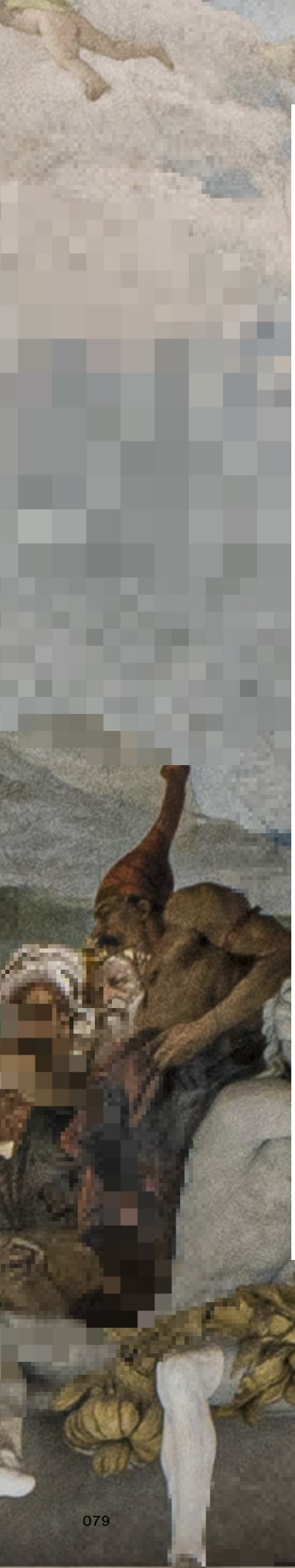
Creating a virtual reconstruction of the original appearance of the »Golden Room« in the Mauritshuis, The Hague



Margriet van Eikema Hommes,
Carol Pottasch, **Jan de Rode**, **L. de Moor**

C. Creating a virtual reconstruction of the original appearance of the »Golden Room« in the Mauritshuis, The Hague

→ architectural paint research, eighteenth-century decorative scheme, Giovanni Pellegrini, Mauritshuis, original appearance, virtual reconstruction

This paper discusses the creation of a virtual reconstruction of the early eighteenth-century appearance of the »Golden Room« in the Mauritshuis, The Hague. This room was created between 1708 to 1718 as the main reception room and includes fifteen paintings on canvas made specifically for this room by the Venetian painter Giovanni Pellegrini during his stay in the Dutch Republic. The room's appearance has changed considerably over the centuries. In order to reconstruct its original colour scheme as well as the original appearance of Pellegrini's paintings, extensive historical and analytical research was carried out. Based on the results, a virtual reconstruction was created for the museum public. This paper discusses what choices were made in implementing the scientific results into virtual imagery, from the perspective of the art historians and conservators who were involved. We conclude with a consideration of how the virtual reconstruction adds to our understanding and perception of the room.

C.1 Introduction

Few historical painting ensembles have been preserved in their original location. The appearances of those that remain in situ, moreover, have usually been affected by natural ageing, building renovations, and restorations, among other factors. To visualise the original appearance of such decorative schemes, virtual reconstructions can form a useful tool. In this paper, we will discuss the virtual reconstruction of the main reception room in the Mauritshuis, The Hague — today home to the famous Royal Cabinet of Paintings — as it appeared in the early eighteenth century. For the purpose of this paper, we approach its creation not from a technical standpoint, but from the perspective of the art historians and conservators involved in its development. First, we will discuss the historical and material-technical research that was carried out to establish the early eighteenth-century colour scheme of the room and the original appearance of its paintings. Subsequently, the process of creating the virtual reconstruction itself is considered; what choices were made when translating scientific results into virtual imagery? Finally, we will explore how the virtual reconstruction adds to our understanding and perception of the room in the present.

□ 01
The Mauritshuis, The Hague, in 2014 (Photo: Ivo Hoekstra).

C.2 The Mauritshuis

The Mauritshuis, was built around 1640 by the architects Jacob van Campen (1596–1657) and Pieter Post (1608–1669) as a residence for Count Johan Maurits of Nassau-Siegen (1604–1679) 01. 01 Following his death in 1679, the States of Holland used the building for the reception and accommodation of foreign diplomates and guests. After a fire completely destroyed its interior in 1704, the building was renovated from 1708 to 1718. Late Louis XIV style fireplaces and stucco decorations that date to this period have been preserved in various rooms. In the large ground floor reception hall, presently called the Golden Room, the decorative scheme has remained almost intact 02 03. Except for the chimneys and the panelling on the walls and ceiling, the decorative woodcarvings have also been preserved, along with fifteen paintings: three on the ceiling that together depict Aurora driving away Night to make way for Apollo, two chimney pieces with allegorical figures, four grisailles with trompe-l'oeil depictions of stone statues representing the four elements in niches on the walls, and over the doors six **tondi** with flower bouquets. The Venetian painter Giovanni Pellegrini (1675–1741) made these canvases specifically for this room during his stay in the Dutch Republic in 1718.

■ **01**
About the building history: Quinten Buvelot, Mauritshuis. The Building, Zwolle 2014.

□ 02
South West corner of the Golden Room in the Mauritshuis in 2014. The wall sconces had been temporarily removed at the time that the photograph was taken. (Photo: Margareta Svensson).

□ 03
North East corner of the Golden Room in 2014. (Photo: Margareta Svensson).

Today, the wooden ceiling is painted pure white, so visitors might easily mistake it for plasterwork. The wall panelling consists of stripped oak, of which the capitals, the majority of the mouldings surrounding the paintings, and most of the decorative wood carvings are gilded — providing the space with its moniker »the Golden Room«. Its current appearance, however, dates to 1951. At this time the moss-green paint, which had been applied to the wall panelling and nearly all of the carvings in 1927, was removed. 02 Of the period preceding those years, we only know that the oak wall panelling had already been stripped by 1890, and that the ceiling was painted white. No details regarding its original appearance have been preserved, except for a memorandum (»Memorie«) of 1713 which itemises a number of urgently needed works. It includes an entry of sixty guilders for »paintwork in the downstairs salon« (»verwen inden benede sael«), which indicates that the woodwork was originally painted. 03

■ **02**
Buvelot 2014, p. 134.

■ **03**
Buvelot 2014, appendix 6, p. 287.

C.3 Studying the original colour finish

During the 2012–2014 renovation of the Mauritshuis, architectural paint research was carried out to investigate the room's original appearance. 04 Although the wall panelling had been thoroughly stripped in 1951, numerous small patches of old paint had still been preserved. Furthermore, the inside of the shutter boxes had never been stripped of their paint. These now display modern imitation oak that is in keeping with the stripped walls, but they had been painted along with the wall panelling time and again since 1713. The gilded mouldings surrounding the paintings and the gilded carvings were never stripped either, so they, too, contain the entire range of paint layers. This whole build-up was also found in various places on the ceiling. In addition to selective stratigraphic scrapings 04, research was carried out with the help of both paint cross-sections and non-embedded sample material that were examined with the light microscope, and of which the chemical composition of pigments and mediums was analysed 05.

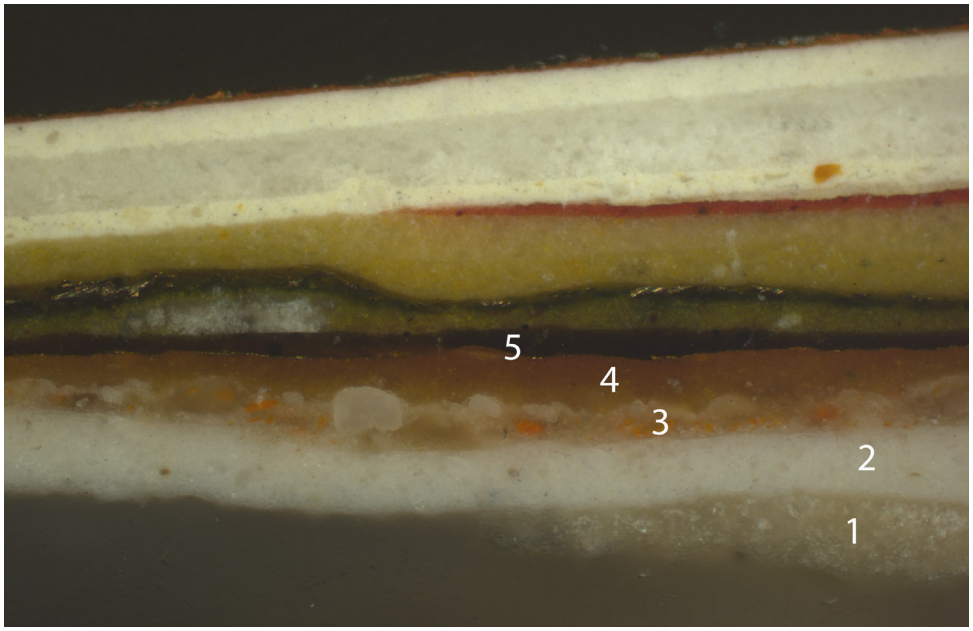
From this research it could be established that the wall panelling, including the fireplaces and cornice, was originally painted a light grey. 05 The wood was first given a priming layer of white chalk, to which one or two layers of a light grey oil paint was applied. A stratigraphic scraping on the inside of one of the shutter boxes shows this finish, which had a soft sheen and in which the brush-strokes have remained clearly visible 04. The above-mentioned »paintwork in the downstairs salon« must refer to the application of this finish. The sum of sixty guilders reserved for this work already indicated that it was an extensive job, given that in those days the daily wage for house-painting was just over a guilder and that the requisite materials could not have been very expensive. 06

□ 04
A paint stratigraphy inside a shutter box shows the various stages of finish: (1) Earliest finish of light grey oil paint. This layer has a soft sheen and the brush-strokes have remained clearly visible. (2) Subsequent somewhat darker grey finish. (3) Subsequent warm yellow finish. (4) Subsequent dark brown imitation wood finish. All these finishing layers were removed from the walls in or before 1890. In 1927 a moss-green paint was applied on the walls (5) that was removed in 1951 so that today the stripped oak is in sight. The inside of the shutter boxes have been painted an imitation oak (6) to match the stripped oak on the walls.

■ **04**
Research undertaken as part of the project From isolation to coherence. A technical, visual and historical study of 17th and 18th century Dutch painting ensembles, led by Margriet van Eikema Hommes. This five-year project is funded by the Netherlands Organisation for Scientific Research NWO and housed at Delft University of Technology. http://www.fromisolationtocoherence.nl/english.

■ **05**
Margriet van Eikema Hommes, Katrien Keune, Ruth Jongsma, Carrol Pottasch, Determining the early 18th-century colour scheme of the Golden Room in the Mauritshuis, The Hague: interpretation issues caused by changes to paint chemistry in: Kirsten Travers Moffitt et al. (Eds.) Examining Architectural Finishes, Postprints of the 6th International Architectural Paint Research Conference, New York, March 15–17, 2017, London 2018, pp. 49–58.

■ **06**
For wages for house-painting: Van Eikema Hommes et al., 2018, note 9.



☐ 05
Cross-section from the moulding of a mantelpiece. 1: Chalk priming on the wood; 2: Light grey original finishing; 3: Orange base layer; 4: Yellow mixtion: 5: Gold leaf. All layers on top of the gilding date from the nineteenth and twentieth centuries
(Photo: Margriet van Eikema Hommes).

The light grey layer was presumably intended to imitate some kind of stone. We can deduce this from the four grisailles with trompe-l'oeil depictions of stone statues in niches. Such trompe-l'oeils were sometimes placed, unframed, in a shallow niche, so that they blended in with the architecture, thus heightening the illusion of reality. 07 But these grisailles were sometimes also framed by mouldings, such as those in the Mauritshuis. 08 The grisailles in the Golden Room have a priming layer of a light-grey colour that Pellegrini must have selected to match the colour of the walls. Together with the walls, the grisailles thus formed a continuous illusionistic whole, whereas today they stand out against the stripped woodwork as isolated elements.

The first light grey paint was also applied to the mouldings surrounding the paintings and wood carving on the walls. Moreover, the whole wooden ceiling also received such a finish. On top of this paint, the mouldings and carvings on the walls and on the ceiling were given a finish with metal foil. Two different types of foil were used. The mouldings surrounding the **tondi**, grisailles and mantelpieces, and their accompanying carvings and the decorations on the pilasters, were decorated with gold leaf. 09 Cross-sections show that the gold leaf was applied over an oil-rich layer of yellow earth: the mixtion 05. A mixtion gilding or oil gilding has a slightly dull appearance, which is why it was called »matte gold«. 10 A mixtion layer on top of the grey paint is also present on the capitals, large carved decoration above the entrance door, and those of the ceiling and the relief-edged sides of the ceiling fields. However, instead of gold leaf these elements had been given a finish with brass leaf, an alloy of copper and zinc with a golden-like colour. Brass is considerably less expensive than gold; only a tenth of the price in the first half of the eighteenth century. 11 From archival documents we know that the money available for the renovation of the Mauritshuis was barely adequate – several times work even came to a standstill because of insufficient funds, so this might have been a consideration for choosing this cheaper material. 12 This is supported by the fact that brass was used solely for decorations that were so high they could be seen only from a distance.

■ **07**
For instance, Dirk Ferreris Putti with armour and palm branches (1688–1690), canvas, 265cm×105cm, Citizens' Hall, town hall, Enkhuizen.

■ **08**
For instance, the grisailles intended for the large reception room in Duivenvoorde Castle (c. 1717) in Voorschoten, in the vicinity of The Hague, as emerges from a nearly contemporaneous modello-sketch for this room: Circle of Daniel Marot, c. 1717. Pen and ink in grey with red wash, 44cm×62cm, Voorschoten, Stichting Duivenvoorde.

■ **09**
Its application was probably not included in the sixty-guilder paint job of 1713, since gold leaf would have cost far more than that: Van Eikema Hommes et. al 2018, note 12.

■ **10**
Lambertus Simis, Grondig Onderwys in de Schilder- en Verw-kunst [...] 2 vols., Amsterdam 1801 and 1807, vol. 1, pp. 258–260.

■ **11**
Eikema Hommes et al., 2018, note 18.

■ **12**
About the financial problems in the renovation of the Mauritshuis: Buvelot 2014, p. 118–123.

☐ 06
Giovanni Pellegrini, Night, canvas 195cm×263cm, The Hague, Mauritshuis. At the right edge where the paint was covered by the frame, the pink-orange and blue colours have been better preserved (see details) (Photo: Margareta Svensson).

C.4 Studying colour changes in Pellegrini's paintings

When during the last restoration (2012–2013) Pellegrini's canvasses were cleaned of dirt, old layers of varnish and old overpainting, it became evident how much his paints had discoloured. 13 Today, the sky in the three ceiling paintings exhibits pale pink and greyish blue colours. However, in areas where this paint had been protected by the frame, a much brighter pink and blue are visible 06. Analytical studies showed that the blue pigment (smalt) had lost its colour due to a reaction with the oil binding medium, and that the organic red and yellow pigments, which had been used for the pink clouds, had faded under the influence of light. In addition, the paint layer of the sky as well as those of the skin tones had become abraded as a result of earlier cleaning efforts, so that the brown priming layer is now disturbingly visible in many places.

In the four grisailles, due to ageing, the paint of the front of the niches has become greener, more blemished and darker. Where this paint was covered by the frame, it has retained a lighter and cooler grey (07 left). The two mantel paintings are in relatively good condition, even if their dark background, blue paint and shadows of the skin tones have become darker. The skin tones have also become more transparent due to abrasion so that the brown priming layer shimmers through more than it should.

■ **13**
Research into the techniques and original colours in Pellegrini's paintings was undertaken by the Mauritshuis conservation studio in partnership with Shell Technology Centre Amsterdam. Carol Pottasch, Susan Smelt, Ralph Haswell, Breaking new ground: investigating Pellegrini's use of ground in the Golden Room of the Mauritshuis, in: Helen Evans et al. (Eds.), Studying 18th-Century Paintings and Works of Art on Paper, London, 2015, pp. 16–29; Carol Pottasch, Sabrina Meloni et al., Vivid colours in the Golden Room: An educated but tentative reconstruction of an ensemble by Pellegrini in the Mauritshuis, in: Rhiannon Clarricoates et. al (Eds.), Colour Change in Paintings, Postprints of the ICON conference Appearance and Reality, Examining Colour Change in Paintings, London, October 9, 2015, London 2016, pp. 118–125.

The flower **tondi** turned out to have dramatically changed. Today, the flowers stand against a dark brown background (08 top). But analytical studies indicate that these backgrounds were made of brass leaf, so that they originally were a golden colour. 14 Over the course of time this metal has degraded and largely disappeared, which is why the background has been overpainted dark brown several times. The containers in which the flowers were arranged must have been painted on top of the brass leaf, but no trace of them has survived. They were probably indicated thinly with diluted paint so that the brass leaf shone through. Such a diluted paint is susceptible to solvents and rubbing and will therefore have been removed during past cleanings. The green paint of the leaves has turned brown while the flowers, which were painted with red and yellow organic pigments, have faded. Under some old retouchings, paint can be found that gives an idea of their original colour intensity. Moreover, in many places the paint layer of the flowers is much abraded.

■ **14**
In the Netherlands, overdoor paintings with flowers were more often pained on metal foil in the eighteenth century. Examples from The Hague can be found in Huis Schuylenburch (1715). Here the background has survived well as here gold leaf has been used.

□ 07
left: Giovanni Pellegrini, Fire, canvas c. 260cm×113cm, The Hague, Mauritshuis. At the bottom left where the paint had been covered by the frame, the grey colour has been better preserved.
right: Digital impression of original appearance of Fire (Photo: Left: Margareta Svensson; Right: L. de Moor).

☐ 08
Top: Giovanni Pellegrini, Flower still life, canvas diameter 96cm, The Hague, Mauritshuis.
Bottom: Digital impression of original appearance with the flowers against a gold-coloured background with vibrant flowers and recognisable leaves in a flower container. Pellegrini's paint handling has only been approximated in this digital impression, since such details are not visible in the overall 3D image of the room (Photo: Top: Margareta Svensson; Bottom: L. de Moor).

C.5 Creating the virtual reconstruction

Based on these scientific results, a digital reconstruction was made for the museum public in 2016 using a 3D-web-application that provides a 360° impression of how the architectural elements and paintings may have looked in 1718 [09]. This visualisation can be viewed via the museum's website, but also via monitors in the Golden room itself [10]. [15] This application was made by **Jan de Rode** and Geeske Bakker of DeroDe3D, a company specialized in digital reconstructions of historical buildings and interiors and archaeological sites. 2D digital reconstructions of the tentative original colours of Pellegrini's paintings were made by painter and visual artist **L. de Moor** and subsequently implemented in the 3D model.

■ **15**
See: https://www.mauritshuis.nl/nl-nl/ontdek/mauritshuis/ , The following advisors contributed: Henny Brouwer, Quentin Buvelot, Willemijn Fock, Johan de Haan, Paula van der Heiden, Ruth Jongsma, Arie Pappot, Carol Pottasch. This digital reconstruction was made possible thanks to financial support from the Johan Maurits Compagnie Foundation.

□ 09
Stills from the application. Top: Present situation. Bottom: Impression of situation in 1718. Note that the placing of the grisailles was different at the time.

□ 10
iPad display kiosk in the Golden Room where visitors can interact with the application (Photo: Carol Pottasch).

Implementing the scientific results into the virtual reconstruction turned out to be challenging process. Our goal was to translate the data obtained from analytical studies and archival research as truthfully possible. But this soon presented the problem that — research efforts notwithstanding — many details regarding the room's elements remained unknown. In the first place this concerned the initial colour scheme. The carvings above the six smaller doors had been stripped so thoroughly that no trace of an old finishing layer was left. Could we, nevertheless, assume that these elements too had been finished with metal leaf, just as the other carvings? And if so, would that metal leaf have been gold or brass? Another uncertainty involved the grey finishing layer; had this paint been applied evenly or in multiple shades of grey, and/or had some kind of detailing been indicated, such as veins? No trace of multiple shades or nuances had been found with architectural paint research. However, the remnants of original grey paint preserved on the walls and ceiling were extremely small, so that nuances, if any, would not have been visible. The original grey finishing layer is well-kept only on the inside of the shutter boxes, where it is applied in one shade and without any nuance. But this section of the painted finish was not intended to be in sight, and is therefore not necessarily representative for the rest of the room.

Uncertainty also remained about the original appearance of Pellegrini's paintings. First, there was the issue of the »lost« containers in the flower **tondi**; how should these be displayed? And reconstructing the discoloured paints also presented difficulties. Although some paints were better preserved underneath the frame or under old retouchings, these passages may also have

discoloured to some extent, so that they do not necessarily match Pellegrini's original colours exactly. Furthermore, transposing the »preserved« colours to the rest of the paint surface is not an easy task since compositions and colour nuances of a certain paint may vary within the painting. Moreover, for many discoloured paints there was no such »protected« reference spot found; in these cases, we had to reason the original colours only on the basis of the current knowledge about the aging of the pigments used. Another issue involved the digital retouching of the effects of abrasion. To what extent did transparency of the paint have to be undone, knowing that Pellegrini sometimes also consciously applied his paint thinly so that the priming layer remained partly visible?

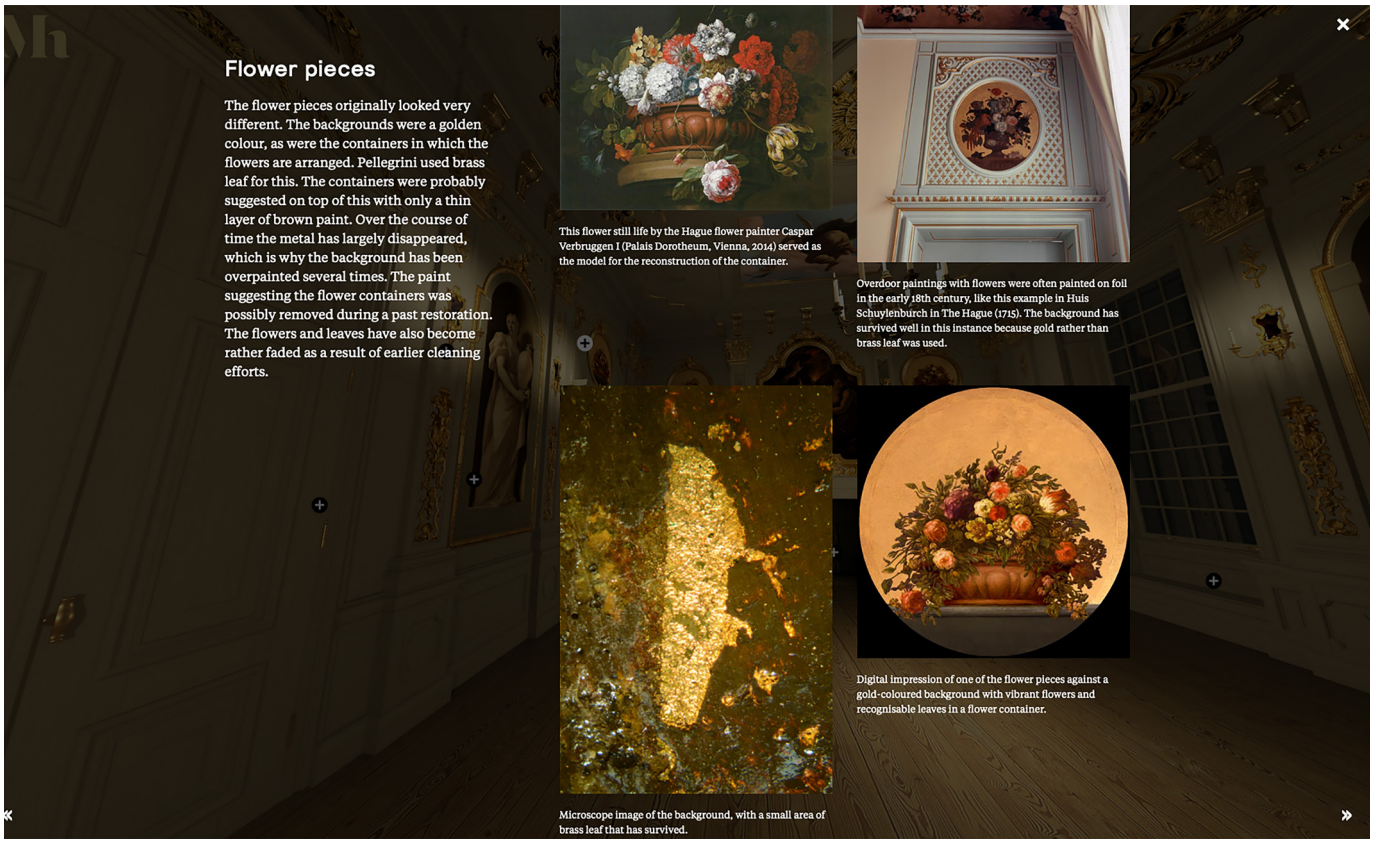
Finally, several early eighteenth-century elements in the room had been replaced over the years, such as the windows, floor, chandeliers, wall sconces and doorknobs. Visual sources had been preserved for some of these elements but for others no information was found. If we would opt to represent these elements in the virtual reconstruction, their rendering would inevitably be speculative.

C.6 How to display speculative elements?

Initially, the Mauritshuis museum wanted a digital reconstruction as »neutral« as possible without speculative elements. This meant the visualisation of only those elements in the room for which sufficient historical data were available. However, in the process of creating the reconstruction, it soon became apparent that it was undesirable to stick to this principle. After all, in terms of certainty, the scientific data showed a sliding scale. While for some elements in the Golden Room it was (almost) certain what these had originally looked like, this could be said less firmly for others, while it was even more uncertain for others. In scientific writing, nuances in certitude can be described by terms as »certain«, »likely«, »presumably« or »plausible«, but how should this be done in a digital visualisation?

In order to decide how uncertain elements should be represented, it is important to consider the function of the digital reconstruction and its intended audience. If the digital reconstruction mainly serves a scientific purpose, it may be appropriate to clearly indicate the degree of certitude visually, for example by means of different textures or colours. This, however, has a huge visual impact. The virtual reconstruction for the Mauritshuis was intended for a general museum audience. Its aim was to give this public an appealing impression of what the Golden room originally looked like in order to clarify its historical function. It was therefore important to visualise all elements in the room as realistically as possible, with light and shadow and with the precise imitation of material effects, so that everything would appear »real«. Such an optical illusion would be seriously disrupted by introducing deviating coloured or textured elements. Therefore, we choose to represent all elements — certain and uncertain — equally realistic. Visitors of the app can see the room both as it is today and as it may have looked in 1718, and easily switch between past and present 09. All specific elements in the room have clickable points for pop-up windows, which provide explanations of the research results and the choices that were made in reconstructing the

respective element [11]. In the present application. this explanation is concise as it is intended for a general readership. But it is conceivable that this could be extended to a complete scientific report.



□ 11
Still from the application, showing pop-up window with explanation of the flower paintings.

C.7 Reconstructing lost colours

While developing the application, there was a constant consultation between the researchers, painting conservators and visual artists, both in making the 3D visualisation of the room by DeRoDe3d and the 2D visualisations of the original appearance of Pellegrini's paintings by **L. de Moor**. In order to make the 2D visualisations as accurate as possible, it was necessary to gain more insight into Pellegrini's intentions regarding colour and paint application. Therefore, his techniques and colours found in the Golden Room were compared with those in his contemporary oil paintings and frescoes. These works are characterised by fresh and bright colours and this greatly helped to interpret the findings in the Golden Room. For example, the intense blue and orange-pink colours that had been protected under the frame of the ceiling paintings, seemed at first too garish to adopt for the rest of the skies. However, comparison with Pellegrini's contemporary works showed that he used such strong colours more often in his skies, especially when depicting dawn.

On the basis of the insights thus obtained, in the digital 2D visualisations, hue, tonal value and intensity of colours were adjusted and the effects of paint loss and abrasion were compensated (07 right) 12. A great advantage here was that De Moor is a painter herself, so that she was able to do these adjustments very considered, resulting in a convincing effect. In determining the original colours, her interim test visualisations appeared to be also very helpful, as these involved various options to choose from. Furthermore, her concrete digital visualisations of the assumed original colours of the paintings, sometimes prompted the restorers and researchers to adjust their initial ideas.

□ 12
Digital impression of original appearance of Night, see also 07 (Photo: L. de Moor).

In the flower **tondi**, the colour and sheen of the brass backgrounds were reconstructed (08 bottom). Brass can have various colour nuances, depending on the percentages of zinc and copper in the alloy. In the early eighteenth century, often alloys were used with a much lower zinc content (only 15 or 25 percent) than today. 16 Alloys with a low zinc content can closely resemble gold. 17 This colour was used in the digital reconstructions, and the relatively matt sheen of mixtion gilding was also imitated. The containers were digitally reconstructed as well. These simulated the effect of a translucent brown paint, in which the brass background remained partially visible. From the shape of the bouquets it could be deduced that the flowers were originally placed in a fairly wide vase, and since these concern overdoors, this container would have been depicted in bottom view. A suitable example for such a vessel was found in an overdoor flower piece by the contemporary The Hague painter Gaspar Verbruggen II (1664–1730). 18

It was also a great advantage that the 3D reconstruction was produced by a visual artist. Therefore, for example, **Jan de Rode** directly understood the importance of imitating the specific textural effects of the first colour finish. Analytical research had demonstrated that this grey paint had been bound in oil. And in the shutter boxes it could still be seen that this paint has a soft egg-shell shine and that the brushstrokes had been left visible. **Jan de Rode** trans-

■ **16**
Jean-Marie Welter, »The Zinc Content of Brass: A Chronological Indicator?« Techne: La science au service de L'histoire de l'art et des civilisations, 18, 2003, pp. 27–36.

■ **17**
A higher percentage of zinc gives brass a greenish tinge.

■ **18**
Canvas 53cm×65.5cm, Dorotheum Vienna 21-10-2014. Verbrugghen II worked in the Hague from 1706 till 1723.

lated these particular qualities in his 3D visualisation, even adjusting the direction of the brush strokes; details that turned out to be crucial for a true-to-life effect.

As mentioned, with a low zinc percentage in the alloy, newly applied brass leaf can be hardly distinguished from gold leaf. Therefore, it was decided to render all finishing with metal leaf on mouldings and carvings with a similar golden colour in the 3D visualisation, regardless whether brass or gold leaf had been found. And also here the relatively matt sheen of mixtion gilding was imitated.

Interim 3D visualisations of the room helped to make a balanced choice regarding those elements of the colour finish that had remained uncertain. For example, such a test visualisation indicated that omitting a metal finish for the carvings above the smaller doors produced an unbalanced effect; reason why it was decided to give these carvings a golden sheen in the reconstruction as well. **Jan de Rode** also made test visualisations with multiple shades of grey and with veining patterns, but none of these yielded a satisfactory visual result. Therefore, a uniform grey finish was chosen for the digital reconstruction, even though a differentiation may originally have been present.

For the visualised grey colour, the NCS colour code (S 2005-G80Y) of the grey paint in the shutter boxes formed the starting point. However, it was not adopted one-on-one in the reconstruction but rendered with much warmer tinge. This choice relates to the influence of the warm light reflection on the oak floor boards (see **p. 094**, and 13 bottom for the choice of the type of floor) but is mainly motivated by our decision to display the room at night with candlelight. This type of light was chosen because the incident daylight in this room is rather limited and cold, as the windows face north and also border a wide water. Illuminated exclusively by daylight, the room has a gloomy and dark appearance. It is therefore conceivable that when the room was in use for receptions, candles would not only be lit at night, but also during the day 13.

In the digital reconstruction, **Jan de Rode** has not consistently applied candlelight, but has combined it with a bright and even illumination in order for all elements in the room to become clearly visible. Without this additional light source many areas in the room would be enveloped in darkness, leaving details there invisible. Although a lifelike rendering of candlelight would have aligned more closely with the historical situation, it was not used in the virtual reconstruction, given that the main goal of this visualisation was to clearly show the museum audience the original appearance of all specific elements in the room. Therefore, historical considerations here gave way to educational ones.

□ 13
Stills from application, with north wall. Top: Present situation. Bottom: Impression of situation in 1718, showing sash windows with small panes, French doors, and wall sconces placed higher, so that the depiction of light in the grisailles matches the actual candlelight. Note also that the placing of the grisailles was different at the time.

☐ 14
Sketch in black chalk on the plaster wall (Photo: Margriet van Eikema Hommes).

C.8 Reconstructing lost architectural and interior elements

Creating the digital reconstruction also prompted us to make choices for all lost original architectural and interior elements. The present cross bar windows are twentieth century reconstruction of the original seventeenth century specimens (13 top). During the renovation of 1708–1718, the Mauritshuis, however, was given sash windows divided into small panes according to the latest fashion (13 bottom). These appear on old prints, drawings and paintings of the building. Those also show that the central window recess was given French

doors at that time, although without any balcony railings. 19 These doors will have lent the reception room a more fashionable and distinguished appearance, in line with the magnificent salons in contemporary French châteaux. The ground floor of those châteaux was laid out according to the same classicist principles as that of the Mauritshuis, featuring a symmetrical floor plan with on the main axis the vestibule followed by the reception room (French: salon) placed between matching apartments. In France, the salon had developed into an exceptionally monumental space, often unusual in height and with splendid decorations. This included French doors to the gardens on the main axis. In the Mauritshuis, this feature has been imitated, even though the doors here only gave access to water.

On early eighteenth-century prints, drawings and paintings of the Mauritshuis, the number of panes changes every time: the artists were clearly only giving an overall impression of the windows and doors. For the digital visualisation, various options were therefore tried. In this process, we found that when the lower part of the windows was made up of 5×5 panes, and the upper part of 4×5 panes, this structure fitted that of the original shutter panels. For the same reason, the French doors were made up of 7×4 panes for the lower part, and 4×4 panes for the upper part (13 bottom).

Traces of other lost elements could still be found in the room. When one of the grisailles adjacent to the entrance door was removed, it appeared that an eighteenth-century black chalk sketch of a decorative detail with a mask and cartouches had been applied to the plaster wall 14. This design closely matches the decorative elements found above the frames of the mantel paintings and flower pieces, but such details are missing above the frames of the grisailles. The sketch, however, indicated that these were meant to have this type of ornamentation as well. This is confirmed by small nail holes that were found in the panelling above each grisaille frame: here, the original ornaments had been attached. The left and right-hand side of the sketch on the wall are different, as was often the case with designs for decorative details, so that the commissioning patron could choose. On the basis of the sketch, **Jan de Rode** designed decorations for the grisaille frames in the digital reconstruction.

No information has been preserved about the original floor finish. Parquet would likely have been too expensive, given the persistent lack of funds during the renovation. At the time, wide pine floorboards were commonly used for formal spaces like the Golden Room. Its floor rests on a stone vault, meaning that floorboards could have been laid both widthways and lengthways. For the digital reconstruction 28cm-wide floorboards were chosen that — based on the advice of architectural historians — were laid lengthwise. It is unlikely that the floorboards stretched the entire length (13.5 metres) of the room because planks that long would have been prohibitively expensive. This is why there are always two floorboards laid end to end in the reconstruction, with the join visible to the right of the entrance door. The pattern of the wood grain in the planks of the pine floor in the Great Hall of Amerongen Castle from 1680 served as the model for those in the reconstruction.

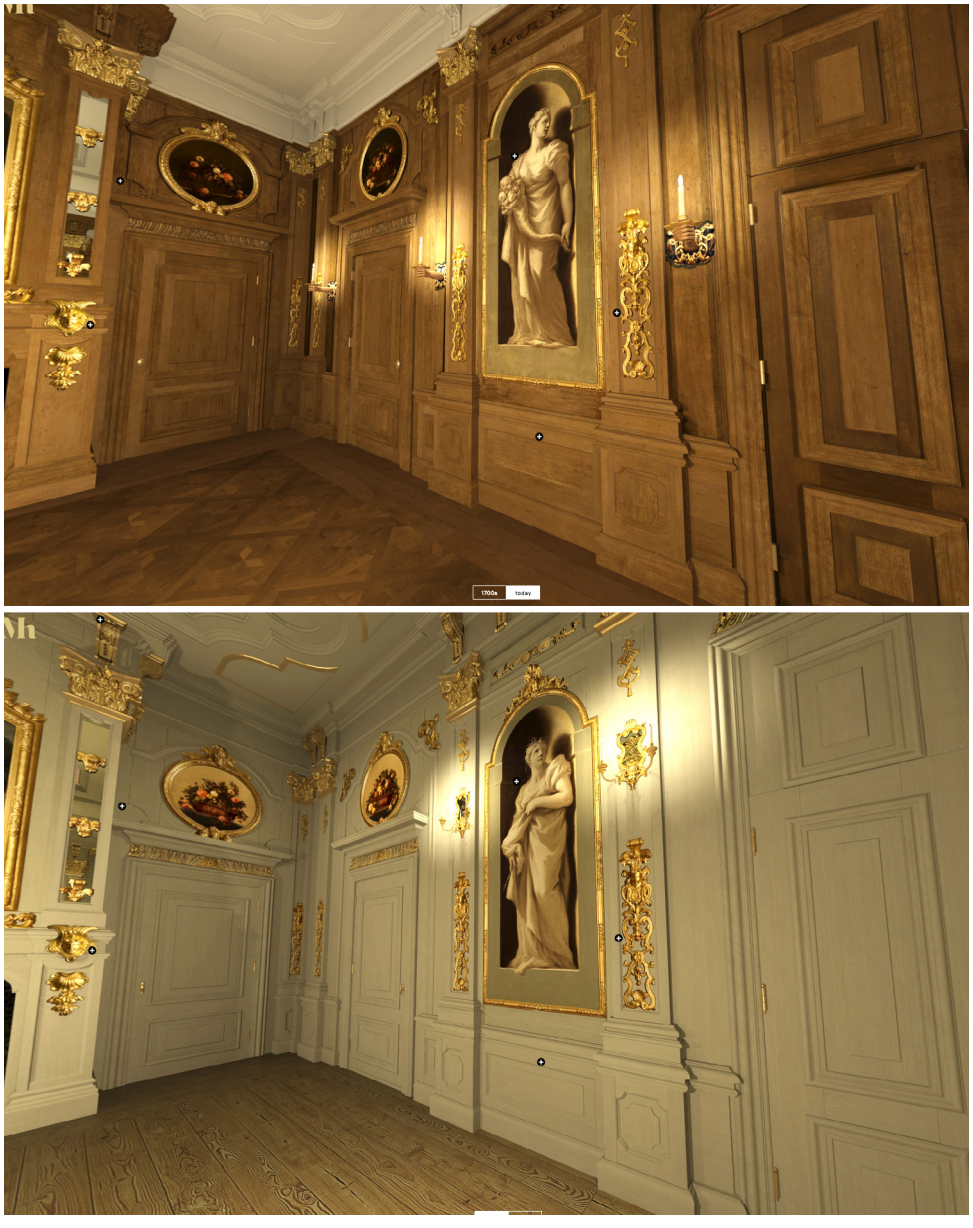
The present-day chandeliers are replicas of examples found in Royal Palace Het Loo and were hung there in 1984. The type of chandelier that hung here in 1718 is unknown. At that time, eight-arm chandeliers were very fashionable for

■ 19
For examples: Buvelot 2014, p. 119 (fig. 110), p. 144 (fig. 150).

distinguished rooms. The chandelier depicted by the Hague artist Cornelis Troost in a pastel drawing of an early eighteenth-century reception room, served as the model for the digital reconstruction (09 bottom). 20

The current wall sconces were also introduced in 1984 (15 top). They are based on the wall brackets in Enkhuizen's town hall, dating from around 1685. But around 1715 a different kind of lighting was popular: sconces with one or more candlesticks in front of a small mirror. They cast more light thanks to the candle-light's reflection. These mirror sconces were most probably attached to the pilasters on either side of the grisailles, since small nail holes were found in the paneling there. We don't know exactly what these sconces looked like. They may have been based on the designs by the French draughtsman Jean Bérain (1640–1711) whose influence can be found in many of the Golden Room's decorations as well as elsewhere in the Mauritshuis. Bérain made several designs for wall sconces with mirrors, one of which served as inspiration for the digital reconstruction (15 bottom).

■ **20**
Cornelis Troost, Nemo loquebatur, Pastel and gouache on paper on canvas 58.3cm×74.5cm, signed 1740, The Hague, Mauritshuis.



□ 15
Still from application.
Top: Present situation.
Bottom: Impression of situation in 1718.

C.9 The added value of the digital reconstruction

The digital reconstruction of the »Golden Room« significantly adds to the museum public's understanding of the »Golden Room«. This early eighteenth-century room is difficult to appreciate in its current appearance 02 03. The reconstruction shows how spectacular this space originally must have been, with its light grey stone-like walls and ceiling and its many gold-coloured decorations (09 bottom, 13 bottom, 15 bottom). When this room was illuminated by candlelight, the brass and gold elements must have produced a particularly spectacular effect. The flower **tondi** with their now dark brown, but originally gold coloured backgrounds were in keeping with these decorations and formed lively accents in the corners of room. The grisailles would really have appeared part of the stone-like walls. And the ceiling paintings with their originally glowing pink and blue twilight skies, looking like real openings, must have been able to emulate Pellegrini's Venetian frescoes. The »open« ceiling made the room seem considerably higher, adding to its magnificence.

Yet, our digital reconstruction also has some limitations. The type of light used — as explained, a combination of candlelight and a bright, more even illumination — will actually never have shone in the room. We chose this light for optimal visibility of all elements. However, it would have been equally interesting to have visualised the effect of pure candlelight and the effect of the limited, cold daylight. Unfortunately, this was not possible due to the limited financial resources. The present digital reconstruction is also static. One misses the flickering of candlelight, but especially the possibility to walk around freely. Instead, the space can only be viewed from a fixed point in the middle of the room. While exploring the room in this 360-degree view, from some angles, the space also appears distorted. And those who know the Golden Room in real life may notice that — despite the fact that exact measurements were taken — one perceives the room as much smaller in the digital reconstruction. These disadvantages are because we view the room via a screen. Regardless, it would be desirable if the spatial experience of the room could be better conveyed.

The initial aim of the digital reconstruction of the Golden Hall was to present research results in an appealing way to visitors of the Mauritshuis. While translating the scientific data into virtual imagery, however, our own understanding of the room also increased. This occurred as we had to make choices about all elements included, even those for which we had found no, or no sufficient, information regarding their original appearance. But it were in fact these »forced« decisions — which can feel uncomfortable to us as scholars — that brought to light details that would have gone unnoticed otherwise. The manner in which Pelligrini had depicted light in his grisailles, for example, casting dark, sharply delineated shadows, at first seemed illogical to us. These were after all **trompe l'oeil** paintings, in which the intensity and direction of the natural light would have been meticulously imitated during this period. 21 But this did not appear to be the case in Pellegrini's canvases. However, when the wall sconces and their accompanying candlelight were incorporated in the digital reconstruction at their original height (shoulder-height for the depicted statues) it became apparent that the grisailles ingeniously imitated the effect of these adjacent light sources. This also strongly

21
As seen in the grisailles by the Amsterdam painter Jacob de Witt (1695–1754).

supported the argument that the room was meant to be viewed by candlelight.

The digital reconstruction greatly helped to envision the original relationships between architecture, colour finish and Pellegrini's paintings in the Golden room, indicating how much this decorative scheme is in concordance with those found in contemporary palaces in other European countries. The large downstairs reception room in the Mauritshuis was built to serve a Republic, but had a truly princely appearance.