and Australasia. He is professionally accredited by CAPC, a Professional Associate of AIC, and a Fellow of IIC.

Moya Dumville is a Risk Analysis Advisor at Protect Heritage, as well as a Professor of Conservation at the Fleming College Cultural Heritage Conservation and Management program. She completed her Master's Degree in Art Conservation at Queen's University in Kingston, Ontario, with a specialization in works of art on paper. She lives in Kingston, Ontario where she is a board member of Heritage Kingston and the Kingston Community Food Forest.

Radhana Raheja | Textile Conservation Consultant | Jaisalmer Fort Palace Museum and Ph.D. Scholar, University of Delhi

JAISALMER FORT PALACE MUSEUM: COMMUNITY OUTREACH THROUGH SUSTAINABLE CONSERVATION PRACTICES

November 20, 2024 1:15pm

Abstract

Sonar Killa, translating to the Golden Fort is one of the only 'living forts' of the world, situated in the city of Jaisalmer in Rajasthan, India. Built in 1156 AD and recognised as a UNESCO heritage site, the fort houses the Jaisalmer Fort Palace Museum, established by the Girdhar Smark Dharmarth Nyas Trust and functioning under the patronage of the Royal family of Jaisalmer. From arms and armoury, to sculptures, paintings, textiles, and architectural marvels, the museum showcases centuries of ancestral wealth.

In an attempt to safeguard this rich cultural heritage, the museum initiated the Textile Conservation Project. The focus of this project was not only to document and conserve the textile collection, but also to collaborate with local communities to develop, implement and evaluate community-led measures built on local customs and traditions. The aim was to establish a shared responsibility for the sustainable management of cultural heritage, acknowledging the diverse expertise and perspectives each stakeholder brings to the process.

This paper examines the implementation of the concept of "vasudhaiva kutumbakam," meaning 'world is one family', emphasizing the interconnectedness of all cultures. The paper highlights the strategies employed between the museums and local community, heritage professionals and the private sector.

Sourcing local alternatives for internationally available materials, conducting internships for knowledge sharing among upcoming conservators, involving local artisans for recreation of objects, implementation of local pest management materials, are some of the efforts made through this project to incorporate indigenous knowledge for a sustainable approach.

Presenter Bio

Radhana Raheja is a textile conservator, researcher, consultant and academician with close to a decade of experience in the field. She is the textile conservation consultant for Jaisalmer Fort Palace Museum, spearheading their textile conservation project for the documentation, conservation and collection care of the textiles belonging to the royal family of Jaisalmer. She has previously worked as a textile conservator at the Mehrangarh Museum Trust, Jodhpur for the traveling exhibition 'Peacock in the Desert 'in collaboration with the Museum of Fine Arts, Houston and has also been a recipient of the Sahapedia - UNESCO fellowship for the Documentation of the history and technique of the traditional craft of Handloom Velvet weaving in India. She is also currently a Ph.D. Scholar at University of Delhi, working on the documentation and conservation of the languishing craft of gold and silver leaf printed textiles of India, and is also a visiting faculty for various universities across India.

ABSTRACTS

Vesna Živković | Senior Conservator - Preventive Conservation | National Library of New Zealand

IMPLEMENTATION OF ENVIRONMENTAL SUSTAINABILITY INITIATIVE IN THE NATIONAL LIBRARY OF NEW ZEALAND

November 20, 2024 1:45pm

Abstract

The Alexander Turnbull Library (ATL) which holds one of New Zealand's largest national documentary heritage collections is a division of the National Library of New Zealand and a part of Te Tari Taiwhenua - Department of Internal Affairs (DIA). The ATL Environmental Management Team was formed with the aim to guide and focus ATL's environmental management activities and highlight opportunities, as well as make recommendations for energy savings and sustainable practices while upholding the long-term preservation of collection materials. The ATL EMT conducted a series of controlled mechanical system shutdowns to confirm the viability of shutdowns as an energy saving strategy and to inform on the performance of the selected ATL collection stores in terms of conditions for preservation of collections and system operations. The results of the tests confirmed that planned mechanical system shutdowns across ATL collection stores would contribute to energy savings, however, that there are further options for energy savings within the HVAC systems at the level of ventilation, fresh air intake and dehumidification as they are considered the biggest consumers of energy in the National Library building. Consequently, mechanical system shutdowns, fresh air intake and ventilation rates reduction, and building tuning in the National Library were identified as activities to be included in Carbon Neutral Government Programme Emission Reduction Plan for 2024 and integrated with DIA Property Capital Forward Works Programme (PCFWP).This allowed for overcoming the challenge of implementing sustainability initiatives in a heritage institution within larger government department.

Presenter Bio

Vesna graduated archaeology at University of Belgrade, Faculty of Philosophy, Department of Archaeology (2000) and obtained master's degree in preventive conservation at University Paris 1, Pantheon Sorbonne (2006). She holds PhD in History and Philosophy of Natural Sciences and Technology, University of Belgrade (2022). From 2001 she worked at the National Museum, Belgrade, as a preventive conservator and has been instrumental in developing preventive conservation services and activities in Serbia. Vesna participated in the establishment of the Department for Preventive Conservation at the National Museum in Belgrade and was responsible for the Centre for Preventive Conservation in the Central Institute for Conservation in Belgrade. Currently, Vesna is working in the National Library of New Zealand as Senior Conservator - Preventive Conservation and is a subject matter expert on preventive systems and processes used to preserve or protect collections and provides advice on the development of preservation policy and strategy for Alexander Turnbull Library collections.

ABSTRACTS

Sarah Potter | Conservator | Whitworth Art Gallery, University of Manchester

CREATING MICROCLIMATES TO DEAL WITH LOANS IN UNSTABLE GALLERY ENVIRONMENTS

November 20, 2024 2:15pm

Abstract

An exhibition for 9 months was proposed to include loans from multiple regional, national and international institutes at the Whitworth Art Gallery in June 2023. The exhibition space has an ambient environment, with all AHUs removed during the 2014 redevelopment to reduce the overall carbon footprint of the art gallery by 10% despite the building area increasing by over 30%.

To deal with vulnerable organic and inorganic objects dating from the late 15th century and the lenders requirements it was decided to create a suite of cases for the exhibition, which could also be used for future exhibitions. These cases were designed and built in-house with consultation across the Whitworth's conservation and technical team, to create a buffering microclimate to protect the objects by meeting GIS standards for security and environment. This talk highlight the processes, construction and results of the microclimates created for the exhibition.

Presenter Bio

Sarah Potter started her career as an archaeologist before heading to Cardiff University to do an MSc in Conservation Practice, graduating in 2013, with distinction. With a background in archaeology and conservation, she has developed strong analytical and practical skills. Since 2015, Sarah has served as a Conservator at the Whitworth, University of Manchester, leading exhibition installations, preventive, and sculptural conservation, with a keen interest in contemporary art. Recognised for her problem-solving abilities, she mentors graduate interns and is a guest lecturer to MA students on Museum & Art Galleries Studies course at The University of Manchester. In February 2023, Sarah became the Communications Officer for the ICON Sustainability Group, promoting sustainable conservation practices to ICON members and beyond.

ABSTRACTS

Alessandro Scola | Senior Book Conservator | Johns Hopkins University

MODULAR AND REUSABLE BOOK CRADLES FOR MORE SUSTAINABLE EXHIBITS

November 20, 2024 2:45pm

Abstract

The traditional practice of making book cradles in-house is time-consuming and wasteful since each cradle is custom designed around the artifact and not re-usable. Off-the-shelf mounts are available on the market, but they are expensive and their design lacks some of the features required for proper displays.
With the goals of simplifying the exhibition preparation process, reducing the conservator's workload, minimizing the handling of the artifact, and producing re-usable mounts to improve the sustainability of our exhibits, a new design for book cradles has been developed at the Sheridan Libraries of Johns Hopkins University.
It departs from the common practice of mirroring the unique profile of an open book. 'Profiling' is practically challenging, often not needed, and theoretically questionable: the tail-edge profile of an open book doesn't necessarily match its head-edge profile. Book spines are frequently asymmetric, either originally or as a result of gravity pulling the text-block down and making the spine's head flatter and spine's tail more curved. Which profile should the mount follow?

Our innovative design, applicable to a variety of materials, consists of two reusable components: a custom V-shaped support and a standard base. The former matches the dimensions of the displayed volume. The latter is predetermined, dictates the opening and tilting forward angles, and provides a platform for supporting the tail-edge of the tilted volume. We build our cradles with the thermoplastic Vivak® (polyethylene terephthalate glycol-modified or PETG) because it is stable, easily machinable (can be cold-bent), cheap, and transparent.

Presenter Bio

Alessandro Scola is Senior Book Conservator at the Department of Conservation & Preservation of the Sheridan Libraries and Museums, Johns Hopkins University, Baltimore. He trained in Italy at the Centro di Formazione Professionale in Cremona, and then worked in Italy, Spain, and Northern Ireland in private practices and public institutions before migrating in the US in 2012. After short experiences as contractor in New York City and as intern in Washington DC at the Folger Shakespeare Library, he joined the Johns Hopkins University Libraries in late 2013.

ABSTRACTS

Gwendoline Fife and Lisa Clifford, Ka Yee (Christy) Ching, Naomi Toyama, Lucile Pourett, Rosie Grayburn | Sustainability in Conservation (SiC)

IMPACTS FROM SUSTAINABILITY IN CONSERVATION'S SOLVENT USE SURVEY – THE RESULTS

November 20, 2024 3:15pm

Abstract

A worldwide survey into solvent use in conservation was released in the Spring of 2024 as part of Sustainability in Conservation's (SiC) Greener Solvents Project. Creating accessible resources for promoting and disseminating greener solvent research since 2021, the project aims to support conservators in appropriate implementation of greener solvent approaches and includes researching greener solvent alternatives in partnership with industrial and academic research partners in the US and EU. Acknowledging that solvent use in conservation must be changed to benefit the health and safety of the conservator and environment, a key action point identified for targeting this research and adapting practice was the need to understand the current practices and solvent use within conservation. With the last major survey in 1998, an updated survey of the field was required to provide this data.

With feedback and support received from institutional and individual experts, the survey was developed with partners at the University of Delaware where it was assessed by the research ethics committee (or institutional review board). The survey comprised seven sets of questions whereby the specific solvents used and the various impacts, including those to personal health, could be investigated. The survey was translated by project team volunteers and thereby made available in nine languages.
The survey will run until June 1st. The results will be analyzed by the authors during the summer of 2024 with support from the Royal Society of Chemistry. This paper will be the first opportunity to share the results with the conservation community.

Presenter Bios on Following Page

ABSTRACTS

SUSTAINABILITY GROUP

Gwendoline Fife and Lisa Clifford, Ka Yee (Christy) Ching, Naomi Toyama, Lucile Pourett, Rosie Grayburn | Sustainability in Conservation (SiC)

IMPACTS FROM SUSTAINABILITY IN CONSERVATION'S SOLVENT USE SURVEY – THE RESULTS

November 20, 2024 3:15pm

Presenter Bios

Gwendoline Fife is Director of Sustainability in Conservation's Greener Solvent Project, and is working for the Rijksmuseum in GOGREEN (Horizon Europe 2022-2026). After her chemistry degree from York University, she trained in easel painting conservation at the Courtauld Institute of Art, London. Following her Mellon Fellowship at the Walters Museum in Baltimore, she has worked for over 20 years as a paintings conservator and researcher in various museums and institutions in the USA, Ireland, and The Netherlands. She has regularly published her work and research, and with expertise in solvent effects on paint films and the practical ramifications, she has been providing international lectures and workshops on sustainable solvent approaches in conservation practice since 2009.

Rosie Grayburn is the Head of the Scientific Research and Analysis lab at Winterthur Museum, Garden and Library and Affiliated Associate Professor in the Winterthur/University of Delaware in Art Conservation, where she teaches conservation science and analytical methodologies to graduate fellows in art conservation. In her current role she facilitates research in a broad variety of materials. She was previously a postdoctoral fellow in Conservation Science at the Getty Conservation Institute in Los Angeles and is the

Research Coordinator for the Sustainability in Conservation's Greener Solvent Project. Rosie holds a joint PhD in Physics and Analytical Chemistry from Universiteit Gent and the University of Warwick.