



Ca' Foscari
University of Venice
Department of
Philosophy and
Cultural Heritage

LCM
Laboratorio di
Caratterizzazione
Materiali

THE ARMID@Venezia: A PROJECT POST-ACQUA GRANDA

Preservation of music sources at the «Benedetto Marcello» Conservatory of Venice

M. Baldan^{1*}, A. Martignon¹, S. Eupani¹, P. Da Col², D. Manzini³, G. Pojana¹

¹ Ca' Foscari University of Venice, Department of Philosophy and Cultural Heritage, Dorsoduro 3484/D, Venice, Italy

² Benedetto Marcello Conservatory of Venice, San Marco 2810, 30124, Venice, Italy

³ MADATEC S.r.l., Via Monte Grappa 18, 20060, Pessano con Bornago (Milan), Italy

*maela.baldan@unive.it



Formazione, Produzione, Ricerca

STATUS QUO

The exceptionally high tide on 12 November 2019 (*Acqua Granda*) heavily damaged the document collections at the library of the «Benedetto Marcello» Conservatory of Venice

PURPOSES

The **ARMID@Venezia** (*ARchivio Musicale e Iconografico Digitale A Venezia*) project aims to safeguard the documents collection of the Conservatory through

- Digitalization
- Virtual restoration (of the most damaged documents)
- Diagnostic investigation of the materials

THE WORKING TEAM

ARMID@Venezia is applying an interdisciplinary approach involving specialists from different disciplines

- art history
- archive systems
- history of music
- music philology
- digital restoration
- conservation science

OBJECT OF THE STUDY

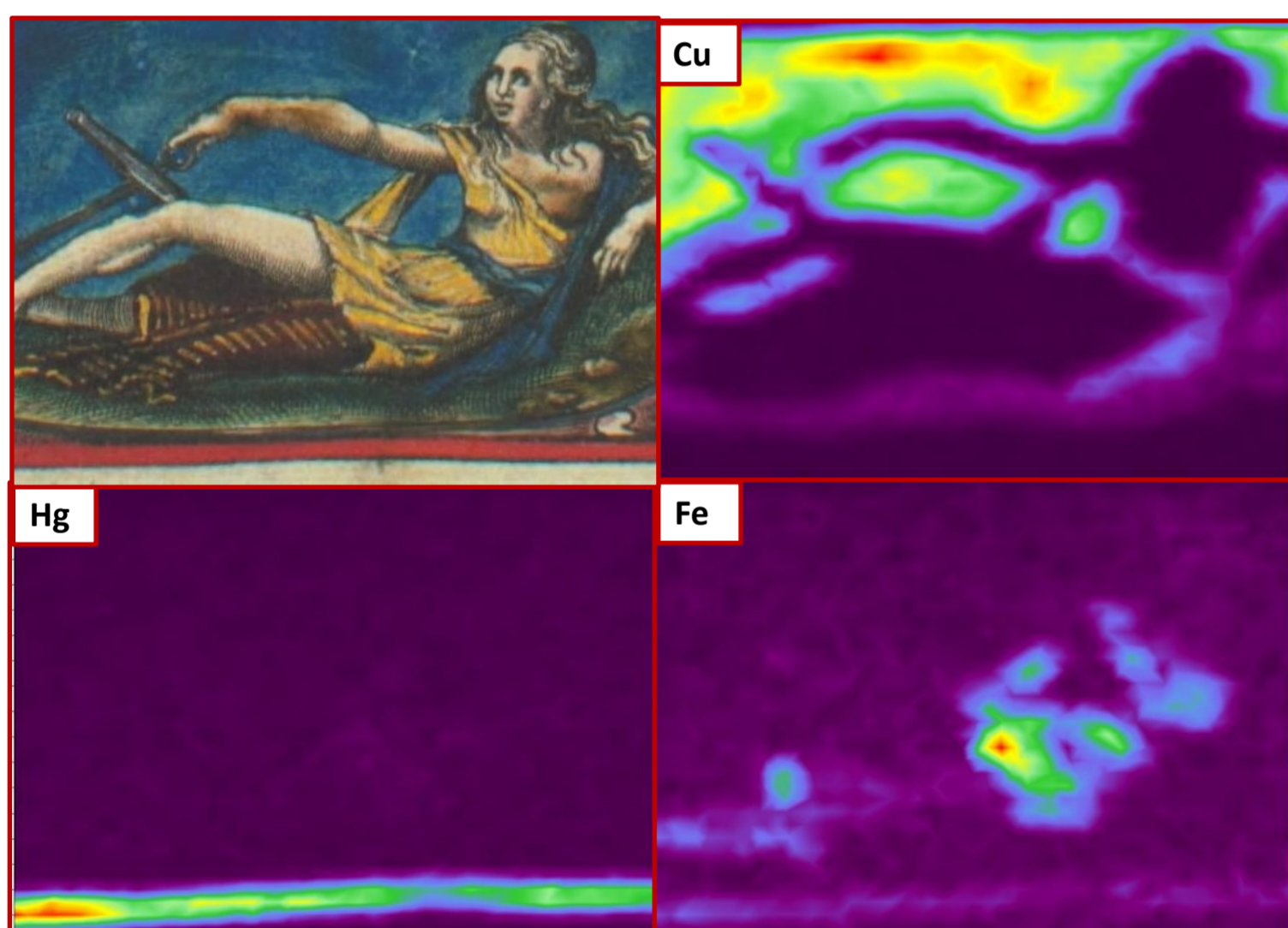
INVESTIGATED DOCUMENTS ARE MUSICAL SOURCES (XV-XIX Century)
DIVIDED INTO

HANDWRITTEN
SCORES

PRINTED
EDITIONS

DIAGNOSTIC INVESTIGATION OF PIGMENTS AND INKS

- Vis Imaging
- UVF Imaging
- UVR Imaging
- NIR Imaging
- IRFC (Infrared Reflected False Colour)
- Fiber Optics Reflectance Spectroscopy (FORS)
- μ -Raman Spectroscopy (μ -RS)
- X-ray fluorescence Spectroscopy (XRF)



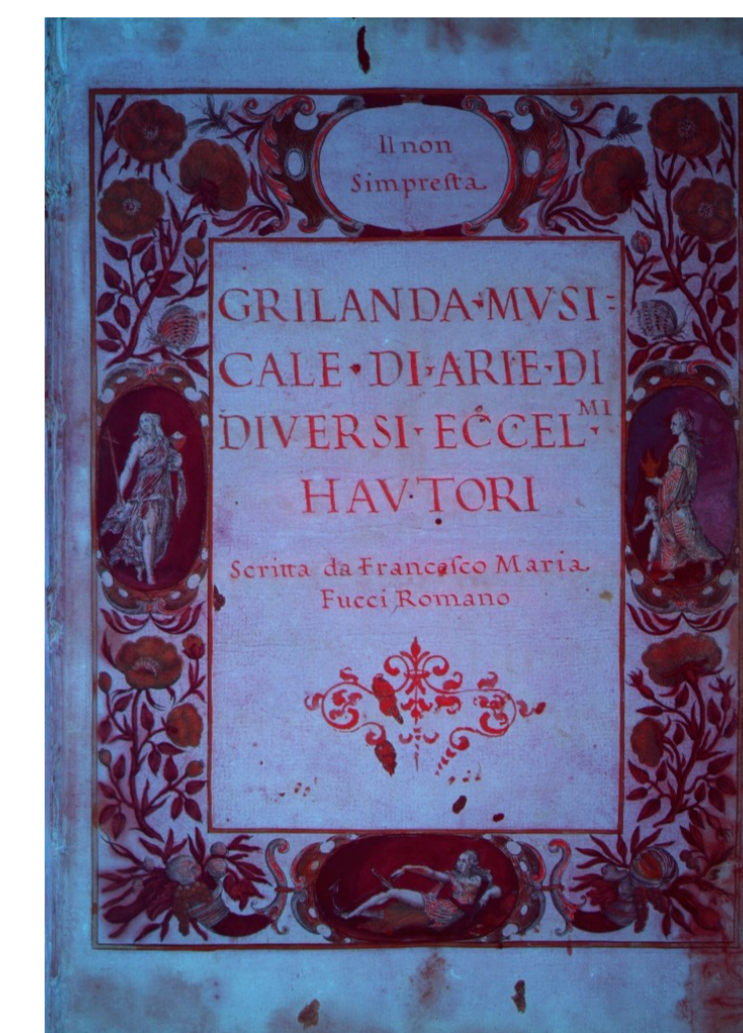
Grilanda musicale di arie di diversi eccellentissimi autori scritta da Francesco Maria Fucci romano (XVIIth Century)



IRON GALL INK
used for scores,
music, lyrics and
initial letters

Main source of degradation

- brown stains
around letters and
notes
- sulfuric acid
“burnings” on the
support



InfraRed False Colour (IRFC)
imaging

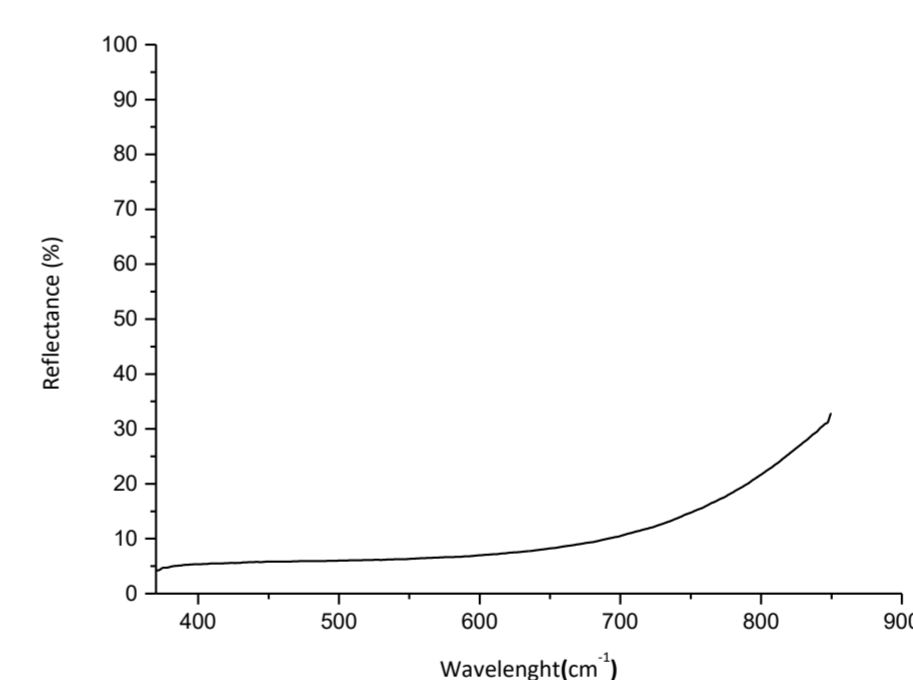


DIGITAL RESTORATION
Before(left) and after (right)

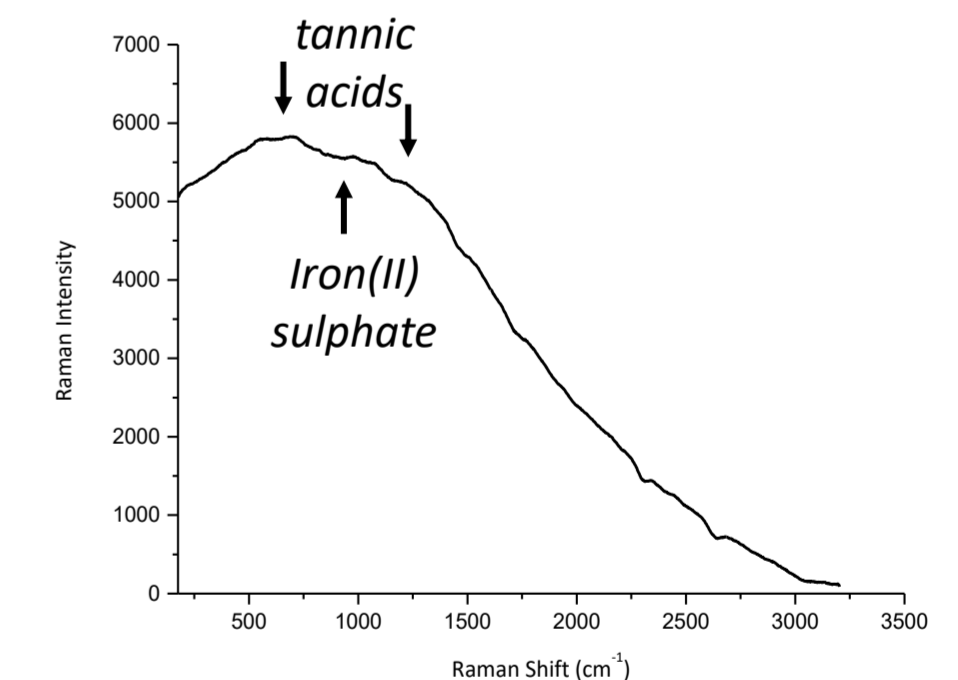
DIGITAL INTEGRATIONS OF HOLES AND MISSING NOTES



Iron gall ink identified by both Fiber Optics Reflectance Spectroscopy (FORS) and Raman Spectroscopy (RS) investigation in black areas



FORS spectrum shows an increase of reflectance in the red region because of the iron gall ink typical red-brown shade



Raman spectrum shows the typical large band at around 550 and 680 cm^{-1} and a shoulder at around 1350 cm^{-1} , due both to vibrations of the tannic acids, and a peak at 1095 cm^{-1} due to iron(II)sulphate

DIGITALIZATION OF DOCUMENTS

PHOTOGRAPHIC REPRODUCTION BY USING

- Hi-Res digital cameras (60-200 Mp)
- apochromatic macro lenses
- polarizer filter
- repro stands and high-CRI LED lightings
- white and colour calibration

Until now more than 1800 documents have been digitalized

VIRTUAL RESTORATION

THROUGH POSTPRODUCTION SOFTWARE

- Removal of stamps and chromatic alterations
- Repair of the original text in corroded areas
- Repair of the lacerated borders

FINAL REMARKS

- Digitalization of ancient documents is a recommendable practice to make widely available to the public prestigious collections of books and documents
- Virtual restoration is a valid alternative to physical restoration
- The selected set of non-invasive diagnostic techniques proved to identify pigments and inks in investigated documents without affecting original materials



FUTURE PERSPECTIVES

Virtual restoration of the most damaged documents as starting point for the evaluation of a physical restoration involving:

- de-acidification operations
- cleaning of brown stains
- repair of lacerated borders

More detailed analytical analyses could be carried out by means of invasive techniques, if micro-sampling will be allowed

Acknowledgments

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