



COLOR & SPACE IN  
CULTURAL HERITAGE

COST Action TD1201  
**Colour and Space in Cultural Heritage (COSCH)**  
**London Meeting 2013**  
[www.cosch.info](http://www.cosch.info)

**3D IMAGING WORKSHOP**  
**Monday, 23 September 2013**  
**9:30 – 12:30**



**University College London (UCL), Gower Street, WC1E 6BT**

**Venue:** UCL Main entrance from Gower Street,  
Chadwick Building, via Main Quad, Room G07, Ground Floor  
Building location <http://goo.gl/maps/3c2tc>



Chadwick Building

The nearest Underground stations are: Euston Square and Warren Street.  
Further route-finding here:  
<http://crf.casa.ucl.ac.uk/screenRoute.aspx?s=1316&d=29&w=False>

## PROGRAMME

Maximum number of participants: 60

From 09:30 **Arrival and coffee** in Chadwick Building, Room G07. Entering the Main Quad a volunteer will point you to the lecture room/venue. (*see links and map above*)

10:00 – 11:00 **Welcome and Presentations** – Chadwick Building, G07, Accessible from Main Quad

- a) Imaging techniques for cultural heritage objects      Kirk Martinez (Univ. of Southampton)
- b) Image capture and rendering by RTI      Lindsay MacDonald (UCL)
- c) Principles of 3D scanning      Jan Boehm (UCL)
- d) 3D documentation and virtual collections at UCL      Mona Hess (UCL)

11:00 – 12:30 **Demonstrations**

Separate into four groups of 15 people each with guides.

Circulate around demonstrations at four locations on UCL campus:

- a) Arius 3D colour laser scanner      Chorley Institute      Mona Hess  
Stuart Robson
- b) Low-cost 3D scanning techniques      Chadwick G07      Jan Boehm
- c) Dome for PTM/RTI image acquisition      Chadwick B06      Lindsay MacDonald
- d) Petrie Museum of Egyptology      Malet Place      Ivor Pridden  
Tonya Nelson  
Giancarlo Amati

Time	Low cost	PTM/RTI	Arius	Petrie
11.00	Group 1	Group 2	Group 3	Group 4
11.25	Group 4	Group 1	Group 2	Group 3
11.45	Group 3	Group 4	Group 1	Group 2
12.05	Group 2	Group 3	Group 4	Group 1
~12.25	Meet in Main Quad for departure. Point out lunch options.			

12:30 **Depart for Kings College Guy's Campus (self-pay).**

## TRAVEL

Participants are advised to buy an Oyster Card or one-day Travelcard (Zone 1) in advance.

See Transport for London (TFL) website <http://www.tfl.gov.uk/> and TFL Journey Planner <http://journeyplanner.tfl.gov.uk> Recommended transport is by Underground train: Northern Line Bank branch from Euston to London Bridge. <http://goo.gl/maps/PPCTw> Some of the UCL team will also travel to Guy's Campus, so please let us know if you want to join the group to travel to Kings.

UCL will provide morning coffee but not lunch. Participants are advised to buy a packed lunch at UCL or on their way to King's College London Guy's Campus (plenty of food outlets in the London Bridge area) and bring it to the COSCH meeting in the Henriette Raphael Building, Function Room: [www.kcl.ac.uk/campuslife/campuses/guys/Guys.aspx](http://www.kcl.ac.uk/campuslife/campuses/guys/Guys.aspx)

## University College London

UCL was established in 1826 to open up education in England for the first time to students of any race, class, religion or gender. Its founding principles of academic excellence and conducting research aimed at addressing real-world problems inform the ethos of the College to this day.

[www.ucl.ac.uk/about-ucl](http://www.ucl.ac.uk/about-ucl)



UCL portico with banners for the Olympics London 2012  
Photo: M. Hess



## UCL Photogrammetry, 3D Imaging and Metrology Research Centre

The photogrammetry and imaging team is one of three groups within the Department of Geomatics, University College London, which is involved in the science, engineering and modelling of measurements and data relating to Earth and its environment.

The 3D Imaging and Metrology Research Centre (UCL CEGE) focuses on the acquisition and analysis of accurate and reliable measurements using techniques such as imagery and laser scanning, applying these to natural and man-made objects, across a range of application areas.

Research group profile: <https://iris.ucl.ac.uk/research/group/showgroup?groupId=1463>

See also [www.ucl.ac.uk/geomatics/research](http://www.ucl.ac.uk/geomatics/research)

## UCL Museums and Collections [www.ucl.ac.uk/museums/](http://www.ucl.ac.uk/museums/)

UCL's outstanding collections cover a wide variety of disciplines, reflecting the range of the university's academic work. Four collections — the UCL Art Museum, the Grant Museum of Zoology, the Petrie Museum of Egyptian Archaeology, and the Geology Collections — are open to the public. Other collections are primarily for teaching and research but can be seen and studied by appointment. Museums and Collections support teaching and learning, undertake and support research and run a wide range of events and outreach programmes.

## UCL Petrie Museum of Egyptian Archaeology

UCL Petrie Museum has a world-renowned Egyptology collection. Based on the wide-ranging finds and excavation records of the famous Egyptologist Sir Flinders Petrie, it is one of the most representative collections of life in ancient Egypt. The Petrie Museum houses an estimated 80,000 objects, making it one of the greatest collections of Egyptian and Sudanese archaeology in the world. It illustrates life in the Nile Valley from prehistory through the time of the pharaohs, the Ptolemaic, Roman and Coptic periods to the Islamic period.

The Petrie Museum is richest in the personal items that illustrate life and death in ancient Egypt. The collection also includes the world's earliest surviving dress, decorative art from Akhenaten's famous city of Amarna and one of the largest and finest collections of Roman mummy portraits. Open to the public Tuesday to Saturday 13.00 – 17.00. Admission is free.

[www.ucl.ac.uk/museums/petrie](http://www.ucl.ac.uk/museums/petrie)



Left: UCL Malet Place. Photo: M. Hess. Right: Visitors to the Petrie Museums of Egyptian Archaeology, UCL Museums and Collections. Photo: Gary Black

## 3D Petrie project : 3D imaging research, digital applications and use of new technologies in the museum



3D Petrie project website <https://www.ucl.ac.uk/museums/petrie/research/3dpetrie>.

Follow us on Twitter [@3Dpetrie](https://twitter.com/3Dpetrie)

### Mission statement

To prove the viability of high quality 3D images of museum collections for engaging a range of audiences through the production of 3D models of Petrie Museum artefacts and the development of end-user digital 3D applications.

3DPetrie interactive exhibitions combine high resolution 3D colour scanning of museum objects with rich investigative story telling.

## Petrie Partners

The Petrie Museum is part of a pioneering joint initiative with Arius3D (Canada) and IET (Ireland), 3D Encounters, which aims to undertake ground-breaking interactive exhibitions and to build an outstanding 3D image library. Arius3D is a pioneer in the fields of 3D digital recording and interactive exhibitions.

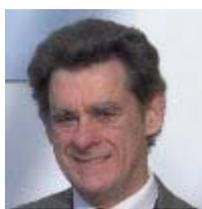


Interactive applications in the Petrie Museum

## Who is who at the COSCH Workshop?



**Kirk Martinez** is a Reader in Electronics and Computer Science, at the University of Southampton. He has a PhD in Electronic Systems Engineering from University of Essex. He previously ran the MA in Computer Applications for History of Art in Birkbeck College London while working on a variety of EU imaging projects. These included VASARI (High resolution colorimetric imaging of art), MARC (image and print), ACOHIR (3D objects), and Viseum (IIPimage viewer) projects. He went on to content-based retrieval and semantic web applications for museums (Artiste, SCULPTEUR, eCHASE). He also works on Sensor networks for the environment: Glacsweb (running since 2003 with 4 grants) Semantic sensor web (FP7). He founded the VIPS image processing library and co-designed RTI imaging systems as part of an AHRC project. Webpage <http://users.ecs.soton.ac.uk/km/>



**Lindsay MacDonald**. Research Fellow. His current research is comparing the performance of a colour laser scanner with multi-image digital photography for the capture of 3D datasets. He is characterising both technologies in terms of tone, colour, MTF and noise, and modelling of the bidirectional reflectance distribution function (BRDF) of object surfaces. With degrees in both science and engineering from Sydney University, Lindsay previously worked in industrial R&D for 22 years developing software and algorithms for graphic arts imaging systems, and then for 15 years as Professor of Digital Media in three UK universities. Lindsay is a Fellow of five professional societies (IEE, BCS, RPS, IS&T and RSA), and a Life Member of the Colour Group (GB). He is also a member of the International Executive Committee of the International Colour Association (AIC), and was Co-Chair of 12th AIC Congress, held in the UK in July 2013. He has also been involved for many years with the Electronic Visualisation and the Arts (EVA) Conference, and is author of eight books on the application of colour image science to cultural heritage. He was leader of the EU FP5-IST project VITRA ('Veridical imaging of transmissive and reflective artefacts').



**Jan Boehm** is Senior Lecturer in Photogrammetry and 3D Imaging at University College London where he teaches courses on Mapping Science, Terrestrial Data Acquisition, Airborne Data Acquisition. He has a background in Computer Science, for which he holds a Masters' degree from the University of Massachusetts, Dartmouth, USA, and a Diploma degree from the University of Stuttgart, Germany. Jan holds a doctoral degree from the department of Aerospace Engineering and

Geodesy at the University of Stuttgart. He is co-chair of the working group V/4 on Image-based and range-based 3D modelling of the International Society for Photogrammetry and Remote Sensing (ISPRS). He serves on the Association of German Engineers (VDI) panel for optical metrology, where he works on the VDI 2634 guidelines. Jan is also council member of the RSPsoc (Remote Sensing and Photogrammetry Society, UK). He has published extensively on the topics of close-range photogrammetry, 3D point cloud processing and robotics. In past projects he successfully leveraged the productivity in terrestrial laser scanning by introducing automation to georeferencing, with registration using intensity features and automated modelling strategies. His current research projects include creating building information models (BIM) from point clouds, detailed façade modelling from terrestrial and mobile laser scanning and developing measurement systems from low-cost, natural, user-interface sensors. Webpage: [www.ucl.ac.uk/3dim/](http://www.ucl.ac.uk/3dim/)



**Mona Hess** is Research Assistant at UCL Museums and Collections and a PhD candidate at the UCL Photogrammetry, 3D Imaging and Metrology Research Centre (UCL Civil, Environmental and Geomatic Engineering). After finishing her architecture studies in Germany and an internship in an architectural office in Montreal, Canada, Mona pursued a Master's degree in Heritage Conservation in Bamberg/Germany, where she focused on CAD, 3D imaging techniques and databases, especially in the field of conservation science and in architectural conservation. Her Graduate Internship in 2006/07 at the Getty Conservation Institute in Los Angeles/USA gave her working experience in international projects. Specialised in 3D colour imaging, digital heritage and replica for museum objects, she has taken on projects within UCL (E-Curator '3D colour scans for remote object identification and assessment', workshop 'Life cycle of a digital object'), for museums in London (British Museum, Science Museum) and also internationally (Università degli studi Lecce/Italy, CULTNAT Egypt). Currently she is actively involved with the 3DPetrie project.

Webpage <https://iris.ucl.ac.uk/research/personal/index?upi=MHESS91>



**3DPetrie team:** Ivor Pridden: 2D and 3D imaging technician, conservator, collections imaging; Tonya Nelson is the Petrie Museum Manager; Giancarlo Amati is 3D Digital Developer and Research Associate. Margaret Serpico (absent), Mona Hess and Stuart Robson are also part of the team.

[www.ucl.ac.uk/museums/petrie/research/research-projects/3dpetrie/about-us](http://www.ucl.ac.uk/museums/petrie/research/research-projects/3dpetrie/about-us)



**Stuart Robson** is Professor of Photogrammetry and Laser Scanning at University College London, where he leads the Photogrammetry, 3D Imaging and Metrology Research Group. Building on a 1st class Honours. Degree in Photographic Sciences from the Polytechnic of Central London his career spans some 25 years of applied imaging and optical metrology. He is an enthusiast with a wealth of interdisciplinary knowledge gained from experiences in aerospace, nuclear engineering and fisheries research to heritage building and museum object recording. Collaborations include the British Museum, the Science Museum, Tate, Courtauld Institute of Art in London, as well as NASA, Airbus, NPL, Rolls Royce, UKAEA and CSIRO. Stuart was recently made a Fellow of the Royal Institution of Chartered Surveyors. Webpage: <https://iris.ucl.ac.uk/iris/browse/profile?upi=SROBS78>