



**GENERAL INFORMATION  
SCIENTIFIC PROGRAMME  
BOOK of ABTRACTS**

**14<sup>th</sup> International Conference on Nuclear  
Microprobe Technology and Applications**

7 July 2014 - 11 July 2014

Palazzo del Bo and Centro Culturale San Gaetano - Padova, Italy

Organized by



In cooperation with



Under the patronage of



UNIVERSITÀ  
DEGLI STUDI  
DI TORINO



UNIVERSITÀ  
DEGLI STUDI  
DI PADOVA

## Friday 11 July 2014

### **Session 10 - Nuclear Microprobe Applications: Geology and Environmental Science - Auditorium (09:00-10:30)**

- Convener: Kristiansson, Per

time	title	presenter
09:00	Invited: High-Speed PIXE: Fast Elemental Analysis with a Colour X-Ray Camera	BUCHRIEGLER, Josef
09:30	Deuterium/Hydrogen microscopy in astrogeological material	ROS, Linus
09:50	Measurement of ratios of oxygen isotopes with pNRA at a microprobe beamline.	BORYSIUK, Maciek
10:10	Elemental compartmentalization changes of marine diatoms as a reporter of biogeochemical cycles	PINHEIRO, Teresa

### **Coffee Break - (10:30-11:00)**

### **Session 11 - Nuclear Microprobe Applications: Art and Archaeometry - Auditorium (11:00-12:30)**

-Convener: Castelli, Lisa

time	title	presenter
11:00	Invited: Evidences for an Afghan provenance of lapis lazuli utilized for glyptic by ancient Egyptian combining micro-PIXE and XRF results	RE, Alessandro
11:30	Correlation between ionoluminescence signal and the manufacturing conditions of the clay bodies of ancient tiles	CORREGIDOR, Victoria
11:50	Implementation of ionoluminescence in the IBA micromapping setup of AGLAE facility	PICHON, Laurent
12:10	A comparative study of Etruscan and Tartesian gold jewels by micro-XRF	SCRIVANO, Simona

### **Closing Remarks - Auditorium (12:30-13:00)**

## Session 11 – Nuclear Microprobe Applications: Art and Archaeometry / 124

### Correlation between Ionoluminescence signal and the manufacturing conditions of the clay bodies of ancient tiles

CORREGIDOR, Victoria <sup>1</sup>; RUVALCABA-SIL, J.L. <sup>2</sup>; PRUDÊNCIO, M.I. <sup>3</sup>; ALVES, E. <sup>4</sup>; ALVES, Luis <sup>1</sup>

<sup>1</sup> *Campus Tecnológico e Nuclear, IST, Universidade de Lisboa, Bobadela LRS - Portugal*

<sup>2</sup> *Instituto de Física, Universidad Nacional Autónoma de México, México*

<sup>3</sup> *C2TN, IST/CTN, Universidade de Lisboa, E.N. 10, 2686-953 Sacavém, Portugal*

<sup>4</sup> *IPFN, IST/CTN, Universidade de Lisboa, E.N. 10, 2686-953 Sacavém, Portugal*

**Corresponding Author:** vicky.corregidor@ctn.ist.utl.pt

The first uses of tiles appeared in the region of Mesopotamia, Egypt and Persia, being the beginning of an enduring tradition. From there, the tile manufacturing technology and utilization spread worldwide, usually through commercial circuits, and consequently the tile evolved and adapted to each culture and local styles.

Tiles are composed of a ceramic body covered by a vitreous glaze layer, which is usually coloured. The ceramic body acts as support of the glaze and its quality is essential for the good conservation and preservation of tiles along the centuries. Some of the factors which will affect the ceramic body quality are the kiln temperature during the manufacturing process and also the raw materials used. In this sense, underfired bodies will tend to be soft, and brittle when they are overfired. The initial clays will also affect the final composition of the ceramic body, with influence for example in its hardness or final colour.

In this work we propose the combination of non destructive IBA techniques to assess the manufacturing conditions of ancient tiles, specially the ceramic body. The conditions to be determined are:

- the identification of the raw materials through the study of the elemental composition by means of PIXE and PIGE techniques;
- the firing temperature through the study of the compounds or particular mineral phases present in the ceramic body by means of IL measurements.

In this work a set of tiles with quite different chronological production (from the XVII to the XX centuries) were analysed and the obtained results will be presented and discussed.

V. Corregidor acknowledges the funding support from the FCT - Ciência 2008 program and Banco Santander-Becas Iberoamérica fellowship. The work was partially supported by FCT-Portugal (PEST-OE/FIS/UI0275/2011).