

Revealing the Distribution of Painting Pigments

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The visible surface of a painting hides many important traces of the painting process. The substructure of a painting may include initial sketches of the composition of a painting, modifications made during the actual painting stage, as well as abandoned compositions covered by a different painting. The visualization of such hidden layers provides information on the condition, genesis and authenticity of an artwork.

Laboratory-based imaging techniques include x-ray radiography and infra-red reflectography. Main drawback are the insensitivity of x-rays to light element pigments and the limited penetration of infra-red radiation.

Using monochromatic x-rays and/or neutrons at large facilities, such as the ESRF and ILL, obstacles of traditional imaging can be overcome. The first example shows the use of neutron irradiation and subsequent autoradiography in the imaging of a discoloured pigment. This allowed to make a digital reconstruction of the original appearance of a discoloured painting. The second technique concerns the use of x-ray K-edge imaging of paintings. An example of this technique is presented and its potential is discussed.