

Photons for and against pigments? - Study and Preservation of Cultural Heritage

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Historical paintings are an important part of our tangible cultural heritage, preserving artistic, historical, and cultural information across centuries. We perceive paintings through the visible-light photons reflected by the pigments from which they are composed. However, the very photons that allow us to admire these works can also drive photochemical degradation processes, contributing to their gradual alteration over time.

While photons can therefore be both friend and foe to pigments, they are also indispensable tools for their study. Imaging spectroscopy techniques employing visible, infrared, ultraviolet, and X-ray radiation allow us to investigate the layered structure and material composition of paintings. These methods can reveal hidden features, such as underdrawings and overpainted compositions, while also providing insight into the chemical mechanisms responsible for pigment degradation.

This lecture will discuss these interactions between photons and pigments through case studies on works by major European artists, including Vincent van Gogh and Rembrandt van Rijn, highlighting how scientific investigation contributes to both our understanding and preservation of cultural heritage.

Biography:



Matthias Alfeld obtained his PhD in chemistry from the Universities of Hamburg and Antwerp in 2013. He subsequently held postdoctoral positions at the CNRS Laboratory of Molecular and Structural Archaeology in Paris and at DESY in Hamburg. Since joining TU Delft as an Assistant Professor in 2018, his research has focused on the development of novel instrumentation and data-analysis methods for multi-scale imaging spectroscopy, making use of X-rays, visible and infrared light. His work aims to improve our understanding of cultural heritage objects by enabling non-invasive, high-resolution chemical imaging.