

The application of optical coherence tomography in a technical study of *The Mellow Pad* by Stuart Davis

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In 2015, the Brooklyn Museum was awarded a Bank of America Art Conservation Project Grant to study the materials and techniques used in Stuart Davis's seminal artwork, *The Mellow Pad* (1945-51). *The Mellow Pad* is Davis's most complex composition. He took six years to complete the painting, working out in excruciating detail his theories of "color-space logic" and finally achieving what he called "the most powerful objective Art realization of my life." The painting has been a highlight of the Brooklyn Museum's American Art collection since its acquisition in 1992.

The primarily non-invasive technical study was undertaken in preparation for the upcoming retrospective exhibit *In Full Swing: The Art of Stuart Davis*, organized by the Whitney Museum of American Art. Upon request for loan to the exhibit, questions about the painting's condition and stability prompted treatment as well as the Bank of America-funded investigation into its materials.

The investigation focused on narrowing down potential causes for interlayer cleavage and discolored paint. Because of the painting's complexity, non-invasive analytical techniques offered the best opportunity to gain comprehensive knowledge of the materials without excessive sampling. The non-invasive techniques used included optical coherence tomography (OCT), fiber optic reflectance spectroscopy (FORS), x-ray fluorescence spectroscopy (XRF), multispectral imaging, and x-radiography. This range of techniques provided information about the painting's colorants and layer structure, which can be used to tell a more complete story of the painting's development and condition in conjunction with historical records. This poster focuses on discoveries made using OCT, with supporting information from FORS and XRF.

The 810nm ultra-high resolution OCT, with axial resolution of 1.2 μm in paint, scanned three dimensional image cubes of surface topography and subsurface microstructures in areas of interest. Many successful studies of historic paintings and artifacts have been conducted with the instrument from Nottingham Trent University, but *The Mellow Pad* was its first Modern-Contemporary application. Thus, the study was beneficial in better understanding the painting as well as the analytical potential of OCT. Optical scattering and absorption properties of some colorants prevented capturing a full stratigraphy of the paint layers; however, other aspects of the painting's condition were clarified, sometimes as a result of the same optical properties. Insights into Davis's use of paint mixtures and charcoal, and into restoration materials present, were among the most interesting results.
