

PUBLIC TALK | EXAMINING OLD PAINTINGS WITH NEW X-RAY METHODS: A FRESH LOOK AT AND BELOW THE SURFACE

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Imaging of painted works of art such as oil and panel paintings is traditionally done by means of X-ray radiography and Infra-red reflectography, where the first method allows to obtain information on hidden/overpainted layers and the second is very suitable for visualization of underdrawings. In the last decade, a number of hyperspectral methods have been developed that allow to obtain more information in a non-invasive manner from such artworks. Two of these are macroscopic X-ray fluorescence (MA-XRF) and Macroscopic X-ray powder diffraction (MA-XRPD), allowing to record respectively large scale elemental and crystal phase maps. In the first half of this lecture, the examination by means of MA-XRF of well-known works of art such as Van Eyck's 'The Ghent Altarpiece', Bosch' 'Last Judgement' and Rubens' 'The Little Fur' will be discussed, revealing information that is highly relevant for art-historians and others interested in the creative process that gave rise to these artworks. In the second half of the lecture, the phenomenon of spontaneous (chemical) degradation of painted works of art will be the central theme. For the first time, MA-XRPD allows to visualize and detect the effect of subtle chemical transformations below or at the surface of painting. As examples, the examination of Vermeer's 'Girl with the Pearl Earring' and Van Gogh's 'Sunflowers' will be discussed. In many cases, to complement the macroscopic imaging, microscopic analysis of paint cross sections with synchrotron X-ray beams is also highly useful as this allows to better understand at which depth below the surface the degradation phenomena are taking place.