Scientific Methods in Cultural Heritage Research
Gordon Research Conference

Leading Edge Applications of Data Science, Degradation Science, and Conservation Strategies for Cultural Heritage

July 22 - 27, 2018

Chairs

C. Richard Johnson, Jr and Robert Van Langh

Vice Chairs

Julie Arslanoglu and Loïc Bertrand

Rey Don Jaime Grand Hotel

Avinguda de l'Hotel
Castelldefels, ES

Application Information

Applications for this meeting must be submitted by **June 24, 2018**. Please apply early, as some meetings become oversubscribed (full) before this deadline. If the meeting is oversubscribed, it will be stated here. *Note*: Applications for oversubscribed meetings will only be considered by the conference chair if more seats become available due to cancellations.

Conference Description

The 2018 Gordon Research Conference on Scientific Methods in Cultural Heritage Research will highlight exceptional methodological research in cultural heritage, which has an impact on fundamental knowledge, interpretation, and conservation. This is the first GRC on Scientific Methods in Cultural Heritage Research to be held in Europe. It is also the first to incorporate the

emerging utilization of computational and data science in cultural heritage research. The keynote speakers will provide overviews of the status of conservation science and of the growing impact of data science and artificial intelligence on cultural heritage research and applications.

The featured topics for oral presentations are (i) data science and computational science for image processing, image search, process modeling, and manufactured materials similarity analysis; (ii) advanced analytical methods for tracing object origin and biological applications; (iii) understanding production and degradation experimentally and analytically; and (iv) new strategies for treatment-based and preventive conservation. The 2018 Gordon Research Conference on Scientific Methods in Cultural Heritage Research will also include thematically complementary poster sessions.

Note: Poster abstracts must be unpublished work only. Attendees who submit published work will not be presenting at the meeting.

Related Meeting

This GRC will be held in conjunction with the "Scientific Methods in Cultural Heritage Research (GRS)" Gordon Research Seminar (GRS). Those interested in attending both meetings must submit an application for the GRS in addition to an application for the GRC. Refer to the associated GRS program page for more information.

Conference Program

Sunday	
4:00 pm - 8:00 pm	Arrival and Check-in
6:00 pm - 7:00 pm	Dinner
7:30 pm - 7:40 pm	Introductory Comments by GRC Site Staff / Welcome from

	the GRC Chair
7:40 pm - 9:30 pm	## Keynote Session: Cultural Heritage Research: The Big Picture Discussion Leader: **Jennifer Mass** (Bard Graduate Center, USA)
7:40 pm - 7:50 pm	Opening Remarks
7:50 pm - 8:30 pm	**Barbara Berrie** (National Gallery of Art, USA) "Pasteur's Quadrant and the Status of Science in Cultural Heritage"
8:30 pm - 8:40 pm	Discussion
8:40 pm - 9:20 pm	**Laurens van der Maaten** (Facebook AI Research, USA) "How Modern Computer Vision and Machine Learning May Impact the Analysis of Art"
9:20 pm - 9:30 pm	Discussion
Monday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	## Data Science for Cultural Heritage Discussion Leader: **John Delaney** (National Gallery of Art, USA)
9:00 am - 9:30 am	**Paul Messier** (Yale University, USA) "Large-Scale, Networked Analysis and Interpretation of Material Attributes for the Study of Artistic Practice"
9:30 am - 9:40 am	Discussion

9:40 am - 10:10 am	**David Donoho** (Stanford University, USA) "Recent Developments in Deep Learning: New Opportunities for Art Preservation?"
10:10 am - 10:20 am	Discussion
10:20 am - 10:50 am	Coffee Break
10:50 am - 11:20 am	**Robert Erdmann** (Rijksmuseum / University of Amsterdam, The Netherlands) "End-to-End Strategies for Data Fusion, Deep Analysis and Visualization for Art Conservation and Art History"
11:20 am - 11:30 am	Discussion
11:30 am - 11:40 am	Short Talk Selected from Poster Abstracts
11:40 am - 11:45 am	Discussion
11:45 am - 11:55 am	Short Talk Selected from Poster Abstracts
11:55 am - 12:00 pm	Discussion
12:00 pm - 12:30 pm	Poster Previews
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:30 pm	Free Time
4:30 pm - 6:00 pm	**Poster Session**
6:00 pm - 8:00 pm	**Computational Modeling and Detection for Cultural Heritage** Discussion Leader: **Warren Warren** (Duke University, USA)

6:00 pm - 6:30 pm	**Alessandra Satta** (Istituto Officina dei Materiali (IOM), National Research Council (CNR), Italy) "Towards Modelling the Degradation of Pigments: Cadmium Yellow as a Case Study"
6:30 pm - 6:40 pm	Discussion
6:40 pm - 7:10 pm	**Linda Broadbelt** (Northwestern University, USA) "Understanding the Autoxidative Curing and Degradation of Oil-Based Paints Through Quantum Chemical Calculations and Microkinetic Modeling"
7:10 pm - 7:20 pm	Discussion
7:20 pm - 7:50 pm	**Serge Cohen** (Synchrotron SOLEIL, France) "Safer Detection Through Optimised Data Processing"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 9:00 pm	Dinner
Tuesday	
7:30 am - 8:30 am	Breakfast
8:30 am - 9:00 am	Group Photo
9:00 am - 12:30 pm	**Advanced Analytical Techniques: Biological Applications** Discussion Leader: **Admir Masic** (Massachusetts Institute of Technology, USA)
9:00 am - 9:30 am	**James Weaver** (Harvard University, USA) "High Resolution Multi-Material Additive Manufacturing: 3D

	Fabrication of Biologically Inspired Structures"
9:30 am - 9:40 am	Discussion
9:40 am - 10:10 am	**Maria Colombini** (University of Pisa, Italy) "Art Demystified: How to Authenticate a Modern/Contemporary Painting by Analytical Techniques"
10:10 am - 10:20 am	Discussion
10:20 am - 10:50 am	Coffee Break
10:50 am - 11:20 am	**Johannes Krause** (Max Planck Institute for the Science of Human History, Germany) "Reconstructing the Genetic History of World Wide Human Populations"
11:20 am - 11:30 am	Discussion
11:30 am - 11:40 am	Talk Selected from the GRS
11:40 am - 11:45 am	Discussion
11:45 am - 11:55 am	Short Talk Selected from Poster Abstracts
11:55 am - 12:00 pm	Discussion
12:00 pm - 12:30 pm	Poster Previews
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:30 pm	Free Time
4:30 pm - 6:00 pm	**Poster Session**
6:00 pm - 8:00 pm	**Advanced Analytical Techniques: Tracing the**

Origin of the Object

Discussion Leader: **Ina Reiche** (Rathgen Research Laboratory, Berlin State Museums, Germany / IRCP, C2RMF, CNRS, France)

6:00 pm - 6:30 pm	**Yong Lei** (The Palace Museum, Beijing, China) "Identifying Ancient Chinese Pigments and Dyestuff Using Hyper-Spectroscopy, UPLC and SERS"
6:30 pm - 6:40 pm	Discussion
6:40 pm - 7:10 pm	**Manako Tanaka** (Showa Women's University, Japan) "Nondestructive Study of Cultural Objects Using Neutron and X-Ray Imaging to Clarify Their Material Characteristics and Manufacturing Techniques"
7:10 pm - 7:20 pm	Discussion
7:20 pm - 7:50 pm	**David Thurrowgood** (Queen Victoria Museum and Art Gallery, Australia) "Evidence of Origin: The End of Traditional Connoisseurship Precipitated by Advanced Analytical Technology and Deep Learning"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 9:00 pm	Dinner

Wednesday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	**Detecting, Quantifying and Predicting Degradation Phenomena: Experimental**

Approaches

Discussion Leader: **Marco Leona** (Metropolitan Museum of Art, USA)

9:00 am - 9:30 am	**Haida Liang** (Nottingham Trent University, United Kingdom) "Advances in Optical Coherence Tomography for Heritage Science"
9:30 am - 9:40 am	Discussion
9:40 am - 10:10 am	**Philippe Walter** (Laboratoire d'Archéologie Moléculaire et Structurale, Sorbonne Universite, CNRS, France) "Interpreting Artistic Practices Despite the Alterations of Works of Art"
10:10 am - 10:20 am	Discussion
10:20 am - 10:50 am	Coffee Break
10:50 am - 11:20 am	**Thomas Wurdinger** (VU University Medical Center, The Netherlands) "Alternative Probing for Cultural Heritage"
11:20 am - 11:30 am	Discussion
11:30 am - 11:40 am	Talk Selected from the GRS
11:40 am - 11:45 am	Discussion
11:45 am - 11:55 am	Short Talk Selected from Poster Abstracts
11:55 am - 12:00 pm	Discussion
12:00 pm - 12:30 pm	Poster Previews

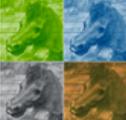|	
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:30 pm	Free Time
4:30 pm - 6:00 pm	**Poster Session**
6:00 pm - 8:00 pm	**Detecting, Quantifying and Predicting Degradation Phenomena: Experimental and Theoretical Approaches** Discussion Leader: **Francesca Casadio** (Art Institute of Chicago, USA)
6:00 pm - 6:30 pm	**Joris Dik** (TU Delft, The Netherlands) "Smart*Light: A Table-Top Synchrotron Facility for Cultural Heritage Science"
6:30 pm - 6:40 pm	Discussion
6:40 pm - 7:10 pm	**Dominique Derome** (Swiss Federal Laboratories for Materials Science and Technology (EMPA), Switzerland) "Understanding the Physics of Painted Canvas and Wood: Multiscale Experimental and Modelling Study of Combined Hygrothermal and Mechanical Behavior"
7:10 pm - 7:20 pm	Discussion
7:20 pm - 7:50 pm	**Catherine Patterson** (Getty Conservation Institute, USA) "Pigment Degradation Studies: Coupling Invasive and Non-Invasive Analyses"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 9:00 pm	Dinner

Thursday

7:30 am - 8:30 am	Breakfast
8:30 am - 9:00 am	**Business Meeting** *Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair*
9:00 am - 12:30 pm	**New Strategies for Treatment-Based Conservation** Discussion Leader: **Tom Learner** (Getty Conservation Institute, USA)
9:00 am - 9:30 am	**W. (Bill) Wei** (Cultural Heritage Agency of the Netherlands, The Netherlands) "Virtual and Active Retouching: Technology Versus Perception"
9:30 am - 9:40 am	Discussion
9:40 am - 10:10 am	**Bronwyn Ormsby** (Tate, United Kingdom) "Evaluating Novel Surface Cleaning Systems for Modern and Contemporary Art: Highlights from Selected Case Study"
10:10 am - 10:20 am	Discussion
10:20 am - 10:50 am	Coffee Break
10:50 am - 11:20 am	**Deena Engel** (Courant Institute of Mathematical Sciences, New York University, USA) "The State of the Art in Time-Based Media Conservation"
11:20 am - 11:30 am	Discussion

11:30 am - 11:40 am	Short Talk Selected from Poster Abstracts
11:40 am - 11:45 am	Discussion
11:45 am - 11:55 am	Short Talk Selected from Poster Abstracts
11:55 am - 12:00 pm	Discussion
12:00 pm - 12:30 pm	Poster Previews
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:30 pm	Free Time
4:30 pm - 6:00 pm	**Poster Session**
6:00 pm - 8:00 pm	**New Strategies for Preventive Conservation** Discussion Leader: **Matija Strlic** (Centre for Sustainable Heritage, University College London, United Kingdom)
6:00 pm - 6:30 pm	**David Thickett** (English Heritage, United Kingdom) "Epidemiology and Data Mining to Assess Environmental Requirements for Collections"
6:30 pm - 6:40 pm	Discussion
6:40 pm - 7:10 pm	**Costanza Miliani** (Institute of Molecular Science and Technologies, CNR, Italy) "Photochemistry of Artists' Materials: Implications for Preventive Conservation and Museum Lighting Policies"
7:10 pm - 7:20 pm	Discussion
7:20 pm - 7:50 pm	**Ulderico Santamaria** (Vatican Museums, Vatican City) "Remote Sensing of Ancient Sculpture Using Fiber Bragg

	Grating"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 9:00 pm	Dinner
Friday	
7:30 am - 8:30 am	Breakfast
9:00 am	Departure

Contributors