

## Joris Dik

Professor / Materials in Art & Archaeology

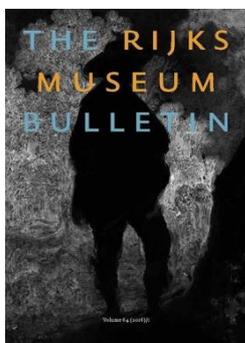


Tel: +31 (0) 1527 89571  
E-mail: [j.dik@tudelft.nl](mailto:j.dik@tudelft.nl)  
Website: [www.mse.tudelft.nl](http://www.mse.tudelft.nl)

Research interests:  
Materials in Paintings  
Analysis of optical and chemical properties of artwork  
Conservation of art objects  
Authenticity Studies

## Materials in Art & Archaeology

### Recent Activities:



We have developed a new X-ray technique to analyze and image the paint stratigraphy of Old Master paintings. The method is called Macro X-ray Fluorescence Spectrometry and allows for the elemental analysis of artwork as well as the visualization of hidden paint layers. Over the past year our method was used in major museums in the USA, the UK and the Netherlands. Our work has enabled the discovery of a new self-portrait by Rembrandt in the J. Paul Getty Museum in Los Angeles (see inset on the right). Other hidden paintings were discovered in the work of Goya (National Gallery, London), Jackson Pollock, Rene Magritte

(Museum of Modern Art, NY, NY) Vincent van Gogh (Art Institute, Chicago, IL) and Govert Flinck (Rijksmuseum, Amsterdam, see inset on the left). Our work has been published in academic journals, both in art historical and scientific titles. In addition, our discoveries were featured in 4 museum exhibitions over the past year, which was publicized widely and received both national and international press attention.



#### **Inset on the right:**

The painting *An Old Man in Military Costume* in the J. Paul Getty Museum, by Rembrandt Harmensz van Rijn, was studied using two complementary, element-specific imaging techniques—neutron activation autoradiography (NAAR) and macro-X-ray fluorescence (MA-XRF) mapping—to reveal the second, hidden painting. NAAR provided a strong image of the face and cloak of the underlying figure, along with an indication of the chemical composition. The single-element distribution maps produced by MA-XRF mapping provided additional details into the shape of the underlying image and the composition of the pigments used. The underlying figure's face is richer in mercury, indicative of the pigment vermilion, than the face of the figure on the surface. Likewise, the cloak of the underlying figure is richer in copper than the surface figure though the identity of the copper-containing pigment cannot be determined from these data. The use of iron earth pigments, specifically Si-rich umbers, is indicated through the complementary information provided by the NAAR and MA-XRF maps. These data are used to create a false color digital reconstruction, yielding the most detailed representation of the underlying painting to date.

#### Key publications:

Karen Trentelman, Koen Janssens, Geert van der Snickt, Yvonne Szafran, Anne T. Woollett, Joris Dik, "Rembrandt's *An Old Man in Military Costume*: the underlying image re-examined", in: **Applied Physics A**, 2015, vol. 121, p. 801-811

Geert Van Der Snickt, Ana Martins, J.C. Delaney, K.A. Janssens, J.D. Zeibel, M.B. Duffy, C.B. McGlinchey, B.E. Van Driel, J. Dik, "Exploring a Hidden Painting Below the Surface of René Magritte's *Le Portrait*", in: **Applied Spectroscopy**, 2016, vol. 70, p.57-67

Margriet van Eikema Hommes, Ruud Lambour, Bianca M. du Mortier, Marieke de Winkel, Gwen Tauber, Matthias Alfeld, Koen Janssens and Joris Dik, "The Hidden Youth of Dirck Jacobsz Leeuw: a Portrait by Govert Flinck Revealed", in: *The Rijksmuseum Bulletin*, 2016, vol 64, p. 1-48

#### Media Coverage:

##### Wall street Journal:

<http://www.wsj.com/articles/new-facial-details-surface-beneath-a-rembrandt-1441090860>

##### LA Times:

<http://www.latimes.com/entertainment/arts/culture/la-et-cm-getty-learns-more-about-young-man-lurking-beneath-its-rembrandt-old-man-20150827-story.html>

##### Volkskrant:

<http://www.volkskrant.nl/beeldende-kunst/deel-zelfportret-gevonden-onder-schilderij-rembrandt~a4133419/>

#### museum exhibitions:

Rembrandt, Mauritshuis, Den Haag, 11 juni – 13 september 2015

<https://www.mauritshuis.nl/nl-nl/pers/persarchieef/2015/mauritshuis-schrijft-schilderij-saul-en-david-toe-aan-rembrandt/>

Vincent van Gogh, Art Institute Chicago, 6 januari – 10 mei 2016

<https://www.mauritshuis.nl/nl-nl/pers/persarchieef/2015/mauritshuis-schrijft-schilderij-saul-en-david-toe-aan-rembrandt/>

Van Gogh, Metropolitan Museum of Art, New York, 12 mei – 16 augustus 2015

<http://www.metmuseum.org/press/exhibitions/2015/van-gogh-irises-and-roses>

Goya, the National Gallery, 7 oktober – 10 januari 2016

<http://artdaily.com/news/81214/Francisco-de-Goya-s--Portrait-of-Dona-Isabel-de-Porcel---A-question-of-attribution#.Vyc3cGPsGBR>