

CENIMAT

CENTRO DE INVESTIGAÇÃO DE MATERIAIS

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INSTITUTO DE
NANOESTRUTURAS,
NANOMODELAÇÃO E
NANOFABRICAÇÃO

INVITED SPEAKER

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WEBINAR

ION BEAM ANALYTICAL TECHNIQUES:

FROM SEMICONDUCTORS TO CULTURAL HERITAGE ARTIFACTS

Ion Beam Analytical (IBA) techniques, individually or in combined use, are able to determine not only the elemental composition of a sample with high accuracy and sensitivity, but also the distribution of the elements over the surface and in some cases their depth profile through the first microns from the surface.

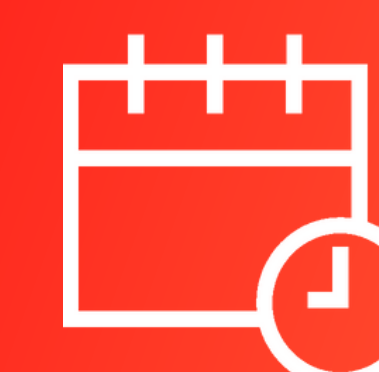
There is a wide variety of analytical problems and materials with many different applications that can be studied using IBA techniques. Some examples are: semiconductor alloys, metallic contacts, heterostructures, thin films, biological samples or cultural heritage artefacts.

The reasons of this wide field of applications are their versatility, their simple or non-existent sample preparation requirements and their non-destructive character. Regarding large samples or when sampling is not allowed (as in the cases of archaeological artefacts), or fragile samples which cannot stand vacuum conditions, the external beam setup can be used.

During this presentation gold will be element under study using IBA techniques. In the first case, gold has been used as a metal of choice to obtain ohmic contacts on CdZnTe (CZT) crystals, used to obtain room temperature radiation detectors. In a second example, gold has been used to obtain golden surfaces on specific parts of a silver artefact from the XVI century, which were applied following the leaf method.

In both cases, gold layer thicknesses and diffusion profiles were obtained whether using Rutherford Backscattering Spectrometry (RBS) by means of an 2 MeV alpha particle beam or by combining Proton Induced X-ray Emission (PIXE) and RBS data using the external proton beam set-up respectively.

Finally, IBA techniques were used to study some stains that appeared in gold commemorative coins minted by the Portuguese Mint House.



30TH

**APRIL, 2021
01:30 P.M.**



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