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## Secrets of Leonardo da Vinci painting laid bare by new scanning technique

Art expert hails 'remarkable' revelation by French scientist that Lady with an Ermine portrait was painted three times



Three versions of Leonardo da Vinci's Lady with an Ermine, discovered by French scientist Pascal Cotte. Photograph: Lumiere Technology

The secrets of one of Leonardo da Vinci's most famous paintings have been revealed by a French scientist using a new technique.

Pascal Cotte has spent three years using reflective light technology to examine Lady with an Ermine, which was believed to have been painted between 1489 and 1490.

It had been thought that the work had always included the ceremonial animal, but Cotte's efforts have shown that Leonardo painted one portrait without the ermine and two with alternative versions of the fur.

The painting depicts Cecilia Gallerani, a young woman in the Milanese court who was mistress to Ludovico Sforza, the duke of Milan. The duke was Leonardo's principal patron in the 18 years he spent in the Italian city and was known as "the white ermine".

Cotte, a co-founder of Lumiere Technology in Paris, has developed a technique called the layer amplification method (LAM). It works by projecting a series of intense lights on to a work while a camera measures the reflections. The resulting information allows Cotte to analyse and reconstruct what has happened between the layers of paint used on the canvas.

"The LAM technique gives us the capability to peel the painting like an onion, removing the surface to see what's happening inside and behind the different layers of paint," he told BBC News. "We've discovered that Leonardo is always changing his mind. This is someone who hesitates – he erases things, he adds things, he changes his mind again and again."

Martin Kemp, an emeritus professor of the history of art at Oxford University, described the revelations as "remarkable", adding: "It tells us a lot more about the way Leonardo's mind worked when he was doing a painting.

"We know that he fiddled around a good deal at the beginning, but now we know that he kept fiddling around all the time and it helps explain why he had so much difficulty finishing paintings. Leonardo is endlessly fascinating, so getting this intimate insight into his mind is thrilling."

The painting is owned by the Czartoryski Foundation. It is usually displayed at the National Museum in Kraków, but is hanging in nearby Wawel castle while the museum is being renovated.