

Cantor exhibition depicts how ancient world used color, how science reveals the faded past

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A Cantor Arts Center team led by undergraduate chemical engineering major Ivy Nguyen discovered minute traces of pigments that originally covered the original sculpture but were washed away by the millennia. Nguyen's team used 3D rapid prototypic technology to create replicas of the artwork, which is painted to look as the sculpture did in ancient times. Credit: L.A. Cicero

With the silent attentiveness of a physician, Ivy Nguyen passes her hands over the recumbent white lady in the darkened lab. She cradles a handheld black light in her fingers.

Under the Stanford sophomore's skillful watch in the Cantor Arts Center lab, long-dead colors on marble come alive after two millennia.

The results of Nguyen's painstaking efforts are on display in "True Colors: Rediscovering [Pigments](#) on Greco-Roman Marble Sculpture" at the Cantor. The [exhibition](#) runs until Aug. 7. Admission is free.

Though we still think of [ancient Greece](#) and Rome in terms of white marble sparkling under a hot Mediterranean sun, the new exhibition shows at least one Greco-Roman lady as she was meant to be seen – in Technicolor. Not everyone may take to Stanford's painted lady, but first impressions can change. "It's very different – some have called it kind of garish," admitted sophomore Nguyen, but she confesses that she's gotten used to it.

We've always known that ancient statues were painted: The Metropolitan Museum of Art has a vase, circa 360-350 B.C., depicting a man painting a statue of Herakles. The most important evidence is on the statues themselves – traces of paint that time did not wash from the creases and crevices in porous marble.

Traces of paint offer hints

Unfortunately, while those traces may tell us the statues were painted, they don't give us a real idea of what the statues looked like. Nguyen thinks sculptures may have had several layers of paint for a more nuanced effect, but since the layers closest to the surface were exposed to weathering and cleaning, only the base layer of paints lingered in the nooks and crannies of the marble.

So how do we find the invisible paint, the "true colors" that vanished over time? Nguyen, a student in chemical engineering, had a few ideas.

Nguyen was a student in last spring's "Art, Chemistry, and Madness: The Science of Art Materials," a course taught by chemical engineering Professor Curtis Frank with his wife, artist Sara Loesch Frank.



Ivy Nguyen demonstrates how she worked with a black light to identify areas on the sculpture that could be tested for residual traces of paint.

The course is one of the "sophomore seminar" series that give Stanford faculty a chance to explore the boundaries of their disciplines and experiment outside their accustomed areas of expertise. The interdisciplinary offerings give students an opportunity for some unusual synergies.

The course was inspired by Loesch Frank's experimentation with art material – she would ask her husband for help to explain color changes, bubbling or delamination. "Since my research area is materials science with an emphasis on interfacial properties of polymers, I was intrigued by her questions, and we put together the course in an attempt to organize our collective thinking and to share it with bright Stanford

undergrads," said Frank.

For Nguyen, it was an epiphany: "Prior to this, I had always been intimidated by the humanities and arts," said the science-oriented sophomore. "It definitely showed me other things going on out there – other things besides the current trends.

"Science can give us a deeper understanding of art."

Nguyen submitted a proposal for an exhibition to a juried competition sponsored by the Cantor Arts Center, and won. Susan Roberts-Manganelli, the manager of collections, exhibitions and conservation at Cantor, became a colleague and leading member of the team that examined the Greco-Roman statue and planned the exhibition. (Roberts-Manganelli came into the field from the opposite direction of Nguyen: she's an artist who discovered the wonders of art conservation while traveling in Europe.)

For the exhibition, Nguyen explored techniques to detect paint that you cannot see with the naked eye – trace elements, such as lead and gold, which are not native to marble. Ultraviolet light causes the pigment particles to fluoresce, helping determine where the marble had been painted.

High-tech tool meets ancient art

While the technique is not new, Nguyen went beyond that with the use of x-ray fluorescence (XRF), commonly used in conservation sciences. XRF can find traces of pigment that are invisible to the unaided eye.

Nguyen's ultraviolet imaging with the black light reveals "ghost images," showing the areas that might be promising to test. The XRF reveals what's in those ghost images.

Although other exhibitions have focused on painted Greek and Roman statues, this exhibition focuses on the science as well as the art, taking the visitor through the laboratory process with cases displaying pigments used in ancient times, wall-mounted images of the analysis and small, painted terra cotta works from Cantor's ancient collection that were used as controls in the study.

The exhibition includes those early mineral paints – chalk to create white, goethite that can be powdered to yellow ochre, hematite that can be powdered to red ochre, copper to make the pigment known as Egyptian blue and gold leaf for gilding – along with photos taken during scientific analysis.

But the hit of the exhibition is clearly the painted ladies: two high-density urethane foam replicas of the Stanford's Maenad (4 B.C. – 25 A.D.), a survivor from the Herodian dynasty who was found in a Samarian well.

One of the two reproductions is painted with the colors found during analysis; a second is an educated guess about the additional layers of color that might have been added.

The fully painted Samarian maenad wears a red cloak over an ochre tunic. The figure is headless, but dark hair trails over each shoulder. Over her right shoulder, she has slung a leopard-patterned animal skin. With color, she does indeed look more like a wild Dionysian follower, rather than the noble white marble matron familiar to Stanford museum visitors.

Nguyen predicted in her proposal that "putting the painted reconstruction next to the statue on display will be jarring even for the most knowledgeable of visitors."

She was right. The world of ancient Greece was not an austere civilization of stately white marble – it was awash with vibrant colors.

Were all the statues painted? "It's hard to say what really happened over 2,000 years ago," said Nguyen. "But we know that at least a lot of them were painted."

They may look garish to us – but the Greeks felt that, without the splash of color, their statues were a little naked and, well, kind of ugly.

"My life and fortunes are a monstrosity . . . because of my beauty," lamented Helen of Troy in Euripides' *Helen*. "If only I could shed my beauty and assume an uglier aspect – the way you would wipe color off a statue."

Provided by Stanford University

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