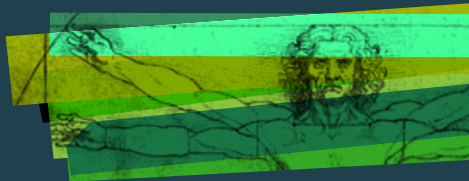


LE STUDIUM CONFERENCES

TOURS | 2023



10-12 May 2023

Novel approaches to Digital Codicology

LOCATION

Centre d'Études Supérieures de la Renaissance (CESR)
59 rue Néricault Destouches,
37000 Tours - FR

CONVENORS

Dr Alberto Campagnolo

LE STUDIUM RESEARCH FELLOW

FROM University of Udine - IT

IN RESIDENCE AT Centre for Advanced Studies in the Renaissance (CESR) / CNRS, University of Tours - FR

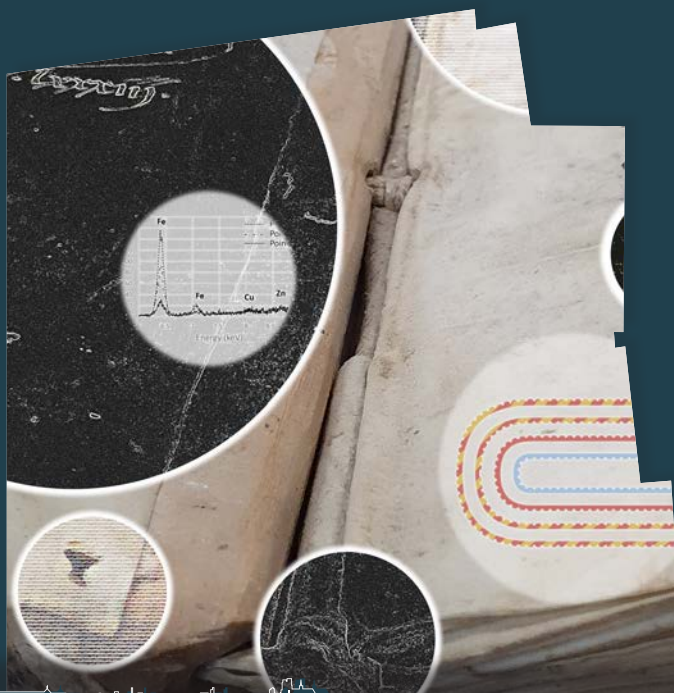
Prof. Elena Pierazzo

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PROGRAMME - REGISTRATION

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LE STUDIUM

CONFERENCES

TOURS | 2023

ABSTRACTS

Novel approaches to Digital Codicology

CONVENORS

Dr Alberto Campagnolo,
LE STUDIUM Research Fellow

FROM: University of Udine - IT

IN RESIDENCE AT: Centre for Advanced Studies in the Renaissance (CESR) / CNRS, University of
Tours - FR

Prof. Elena Pierazzo,

Centre for Advanced Studies in the Renaissance (CESR) / CNRS, University of Tours - FR

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LE STUDIUM Loire Valley Institute for Advanced Studies • Région Centre-Val de Loire • FR

Created in 1996 on the CNRS campus in Orleans La Source, LE STUDIUM has evolved to become a multidisciplinary Loire Valley Institute for Advanced Studies (IAS), operating in the region Centre-Val de Loire of France. LE STUDIUM has its headquarters in the city centre of Orleans in a newly renovated 17th century building. The amazing facilities are shared with the University of Orleans. In 2014 new developments and programmes linked to the smart specialisation of the Centre-Val de Loire region came to strengthen existing IAS cooperative relationships with the local and the international community of researchers, developers and innovators.

LE STUDIUM IAS offers to internationally competitive senior research scientists the opportunity to discover and work in one of the IAS's affiliate laboratories from the University of Tours, the University of Orleans, National Institute of Applied Sciences (INSA) Centre Val de Loire and ESAD Orléans, as well as of nationally accredited research institutions located in the region Centre-Val de Loire (BRGM, CEA, CNRS, INSERM, INRA, IRSTEA). Our goal is to develop and nurture trans-disciplinary approaches as innovative tools for addressing some of the key scientific, socio-economic and cultural questions of the 21st century. We also encourage researchers' interactions with industry via the IAS's links with Poles of Competitiveness, Clusters, Technopoles, and Chambers of Commerce etc.

LE STUDIUM has attracted over two hundred LE STUDIUM RESEARCH FELLOWS and LE STUDIUM RESEARCH PROFESSORS for long term residencies. In addition to the contribution in their host laboratories, researchers are required to participate in the scientific life of the IAS through attendance at monthly interdisciplinary meetings called LE STUDIUM THURSDAYS and gathering members of the regional scientific community and industries.

For the period 2015-2021, LE STUDIUM operates with an additional award from the European Commission in the framework of the Marie Skłodowska-Curie Actions (MSCA) with the programme MSCA-COFUND for the mobility of experienced researchers. LE STUDIUM is also the official partner of the Ambition Research and Development 2020 (ARD 2020) initiated by the Region

Centre-Val de Loire, that supports the specialisation strategy around 5 main axes: biopharmaceuticals, renewable energies, cosmetics, environmental metrology and natural and cultural heritage.

Researchers are also invited and supported by the IAS to organise, during their residency and in collaboration with their host laboratory, a two-day LE STUDIUM CONFERENCE. It provides them with the opportunity to invite internationally renowned researchers to a cross-disciplinary conference, on a topical issue, to examine progress, discuss future studies and strategies to stimulate advances and practical applications in the chosen field. The invited participants are expected to attend for the duration of the conference and contribute to the intellectual exchange. Past experience has shown that these conditions facilitate the development or extension of existing collaborations and enable the creation of productive new research networks.

The present LE STUDIUM CONFERENCE named "Novel approaches to Digital Codicology" is the 128th in a series started at the end of 2010 listed at the end of this booklet.

We thank you for your participation and wish you an interesting and intellectually stimulating conference. Also, we hope that during these days in our region some of you will see an opportunity to start a productive professional relationship with LE STUDIUM Loire Valley Institute for Advanced Studies and research laboratories in the Centre-Val de Loire region.

Yves-Michel GINOT

Chairman
LE STUDIUM



INTRODUCTION

Despite the advancements in digitization, the study of books as objects, for the most part, still relies on autoptic investigations because traditional digitization transmediates only limited information regarding an object's materiality. Autoptic observations are not always possible, and this has become even more evident and relevant with the pandemic crisis of Covid-19. While significant progress has been made in accessing written heritage through digitization efforts (IIIF, TEI), the digitization of the material features of books is still lagging and at the experimental phase. The availability of great numbers of textual data has permitted the development of distant reading techniques to discover patterns in texts and the utilization of artificial intelligence to read manuscripts (HTR) and printed books (OCR) en mass. The availability of digital data on the materiality of books would extend these practices to the book as an object. Recently, some projects have brought forward novel approaches to the digitization of material features of books but we lack a comprehensive methodology capable of bringing it together in a coherent research field: digital codicology. In the first two and a half days of the event, eminent scholars at the forefront of material digitization efforts will present their research. The last half-day will be dedicated to a round table and a working group to discuss and set the groundwork for a white paper on what digital codicology is and still needs to become the overarching field we foresee.

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CONVENORS



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Alberto Campagnolo is a trained book conservator who has worked in various institutions including the Vatican Library. He obtained his PhD from the Ligatus Research Centre (University of the Arts, London) in 2015 with a thesis on an automated visualization for historical bookbinding structures. He held fellowships at the Herzog August Bibliothek Wolfenbüttel in Germany and the Library of Congress in Washington, DC. Currently, he is a Postdoctoral Research Fellow at the Université Catholique de Louvain in Belgium. Alberto collaborated with Dot Porter (Schoenberg Institute for Manuscript Studies, University of Pennsylvania) on VisColl, a modelling and visualization tool for codex format books since 2013. He is Editor-in-Chief of the Journal of Paper Conservation and a member of the Executive Board of IADA.



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Elena Pierazzo is Professor in Digital Humanities at the University of Tours, and director of the Centre d'Etudes Supérieures de la Renaissance (CESR) in Tours. She is a former professor in Italian Studies and Digital Humanities at the University of Grenoble, and associate professor in Digital Humanities at King's College London.

Elena's research work focuses on the Digital Humanities from both foundational and application perspectives; in particular, she works on Digital Philology and Digital Scholarly Editing, among others. Elena has authored books and several papers on these topics in academic journals and venues.

What a carve-up! A new codicology-based method for highly perturbed textual traditions

Text transmission is subject to variation. In modern times, print technology represents a regulation principle capable of reducing variation (unless the author gets involved). On the other hand, texts transmitted by manuscripts in modern times present a very large variation rate that prevents the use of any of the traditional editorial approaches to establish genealogical relationships of the witnesses. For instance, the Gesuitede, a collection of sonnets written against Jesuits in the 1720s by Filippo Buttari Caccianemici, is transmitted by at least 6 manuscripts that only share 8 of the 290 sonnets (2.75% of the text). To cope with such a level of variation, we are testing a new approach based on the comparison of selected features that we have divided into three categories: textual, paratextual and codicological. It is our argument that when copying texts from one support to another, not only the words are transmitted, but also the form and features like the layout or the format can be useful in clustering copies and establishing connections and lines of transmission. The paper will present the case of *Il Capitolo dei Frati*, a satirical poem composed in the second half of the 17th century and preserved in at least 60 manuscripts which presents an unmanageable number of variants. With the help of network analysis software, we have studied the relationship between half of the witnesses and produced an analytical grid to help scholars choose which codicological aspects are the most useful for grouping versions. This research is part of a larger project focussing on modern manuscript production and circulation and aims to assess the impact of manuscript transmission on textuality.

SPEAKERS

SESSION 1: MODELLING AND METADATA



Prof. Peter Stokes

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Peter Stokes is directeur d'études at the École Pratique des Hautes Études – Université PSL. Combining palaeography, digital humanities and computer science, he has worked principally in Cambridge, London and Paris, and has led or co-led projects including DigiPal, Exon Domesday, Models of Authority, and eScriptorium, as well as coordinating a Cluster in the French national project Bibliissima+. He is author of *English Vernacular Minuscule from Æthelred to Cnut, circa 990 – circa 1035* (Cambridge, 2014), and he teaches Digital Humanities and its application to palaeography and codicology. Other professional positions include an elected member of the Committee of Humanistica, the Francophone association of Digital Humanities, and the Bureau of the Comité International de Paléographie Latine.

Modelling Manuscripts in Theory and Practice

The modelling of palaeographical and codicological features is gaining new interest as a result of developments in digital tools and the Digital Humanities. Palaeographers and codicologists have certainly long been interested in questions of terminology, but the demands of digital databases and other resources, and especially the desire for combining datasets through ontologies and Linked Open Data, have quickly revealed the limits of palaeographical and codicological terminology. This contribution will therefore present some of the challenges and questions that have arisen during a number of projects where researchers in palaeography and codicology have attempted to use digital models to understand particularly complex cases. One particular example is the Exon Domesday Book, which shows the involvement of over 25 contemporary scribes who together wrote what is now over a hundred codicological units (quires), most of which are irregular. The question therefore becomes how digital tools, modelling and visualisations can help us to understand the complex relationships between the palaeographical, codicological, philological and historical dimensions of the books, in order to address long-standing questions about the production, circulation, modification and use of these objects that have long been so central to our culture.



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After completing an Associate of Science degree in California in 1987 (computer science), I studied Greek literature at the Univ. of Geneva, where I completed my master in 1991 and my PhD in 2001 (a study on the polemical *Dialogue of Athanasius an Zacchaei*). In-between I completed a Post-graduate degree in Greek palaeography and codicology at the Scuola Vaticana di Paleografia, in 1995. In 2011, I received an habilitation at the Univ. of Fribourg.

From 2015 to 2020, I was project leader (and project Database manager) of the ERC project ParaTexBib. I have currently a permanent position at the LMU, Munich, where I co-lead (with M. Wallraff and M. Karrer) the project *Buchgeschichte der Apokalypse* (funded by the Thyssen foundation). Since 2021, I am also member of the CSMC in Hamburg, where I now teach Book History in Antiquity and the Middle Ages.

Currently, my main interests are the material history of the Bible, the development of a new database for the study of manuscripts, and the polemical literature of the first centuries CA.

Prototype of a new generation database for the integrated study of manuscripts

With the growing interest in manuscript research and the rapidly increasing number of electronic facsimiles, there is also a growing need for a new generation of databases that allow manuscript data to be visualized and worked with in different and flexible ways. The prototype of such a database, under development in Munich, is a first step in this direction.

In this talk, I will present the principles behind this new approach including a few remarks on the underlying data model. I will then explain how the "internal page ID" is at the core of how the system operates. I will finish with the brief presentation of a tool built on top of it for "mass description" of the content.



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As Head of Conservation and Treatment Development at The National Archives, Sonja Schwoll ACR leads on documentation and conservation practices. Her previous experience includes teaching book conservation at West Dean College and the MA Conservation programme at Camberwell College of the Arts. For many years, she ran a London-based book conservation studio for libraries, archives, museums and private clients. She has a Master in Conservation from the University of Arts London and a Magister Artium in Art History and History from the Freie Universitaet Berlin. Over the past three years, she has led the development of a new conservation documentation knowledge system for the TNA Collection Care Department.

ResearchSpace - from Conservation Documentation to documenting Book Structures

At the National Archives, the Collection Care Department has a long history of documenting objects, condition assessments, treatments, surveys, as well as loan and exhibition information. The databases used recently, however, did not reflect actual working practices, nor did they reflect the development of skills and methods, nor were they able to record the knowledge generated during the conservation process. In the absence of a space for recording binding structures, no information could be recorded.

Databases are often difficult and expensive to change after they have been implemented, so it is typically necessary to design the elements of the database upfront. Due to this inflexibility, even small changes are costly because semantics and logic are built into the user interface. As a result of using the ResearchSpace semantic data knowledge base, an evolutionary route could be followed. Furthermore, conservators were able to participate in the process of improving the system, gradually introducing the concepts of semantic data and new methods for approaching data.

The book is a varied and developing concept reflecting its different position over time. Its history, methods, and techniques of manufacture, as well as its different aspects, illustrate not only the development of technology but also its social position as well as the type and significance of its subject matter. The ResearchSpace system has provided new opportunities for recording binding structures.

SESSION 2: HERITAGE SCIENCE

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De l'analyse des matériaux à la représentation des données : le cas des encres anciennes

L'objectif du programme CodikHum était d'une part de mettre en évidence les variabilités des encres anciennes à partir de corpus qui font varier séparément les dates, les lieux de production des documents, les institutions productrices des documents. On cherchait aussi, d'autre part, à tester des méthodes d'analyse des encres, non destructives, pour compléter un protocole d'ensemble de nature à déterminer une sorte de signature des encres. Les méthodes utilisées relèvent de la profilométrie et de la spectrométrie dans différentes longueurs d'ondes. elles supposent des appareillages très divers qui rendent compte de certains aspects des encres anciennes (composition, viscosité, rugosité, analyse des surfaces etc.) en produisant des résultats sous des formes les plus



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Zina Cohen's research focuses on the question of materiality in manuscript production. After a position where she explored the uses of writing materials of monastic manuscripts copied in Tours during the early Middle Ages, she currently holds a post-doctoral position in archaeometry at the BAM (Bundesanstalt für Materialforschung und -prüfung), Berlin. She works there on similar questions for medieval Torah scrolls. She aims to establish whether significant differences exist in the use of writing materials in those religious scrolls and if yes, to establish the reason for these differences.

Unveiling the use of writing materials in Carolingian manuscripts

After having been neglected for a long time, materiality is nowadays of great interest in the study of manuscripts. This allows us to explore the variety (and potential coexistence) of different inks and pigments in type and composition in their use over time and geographical area. In this presentation, we aim to contribute to their study through archaeometric analyses of black and red inks used in Carolingian manuscripts copied between the 8th and the 10th centuries. These analyses are based on an interdisciplinary strategy, bringing together knowledge from the humanities and natural sciences to understand the global use of black and red inks in the Carolingian Empire. In this regard, we adopted a non-invasive protocol that included near-infrared imaging and X-ray fluorescence spectroscopy for on-site measurements supported by historical and palaeographic analysis. The results have been collected in the framework of two projects at the University of Hamburg in close collaboration with the Bundesanstalt für Materialforschung und -prüfung, Berlin (BAM) and will be compared with several other archaeometric studies of contemporary manuscripts.



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Ira Rabin studied chemistry at the Hebrew University Jerusalem; she obtained her PhD degree in physical chemistry at the Max-Planck-Society in collaboration with the Free University Berlin. Until 2003 she worked in basic research in cluster physics at the Fritz-Haber-Institute of the Max-Planck-Society and continued her research on parchment as a hobby. Since 2003, her research has been dedicated to manuscripts on papyrus and parchment, particularly the Dead Sea Scrolls and the history of black writing ink. Since 2008 she works at the BAM Berlin, and since 2012 also at the University of Hamburg. Since 2016, she is a professor at the University of Hamburg.



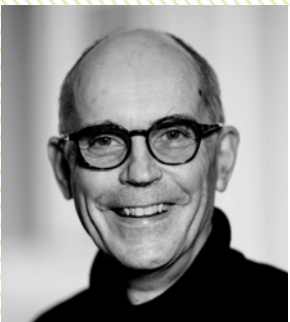
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Sarah Fiddymment received her BSc in Biochemistry from the University of Zaragoza (Spain) in 2006, having completed three years of medical school and two years specialization in Biochemistry. Her MSc and subsequent PhD (awarded in 2011) were both completed in the Laboratorio de Investigacion Molecular, at the Miguel Servet University Hospital in Zaragoza, working in the field of cardiovascular research. Sarah's work focused on the expression and production of apolipoprotein A-I Zaragoza, a mutant variant of apolipoprotein A-I that offers cardiovascular protection. During this time she gained extensive experience in the field of protein production, purification and characterization using a wide range of molecular techniques. In 2012, she joined BioArCh as a Marie Curie postdoctoral research fellow (EU-IEF) where she developed a non-invasive sampling technique enabling the use of ZooMS for parchment species identification in medieval manuscripts (eZooMS). In 2014 Sarah was awarded a British Academy Postdoctoral Fellowship to continue working on biomolecular analysis of manuscripts.



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Matthew Collins FBA is a Niels Bohr Professor at the University of Copenhagen and professor of biomolecular archaeology at the University of Cambridge. Formerly he worked at the University of York where he founded BioArCh, a collaboration between the departments of biology, chemistry and archaeology (BioArCh: Biology Archaeology, Chemistry). His research focuses on the persistence of proteins in ancient samples, using modelling to explore the racemization of amino acids and thermal history to predict the survival of DNA and other molecules. Using a combination of approaches (including immunology and protein mass spectrometry) his research detects and interprets protein remnants in archaeological and fossil remains. With former PhD student Dr Mike Buckley he developed ZooMS (Zooarchaeology by Mass Spectrometry), a way to rapidly identify bone and other collagen-based materials using peptide mass fingerprinting. In 2014 he was elected a Fellow of the British Academy, the United Kingdom's national academy for the humanities and social sciences.

What do we do with biocodicological data?



The emerging field of biocodicology brings with it new types of data which pose new problems for data management, storage and curation. In particular, linking biomolecular data to the book or the bifolia is a challenge that is being increasingly faced in heritage science, with ever wider ranges of scientific analysis being applied to art-historical objects. Being able to make biomolecular data available, understandable and linked it is an issue which the Beasts to Craft project has had to grapple with and is still continuing to develop. The importance of coherent metadata, the accommodation in catalogues for new types of data and the discoverability of this new information highlights the need for coordinated and cooperative solutions.



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Holly Wright is Research Projects Manager for the Archaeology Data Service, based at the University of York. Her current projects include the AHRC/Towards a National Collection-funded project Unpath'd Waters: Marine and Maritime Collections in the UK, the COST Action Saving European Archaeology from the Digital Dark Age (SEADDA) (CA18128) funded by the Horizon 2020 Framework Programme of the European Union, Transforming Data Reuse in Archaeology (TETRARCHs) funded by the CHANSE ERA-NET Co-fund programme. Her research focuses on using Semantic Web technologies and methodologies to make archaeological data more FAIR, collaborative digital infrastructures for archaeological data, and capacity-building for archaeological data management.

Linking our data together: Challenges and Opportunities

Considerable work has been undertaken over the last 25 years by the Archaeology Data Service to make UK archaeological data more freely and openly available to users around the world. Over the last 15 years, this work has focussed on interoperability, allowing users to search across disparate datasets to find new research data resources. For archaeology, this is exemplified by the ARIADNE Portal, which is an aggregation infrastructure for archaeological data around the world. This work has been implemented alongside the development of the FAIR Principles; the framework for understanding how research data should be made Findable, Accessible, Interoperable and Reusable in a way that is machine actionable. As archaeology is an early adopter of digital technologies and methodologies, how to make archaeological data Findable, Accessible, and Interoperable across a wide range of data types is now well-understood but understanding Reuse best-practice will be the work of the next 10 years. Projects such as Transforming Data Reuse in Archaeology (TETRARCHs) are working to address this from the point of data capture to dissemination. This paper will discuss the challenges and opportunities related to how we link our archaeological data together, with a particular focus on work to better understand scientific data workflows, and the reuse needs of researchers using scientific data.



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Fenella G. France, Chief of the Preservation Research and Testing Division, Library of Congress, is an international specialist on the environmental deterioration of cultural objects. She has developed a research infrastructure that integrates heritage and scientific data and also focuses on data visualization. Her team is expanding the use of portable instrumentation through the "go-team" and the development of heritage reference materials that support the investigation and preservation of cultural heritage. Dr France has worked on projects including Ellis Island Immigration Museum, Lluillaco High Altitude Museum in Chile, and the 1507 Waldseemüller World Map. She collaborates extensively with academic, cultural, forensic and federal institutions. She is currently PI on a Mellon-funded project to scientifically assess the condition of print materials in USA research libraries. Other international collaborations include; Inks&Skins, University College Cork, Ireland, Collections Demography, SEAHA doctoral training, Beast2Craft Biocodicology project, and CHaNGE – Cultural Heritage Analysis for New Generations.

From Materiality to Visualization

Manuscripts often have very different inherent material properties, each exposed to different environments, historical use and treatments. New techniques and non-invasive instrumentation have allowed us to learn more from our collections, delving beneath the surface to reveal lost and hidden text, layers of pigments that might show trade routes and overlays, and often degradation components that give us hints of the history of the manuscript. Understanding and characterizing the materiality opens new avenues for researchers and scholars, leads to the best options for long-term preservation and aids in expanding our knowledge of each collection item, almost an archaeology virtual dig, as we go beneath the layers to reveal new perceptions about the collections. Creating platforms and visualizations to access this information allows diverse audiences to engage with the collections in different ways, and the collaborative knowledge generated can create fresh insights.

SESSION 3: REMOTE SESSION (USA)



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Abigail Slawik is a fourth-year dual master's degree candidate (expected May, 2023) in Conservation and Art History at the Conservation Center in the Institute of Fine Arts at New York University. She also earned a BFA from NYU in Studio Art. She specializes in the conservation of books and is currently completing a full-time placement at Columbia University Libraries in New York City in fulfillment of her degree. For her master's thesis, she explored the codicology of four albums of decorative engravings of Jean Berain in New York collections. As a graduate assistant to the LEOcode project since January 2020, she has worked with Margaret Holben Ellis (NYU), William A. Sethares (UW Madison) and C. Richard Johnson, Jr. (Cornell) to investigate mouldmates in Leonardo da Vinci's papers, incorporating a suite of open-source software tools and developing the online resource LEOcode.org to present and make accessible the team's ongoing findings.

Using the Open-Source Paper Studies Suite to Identify Mouldmates in Leonardo's Papers

Identifying historical papers that were made from the same papermaking mould puts them in temporal relation to one another more precisely than simply identifying common watermark types. In order to establish this mouldmate status, the internal features of a sheet of handmade laid paper (watermarks, chain lines, and laid lines) should be superimposable without a high degree of variation. However, both traditional approaches to this analysis (tracing or superimposing images by hand), as well as digital (using black-box imaging software such as Adobe Photoshop), are cumbersome and difficult to conduct precisely at scale; in addition, the results are not always quantifiable. The Paper Studies software suite, developed by William A. Sethares (UW Madison) and C. Richard Johnson, Jr. (emeritus, Cornell University), was created to achieve two main goals: one, to eliminate issues of scale and resolution by using ratios and point-matching to compare images; and two, to provide not only qualitative, but also quantitative outputs, to establish mouldmate status between papers more robustly. As a case study, I will present the work myself, Margaret Holben Ellis (emerita, New York University), Sethares, and Johnson are currently conducting on images of internal features of Leonardo's papers, the results of which are publicly accessible online, along with the Paper Studies Suite of software tools, at LEOcode.org.



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As Curator of Digital Research Services in the Schoenberg Institute for Manuscript Studies, Dot Porter participates in a wide-ranging digital humanities research and development team within the context of a special collections department. Dot's projects focus on the digitization and visualization of medieval manuscripts. Dot holds Master's degrees in Medieval Studies and Library Science and started her career working on image-based digital editions of medieval manuscripts. She has worked on a variety of digital humanities projects over a decade-long career, focusing on materials as diverse as ancient texts and Russian religious folklore, providing both technical support and scholarly expertise. From 2010 until March 2013, she was the Associate Director for Digital Library Content and Services at the Indiana University Bloomington Libraries, where she led in planning and implementing new services to support librarians and faculty in the creation of digital projects. She has also worked for the Digital Humanities Observatory at the Royal Irish Academy, and the Collaboratory for Research in Computing for Humanities at the University of Kentucky.

Radical potential for the digitization of premodern manuscripts

Every act of manuscript digitization is an act of virtual biblioclasm. Digitization deconstructs; the process takes books apart, breaking them down into the most basic object - the page. Then we use interfaces to put them back together to be viewed and interacted with in a virtual space. For medieval manuscripts, these interfaces typically focus on the order of pages, primarily through the use of page-turning interfaces that present the virtual book as a series of openings, a simulacrum of what it would look like if the book was laid open in front of you. But what if we did things differently? What if we had different data - different photographs, and different expectations of our metadata? What if we changed the expectations to include images that illustrate the structure of books? What if we had data that told us about how manuscripts were constructed, which leaves are connected, and even how? How would our interfaces look then? This paper will focus on the potential of manuscript digitization, the labor behind it and the conversations that are necessary between photographers and scholars to ensure that digitization is being used to its greatest advantage.



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Bill Endres specializes in advanced imaging techniques and Insular manuscripts. Using a variety of imaging and post-processing approaches, Bill digitized the 8th-century St Chad Gospels and presented the results on the Web, providing innovative interactive interfaces for 3D renderings, Reflectance Transformation Imaging, and stacked and comparable multi-spectral and digitized historical photographs (<https://lichfield.ou.edu/>). Currently, for research, teaching, and public interactions, Bill is developing approaches to engage manuscripts in virtual and augmented reality. He is author of *Digitizing Medieval Manuscripts: The St Chad Gospels, Materiality, Recoveries, and Representation in 2 D & 3D*, ARC Humanities Press, 2019. Bill teaches and researches at the University of Oklahoma.

Digitization and Digital Codicology: 3D Renderings, Affect, and Leverage

With digital surrogates, what we study is always disciplined by how a manuscript is digitized. It is the first interpretive act, regularly made without scholarly control. For codicology, while beneficial, typical digitization regularly misses the mark. For example, high-resolution images are taken using diffused lighting, producing consistent brightness across a page to equally illuminate text and imagery for study. However, surface details are lost—such as dry-point writing, hair follicles, and rulings. To state this jokingly, in the battle between paleography and codicology, paleography has won. For scholars of codicology, a manuscript is a three-dimensional artifact. 2D-capture works well for text. For other concerns, such as rulings, it does not. Having 3D renderings provides substantial benefit, beyond having the ability to measure any feature (which is no small gain). In my talk, I will explore what Peter Stokes calls the incompleteness of any piece of scholarship and any digitization method. I will advocate for a move from discovering meaning to a focus on affect and engagement. The question of how to digitize then becomes one of how the digital representation presents and provokes experience. In this, in approaching the manuscript as a whole (advocated in bibliographic research by a host of scholars, such as Jerome McGann and his view of a book as an event), I will turn from a search for meaning (predicated on the interruption of experience) and toward a knowing based in experience and affect, one possibility exemplified by Walter Benjamin's second rarely studied definition of aura, an impression consigned to the unconscious through which we gain fuller recognition in our dreams.



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Bridget Whearty (she/her) works at the intersection of literary, medieval, manuscript, and information studies. Her research and teaching interests include late medieval death culture and the legacy of the poet Geoffrey Chaucer; manuscripts, digital humanities, media history, and digitization; pedagogy and information literacy instruction; and queer and trans medieval literature and material culture. Whearty is the author of *Digital Codicology: Medieval Books and Modern Labor* (Stanford University Press, 2022). She is also the creator of the Caswell Test, which challenges humanities scholars writing about “the archive” to more rigorously and thoughtfully cite and collaborate with real archivists and librarians. She is co-PI, with Masha Raskolnikov, of the nascent digital project and OER “Always Here: a Queer+Trans Global Medieval Sourcebook.” In March-April 2023, Whearty will hold the position of the John Green Memorial Book Historian in Residence at Green College at the University of British Columbia. A former Council on Libraries and Information Resources (CLIR) Postdoctoral Fellow in Data Curation for Medieval Studies at Stanford University, Whearty is currently an Associate Professor at Binghamton University, in upstate New York, in the United States.

A Codicology for Digital Books: Approaching Medieval Manuscripts On Screen and In the Flesh

The digitization of rare books and manuscripts has transformed humanities research over the last forty years. Yet, while a consensus has emerged over what digital manuscripts are not, we're still working out what digital manuscripts are. In this talk, I emphasize how digitized medieval books are complicated objects in their own rights, with their own unique histories separate from their hardcopy exemplars. Drawing on important early digital manuscripts projects and more recent, less famous digitizations, I highlight how many of the traditional approaches to book history and manuscript studies still apply when we approach our objects of study not (just) through traditional in-the-flesh reading rooms but (also) via digital copies and modern screens. Asking like—Who made this book? When? Where? Using what tools? To what end?—only becomes more urgent as new copies of medieval books migrate into the murky atemporality of the internet. Ultimately, I contend that recovering digital manuscripts' recent project histories should catalyze important conversations on what and who digital manuscripts are for—today, in an increasingly fraught historical moment.

SESSION 4: BOOK CULTURE AND DIGITAL PRACTICES (I)



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After completing studies in conservation in Prague, studied in 1992/93 as an intern with Christopher Clarkson at the West Dean College, England. In 2010 received Master degree in Conservation Science from the School of Conservation of the Royal Academy of Fine Arts in Copenhagen, Denmark. In 2019 he completed PhD interdisciplinary research at the University of York (Centre of the Medieval Studies and the department of the Archaeology) in England.

Specialize in conservation of parchment manuscripts. His research includes experimental parchment making and production of manuscripts. Most recently is participating on EU research project Beast to Craft that is using biocodicology as a new approach to the study of parchment manuscripts.

Observing beast & craft on manuscript folia

The quality of the parchment and the care taken in its selection and preparation are a yardstick for the standards of a scriptorium. (Bischoff, Latin Paleography)

To improve historical knowledge of manuscript production a holistic approach to studying parchment is useful, a field often called Biocodicology. eZooM and DNA can reveal information about the animal types used for producing parchment. Visual analyzes focus on evaluating tool marks on the parchment surface. Observing imprints of visible animal anatomy on parchment can help estimating size and age of animals used.

Visible striation marks on the parchment surface are unique signatures, showing the particular way a parchment was prepared, how the parchment-maker used his knives, creating patterns of a personal style. The knife leaves «bar codes» on the surface possible to record and compare, and finally trace the distribution of parchment produced in one batch, and find similarities in different folia of a manuscript, or even in different codices.

To get an idea of a parchment maker's style, or an animal's size, the reassembling of individual bifolia into an original shape of the skin helps. This can be done either by re-connecting patterns left by the knife on individual folios, or observing the animal anatomy visible on the skin. The cutting of a parchment into bifolia and how the quires were formed, e.g. the organization of hair- and flesh-side in manuscripts, is significant for various geographical areas and can propose provenance. Other traces able to indicate specific practices in individual scriptoriums are parchment repairs, either sewing or patching. This category also includes methods of removing imperfections, where individual scribes used different methods to prepare the surface before or during the writing of a manuscript.

How to record, evaluate and share these data is still a challenge. I hope that in a near future a closer visual study of parchment will become a regular part of codicological study.



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Prof. dr. Lieve Watteuw attained her PhD in Art History at KU Leuven in 2008. She lectures on codicology, medieval illuminated manuscripts and art-technical research. Her academic focus concentrates on miniatures, book archeology, conservation techniques, art-technical research, analytical and imaging methods and the study of artists' materials and techniques. She is member of the Faculty of Theology and Religious Studies and Faculty of Arts at KU Leuven where she is head of the Book Heritage Lab and the Core Facility VIEW.

Characteristics of the 14th century Bible of Anjou. The combined use of Multi Light Reflectance Imaging and MA-XRF to identify materials and techniques

High quality, well documented and consistently produced digital images have proven to be crucial assets for the study and conservation of the manuscript, including condition reporting, study of the codicology, and more in depth the identification of the used materials by the illuminators (inks and pigments). This lecture will present the applied methods and equipment, illustrated with research questions concerning the richly illuminated 14th century Bible of Anjou (KU Leuven, Maurits Sabbe Library). A selection of illuminations and specific passages were captured in a multi-modal approach: imaging with the White Light Microdome, Multi-Spectral Microdome, NBMSI and MA-XRF scanning (in collaboration with KIK-IRPA, Brussels).

SESSION 5: BOOK CULTURE AND DIGITAL PRACTICES (II)



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Orietta Da Rold is Professor of Medieval Literature and Manuscript Studies, Fellow of St John's College at Cambridge and the Academic Director of the newly founded Cambridge University Library Research Institute. Orietta researches medieval material and textual culture, editorial practice, and the digital humanities. She is the author of *Paper in Medieval England* and is currently working on the sequel entitled 'Paper in Time and Space'.

Some Experiments with Digital Imaging and Medieval Paper

In this paper, I will present some of the results from the Hidden knowledge: the extraction of the fingerprint of medieval paper from digital images Project. The project, a cross-disciplinary collaboration between the Faculty of English (Prof Orietta Da Rold), Cambridge University Library (Dr Suzanne Paul), Department of Applied Mathematics and Theoretical Physics (Tamara Grossman and Prof Carola-Bibiane Schönlieb) examined paper in medieval manuscripts from digital images by using new mathematical methods of analysis. Considering the vast amount of reflected light images readily available from many archives and libraries, we argued that there is a need to broaden the study of the evidence provided by a sheet of paper to study chronology, localization and movements of medieval artefacts and people. This proof of concept will then, hopefully lead to the use of automatic feature extraction from reflected light images. This method has the potential to improve the speed, scale and accuracy of paper stock identification, facilitate research into heritage questions we can only answer at scale and transform this field of study.



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Dr. Alicia Fornés received the Ph.D. degree in 2009 from the Universitat Autònoma de Barcelona (UAB). Her Ph.D. work on writer identification of old music scores received the best thesis award 2009-2010 by the AERFAI (Spanish Branch of the IAPR - International Association for Pattern Recognition). She has done several research stays abroad, including the University of Bern (Switzerland), University of La Rochelle (France), Osaka Prefecture University (Japan) and Uppsala University (Sweden). She is currently an Associate Professor at the UAB, and an attached researcher at the Computer Vision Center. She has published more than 100 papers in international conferences and journals, and she has participated in many research and technology transfer projects related to the recognition of handwritten documents. She received the IAPR/ICDAR Young Investigator Award in 2017 for outstanding contributions in the recognition of handwriting, text and graphics, with high impact to the field of Digital Humanities. More info: <http://www.cvc.uab.es/people/afornes/>



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Kévin Roger is a doctor in musicology of the University of Tours and a research engineer in musicology in the context of the cluster 6 (led by David Fiala) of the Bibliissima+ project. His mission focuses on the digital visualization of early music sources and their metadata using IIF technology. He also co-leads the HumNum MUSICA2 consortium, with Philippe Vendrix, Achille Davy-Rigaux and Joann Elart, dedicated to digital musicology. He is in charge of the working group dealing with the MEI (Music Encoding Initiative) and tries to improve the digital encoding of medieval and Renaissance music.

Computer Vision methodologies applied to musical documents

In the last decades, Document Image Analysis and Recognition has become a fundamental technology for recognizing, searching and extracting information from document collections, thus helping in the preservation, access and indexing of our cultural heritage. However, and even with the recent advances in deep learning, musical documents are still challenging, given the particularities in music notation when compared to textual documents, and also, the few available labelled data to train these deep learning architectures. Moreover, these difficulties increase when dealing with handwritten scores, due to the high variability among handwriting styles and differences in the notation system. This talk will overview some of these techniques for the analysis and recognition of music documents, showing some examples of their application, such as optical music recognition, writer identification, music alignment, etc.



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Wouter Haverals is a postdoctoral researcher, working at the Institute for the Study of Literature in the Low Countries (ISNL), and the Antwerp Centre for Digital Humanities and Literary Criticism (ACDC). In his research, he unites two disciplines: traditional philology and computational literary studies. For his PhD thesis, he investigated how artificial intelligence can contribute to an objective reconstruction of the rhythm of medieval Dutch poetry. Currently, he is working within the project Silent Voices, aimed at uncovering the stylistic features of an extensive corpus of medieval texts.



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Mike Kestemont, PhD, is an associate research professor in the department of Literature at the University of Antwerp (Belgium). He specializes in computational text analysis for the Digital Humanities. Whereas his work has a strong focus on historic literature, his previous research has covered a wide range of topics in literary history, including classical, medieval, early modern and modernist texts. Together with Folgert Karsdorp and Allen Riddell he has written a textbook on data science for the Humanities. The persistence of cultural information over long stretches of time is his key research topic at the moment. In the new framework of Cultural Ecology, empirical methods are imported from ecology and biostatistics to provide innovative quantitative models of cultural change and survival. Together with his Polish colleagues Maciej Eder and Jan Rybicki he is involved in the Computational Stylistics Group. Mike lives in Brussels (<http://mikekestemont.github.io/>), tweets in English (@Mike_Kestemont) and codes in Python (<https://github.com/mikekestemont>).



Manuscripts in Order: Charting the Evolution of Scribal Practice in the Herne charterhouse (c. 1350-1400) through Stylochronometry

The Carthusian monastery of Herne played a significant role in the cultural history of the Low Countries. During a period when Latin was the dominant language in literature, the monastery was a center for the creation, and exchange of texts in the vernacular. From approximately 1350 to 1400, the Herne charterhouse produced a noteworthy collection of Middle Dutch manuscripts, many featuring original texts. For many manuscripts, however, only a rough estimate of the period of composition can be established (e.g. a post quem, on the basis of the date of the text they contain). This lack of supported dates troubles the view on the evolution of the monastery's literary production. To further understand the cultural significance of the Herne charterhouse, we aim to determine the chronological order in which its collection of manuscripts (and the production units they are composed of) was produced. This will be achieved through the use of stylochronometry, a sub-field of stylometry (the quantitative study of writing style) that examines the formal properties of texts over time.



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Dominique Stutzmann is director of research at the IRHT (Institute for Research and History of Texts) of the CNRS and, since 2022, professor at the Humboldt University in Berlin. His research fields are the scribal practices, literacy and textual transmission among religious and devote communities as well as the use of artificial intelligence to analyse the written cultural heritage, esp. computer vision applied to handwritten text recognition and writer identification. He has led several research projects at European level, e.g. Himanis project, he published a full text search engine on ca. 80000 pages of medieval registers (<http://himanis.humanum.fr/app/>).

Computer Vision and codicology at large scale: looking at (many) books of hours and cartularies

The developments of AI and Computer vision applied to the study of digitized cultural items have advanced layout analysis, object detection, script classification, writer identification, handwritten text recognition. Layout analysis is a standard process and was already performed at large scale in several projects, e.g. eCodicology, combined with some metadata like dimensions and century (H. Busch, S. Chandna, et al., 2015-2019). This paper will draw on the experiences in the HORAE (Hours Recognition, Analysis, Editions) and HOME (History of Medieval Europe) research projects. In the first one, we have analyzed more than 1100 books of hours, finding more than 18'900 miniatures and started the automated cataloguing of texts contained within the manuscripts. In the second, we have analyzed the layout of more than 2300 cartularies and volumes containing copies of charters (not all processed for HTR). Beyond difficulties provided by the diverse digitization procedures (even with one library or one volume), we will see how image analysis, especially if combined with writer recognition or text analysis, can help us to gain a new understanding, on codicological evolutions or on specific features in some volumes that were not mentioned in catalogues, such as changes in layout or (missing) miniatures.

SESSION 6: BOOK CULTURE AND DIGITAL PRACTICES (III)



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Serena Crespi is a PhD student in co-tutorship between the University of Florence and the CESR (Centre Etudes Superieures de la Renaissance) of Tours with a project in Digital Humanities focused on the study of 17th-century Florentine manuscript culture.

Her research interests include manuscript history, philological and codicological studies, Digital Humanities, text-encoding and databases. She is currently collaborating on the SISMEL MDL (Mirabile Digital Library) project being in charge of the text processing and the XML-TEI digitisation. Previously, she won a research grant from the University of Milan, as result of which she spent a visiting period at the University of Grenoble collaborating on the international project Fontegaia: bibliothèque numérique des études italiennes in the OCR part and valorisation of the manuscript archives.

Exploring Florence's 17th-century manuscript culture through quantitative analysis and distant reading

Since the standardisation of the printing industry, in the mid-16th century, manuscripts have been classified and studied as a subordinate cultural system. According to book historians, the use of manuscripts during the late Renaissance is unusual, and it survives mainly as a symbol of an ancient system of production (Eiseinstein, 1997). Similarly, according to literary criticism, printing became opposed to manuscripts, creating a binary reality in which the second was used only for low-quality literary works and for all the texts that could not be printed due to political or religious constraints.

Giving credit to these assumptions, we should therefore imagine a pre-modern world dominated by print production, in which the manuscript book survives mainly as a rare archaeological object. Yet, this does not correspond to reality according to more modern studies (Marotti-Bristol, 2000; Richardson, 2009; McKitterick, 2013), this does not totally correspond to reality. For this reason, I propose a reconstruction of the manuscript diffusion in the 17th century Florence, using the Medici's capital as my case study. Through an in-depth survey of Florence's manuscript collections and a quantitative analysis of the collected data, I aim to show a more complex cultural system in which printing and manuscripts not only coexist, but also participate jointly in the diffusion of Florentine culture and literature.



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Riccardo Macchioro is currently Junior Researcher (RTD-A) at the State University of Milan (IT), where he teaches Humanistic Philology, and Visiting Researcher at the Radboud University Nijmegen (NL). After having obtained the Ph.D. in Medieval Latin Literature, he has been awarded the Claudio Leonardi Fellowship of the Schindler Foundation for Medieval Latin Studies (Genève), and has worked as Post-Doctoral Fellow at the University of Cassino and at the Ezio Franceschini Foundation (Florence). From 2020 to 2022 he was Post-Doctoral Fellow at the Radboud University Nijmegen in the ERC Project PASSIM (Patristic Sermons in the Middle Ages). He is also a member of the Projects Vocabolario Dantesco Latino (SISMEL – International Society for the Study of Medieval Latin Culture, Florence; University of Pisa; Accademia della Crusca) and Osservatorio sulle Edizioni Critiche (Milan). His research interests have focused on several areas and ages in Medieval Latin Literature, and the topics of his publication include: the translations from Greek into Latin in the Middle Ages; the reception of classical literature in medieval florilegia and scholarly milieux (in particular Pseudo Quintilian; the transmission of patristic homiletics and its reception in medieval manuscripts (especially concerning collections of Augustinian texts and Paul the Deacon); Bruno of Querfurt and the Ottonian Renaissance; the Latin Language of Dante Alighieri. He is also interested in Digital Humanities applied to manuscript studies; in the field, he has cooperated with SISMEL for the projects Te.Tra (Transmission of Latin Text in the Middle Ages), R.O.M.E. (Repertory of Medieval Homiliaries) and Pa.L.M.A. (Passionaria Latina Medii Aevi). In the framework of PASSIM ERC Project he works on the development of a digital infrastructure for an integrated study of medieval manuscripts collection, and has organized (with Gleb Schmidt) the International Workshop "On the Way to the Future of Digital Manuscript Studies".



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I am a postdoctoral researcher in Medieval manuscript studies at the Department of History, Art History and Classics, where I conduct research on the transmission of Caesarius of Arles' sermons in the High Middle Ages within PASSIM (Patristic Sermons in the Middle Ages) project. My main fields of study are medieval Latin literature, manuscript, and reception studies with a particular accent on dissemination of "bestselling" texts. In February 2021, I have defended a PhD thesis on Honorius Augustodunensis' Elucidarium at the University of Lorraine (academic adviser prof. Cédric Giraud).



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Shari Boodts is Assistant Professor of Medieval History in the Department of History, Classics and Art History at Radboud University, Nijmegen, The Netherlands, and Senior Researcher at the Radboud Institute for Culture and History. She specializes in the medieval transmission and reception of early-Christian literature, particularly patristic preaching. She edited Augustine's *Sermones ad populum 157-183* in the *Corpus Christianorum. Series Latina 41Bb* (Brepols, 2016), and is co-editor of *Preaching in the Patristic Era. Sermons, Preachers, Audiences in the Latin West* (Brill, 2018). She is PI of an EU-funded research project, as part of which an international team of scholars is creating the PASSIM-database and research tool, a digital environment for the study of patristic sermons in medieval manuscripts.

Codicological descriptions of sermon manuscripts. An experiment in layout analysis combining YOLO and Kraken

The PASSIM database has gathered a large amount of metadata on Latin patristic sermons and the manuscripts that transmit them. These manuscripts are difficult to catalog, they can contain up to hundreds of difficult-to-identify sermons, often interspersed with lectiones and organized in a complex structure. Assisted extraction of identifying features – title, incipit, explicit – is particularly useful for this corpus. In this paper, we report on an experiment that aims to integrate more sophisticated layout analysis as a step in the process of image segmentation. Our experiment uses YOLOv8, an object detection and image segmentation tool, to automatically detect relevant zones in so-called transition pages, i.e. pages on which one text ends and another begins, and integrate the result of detection in the Kraken segmentation pipeline to enable targeted transcription and extraction of zones. The result of this experiment allows us to reflect on different strategies which can be embraced for automated transcription for assisted cataloging, as well as on the need for controlled vocabulary to describe codicological features of medieval manuscripts. Manuscripts can be improved in the direction of a single language and common standard.



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Suzette van Haaren's research focuses on the digitisation and digital uses of medieval objects. She is currently working as postdoctoral researcher at the Ruhr-Universität Bochum at the SFB 1567 Virtuelle Lebenswelten (TP B02 'Virtuelles Mittelalter'). She finished her PhD at the University of St Andrews and the University of Groningen in May 2022, where she looked at medieval manuscript digitisation and the idea of 'digital codicology'. With a strong focus on the materiality of (digital) heritage, Suzette's work always seeks to overarch the dividing lines between disciplines. She holds an MA in Medieval Studies and a BA in Art History, both from Utrecht University.

Reflecting on digital codicology as method

This paper explores the principles of 'digital codicology' as a method for analysing digital facsimiles of medieval manuscripts. I propose using codicological tools to understand digital facsimiles, what they are and how they function in the world. Codicology, the study of the medieval book, places the material manuscript at the centre to explore its historical, cultural, social complexities. Like the codicologist, the digital codicologist aspires to analyse the digital facsimile's material elements, its place as cultural object and carrier of knowledge and tradition, and its position in history. This begins by acknowledging that the digital facsimile is (1) a material object and (2) a distinct object in itself. This paper is a critical examination of how cultural heritage digitisation affects our encounters with manuscripts. Ever-more cultural heritage objects are made accessible online. Examining the presentation and use of medieval books in digital spaces is fundamental to understanding how they move through the world today. The digital manuscript facsimile poses new affordances and constraints, fundamentally affecting how we handle and interpret the medieval book. Through the digital codicological method we can lay bare the digital facsimile's place in the manuscript's life and understand exactly how the digital continues and affects the medieval book's life.



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N. Kivilcim Yavuz is Lecturer in Medieval Studies and Digital Humanities at the University of Leeds. She works at the intersection of medieval studies and digital humanities with an expertise in European manuscript culture, specifically the role of manuscripts as material artefacts in textual transmission and book history. She is especially interested in digitization of manuscripts as cultural heritage items and creation, collection and interpretation of data and metadata in the context of digital repositories. She is the PI for the project 'Digital Explorations: Opening the Medieval Manuscript Fragments from the Ripon Cathedral Library' supported by UK Research and Innovation (UKRI) Research England under the Enhancing Research Culture funding stream. Since August 2022, she is the Director of the Executive Board of Digital Medievalist, a community of international scholars working on applying digital methods to the field of medieval studies. She posts about manuscripts on Twitter and Instagram with the handle @manuscriptsetc. For further information, visit <https://nkyavuz.com/>.

Manuscript Metadata and the Potentials of Digital Codicology

Manuscript scholars today need to have digital competencies and to be trained not only in how to read and interpret handwritten objects but also in how to think about manuscripts as sources of data. When it comes to how recent technologies have impacted manuscript studies, the emphasis has been on digital photography and the imaging of manuscripts. How developments in the last three decades have impacted the description of manuscripts on the digital domain has been largely taken for granted. With unprecedented access to digitised manuscripts, we now are in the privileged position to be able to re-discover and re-construct long-lost manuscripts, but there are two criteria necessary for this to bear fruit: 1) widespread adoption of open scholarship practices and 2) creation of open access metadata. Many manuscripts, however, still need to be catalogued, and when this is done, the focus is still almost always on the textual contents; a meaningful description of the codicological features is often lacking. This paper will discuss the cataloguing of complex manuscripts, ranging from composite manuscripts to hybrid codices and to those with in situ manuscript fragments, and the many potentials of digital codicology. It will also emphasize the importance of descriptive and structural metadata as well as linked open data for discoverability and accessibility of collections, as artefacts might be digitised but still remain unknown to the scholarly community.



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M. J. Driscoll is Professor of Old Norse Philology at the Arnarnagnæan Institute, a research centre within the Department of Nordic Studies and Linguistics at the University of Copenhagen. He holds degrees from the University of Stirling (BA (Hons.) 1979), Háskóli Íslands (Cand.mag. 1988) and Oxford University (DPhil 1994). His research interests include manuscript and textual studies, particularly in the area of late pre-modern Icelandic. He also has a long-standing interest in the Digital Humanities, and served for many years on the technical council of the Text Encoding Initiative. His publications include over 50 articles on various aspects of Icelandic literature, as well as editions and translations of a number of medieval and post-medieval Icelandic works.

Getting physical: The origin, development and future of <physDesc>

In my paper I will talk about the TEI manuscript description module, looking in particular at the elements grouped under <physDesc>. I will discuss the thinking behind some of the decisions that were originally made when the module was under development, some of the problems with the module that have since been flagged and some ideas for future development, taking into account recent developments within codicology and looking in particular at how codicological features which frequently have not been accounted for in manuscript descriptions, and are therefore missing from the module, might be accommodated in future iterations of <msDesc>.

SESSION 7: AI AND COMPUTATIONAL



Evina Stein

Academic limbo

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Evina Stein is an independent manuscript researcher currently residing at the American University of Beirut (Lebanon). She received her PhD in Manuscript Studies from Utrecht University in 2016 for her research on annotation symbols used in late antique and early medieval Western manuscripts. From 2018 to 2021, she was a VENI postdoctoral researcher at the Huygens Institute in Amsterdam, leading a project on the early medieval manuscripts of the Etymologiae of Isidore of Seville and their diffusion.



Martin Tamajka

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Martin Tamajka is a researcher and lead research engineer at the Kempelen Institute of Intelligent Technologies. He focuses on research of novel methods of deep learning, as well as on increasing the transparency of neural networks through methods of explainability and interpretability. His past research also includes analysis of multidimensional medical images and images in general.



QVIRE: investigating the structure of medieval manuscripts with the help of AI

In medieval Latin West, the assembly of a codex from smaller material units, the quires, had been typically guided by specific cues – quire marks and catchphrases. These devices are interesting due to their diagnostic potential, as the preference for a specific type of assembly cues differed both in time and space, and because they provide us with a general picture of the codicological structure of a manuscript even in the absence of its detailed physical examination. In particular, quire marks and catchphrases could guide our assessment of the codicological structure of manuscripts from their digital facsimiles alone, and allow us to identify composite manuscripts and manuscripts that sustained damage or alteration. The examination of assembly cues is particularly promising if done on a large scale, as it can shed light on the general patterns of manuscript production in the medieval Latin West. However, large-scale examination of assembly cues has been so far hampered by the need to collect the relevant data manually. In the QVIRE project (November 2022 – March 2023), we developed a prototype of an AI model for automated large-scale precision harvesting of data on medieval assembly cues that could reduce the need to involve human data collectors. In our presentation, we shall introduce the project, describe a case study we are currently conducting involving digitized manuscripts from the library in Saint-Omer, and present the results of the project.



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Hannah Busch studied German-Italian studies (B.A./Laurea Triennale) at the Universities of Bonn and Florence, followed by the completion of a M.A. in Textual Scholarship at the Free University of Berlin. Prior to moving to the Netherlands in 2018, she worked as research assistant at the Trier Center for Digital Humanities, where she was a member of the eCodicology-project. From 2018 to 2022 she was a PhD candidate in the project Digital Forensics for Historical Documents at Huygens ING in Amsterdam, currently Hannah is completing her PhD thesis at Leiden University. In her thesis, she focuses on the application of Artificial Intelligence and Machine Learning for the study of medieval Latin paleography. Further, her research interests include large scale digitization of medieval manuscripts, and experimenting with the application of computational methods that can support and enhance the work of manuscripts scholars. She is member of the editorial team of the German science blog *Mittelalter – Interdisziplinäre Forschung und Rezeptionsgeschichte*, the DFG funded network «Open Middle Ages», and part of the Digital Medievalist Postgraduate Committee. From June 2023 onwards you can find Hannah at the Cologne Center for eHumanities at the University of Cologne, Germany.

Manuscripts, Metadata, and Machine Learning: How to train an Artificial Paleographer ?

Large-scale digitization projects of the past twenty years and the possibility of exploitation with the help of the International Image Interoperability Framework (IIIF) have substantially contributed to reaching a critical mass which allows the application of deep learning for the study of medieval book scripts. In the past years, not only the number of digitized medieval sources increased significantly, but also the quality of the image data. Parallel to this development, the computation of images is becoming more powerful, and—more importantly—affordable. My research investigates the possibilities of dating and localizing medieval manuscripts with the help of Artificial Intelligence. Within the project “Digital Forensics for Historical Documents” we attempted to create such a digital tool, based on a deep learning system, in which the unique characteristics of one medieval script sample will be matched with similar script samples by making use of digitized manuscript collections available in the world wide web. In my presentation, I will be focusing particularly on the reuse of existing scholarly manuscript descriptions for the training of Artificial Neural Networks and the challenges of the approach.



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Giuliano Giuffrida is a member of the Coordination of IT Services of the Vatican Apostolic Library, he is involved in the management of the internal manuscripts database and the digitization project of the Library, particularly in the management of the Long Term Data Preservation archive of the digitized manuscripts. He is also involved in the scientific exploitation of the digital corpus of the Vatican Apostolic Library, from digital quantitative codicology to AI techniques applied to images. Giuliano has a degree in Physics and a PhD in Astronomy, he previously worked at the University Tor Vergata of Rome, the Astronomical Observatory of Rome, the European Southern Observatory, the Italian Space Agency and the IT department of the Vatican Apostolic Library.

Digital Libraries and digital codicology: the exploitation of the Vatican Apostolic Library's FITS archive

The Vatican Apostolic Library preserves an artistic, cultural, and scientific heritage of the utmost importance, including the digitized manuscripts to be considered as the latest acquisition within the holdings of the Library. This «digital corpus» constitutes a rich and homogeneous dataset that is opening new possibilities for the study of our cultural heritage. Palaeographic or codicological analyses could be performed automatically or in a semi-interactive way on millions of images; furthermore, pattern recognition and classification algorithms applied to the images could be a great help to scholars. This new approach represents one of the main challenges in the Coordination of IT Services of the Vatican Library. This presentation will focus on state-of-the-art related to these ongoing researches.



Rachel Di Cresce

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Rachel Di Cresce is a Project Librarian at the University of Toronto Libraries. Di Cresce partners with researchers to develop research services and projects using UTL's deep and unique collections. Her areas of focus include investigating new data standards, software and repositories, working on metadata standards that enable discovery of collections and new research, and building new research tools for the study of rare materials. Her work has often put her at the intersection of manuscripts and early printed books, technology and scientific inquiry. She worked as the project librarian for the *Book and The Silk Roads: Phase I project* and now for *Hidden Stories: New Approaches to the Local and Global History of the Book*. She oversees the project's technical development, data rights, data management and sustainability, and curating, preserving, and mobilizing knowledge with collaborators from around the globe.



Melissa Moreton

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Melissa Moreton is a codicologist and historian of the book who studies material culture and the development and exchange of manuscript technologies across Eurasia, Africa, and the Americas. She works on projects relating to global book history (1000-1700) and Indigenous language and cultural revitalization. Moreton is currently a Research Associate at the Institute for Advanced Study in Princeton, New Jersey, and project manager for *The Book and the Silk Roads* project and *Hidden Stories: New Approaches to the Local and Global History of the Book* working on research projects related to the book history of Ethiopia, the Himalayas, and Indigenous Great Lakes and Eastern Woodlands.

Making the Book Visible: Visualization Tools and Descriptive Terminology

Beginning in 2015, the Old Books New Science team based at the University of Toronto began its collaboration with the University of Toronto Libraries with Digital Tools for Manuscript Studies, a project funded by the Mellon Foundation to develop new ways to use manuscripts in a digital space. The projects, *The Book and the Silk Roads (2019-2022)* and subsequent *Hidden Stories: New Approaches to the Local and Global History of the Book (2023-2026)*, continue this Mellon-funded work with the goal of improving access to manuscript culture for a range of audiences. Working in collaboration with source communities and book scholars (sometimes one and the same), the goal is to find ways to 'make the book visible' - to better visualize, describe, and create access to the cultural heritage of the book. Rachel Di Cresce and Melissa Moreton will briefly discuss the digital codicology projects connected to this work and then share the methodology that shapes the current project, which is guided by conversations and collaborations with source communities.

Two projects highlighted are the 3D Codex Modeller and new work on descriptive terminologies. For the Codex Modeller, the technical team was interested in prototyping a 3D binding web application as well as a binding input form to streamline data collection throughout the project into this next phase. Drawing heavily on the Ligatus data model and the Language of Bindings Thesaurus, as well as the expertise of codicologists such as Alberto Campagnolo, they produced a publicly available tool which allows users to manipulate a codex book in a 3D space and experiment with various binding features. In addition, they developed an input form which allowed team members and collaborators to save binding descriptions and produce 3D models based on those descriptions. In the current *Hidden Stories* project, the team plans to return to binding descriptions and models, but with a new methodological approach that grows out of interdisciplinary conversations with collaborators across the project's global research areas. This includes: (1) expanding our descriptions form, data model, and vocabulary to include non-European book traditions; (2) supplementing the catalogue descriptions of our rare book holdings to include binding related information, language and terminology reflective of varied manuscript traditions and important contextual data and; (3) improving the discovery and re-use of data, research and descriptions of books - bindings, collation and beyond - through the library catalogue and a Digital Hub. Making the book visible through descriptive cataloging language and creating user-friendly visualization and modeling tools allows users to access, study, and connect with these objects in new ways.

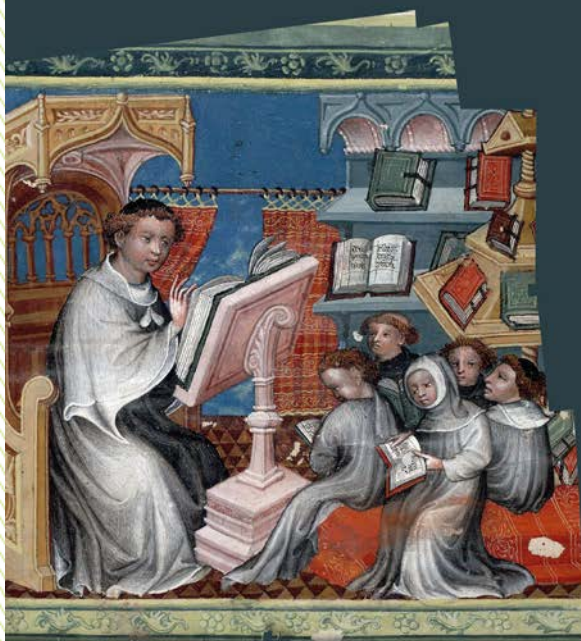
LE STUDIUM
LECTURES

TOURS | 2023

ENTRÉE LIBRE

Mercredi 10 Mai 2023 - 18h30

Un témoin muet et pourtant si éloquent : le manuscrit médiéval



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Centre d'Études Supérieures
de la Renaissance (CESR)
Salle Rapin
59 Rue Néricault Destouches
37000 Tours

INTERVENANTE

**Prof. Anne-Marie
Turcan-Verkerk**

École Pratique des Hautes
Études - PSL

Conférence grand public en lien avec la
conférence :
Novel approaches to Digital Codicology

INFORMATIONS

lecture@lestudium-ias.fr
www.lestudium-ias.com

PUBLIC LECTURE

UN TÉMOIN MUET ET POURTANT SI ÉLOQUENT : LE MANUSCRIT MÉDIÉVAL



Prof. Anne-Marie Turcan-Verkerk

École Pratique des Hautes Études - PSL

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Normalienne, ancien membre de l'École française de Rome, chercheuse au CNRS puis directrice d'études à l'École Pratique des Hautes Études (chaire de Langue et littérature latines du Moyen Âge, depuis 2008), Anne-Marie Turcan-Verkerk contribue à l'essor en France des travaux sur les bibliothèques du Moyen Âge à l'époque moderne et sur leur rôle dans la transmission des textes antiques et médiévaux. Elle a été responsable de l'équipe de Codicologie, histoire des bibliothèques et héraldique de l'Institut de recherche et d'histoire des textes (CNRS, 2005-2019). Elle a construit et dirige l'équipex Biblissima porté par le Campus Condorcet depuis 2012, infrastructure numérique consacrée à l'étude des cultures écrites anciennes financée jusqu'en 2029 par le projet Biblissima+ (<https://projet.biblissima.fr/>). Elle a fondé en 2020 l'Institut des langues rares de l'EPHE-PSL, l'ILARA (<https://ilara.hypotheses.org/>).

Un témoin muet et pourtant si éloquent : le manuscrit médiéval

Rien ne décrit mieux le métier de l'historien des textes anciens que l'enquête de frère Guillaume dans le Nom de la rose. Entre le Ve et le XVe siècle, les copistes ont patiemment copié des manuscrits et transmis les textes qui, à leurs yeux, méritaient d'être lus. Qui étaient ces maillons de la longue chaîne de transmission des textes grâce à laquelle, aujourd'hui, nous lisons Cicéron ou Virgile ? Comment se procuraient-ils les textes, comment les copiaient-ils et comment les conservaient-ils ? Qui lisait ces manuscrits, quels étaient les lieux et les gestes de la lecture ? Comment et pourquoi les textes se sont-ils perdus ou conservés, et peut-on, encore aujourd'hui, découvrir des textes que personne n'a lus depuis des siècles ? Cette conférence tentera d'apporter des réponses à ces questions en faisant la synthèse des connaissances actuelles et en suggérant comment on pourrait faire de nouvelles découvertes, en particulier grâce aux nouvelles technologies.

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PAST LE STUDIUM CONFERENCES

2023

Dr Dominique Arrouays & Anne Richer de Forges

**Soil Mapping for a Sustainable Future
2nd joint Workshop of the IUSS
Working Groups Digital Soil Mapping
and Global Soil Map**

7-9 February 2023

Dr Bernard Gratuze, Dr Inès Pactat, Dr Gaspard Pagès, Dr Nadine Schibille & Dr Line Van Wersch

Secondary glass productions in the early Middle Ages

26-27 January 2023

2022

Dr Alberto Marzo & Dr Ayache Bouakaz
**Cardiovascular Modelling: Basic
Science to Clinical Translation**

13-14 December 2022

Prof. Feng Huang, Dr Eric Robert & Dr Augusto Stancampiano

**On-line Meeting on Artificial
Intelligence for Plasma Science**

29-30 November 2022

Dr David Cottès, Prof. Christophe Vandier & Prof. Stéphane Petoud

**Ion channels in pathological context,
new methods and diagnosis tools**

21-23 September 2022

Prof. Rita Singh & Dr Pascale Crépieux
**Gonadotropins in the
Physiopathology: Current advances in
the Mechanisms of Action**

14-15 September 2022

Dr Duangjai Tungmunnithum, Dr Christophe Hano & Prof. Leslie Boudesocque-Delaye

NaDES for biomass valorization: new

insight of a green technology

6-7 September 2022

Dr Kathia Zaleta & Prof. Patrick Vourc'h
RNA therapeutics and Neuroscience

24-25 May 2022

Dr Cynthia Gabbay, Dr Brigitte Natanson & Dr Valentina Litvan

**Jewishness between Latin America
and Europe: Languages in Contact,
Linguistic Imaginaries and
Translation**

16-17 May 2022

Dr Duangjai Tungmunnithum & Dr Christophe Hano

**1st Franco-Thai Seminar on
Phytocosmeceutical Research and
Applications**

11 May 2022

Dr Franciska Vidáné Erdő, Dr Franck Bonnier & Prof. Emilie Munnier

**Skin Models in Cosmetic Science:
Bridging Established Methods and
Novel Technologies**

7-8 April 2022

2021

Dr Robert Courtois

**De la séduction à l'agression ? La
question du harcèlement**

29-30 November 2021

Prof. Adrian Wolstenholme, Prof. Georg von Samson-Himmelstjerna & Dr Cédric Neveu

**New approaches to get around
roundworms**

29 November - 1 December 2021

Dr Valérie Hayaert, Hélène Jagot & Christophe Regnard

Justice en scène(s)

11-12 October 2021

Dr Raphaël Cahen, Prof. Pierre Allorant &

Prof. Walter Badier
Law(s) and International relations : actors, institutions and comparative legislations

15-17 September 2021

Prof. Eugeen Schreurs, Prof. Philippe Vendrix & Wendy Wauters

Music and Lived Religion in the Collegiate Church of Our Lady in Antwerp (1370 - 1566). A Multidisciplinary Study in a European context

2-4 September 2021

Dr Cristina Del Rincon Castro & Dr Elisabeth Herniou

2021 International Congress on Invertebrate Pathology and Microbial Control & 53rd Annual Meeting of the Society for Invertebrate Pathology

28 June - 2 July 2021

Dr Edurne Serrano-Larrea, Dr Conchi Ania & Dr Encarnacion Raymundo-Piñero

Challenges and opportunities in materials for green energy production and conversion

15-17 June 2021

Prof. Maxwell Hincke & Dr Sophie Réhault-Godbert

Innate immunity in a biomineralized context: trade-offs or synergies?

23-24 March 2021

Dr Rebecca Tharme & Prof. Karl Matthias Wantzen

Managing riverscapes and flow regimes for biocultural diversity

20-21 January 2021

2020

Dr Magdalena Malinowska & Dr Arnaud Lanoue
Exploring the molecular diversity of grape, a source of natural ingredients

3 December 2020

Dr Jean-François Deluchey & Prof. Nathalie Champroux

What are our lives worth to a neoliberal government?

Capitalism, War and Biopolitics in the Pandemic Era

18 - 19 November 2020

Prof. Pieter Hiemstra & Dr Mustapha Si-Tahar

Novel host- and microbiota-directed strategies for treating respiratory infections

24 - 25 September 2020

Dr Emilio Maria Sanfilippo & Xavier Rodier
FAIR Heritage: Digital Methods, Scholarly Editing and Tools for Cultural and Natural Heritage

17-18 June 2020

Dr Margriet Hoogvliet & Prof. Chiara Lastraioli

Spatial Humanities and Urban Experiences During the Long Fifteenth Century

11 Mai 2020

Dr Thimmalapura Marulappa Vishwanatha & Dr Vincent Aucagne

Challenges and prospects in chemoselective ligations: from protein synthesis to site-specific conjugation

27-29 January 2020

Dr Arunabh Ghosh & Prof. Fouad Ghamouss

Towards Futuristic Energy Storage; paving its way through Supercapacitors, Li-ion batteries and beyond

22-24 January 2020

2019

Dr Yuri Dancik & Dr Franck Bonnier
Skin Models in Cosmetic Science: Bridging Established Methods and Novel Technologies

2-4 December 2019

Dr Eric Robert, Dr Jean-Michel Pouvesle & Dr Catherine Grillon

International Meeting on Plasma Cosmetic Science

25-27 November 2019

Prof. Richard Freedman & Prof. Philippe Vendrix
Counterpoints: Renaissance Music and Scholarly Debate in the Digital Domain

14-16 November 2019

Prof. Manuela Simoni, Dr Frédéric Jean-Alphonse, Dr Pascale Crépieux & Dr Eric Reiter

Targeting GPCR to generate life, preserve the environment and improve animal breeding: technological and pharmacological challenges

16-18 October 2019

Prof. Akkihebbal Ravishankara & Dr Abdelwahid Mellouki

Climate, air quality, and health: long-term goals and near-term actions

28 June 2019

Dr Wolfram Kloppmann

N and P cycling in catchments: How can isotopes guide water resources management?

18 June 2019

Dr Carmen Díaz Orozco & Dr Brigitte Natanson
Forging glances.

Images and visual cultures in XIXth century Latin America

28-29 May 2019

Dr Marcelo Lorenzo & Prof. Claudio Lazzari
New avenues for the behavioral manipulation of disease vectors

21-23 May 2019

Dr Agnieszka Synowiec & Dr Christophe Hano
Biological Activities of Essential Oils

13-15 May 2019

Prof. Yiming Chen & Prof. Driss Boutat
2019 International Conference on Fractional Calculus Theory and

Applications (ICFCTA 2019)

25-26 April 2019

Prof. Temenuga Trifonova & Prof. Raphaële Bertho
On the Ruins and Margins of European Identity in Cinema: European Identity in the Era of Mass Migration

2-3 April 2019

Dr Patrizia Carmassi & Prof. Jean-Patrice Boudet
Time and Science in the Liber Floridus of Lambert of Saint-Omer

27-28 March 2019

Dr Vincent Courdavault & Prof. Nathalie Guivarc'h
Refactoring Monoterpenoid Indole Alkaloid Biosynthesis in Microbial Cell Factories (MIAMI)

5-6 February 2019

Dr Denis Reis de Assis & Prof. Hélène Blasco
Induced Pluripotent Stem Cells (iPSCs): From Disease Models to Mini-Organs

28-30 January 2019

2018

Prof. Igor Lima Maldonado & Prof. Christophe Destrieux
Frontiers in Connectivity: Exploring and Dissecting the Cerebral White Matter

5-6 December 2018

Dr Marius Secula, Prof. Christine Vautrin-UI & Dr Benoît Cagnon

Water micropollutants: from detection to removal

26-28 November 2018

Prof. Guoxian Chen & Prof. Magali Ribot
Balance laws in fluid mechanics, geophysics, biology (theory, computation, and application)

19-21 November 2018

Dr Volodymyr Sukach & Prof. Isabelle Gillaizeau
Progress in Organofluorine Chemistry

15-17 October 2018

Jens Christian Moesgaard, Prof. Marc Bompaire, Bruno Foucray & Dr Guillaume Sarah
Coins and currency in the 10th and 11th centuries: issuing authorities, political powers, economic influences
 11-12 October 2018

Dr Norinne Lacerda-Queiroz & Dr Valérie Quesniaux
Malaria - Current status and challenges
 27-28 September 2018

Dr Renaud Adam & Prof. Chiara Lastraioli
Lost in Renaissance
 20-21 September 2018

Prof. Abdelwahid Mellouki & Dr Véronique Daële
The 6th Sino-French Joint Workshop on Atmospheric Environment
 10-12 September 2018

Prof. Emre Erdem & Dr Guylaine Poulin-Vittrant
Frontiers in Nanomaterials for Energy Harvesting and Storage
 27-29 August 2018

Prof. Graeme Boone & Prof. Philippe Vendrix
Affective horizons of 'song' in the long fifteenth century
 27-28 June 2018

Prof. Bilal Haider Abbasi, Prof. Nathalie Guivarc'h & Dr Christophe Hano
Modern aspects of Plant in Vitro Technology
 27 June 2018

Prof. Marek Łos & Dr Catherine Grillon
Stem cells & cancer stem cells: Regenerative medicine and cancer
 11-13 June 2018

Dr Ewa Łukaszyk & Prof. Marie-Luce Demonet
Transcultural Mediterranean: in search of non-orthodox and non-hegemonic universalism(s)
 30-31 May 2018

Prof. Vladimir Shishov & Dr Philippe Rozenberg
Wood formation and tree adaptation to climate
 23-25 May 2018

Dr Ján Žabka & Dr Christelle Briois
Advances in Space Mass Spectrometry for the Search of Extraterrestrial Signs of Life
 16-18 May 2018

Dr Massimiliano Traversino Di Cristo & Prof. Paul-Alexis Mellet
From Wittenberg to Rome, and Beyond Giordano Bruno: Will, Power, and Being
Law, Philosophy, and Theology in the Early Modern Era
 26-27 April 2018

Dr William Horsnell & Dr Bernhard Ryffel
Neurotransmitters: non-neuronal functions and therapeutic opportunities
 26-28 March 2018

Prof. Eric Goles & Prof. Nicolas Ollinger
Discrete Models of Complex Systems
 19-21 March 2018

2017

Dr Kristina Djanashvili & Dr Éva Jakab Tóth
Is Multimodal Imaging an Invention with a Future? The Input of Chemistry
 11-13 December 2017

Dr Emmanuel Saridakis & Dr Marc Boudvillain
Structural biology and biophysics of RNA-protein complexes
 13-15 November 2017

Prof. Franco Pierno & Prof. Chiara Lastraioli
The Runaway Word. Languages and Religious Exile in the Renaissance
 7-8 November 2017

2015

Dr Gyula Tircsó & Dr Éva Jakab Tóth
Medicinal flavor of metal complexes: diagnostic and therapeutic applications
 7-9 December 2015

Prof. Erminia Ardissino & Dr Elise Boillet
Lay Readings of the Bible in Early Modern Europe

Dr Mauro Simonato & Dr Jérôme Rousselet
Species spread in a warmer and globalized world
 18-20 October 2017

Dr Sophie Heywood & Dr Cécile Boulaire
1968 and the boundaries of childhood
 12-14 October 2017

Prof. Mihai Mutascu & Prof. Camelia Turcu
Globalization and growth in eurozone: new challenges
 28-29 September 2017

Dr Mauro Manno & Prof. Richard Daniellou
The role of glycosylation on serpin biology and conformational disease
 27-29 September 2017

Prof. Salvatore Magazù, Prof. Francesco Piazza, Dr Sivakumar Ponnuregam Malliappan, Dr Emilie Munnier
Recent advances in basic and applied science in cosmetics
 3-5 July 2017

Dr Maria Clotilde Camboni & Prof. Chiara Lastraioli
The dynamics of the relationship with the more recent past in early modern Europe: between rejection and acknowledgement
 20-22 June 2017

Dr Sohail Akhter & Prof. Chantal Pichon
Messenger RNA therapeutics: advances and perspectives
 22-23 March 2017

Prof. Gary Gibbons & Prof. Sergey Solodukhin
GARYFEST: Gravitation, Solitons and Symmetries
 22-24 March 2017

2016

Dr Mohammed Ayoub & Dr Eric Reiter
Antibodies Targeting GPCRs, Recent Advances and Therapeutic Challenges
 24-25 November 2016

Prof. David Koester, Dr Bernard Buron & Dr Jean-Philippe Fouquet

Practical Engagements and the Social-Spatial Dimensions of the Post-Petroleum Future
 7-9 November 2016

Dr Jorge Gutierrez & Dr Philippe Frank
Lipids, Nanotechnology and Cancer
 10-12 October 2016

Dr Ferenc Kálmán & Dr Éva Jakab Tóth
Being Smart In Coordination Chemistry: Medical Applications
 26-28 September 2016

Dr Satyajit Phadke, Dr Chandrasekaran & Prof. Mériem Anouti
Future strategies in electrochemical technologies for efficient energy utilisation
 7-9 September 2016

Prof. Peter Bennett & Prof. Philippe Vendrix
Sacred/secular intersections in early-modern European ceremonial: Text, music, image and power
 11-13 July 2016

Prof. Leandros Skaltsounis & Prof. Claire Elfakir
Olive Bioactives: applications and prospects
 4-6 July 2016

Dr Mikhail Zubkov & Dr Maxim Chernodub
Condensed matter physics meets relativistic quantum field theory
 13-15 June 2016

Prof. Brown-Grant, Dr Carmassi, Prof. Drossbach, Prof. Hedeman, Dr Turner & Prof. Ventura
Inscribing Knowledge on the Page: Sciences, Tradition, Transmission and Subversion in the Medieval Book
 6-9 June 2016

Prof. Gary Gibbons & Prof. Sergey Solodukhin
Classical and quantum black holes
 30-31 May 2016

24-26 November 2015

Prof. Kathleen Campbell & Dr Frances Westall
Habitats and inhabitants on the early Earth and Mars

17-18 November 2015

Prof. Marion Harris & Dr David Giron
Insects, pathogens, and plant reprogramming: from effector molecules to ecology

5-7 October 2015

Dr Arayik Hambardzumyan & Dr Sylvie Bonnamy
Bioinspired molecular assemblies as protective and delivery systems

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Dr Peter Arensburger & Dr Yves Bigot
Analysis and Annotation of DNA Repeats and Dark Matter in Eukaryotic Genomes

8-10 July 2015

Prof. Scott Kroeker & Dr Pierre Florian
Nuclear Waste Disposal: Designing Materials For the End of Time

27-29 May 2015

Prof. Gary Gibbons & Prof. Sergey Solodukhin
Entanglement, Holography and Geometry

17 April 2015

Prof. Kari Astala & Dr Athanasios Batakis
Loire Valley Workshop on Conformal Methods in Analysis, Random Structures & Dynamics

12-16 April 2015

2014

Dr Natalia Kirichenko & Dr Alain Roques
Insect invasions in a changing world

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Dr Alejandro Martinez & Dr Philippe Rozenberg
Natural and human-assisted adaptation of forests to climatic constraints: the relevance of interdisciplinary approaches

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Dr Magnus Williamson & Prof. Xavier Bisaro
Reconstructing Lost Spaces: acoustic, spatial, ceremonial contexts

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Dr Edouard Asselin & Dr Patrick D'Hugues
Copper, a strategic metal? The present and future of resources, processing and recycling

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Dr Eric Reiter
3rd International Congress on Gonadotropins & Receptors - ICGRIII

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Dr Robin Beech & Dr Cédric Neveu
NemaTours: bringing worms together

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31 March - 1 April 2014

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Prof. Chandani Lokuge & Prof. Trevor Harris
Postcolonialism now

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Dr Fabrizio Gherardi & Dr Pascal Audigane
Geochemical reactivity in CO₂ geological storage sites, advances in optimizing injectivity, assessing

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Vector-borne diseases : a multidisciplinary approach

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Bottom-up approaches to Nanotechnology

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Lanthanide-based compounds : from chemical design to applications

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Vision and image-making : constructing the visible and seeing as understanding

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Macromolecular crowding effects in cell biology : models and experiments

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Dr Lidewij Tummers & Prof. Sylvette Denèfle
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Mount eribus, antarctica : an exceptional laboratory volcano

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Prof. Friedrich Wellmer
Life and innovation cycles in the field of raw material supply and demand — a transdisciplinary approach

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Rare earth elements in our environment from ores towards recycling through the continental cycle

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Prof. Nicola Fazzalari & Prof. Claude-Laurent Benhamou
Osteocyte Imaging

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Prof. Nikolay Nenovsky & Prof. Patrick Villieu
Europe and the Balkans : economic integration, challenges and solutions

3-4 February 2011

Prof. Salvatore Magazù & Dr Louis Hennet
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14-15 February 2011

Prof. Irène Garcia-Gabay & Dr Valérie Quesniaux
Inflammatory and infectious diseases

30-31 May 2011

Prof. Ali Chamseddine, Prof. Alain Connes & Prof. Mickaël Volkov
Non commutative geometry, strings and gravity

25-27 May 2011

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