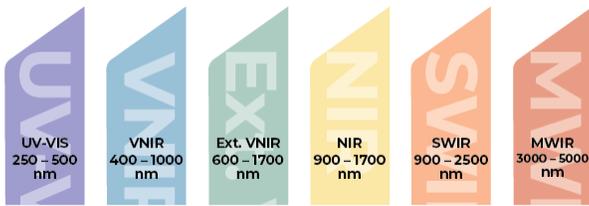


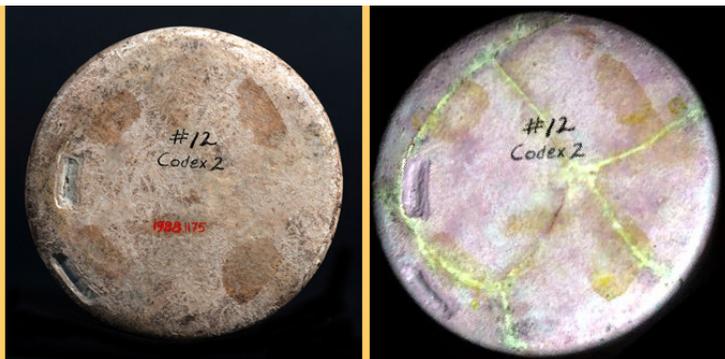
Spectral Imaging for Cultural Heritage

The science of spectral imaging in the infrared ranges is extremely valuable to the field of artwork analysis and conservation. It is a non-invasive, non-contact means by which complete spectral data is collected for every pixel within the field of view across hundreds of narrow, contiguous spectral bands within the range of interest.



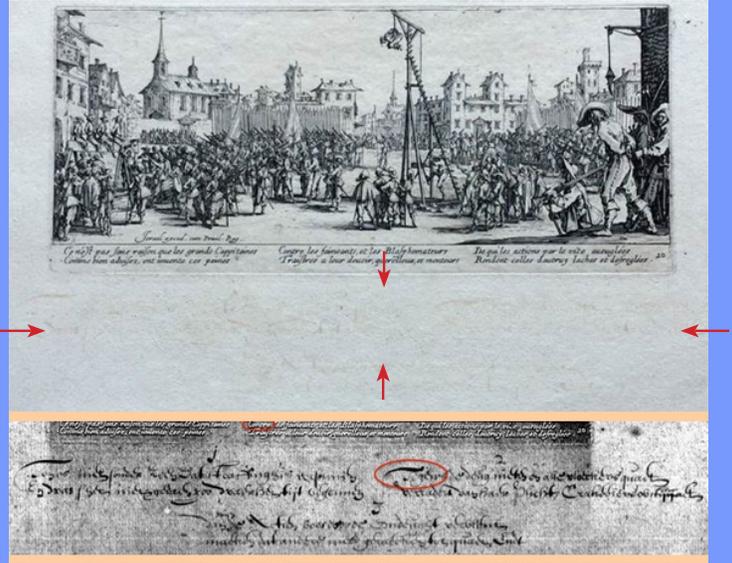
Mayan Vase

Chemical imaging shows that the vase bottom has significant repairs, and that the restoration and original can be separated in SWIR and are chemically different. The restoration has been painted over and is not visible to the eye. Such data can provide information on past repairs that may not be documented.



The Headwall Advantage

- Eliminate manual sampling
- Rapidly scan entire product
- No-contact scanning
- Non-destructive illumination



Historical Documents

The top image is a print of The Gallows, from a set of etchings by French artist Jacques Callot, titled "The Miseries of War." The collection is held by the Johnson Museum at Cornell University. Some very faint markings can be seen in the top image that are nearly invisible to the eye. Upon analyzing the VNIR hyperspectral data using Principal Components Analysis, it was evident in the bottom image that the markings were actually translations of the printed French captions.

Pigment and Binder

Mapping

The SWIR spectral image chart to the right shows there are two different binders in this painting, animal glue and egg. Knowing the nature of the organic pigment binders is important to understanding the chemistry of changes in the objects as well as doing repairs using matching materials.

Analyze Stone Destruction Over Time Using Hyperspectral Imaging



Qualitative change over time: Progression of salt-weathering at Huntington Mausoleum, San Marino, CA

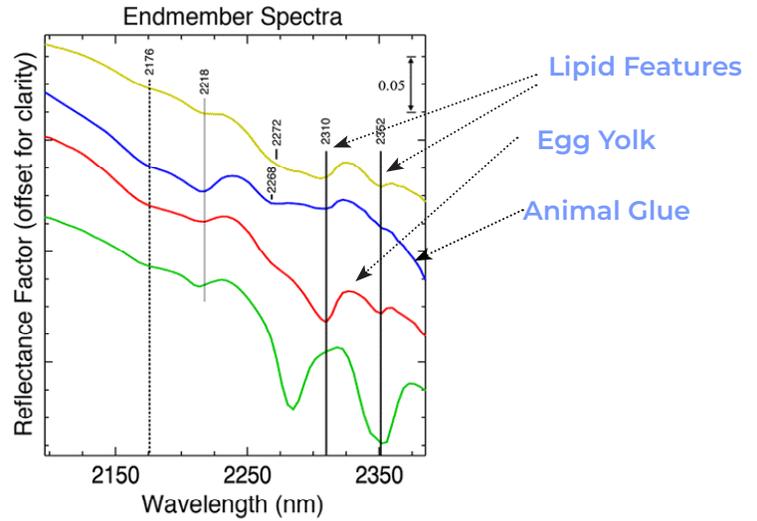
Spectral Imaging Detects Corrosion from Iron-Gall Inks



Ink drawing with iron-gall ink corrosion, which also appears black

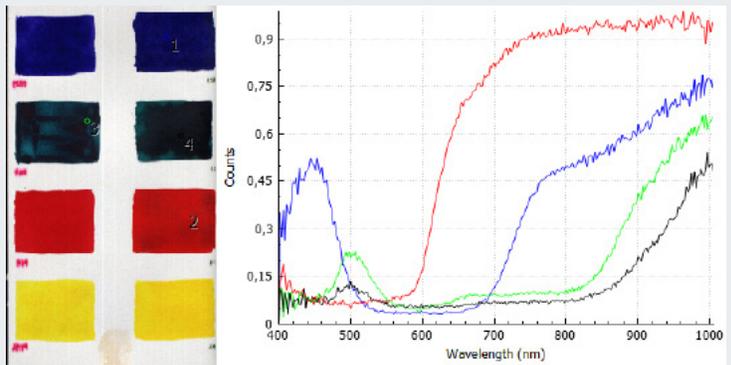
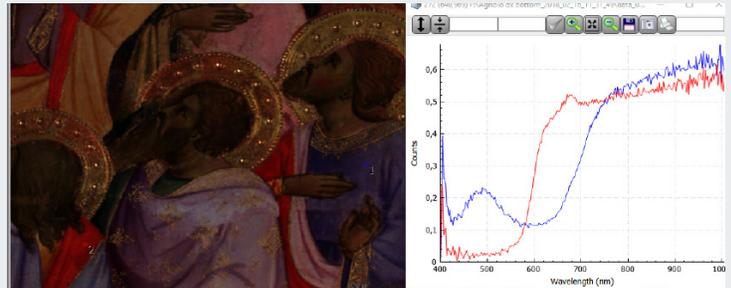
False color composite shows corroded areas in black, on lower right, and ink in red

APPLICATION NOTE



Dooley et al. Mapping of egg yolk and animal skin glue paint binders in Early Renaissance paintings using near infrared reflectance imaging spectroscopy. Analyst. 2013, Vol. 138 , pp. 4838-4848.

Identify Spectral Signals



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