



UNIVERSITY OF
CAMBRIDGE



McDonald Institute for
Archaeological Research

Marie Skłodowska-
Curie Actions



ULL

Universidad
de La Laguna

International workshop on GIS, Remote Sensing and Geoarchaeology

14-19 November 2019
Department of Archaeology, University of Kerala

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In recent years the study of **past archaeological landscapes** has experienced an unprecedented improvement thanks to the advances in quality and resolution of scientific instruments. From remote sensing-based studies covering **large areas** to the **microscale observations** of geoarchaeological investigations, archaeologists have today access to a range of distinct but complementary techniques and data analyses. The integration of **interdisciplinary** methods has become a key aspect in archaeological research, as well as the inclusion of multi-proxy, multi-scalar and multi-temporal data.

Within this perspective, the workshop aims to provide a basic introduction into the broad discipline of landscape archaeology. A selection of talks will reflect the expertise of the invited speakers in different **archaeological contexts** (ranging from Neolithic pastoral contexts, the Indus Civilisation, the classic Mediterranean world or the nomadic empires in Mongolia) and distinct **ecological settings** (including dry deserts, green steppes, mountains and caves).

Hands-on exercises will focus on the multi-scale applications of 1) **GIS and remote sensing**, including geospatial analyses and data visualisation, and 2) **geo-ethnoarchaeology**, including applications of soil micromorphology and soil biochemistry. The workshop intends to offer a starting point for students wishing to expand their current research into a more quantitative landscape approach.

INVITED SPEAKERS

Francesc C. Conesa, *McDonald Institute for Archaeological Research, University of Cambridge*
Arnau Garcia-Molsosa, *McDonald Institute for Archaeological Research, University of Cambridge*
Natalia Égüez, *Archaeological Micromorphology and Biomarker Research Lab, University of La Laguna*

COLLABORATORS

Cameron Petrie, *McDonald Institute for Archaeological Research, University of Cambridge*
Hector Orengo, *Catalan Institute for Classical Archaeology*
Adam Green, *McDonald Institute for Archaeological Research, University of Cambridge*
Agustin Lobo, *Spanish National Research Council*

ORGANIZERS

Rajesh S. V., *Department of Archaeology, University of Kerala*
Abhayan G.S., *Department of Archaeology, University of Kerala*

WORKSHOP PROGRAMME

Thursday 14

- 9:30-11h** **Introduction to workshop** (FC)
 Introduction to Landscape Archaeology (AG)
- 11-11:30h* *Tea break*
- 11:30-13h** **Satellites and drones to study past landscapes** (FC)
 Historical Survey of India maps (AG)
- 13h-14h* *Lunch break*
- 14-16:30h** **QGIS practical:**
 1. Forms and data collection using mobile platforms (GisCloud)
 2. Georeferencing historical maps (Kutch/Kerala)
 3. Feature extraction (topography, hydrology, land cover)
 4. Data visualization
 5. Comparison with archaeological datasets (Kutch/Kerala)
- 16:30-17h* *Tea break and Q&A*

Friday 15

- 9:30-11h** **Presentation of case studies:**
 1. The Cholistan Desert (FC)
 2. Rivers and settlements (Punjab/Catalonia) (AG)
 3. Advances in UAVs and automated field survey (AG)
- 11-11:30h* *Tea break*
- 11:30-13h** **Get started with spatial datasets: Sentinels and Google Earth Engine** (FC)
- 13h-14h* *Lunch break*
- 14-16:30h** **Sentinels and Earth Engine practical:**
 1. Explore ISRO Bhuvan products
 2. Sentinel Data Hub and seasonal change (Kutch/Kerala)
 3. Basic GEE coding: visualise and download Indian DEMs
 Tea break and Q&A

Saturday 16

- 9:30-11h** **QGIS practical**
 1. Data integration
 2. DEM visualization and palaeocanals
 3. Site visibility and cost analyses (Kerala beacons)
- 11-11:30h* *Tea break*
- 11:30-13h** **QGIS practical**
 1. Map composer and landscape interpretation
- 13h-14h* *Lunch break*
- 14-16:30h** **Supervisions and Q&A**
- 16:30-17h* *Tea break*

Sunday 17

- 9:00-14h** Field trip to archaeological site (Department of Archaeology)

Monday 18

- 9:30-11h** **Current approaches to geoarchaeology and ethnoarchaeology (NE)**
11-11:30h *Tea break*
11:30-13h **Presentation of case studies:**
1. Mobile pastoral sites from the Sahara to Mongolia (NE)
2. Prehistoric palimpsests: from fire technology to dung deposits (NE)
3. Ethnoarchaeology in high-mountain environments (AG)
13h-14h *Lunch break*
14-16:30h **Geoarchaeology practical:**
1. How to interpret soil profiles, thin sections... and poo!
16:30-17h *Tea break and Q&A*

Tuesday 19 (*schedule tba depending upon available time**)

- 9:30-11h** **Presentation of group exercises**
11-11:30h *Tea break*
11:30-13h **Final discussion and Q&A**

*Other hands-on training depending upon time:

- Introduction to **R** (e.g. explore archaeological datasets and descriptive statistics)
- PhotoScan **3D** models from photographs/UAVs
- Expand **GEE** data visualisation and analyses (e.g. band combination, SMTVI indexes, classification)

Required software

Links of latest open-source software versions to be distribute to participants shortly before the workshop. All exercises and training data will be hosted in GitHub.



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