

You are invited to

The Physics Department Colloquium

Entropology: an information-theoretic approach to understanding archaeological data

Professor Ray Rivers

Imperial College London (ICL), The UK

In collaboration with: Paula Gheorghide (U of Helsinki), Vaiva Vasiliauskate (ETH Zurich), Henry Price (ICL), Sasha Diachenko (U of Kyiv), Tim Evans (ICL)

In this talk we shall look for ways in which archaeological datasets can give information about the society that produces them, as exemplified by Late Bronze Age Cretan ceramic assemblages catalogued by Dr Paula Gheorghide from what might loosely be termed the ‘Minoan-Mycenaean transition’. Such archaeological data is highly multivariate and to proceed it is necessary to implement a dramatic reduction in the dimension of artefact space. Identifying the artefacts with the labels in this reduced space lets us think of assemblages as ‘word-heaps’ whose information content can provide clues about Cretan society. We analyse our assemblages using syntactic tools taken from ecology (think of our word-heaps as the labels of insects in bug-traps), using different entropies and their induced diversities as a proxy to explore cultural change and separation (e.g. see [1] by one of us). This phenomenological approach is complemented with semantic tools taken from theoretical economics that use utility and which allow us to incorporate ‘value’ in our analysis (think of our word-heaps as the clothes labels of shopping trips). Because of limited data our results are incomplete but promising.

Reference:

[1] A Diachenko, I Sobkowiak-Tabaka, S Ryzhov. Approaching unification and diversity of pottery assemblages: The case of Western Tripolye culture (WTC) ceramics in the Southern Bug and Dnieper interfluvium, 4100 – 3600 BCE, *Academica Praeistorica* 47 (2020), 522-535 ..2

When: Wednesday, June 8, 2022 02:00 PM (Jerusalem)

Where: over Zoom

<https://us02web.zoom.us/j/88678382058?pwd=Rmx0dURkbHBzV2oxRS9xcjZnaFY3QT09>

Meeting ID: 886 7838 2058

Passcode: 652082