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The Application of Neutron and X-Ray Techniques to Analyze Works of Art: Examples from The Unvarnished Truth Project¹

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When considered as an object, a painting consists of multiple components that, when analyzed together, have a unique story to tell about the artist, their practice, and the history of the work of art. Techniques traditionally applied in physics, including neutron-, x-radiographic and near-infrared imaging, and surface elemental analysis via x-ray fluorescence, are useful for generating significant insight into works of art. By examining the supporting material, grounds, pigments, and varnishes that a painter chose to utilize, we generate new knowledge regarding the composition, context, and decision-making involved in the creation of a work. The project '*The Unvarnished Truth: exploring the material history of paintings*' is an interdisciplinary initiative that incorporated the expertise of forensic art historians, conservation scientists, physicists, and biomedical engineers. Through the technical analysis of nine paintings from the McMaster Museum of Art permanent collection, we explored research questions related to painting technique, attribution, authenticity, connoisseurship, and object condition and stability. The paintings span over 500 years of European art history, and include works from Vincent Van Gogh, Alexander Rodchenko, and A. van der Neer. This project highlights the multitude of ways in which micro- and non-destructive methods can be used to answer art historical questions.

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