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A multi-analytical study on two International Gothic paintings

Anna Delle Foglie¹, Anna Candida Felici²

¹Université libre de Bruxelles, Av. Franklin Roosevelt 50, 1050 Bruxelles (Belgium) anna.delle.foglie@ulb.be
²Department of Basic and Applied Science, "Sapienza" University of Rome, Via A. Scarpa 16 – 00161 Rome (Italy) annac.felici@uniroma1.it

The International Gothic Style is a term coined to identify the artistic language which unified Europe in the late fourteenth and early fifteenth century. This is a widespread phenomenon in various territories, from France to Italy and from Germany to Bohemia, which is defined by an extremely refined way of rendering forms as an expression of courtly patronage. The richness and elegance of the artworks is evident in the use of precious materials and pigments as in the case presented here of two paintings which were analyzed on-site by means of Energy Dispersive X-ray Fluorescence (ED-XRF) spectroscopy, Fiber Optics Reflectance spectroscopy (FORS) and near infrared (NIR) reflectography.

Michelino da Besozzo

Michelino da Besozzo (active about 1388-1450) was a Lombard painter and illuminator. He worked under the patronage of the Visconti Dukes in Pavia and Milan and he was recognized as an excellent artist by the humanists of his time. His style is characterized by exquisite elegance and his works also demonstrate great mastery in drawing and in the representation of nature in painting flowers and animals.



Near Infrared Reflectography



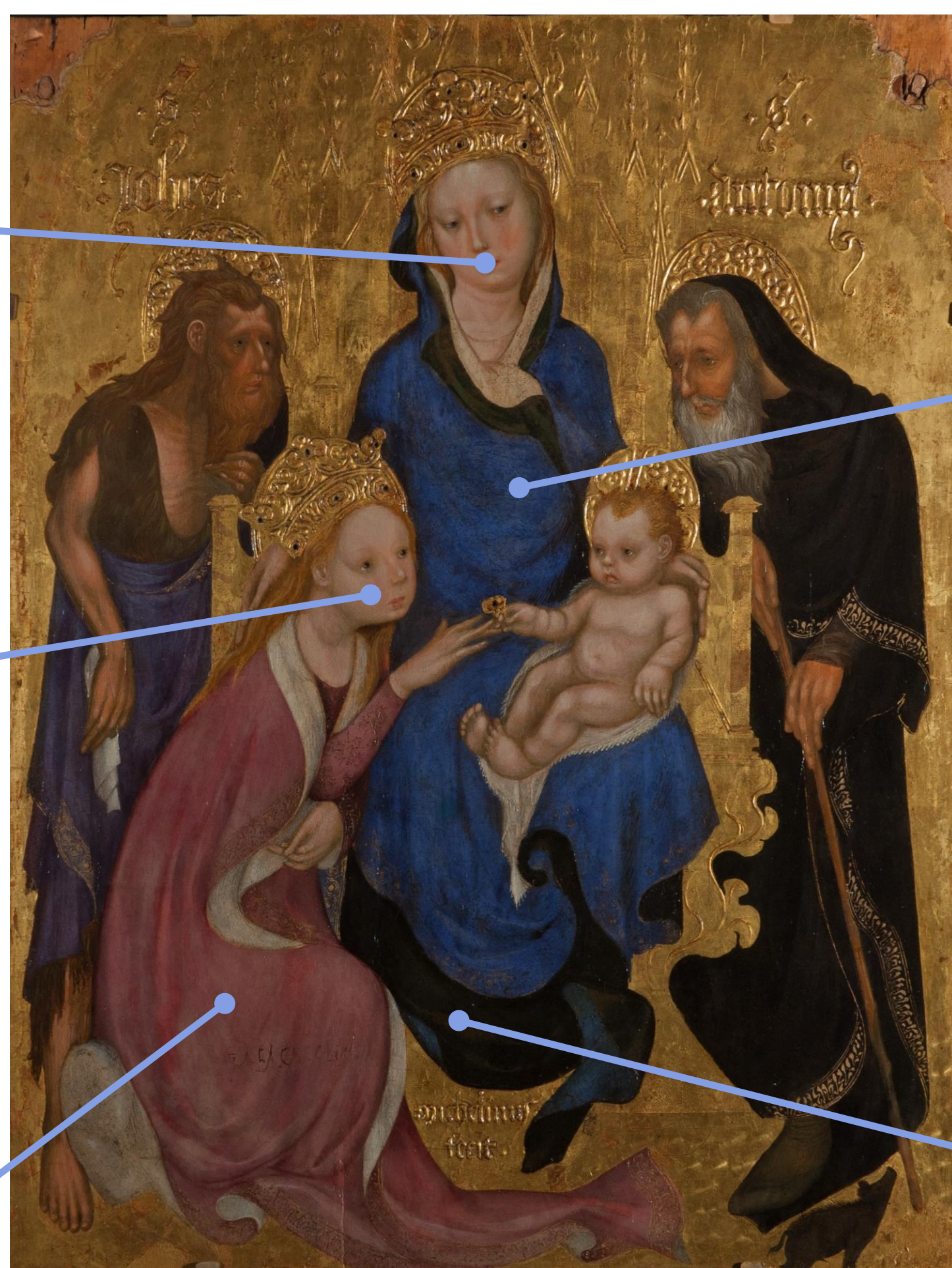
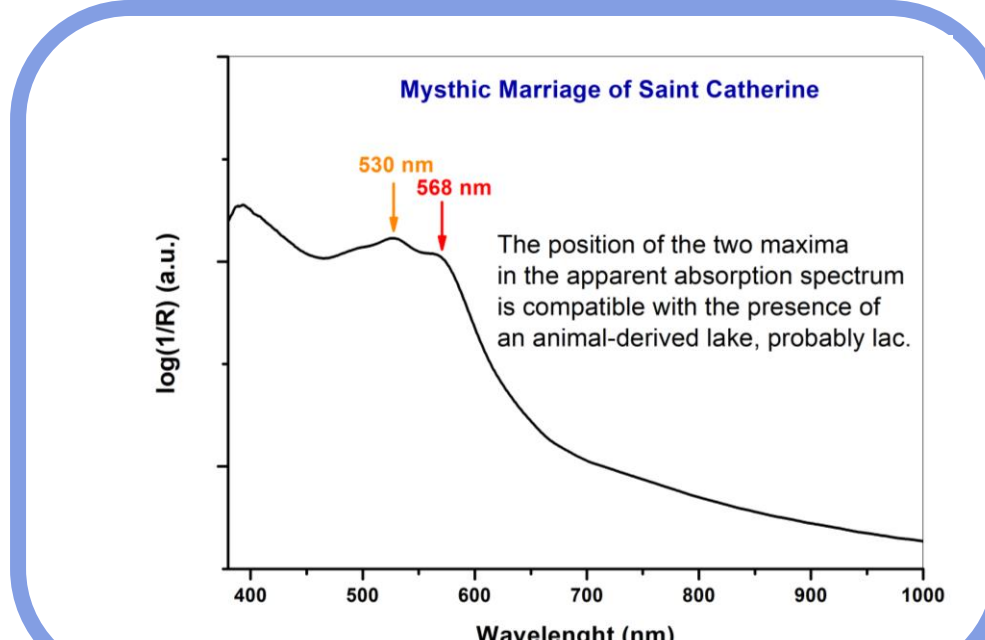
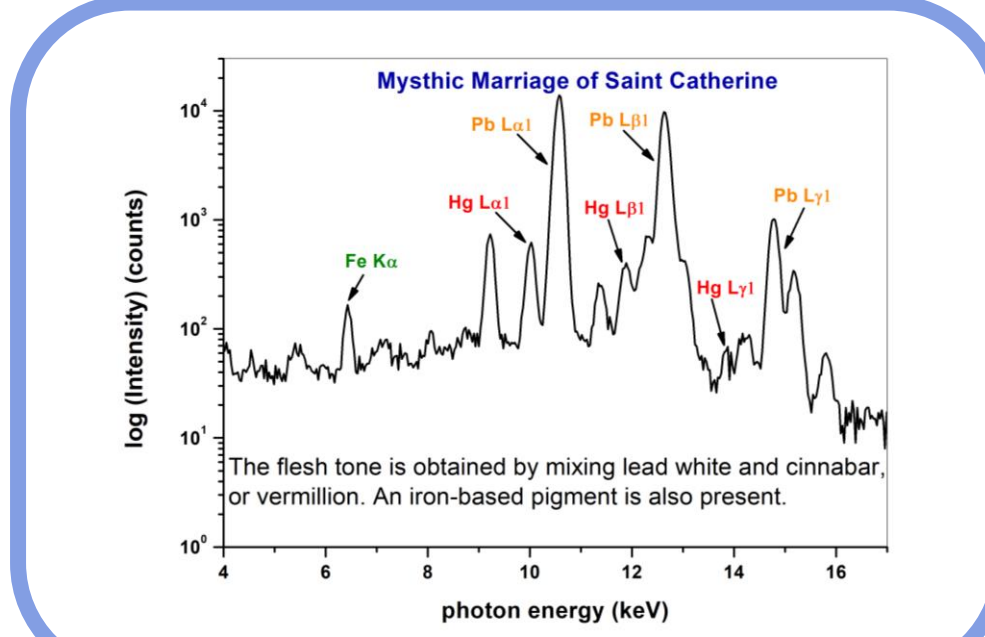
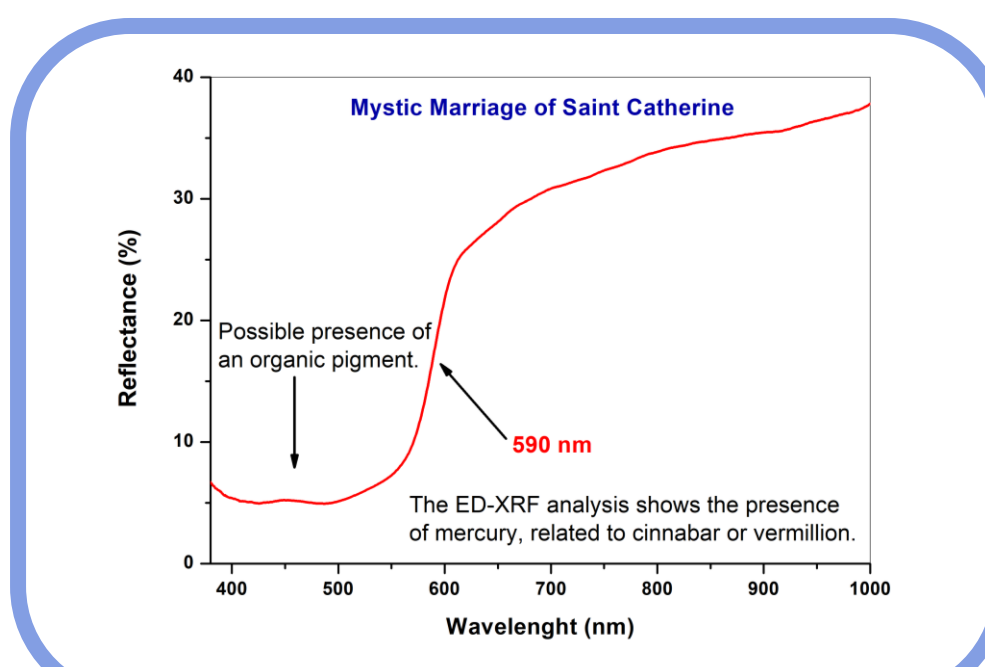
The Madonna of the Rose Garden, detail

The Mystic Marriage of Saint Catherine

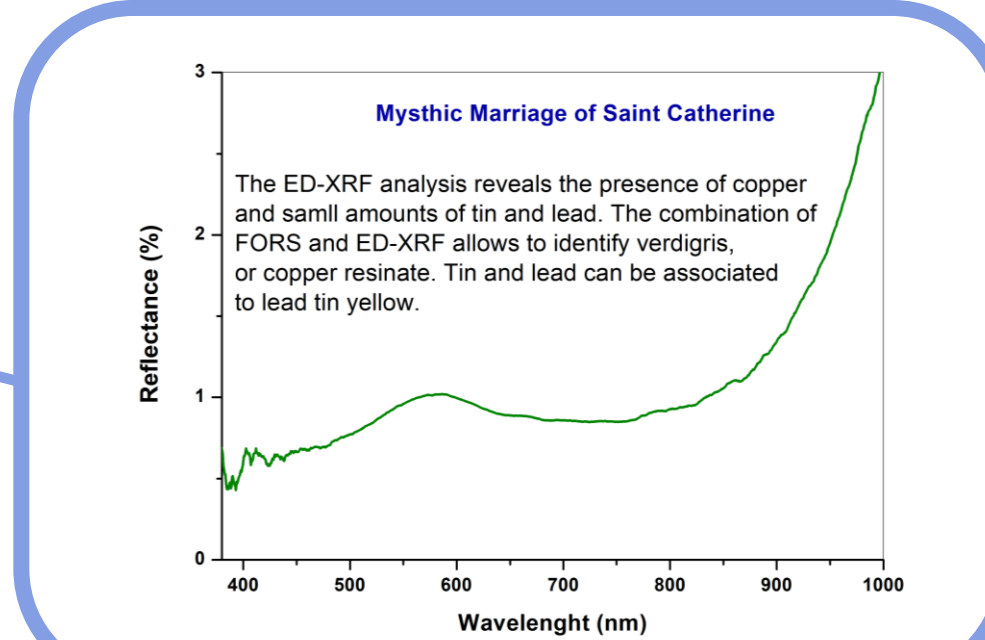
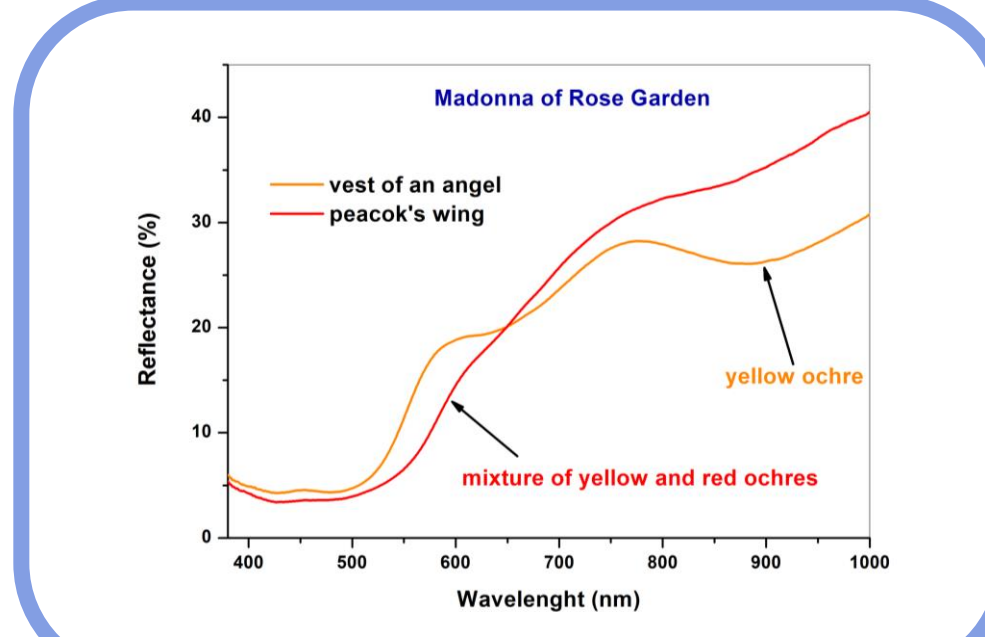
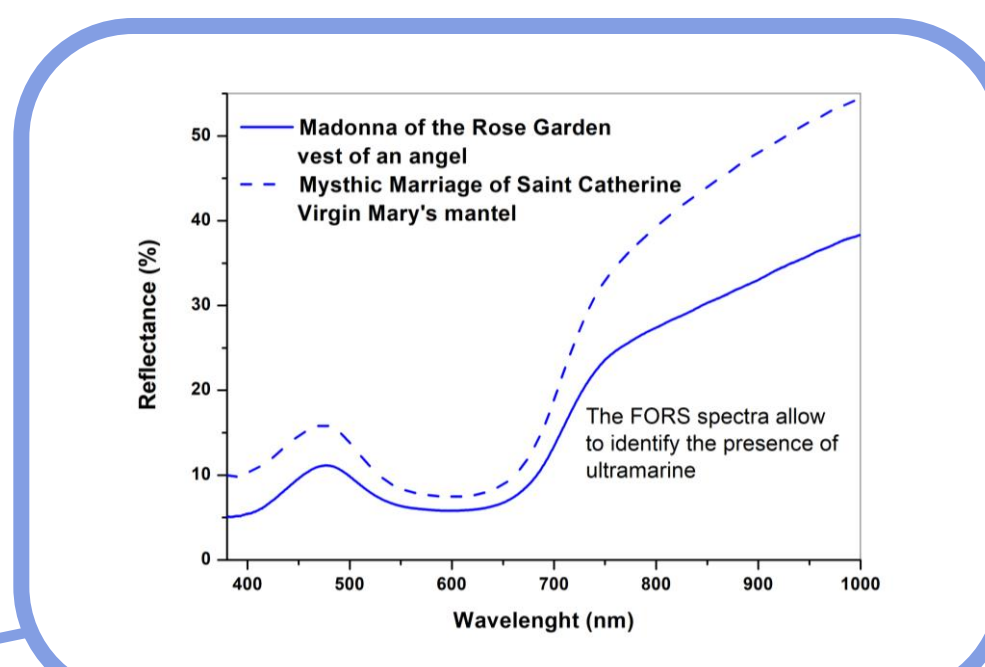
The Mystic Marriage of Saint Catherine of Alexandria with St. John the Baptist and St. Anthony the Abbot (Siena, Pinacoteca Nazionale, inv.171) is a work painted in tempera and gold on panel (75 × 58 cm), dated between 1400 and 1404. This is one of the most important masterpieces of the International Gothic period in Northern Italy and it is the only signed work by Michelino da Besozzo.

The Madonna of the Rose Garden

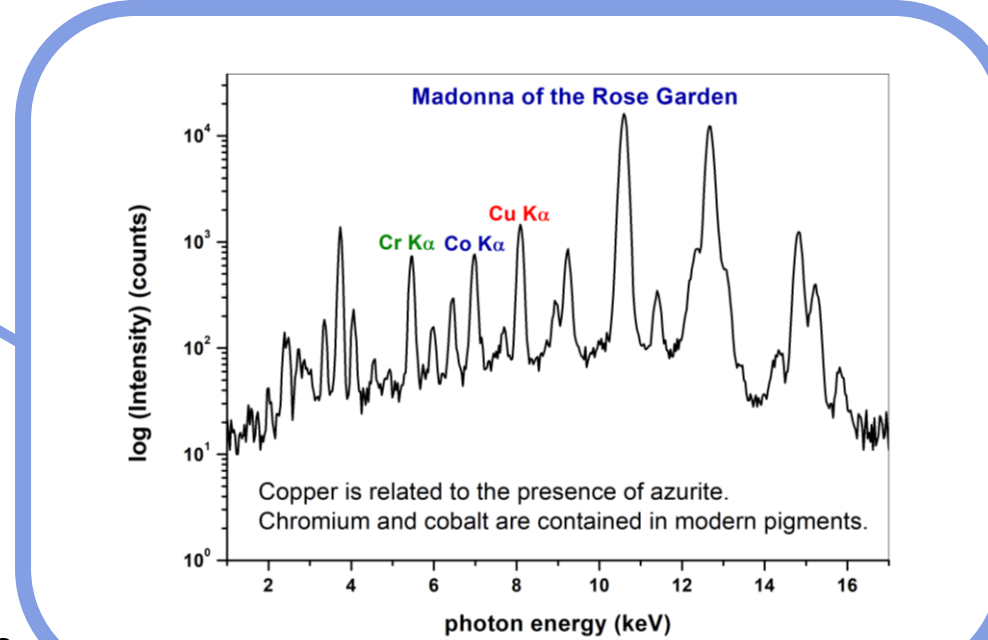
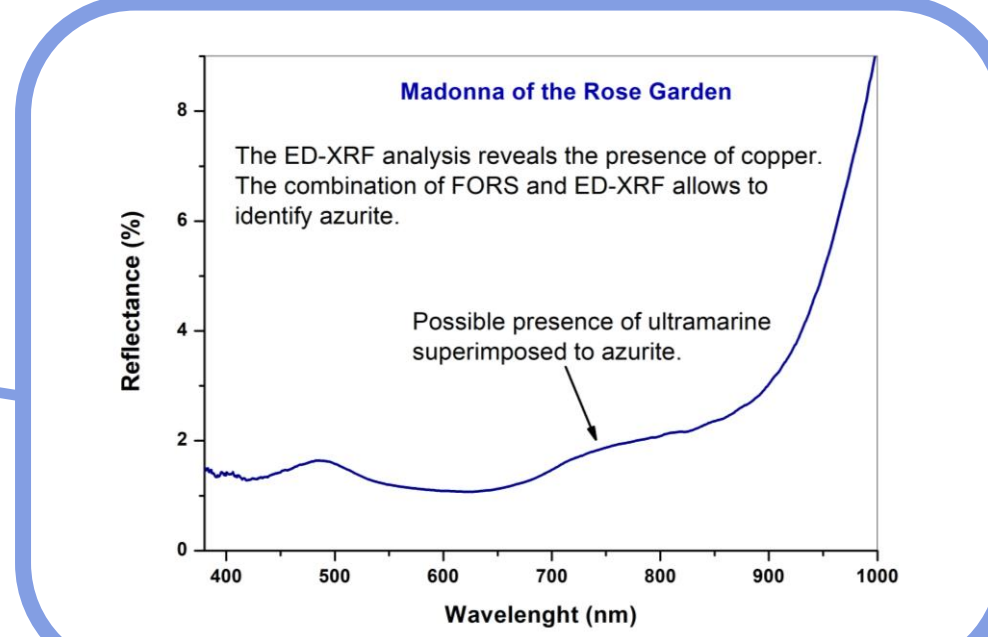
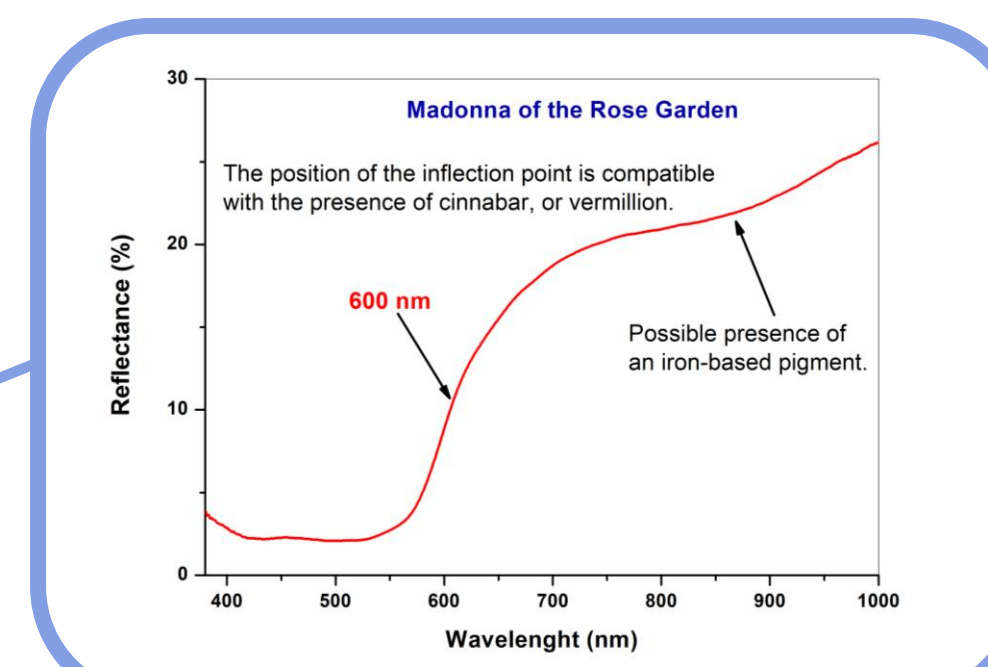
The Madonna of the Rose Garden (Verona, Museo di Castelvecchio, inv. 173-1B359) is a work painted in tempera and gold on panel transferred to canvas (130 × 95 cm) dated to around 1415-1420. The authorship by Michelino da Besozzo is still discussed by scholars, but research and recent technical analyses support this attribution to the artist.



Michelino da Besozzo, *Mystic Marriage of Saint Catherine* (Siena, Pinacoteca Nazionale, inv.171), with permission from Ministero della cultura. Foto Archivio Musei Nazionali di Siena.



Michelino da Besozzo (attr.), *The Madonna of the Rose Garden*, (Verona, Museo di Castelvecchio, inv. 173-1B359), Archivio fotografico (foto Gardaphoto, Salò)



Conclusions

The characterization of the color palette emerging from the results of the technical analyses shows the use of precious pigments, identified through the combined use of ED-XRF and FORS. The blue pigments found are ultramarine and azurite, the green pigments are verdigris or copper resinate, the red pigments are cinnabar or vermilion, also used in mixture with lead white to obtain the flesh tones. The analyses also show the use of yellow, green and red ochres. In *The Mystic Marriage of Saint Catherine* the presence of an animal-derived lake pigment, most probably lac, also known as Indian lake, was highlighted. In *The Madonna of the Rose Garden* the ED-XRF analyses confirmed the presence of some repaintings. Examination of *The Madonna of the Rose Garden* with near infrared reflectography showed the use of the underdrawings particularly in the definition of the drapery.

ED-XRF

Rhodium anode, V = 38 kV, I = 80 μA.
SDD, resolution 140 eV FWHM @ 5.9 keV, detection limit 10²-10³ ppm.

FORS

Halogen lamp, spectral range 380-1100 nm, resolution 0.8 nm, geometry 2x45°:0°.

NIR REFLECTOGRAPHY

Peltier cooled CCD camera, silicon detector, 3348x2574 pixels, pixel area 5.4 μm², analogic-digital conversion 16 bit, bandpass filter (FWHM 10 nm) at 1000 nm.



Delle Foglie, A.; Felici, A.C. The Iridescent Painting Palette of Michelino da Besozzo: First Results of Non-Invasive Diagnostic Analyses. *Heritage* **2024**, *7* (accepted)