

Artistic enigma decoded by cosmic Czech start-up

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The Madonna and Child painting's turbulent backstory encompasses some of Europe's great historical figures, as well as violent fights and lucrative art deals. Commissioned by Pope Leo X, it has hung in the Vatican as well as passing through the hands of the French royal family and Napoleon. However at the end of the 19th century, the painting disappeared from the general consciousness. It is now part of a private collection.

That Raphael was in fact the creator of the masterpiece has been confirmed by expert studies from around the world as well as an international advisory board. This has now been further supported by InsightART, a start-up company based in the Czech Invest-operated ESA business incubation center in Prague, which uses cosmic detector technology to examine artworks.

InsightART's robotic X-ray scanner had earlier been used to identify a previously unknown painting by Vincent van Gogh. The machine uses a particle detector developed at CERN, the European laboratory for [particle physics](#), that was repurposed for [space exploration](#) and manufactured by the Czech company ADVACAM.



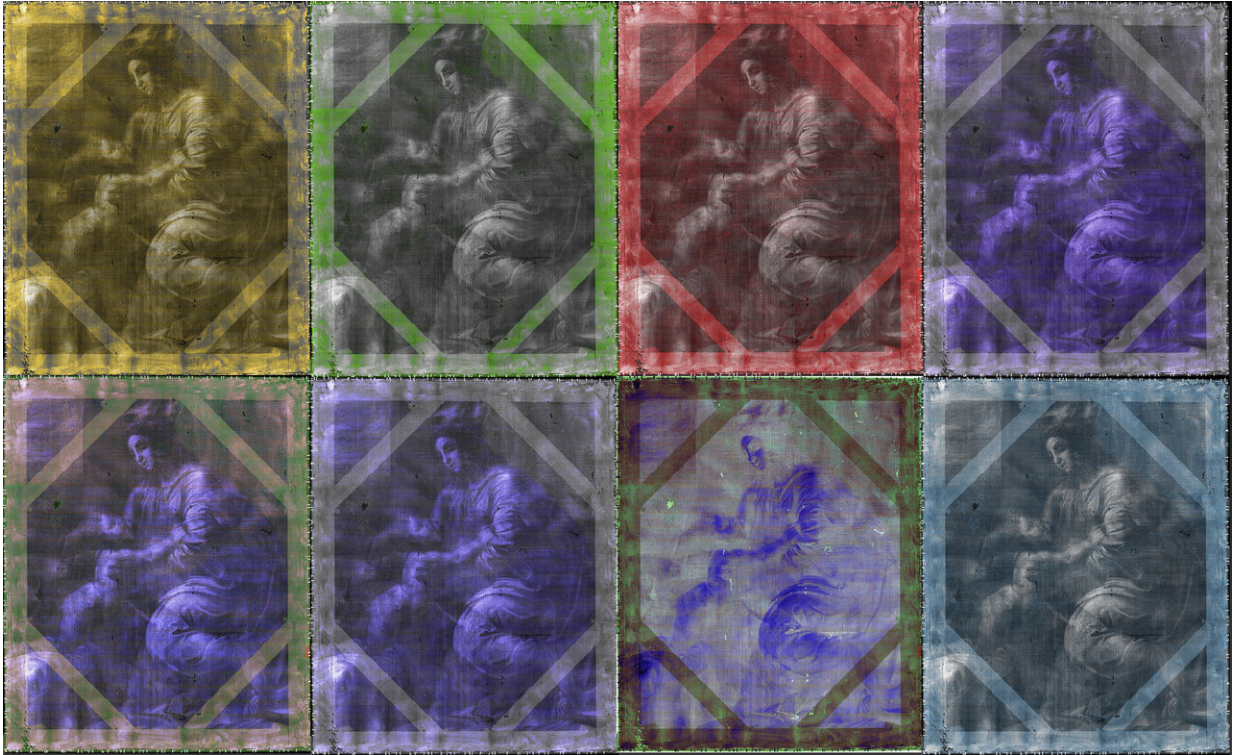
The robotic RToo X-ray scanner in action. Credit: Jiri Lautenkratz, InsightART

"This technology—which is also used to measure radiation at the International Space Station—is capable of detecting and counting single photons, as well as establishing their exact wavelength," says Josef Uher, chief technical officer of InsightART.

"While the standard X-ray machine only creates a black and white image, the RToo scanner provides 'color' – or spectral—X-ray images, which allow the materials to stand out on the basis of their elemental composition," he says.

The artwork was scanned in great detail—from the foundation layers to the final glazes, revealing the internal structure of Raphael's painting in detail.

"During this process it became clear that the work was executed layer by layer by Raphael, without the aid of his workshop assistants and apprentices," says Jiří Lauterkranc, an art restorer and co-founder of InsightART.



Spectral X-ray images reveal previously hidden layers of the painting. Credit: Jiri Lautenkratz, InsightART

The company received business advice and [financial support](#) from the ESA business incubation center in Prague.

"We are used to different kinds of technological applications which make use of satellite data, navigation systems, airplanes or satellites. However, the combination of space technology and art is very unconventional—this is the only project," says Michal Kuneš, project manager of the ESA business incubation center.

Provided by European Space Agency

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