



Metals Conservation & Restoration Laboratory DCR FCT-UNL

Sara Leite Fragoso. DRC. FCT-UNL. 2006

Laboratory 47 - Metals C&R

Practical classes

- Conservator: Sara L. Fragoso
- 1) **Diagnose and conservation of metals** and their alloys. [theoretical classes: Prof. Rui Silva (DCM) - materials department]
- 2) C&R of cultural heritage - **Intervention** in metals and alloys



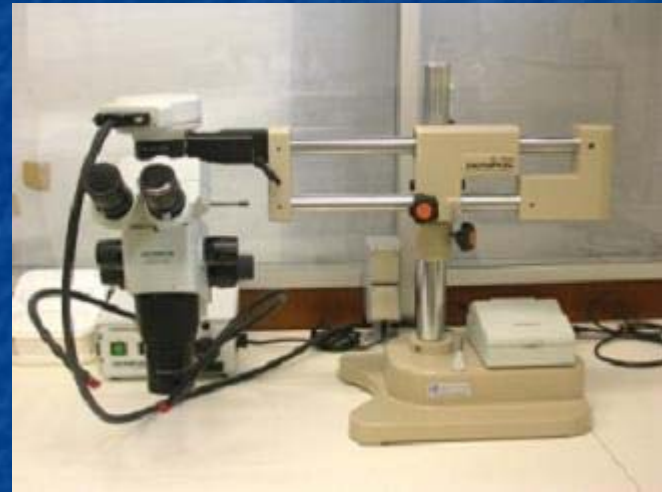
Practical classes on Diagnose and Conservation of Metals

- Prevention of deterioration
 - Handling
 - Micro-climate control
 - Conservation materials



Practical classes on Diagnose and Conservation of Metals

- Practical classes on characterization of deterioration problems in metals and their alloys



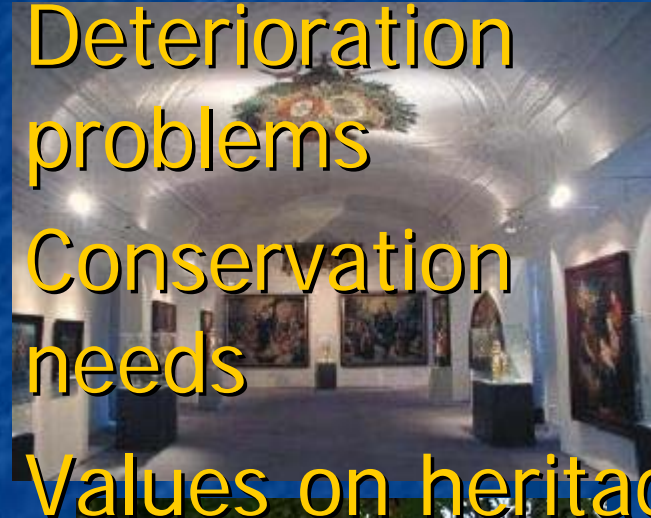
Practical classes on Diagnose and Conservation of Metals

- Outdoor activities

Study visits to:

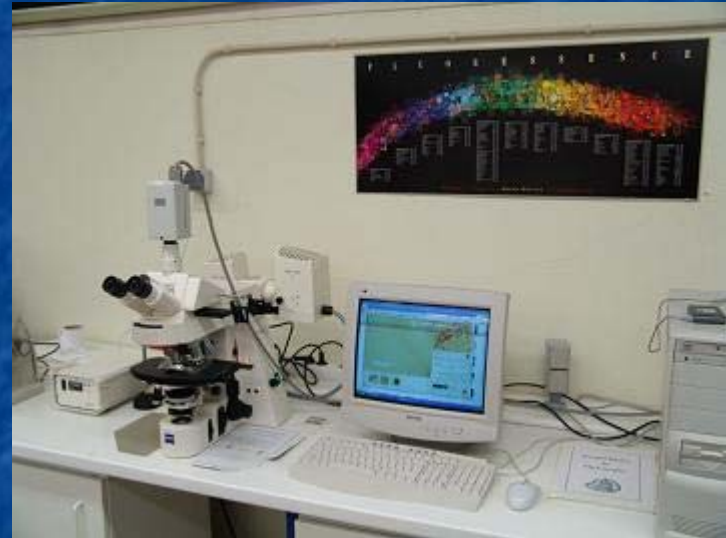
- Museums
- Palaces
- Churches
- Historical gardens
- Conservation centers

- Deterioration problems
- Conservation needs
- Values on heritage



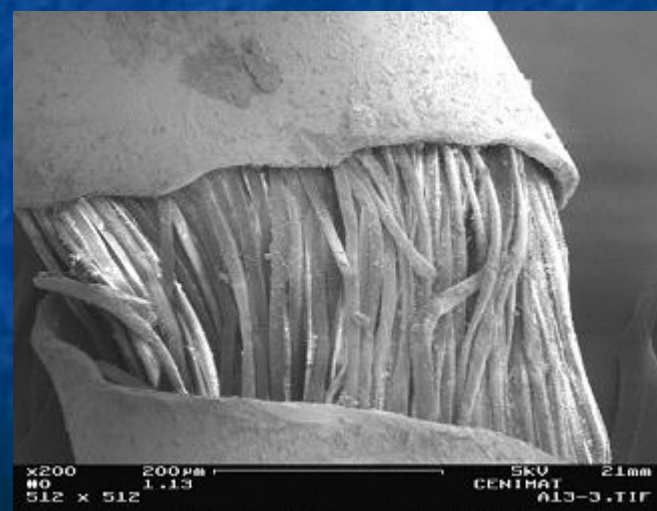
C&R of Cultural heritage - metals diagnosis and research

- Microscopy
- Metallography
- Digital Radiography



C&R of Cultural heritage - metals diagnosis and research

- SEM, Collaboration with DCM/ CENIMAT
- μ -DRX – Collaboration with IPCR



C&R of Cultural heritage - metals diagnosis and research

In the DCR scientific lab

- μ -XRF ArtTax & WinAxil
- FT-IR spectroscopy



C&R of historical metal objects



XVIII century gilded copper alloy



Oriental bronze turtle (Museum of Macao, Lisboa)

C&R of Archaeological metals



silver alloys



copper alloys



iron-C alloys

C&R of musical instruments

In collaboration with the, Museum of Music of Lisbon (IPM):



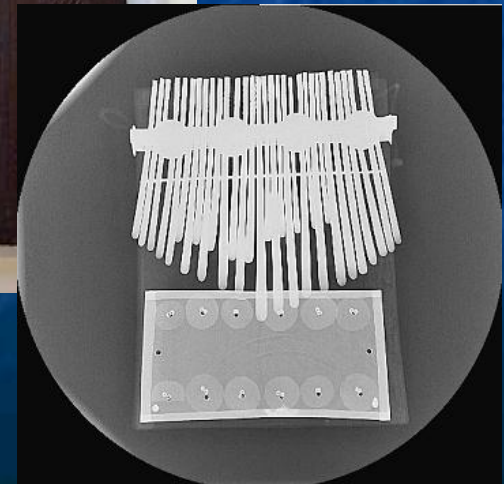
Chinese drum



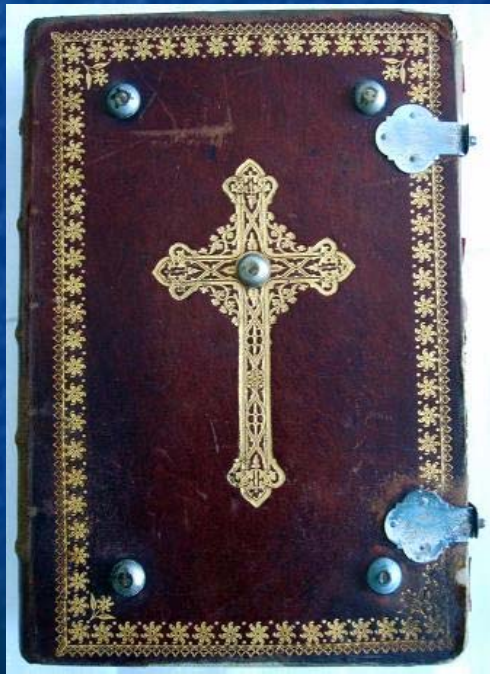
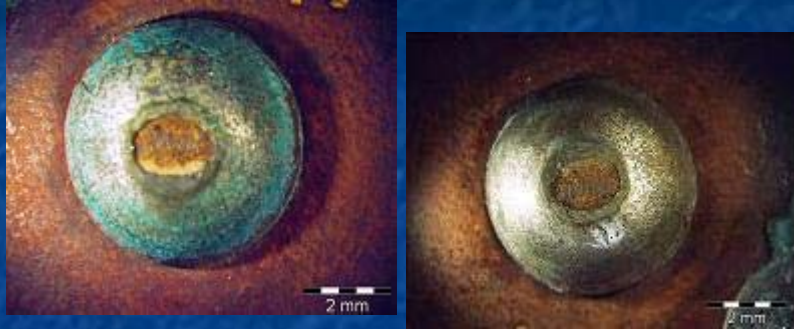
Portuguese Flute, sec. XX



Sansa, Angola



C&R of composites – books & objects



Missal

lady's hand bag, 1940



C&R of composites - textiles



Altar-piece or cloth, with embroidery in gilded silver thread

Research projects - Metals

- Tin deterioration.
DCR/ IPM / Museu
Machado de Castro
2005/2010



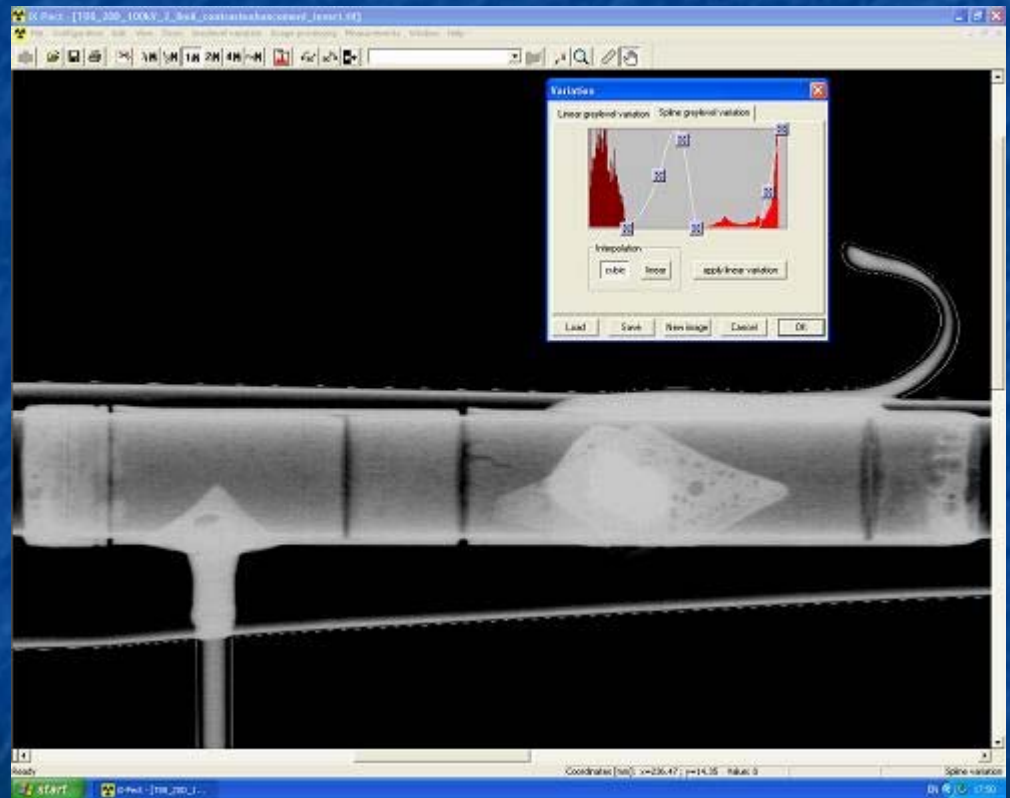
Research projects - Metals

- **Outdoor lead –
characterisation and
conservation DCR / IPPAR
/Palácio da Vila de Sintra
2006**



Research projects - Metals

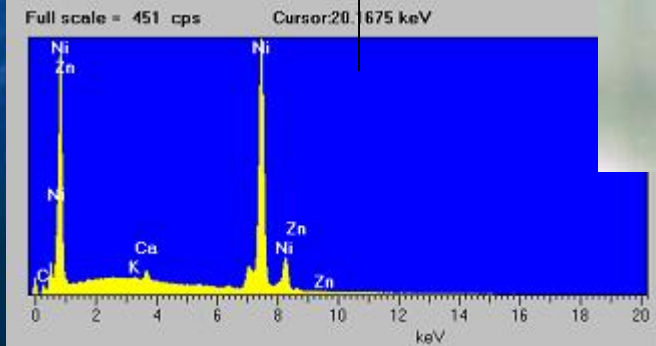
- Conservation of musical instruments
- Diagnosis and preventing conservation
- DCR / Ecomuseu Seixal 2005/2006



Digital radiography

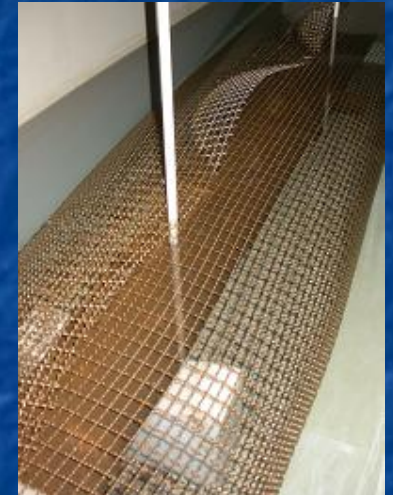
Research projects - Metals

- Archaeological copper alloys (roman) - characterisation and conservation DCR /Ecomuseu Seixal 2006



Research projects - Metals

- Desalination with sesquicarbonate w/ low polarization - Canons DCR/DCM/CNANS – Rui Silva, Filipa Pereira 2005/2006
- Electrochemical studies; and electrochemical reduction comparative study with passive stabilization



Thank you

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