ASTRONOMICAL DATING OF EDVARD MUNCH'S
SUMMER SKY PAINTINGS

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ABSTRACT

Norwegian painter Edvard Munch, most famous for The Scream, created many spectacular works depicting the skies of Norway. Our Texas State group used astronomical methods to analyze three of these paintings: Starry Night, The Storm, and Sunrise in Åsgårdstrand. Astronomical dating of these paintings has some importance because the precise days when Munch visited Åsgårdstrand are unknown. Our research group traveled to Norway in August 2008 to find the locations from which Munch painted these three works. We then used astronomical calculations, topographical analyses, historical photographs, and weather records to determine the precise dates and times for the scenes depicted in these paintings.
THE SKIES OF EDVARD MUNCH

Professor Donald Olson’s Texas State University group has long had an interest in the way Edvard Munch portrayed the sky. He linked the blood-red sky of The Scream to the cloud of volcanic aerosols and other debris that spread worldwide following the eruption of Krakatoa. As part of his research, the group traveled to Norway and found the exact location depicted in The Scream. They verified that the artist was facing to the southwest, exactly the direction where the Krakatoa twilights appeared when at their most spectacular during the winter following the eruption.¹

On that same trip Dr. Olson’s group found the site of Munch’s Girls on the Pier in Åsgårdstrand. They determined the artist’s direction of view and showed that the yellow disk in the sky of this painting was setting in the southwest and therefore must be a summer full Moon – not the Sun, as some had claimed.²

As a starting point for a similar analysis of the Getty Center’s Starry Night (Fig. 1), we consulted biographies of Munch, exhibition catalogues, and a detailed year-by-year Munch chronology, which date this painting to 1893.³⁴ We were intrigued to see that the list of 1893 works includes two other Åsgårdstrand paintings with astronomical content. In The Storm (Fig. 2), a bright star shines in the stormy twilight sky above Åsgårdstrand’s
Grand Hotel. *Sunrise in Åsgårdstrand* (Fig. 3) features the Sun just above the horizon, with a prominent glitter path stretching across the Oslo fjord.

Astronomical dating of these three paintings has some importance because the precise days when Munch visited Åsgårdstrand during 1893 are unknown. Some authors even question whether the artist traveled there at all during that year and imply that he must have created these works from memories of previous visits to the resort.
Figure 1: Edvard Munch, *Starry Night*, 1893

oil on canvas, 135.6 x 140 cm

The J. Paul Getty Museum, Los Angeles

© 2009 The Munch Museum / The Munch-Ellingsen Group / Artists Rights Society (ARS), New York
Figure 2: Edvard Munch, *The Storm*, 1893

oil on canvas, 92 x 131 cm

Museum of Modern Art, New York

© 2009 The Munch Museum / The Munch-Ellingsen Group / Artists Rights Society (ARS), New York
Figure 3: Edvard Munch, *Sunrise in Åsgårdstrand*, ca. 1893

oil on canvas, 65 x 89 cm

private collection

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MUNCH’S VISIT TO ÅSGÅRDSTRAND IN 1893

We checked two of the most detailed chronologies of Munch’s life, and neither of these makes any mention of a visit to Åsgårdstrand in 1893.\textsuperscript{5,6}

Author Ketil Bjørnstad goes further and explicitly states for the year 1893 that Munch was not on the scene in Åsgårdstrand:

During the summer Munch does not go to Åsgårdstrand. Instead, he remains in Germany, paints landscapes with deeply atmospheric, smouldering colour, paints \textit{Starry Night}, \textit{Moonlight} and \textit{The Storm}.\textsuperscript{7}

A recent biography by Sue Prideaux discusses Munch’s stay in Germany in 1893 and likewise concludes:

Summer came, and Munch had neither the money nor the inclination to go to Norway.\textsuperscript{8}

But these biographies and chronologies are incomplete. Our research turned up a first-person account that was apparently overlooked by these authors. Jens Thiis, a long-time director of the National Gallery in Oslo, visited Åsgårdstrand in 1893 with several friends, including Edvard Munch and the poet Helge Rode. Thiis wrote:

I happened to meet Helge again in Åsgårdsstrand. It was his friend Edvard Munch who had invited him there...One day in August, when we were sitting together on the hotel veranda, I had the desire to sketch Helge Rode...\textsuperscript{9}

This drawing, seen in Fig. 4, bears the date of August 17, 1893, handwritten by Thiis in the corner.

\begin{figure}[h]
\centering
\includegraphics[width=0.4\textwidth]{fig4.png}
\caption{Sketch of Helge Rode, by Jens Thiis, 17 August 1893}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.2\textwidth]{fig5.png}
\caption{Detail of upper right corner of Thiis’ Sketch, “Åsgårdsstrand, 17.8.93. J.T.”}
\end{figure}
Because this account definitely places Munch in Åsgårdstrand, where he could be inspired by the Norwegian skies, we realized that we could possibly identify the celestial objects in Munch’s paintings and determine dates for these works.

**VENUS IN STARRY NIGHT?**

![Figure 6: Starry Night, 1893](image)

In the articles and books that we consulted, the art historians who comment on the sky of *Starry Night* all agree that Munch included the planet Venus.

The Getty sponsored a book devoted entirely to an analysis of *Starry Night*. The author, art historian Louise Lippincott, asserts that:

> The pink “star” on the horizon in *Starry Night* is actually the planet Venus…. ¹⁰

Lippincott also refers to the “appearance of Venus” in the painting as “the red star on its horizon.” ¹⁰
Arne Eggum, former chief curator of the Munch Museum, was apparently the first to make this Venus identification. Lippincott acknowledged that she was “deeply indebted to A. Eggum for pointing out the star symbolism in *Starry Night* during his visit to Malibu….” Eggum explained his reasoning:

> The first title Munch gave the painting *Starry Night* was *Evening Star*. As we know, the evening star is the planet Venus.…

Later authors adopted the planetary identification made by Eggum and Lippincott. For example, Marit Lande asserts that the “light on the horizon is the reflection of the planet Venus…”

Dieter Buchhart states that this painting includes “the bright evening star and its prominent swath of light … the planet of Venus….”

These descriptions are somewhat confusing – some seem to be referring to the red light on the horizon and others to the bright object up in the sky – but all of these art historians agree that Munch’s *Starry Night* includes Venus.

**MOON IN *STARRY NIGHT*?**

Louise Lippincott provides an astronomical explanation for the vertical white column visible in the garden:

> The view depicted in *Starry Night* looks down from the Grand Hotel window and across this enclosed private garden. The great linden trees form a mound silhouetted against the night sky, and their bulky shape is pierced by a dot and a streak of light from the moon hidden behind them.

She argues that her lunar theory is reasonable:

> …Munch already had developed the dot and streak as a way of representing a light source and its reflection; it seems plausible to identify the motif in the Getty Museum’s *Starry Night* as the moon and its reflection seen through the trees.
RED SHED IN *STARRY NIGHT*?

Regarding the “small red house” seen inside the silhouette of the trees, Lippincott asserts that

Åsgårdstrand’s topography does not explain *Starry Night*’s most enigmatic element, however: the small red house standing near the great lindens, to the right of the streak of moonlight. No such building seems ever to have existed at the foot of the Kiosterudgarden or anywhere in its immediate vicinity. Nor is it clear in the painting exactly where the house is situated. Is it in front of the trees, or does one glimpse it through the foliage? ¹⁴

To check these planetary, lunar, and topographical identifications, we wanted to carry out our own astronomical analysis.

TRIP TO NORWAY

Accordingly, our Texas State group traveled to Åsgårdstrand during August 2008. For *Starry Night* and also for *The Storm* and *Sunrise in Åsgårdstrand*, we hoped to answer several questions: Where was Munch standing? Which way was he facing and therefore which part of the sky did he depict? Could we determine the dates and times? Could we identify the celestial objects in these works?
We began by making a topographic survey of the town, using surveyor’s chains and transit to measure distances and angles.

Next, Åsgårdstrand resident Knut Christian Henriksen kindly shared his immense local history collection, including hundreds of photographs showing Åsgårdstrand as it appeared in Munch’s time.
By studying the historical photographs, we could see that many of the town’s buildings from 1893 are still standing, and we could see where changes had occurred.

Figure 11: Comparison of modern hotel to the Grand Hotel as it was in Munch’s day. Yellow arrow denotes the approximate view of the Starry Night scene as seen from the Grand Hotel.

The white fence visible in Munch’s Starry Night is easy to find today, and the original group of linden trees is still standing in the garden of the Kiøsterud estate. To obtain the view for Starry Night, Munch must have been somewhere in the nearby Grand Hotel.

A complication is that the hotel burned down in 1930 and then was rebuilt. We used the historical photographs, along with our own topographic survey, to determine the precise location of the original hotel. The southeast corner of the modern hotel is now somewhat farther from the Kiøsterud estate (by about 10 feet) and much closer to the fjord (by about 30 feet).
We allowed for this in our calculations, using a 3-dimensional computer model to simulate placing Munch on the veranda, on the balcony, and in the windows of the original hotel. We found that we could reproduce the view of *Starry Night* only from near the center of the upper floor of the old hotel.

**FLAGPOLE**

Louise Lippincott argues that *Starry Night’s* vertical white column with the round dot on the top is “the moon and its reflection seen through the trees.”[15] With assistance from Knut Christian Henriksen’s resources, we can offer a different explanation.

It is true that Munch depicted summer full Moons and their glitter paths in the fjord in dozens of other works. But glitter paths are reflections in the water and cannot extend up higher than the horizon. In Munch’s other works showing glitter paths, the columns of light stop at the horizon. The vertical white column in *Starry Night* extends well above the horizon and cannot be a glitter path.

More than twenty historical photographs, taken from almost all possible directions, show a flagpole with a round ball at the top standing in the Kiøsterud garden. The flagpole no longer exists, but our computer model shows that it stood exactly where Munch painted it and had the correct height (about 45 feet) relative to the group of linden trees.
We discovered a depression in the grass where the flagpole’s base had been. The depression can be found by starting at the corner of the white fence, walking uphill 20 feet along the fence that runs directly away from the water, and then walking 37 feet into the garden directly away from that fence.¹⁶

The hypothetical “Moon” and reflection in *Starry Night* turns out to be a flagpole.

The Red Shed

To resolve the dilemma posed by Lippincott regarding the existence of a red shed near the large group of linden trees in Munch’s painting we looked at many vintage Åsgårdstrand photographs provided by Knut Henriksen. A small shed outside the garden fence, in exactly the position to be glimpsed through the trees from Munch’s location in...
the Grand Hotel, appears in ten of these pictures. The historic photographs are black-and-white, but we also recognized the same shed depicted with a red roof in two Munch paintings, one at the Wadsworth Athenaeum and another at the Musée d’Orsay.

The “enigmatic” red shed did exist in the location in which it was portrayed by Munch.

What about Venus? Did Munch see Venus during the summer of 1893?
WAS VENUS VISIBLE IN 1893?

During our visit to Åsgårdstrand we took photographs from the hotel by day, during evening and morning twilight, and at night. We verified that Munch’s direction of view for *Starry Night* was generally to the east. The stars on the left side of the painting would lie somewhat north of east, while the trees on the right side are south of east.

Our computer calculations show that Venus was never visible at or above the eastern horizon during morning twilight or at sunrise on any date in the spring or summer of 1893. At sunset and in evening twilight, Venus was to the west of the hotel (the side away from the fjord), and the planet was never higher than 5° above the geometric horizon at sunset. A steep hill behind the hotel rises with a slope that we measured to be 8°. This hill would have blocked the view of Venus at sunset.

Therefore Munch could not have seen Venus from the Åsgårdstrand Grand Hotel whether from the front or back of the hotel, whether looking east toward the fjord or west toward the hill behind the hotel, whether at morning or evening twilight, on any date in the spring or summer of 1893.\textsuperscript{17}
But a very bright “star” is clearly visible in *Starry Night*. What did Munch see? The blue skyglow of *Starry Night* suggests a Norwegian twilight. Is this morning twilight or evening twilight?

**STARRY NIGHT = EVENING STAR**

The composition now called *Starry Night* was exhibited by Edvard Munch in his lifetime with a variety of titles. According to Arne Eggum and other experts at the Munch Museum, the alternate titles used for this work include *The Stars, Evening Star, Night, Starry Heavens*, and finally *Starry Night*.18 We realized that the title *Evening Star* provides an important astronomical clue, telling us that the bright “star” was observed between sunset and midnight.

But like so much else about *Starry Night*, even this use of the title *Evening Star* is hotly disputed by some art historians. Several scholars identify the title *Evening Star* with a composition now known as *The Voice*, which shows a woman standing in a forest along the coastline near Åsgårdstrand, with a yellow glitter path of moonlight reflecting in the fjord.

![Figure 21: The Voice, c. 1896, oil on canvas](image)

This title dispute is considered especially significant because *Evening Star* (whatever painting it was) was shown at Berlin in 1902 in the important position as painting #1 in
the first complete exhibition of the *Frieze of Life*, a group of paintings considered the major work of Munch’s artistic career. Likewise, the catalogue for an exhibition at Oslo’s Diorama Hall in 1904 lists *Evening Star* as painting #1 in the group called *Frieze (Modern Life of the Soul)*.

Munch biographer Sue Prideaux discusses an early exhibition and makes the judgment:

> The first big question of identity concerns whether... *Evening Star* in the catalogue, was *Starry Night* or *The Voice*. I have come down on the side of *The Voice*...19

The catalogue for a recent major Munch exhibition at the Museum of Modern Art comes to the same conclusion.20

With help from librarians at Texas State University, the National Library of Norway, and the Munch Museum Library, we located two primary sources that help to resolve this title controversy.

A newspaper critic from the Norwegian paper, Morgenbladet, gave the following eyewitness description of a Munch exhibition in Oslo:

> And turning to his exhibition in the Diorama Hall, I want people to focus their attention on number 1 in the catalogue – “Evening Star.”

> What in the world should prevent people from understanding that this is a beautiful picture? The poetry of the summer night, the great tree standing there slumbering in the garden, the fence shining white down towards the sea and the evening star shimmering up in a deep blue sky.21

![Figure 22](image.png)

*Figure 22:* Excerpt from Morgenbladet, November 6, 1904. Underlined in blue are references to the title *Evening Star*, the great tree, and the white fence of the Kiøsterud estate.
These details leave no doubt that the writer was describing the painting now known as *Starry Night*.

As further confirmation, the Munch Museum has a series of photographs taken at the Commeter Gallery in Hamburg, Germany. Painting #62 in Figure 23 definitely shows *Starry Night*, and an accompanying list in Munch’s handwriting includes the title “62 – Abendstern” (German for “Evening Star”).

**Figure 23:** Number 62 is the Wuppertal Museum’s *Starry Night* painted by Munch c. 1893.

**Figure 24:** Entry number 62 (in Munch’s Handwriting) corresponds to the image in Fig. 23.

Therefore, despite the contrary claims by some authors, this evidence demonstrates that Munch did use *Evening Star* as an early title for *Starry Night*. 
THE BRIGHT “STAR” IN STARRY NIGHT

During summer evenings in 1893 did any especially brilliant celestial body shine in the eastern sky over the Oslofjord?

Computer calculations provided the answer: the planet Jupiter, dazzling at apparent magnitude – 2.4 and by far the brightest object visible to an observer looking out from Åsgårdstrand’s Grand Hotel.

Above the bright object in the painting is a distinctive asterism that we recognized as the Pleiades. Computer simulations show that the Pleiades star cluster was in fact located just above Jupiter as the planet rose into the evening sky in 1893.

Figure 25: Comparison of computer model with painting. Similarities support the idea that Munch correctly represented the late summer sky of 1893.
Jupiter appears in the painting somewhat north of east, but the lack of topographic landmarks along the coastline makes it difficult to assign a precise azimuth. Because long glitter paths like those seen in the painting occur only for celestial objects near the horizon, Munch must have observed Jupiter at a low altitude, not long after the planet rose.

The scene cannot be from the early part of the summer because, before July 9, Jupiter rose after midnight and would not reasonably be called an “evening star” by Munch. A postcard in the Munch Museum archives proves that Munch had left Åsgårdstrand and was receiving mail at Nordstrand by September 24, 1893. The view in *Starry Night* must correspond to a date between July 9 and September 24.

![Image of postcard to Munch indicating that he had left Åsgårdstrand by 24 September 1893.](image)

Determining a more precise date astronomically is difficult, because Jupiter’s position among the background stars remains nearly the same for many consecutive nights. We therefore consulted weather records of the Norwegian Meteorological Institute. Rain and overcast skies were common, and most nights could be ruled out as a match for the painting. We found two especially clear nights.
Describing the night of August 16-17, 1893, the local Åsgårdstrand paper recorded that the clouds present near sunset quickly disappeared and:

Until late in the night the heavens were clear with twinkling stars.23

The night of August 23-24, 1893, was likewise cloudless.

We conclude that *Starry Night* shows Jupiter and the Pleiades during evening twilight, most likely on August 16 or August 23, 1893.

**THE STORM**

We realized that *The Storm* might provide an independent way to determine when Munch visited Åsgårdstrand.

A woman in white dominates the foreground of *The Storm*, while a cluster of women in the middle distance stands near the same fence depicted in *Starry Night*. A tree bends in the wind in front of lighted yellow windows of the Grand Hotel, the same building from which Munch observed the view for *Starry Night*. Beyond these connections to *Starry Night*, *The Storm* is also of special interest to astronomers because of the bright star visible in the sky just to the north (to the right) of the hotel.24
An actual storm inspired the painting, according to the same eyewitness account that places Munch in Åsgårdstrand during August of 1893. The memoir by Jens Thiis mentions some “beautiful sun-filled late summer days” during this visit to the resort but goes on to describe a sudden change in the weather:

One sultry evening...there suddenly began a rustling in the air and a quaking in the tree in front of the hotel. ... a gale broke out. ... the fjord stood heavy as lead in a foaming uproar. ... fishermen’s wives huddled together in a group. All were looking out through the dusky twilight for the fishing boats that were out there – would they all manage to get home safely?

The next day, Munch painted the events in his famous picture *The Storm*...The house with the illuminated windows is the hotel where we stayed, and the woman in white in the foreground is my future wife. 25

The woman in white, previously unidentified in several publications is therefore Ragna Vilhelmine Dons, who married Jens Thiis in 1895.

The weather records for July, August, and September list many days with rain but only one “strong thunderstorm” – a spectacular event on the evening of August 19, 1893.
The Oslo paper for the next day confirms that the storm hit during evening twilight:

A thunderstorm with magnificent lightning passed over the city around 9 o’clock yesterday evening.²⁶

Another newspaper writer was impressed by the almost unprecedented strength of this storm:

…there was a downpour so heavy and lightning so frequent and strong, in a manner that we can scarcely remember.²⁷

What bright star did Munch observe as the storm began to rage? To answer this question, we needed to know which direction the artist was facing.

The painting shows the corner of the white fence aligned with the house of the Kiøsterud estate, and a tree aligned with the center of the Grand Hotel. Several authors mistakenly identify the tree in The Storm as a poplar. Knut Christian Henriksen and several other Åsgårdstrand residents are certain that it was a birch, and the caption to an early photograph describes it as the birch tree (“bjørketreet”) painted by Munch.

![Figure 29: Munch’s preliminary sketch for The Storm. Red lines indicate objects that we used to triangulate Munch’s position.](image)

Although the tree has recently been cut down, the stump is still locatable. Using the location of the stump and the corner of the white fence along with many historical photographs we were able to triangulate Munch’s position to within a few feet.
We found that the bright star in *The Storm* had an azimuth near 267° (slightly south of west) and an altitude near 25°. For the latitude of Åsgårdstrand (59° 21' North) we calculated a stellar declination near +20°.

The star must therefore be Arcturus, an especially plausible candidate because it has the distinction of being the 2nd-brightest star (after Sirius) in the sky of Norway.²⁸

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**Figure 30:** Ava Pope’s feet and legs standing on the remnants of the birch tree in Munch’s *The Storm.*

**Figure 31:** Ava Pope standing on the tree stump so that its exact location could be used in topographical analysis.

**Figure 32:** Comparison of *The Storm* and photograph taken by Russell Doescher during our visit to Åsgårdstrand. Note Arcturus in the upper right corner of both images.
Sky simulations show that the time depicted in *The Storm* must be during evening twilight, within a few minutes of 9:15 p.m.\textsuperscript{29} The time derived from the position of the bright star is in excellent agreement with the times mentioned by Thiis and the newspaper stories.

We conclude that *The Storm* shows Arcturus in the western sky as the tempest began on the evening of August 19, 1893.

**SUNRISE IN ÅSGÅRDSTRAND**

![Figure 33: Sunrise in Åsgårdstrand, c. 1893](image)

We also found a way to use the Sun to determine the time of year when Munch visited Åsgårdstrand. The point on the horizon where the Sun rises varies seasonally, with the Sun rising farthest to the northeast at the summer solstice, farthest to the southeast at the winter solstice, and directly east at the spring and fall equinoxes.

*Sunrise in Åsgårdstrand* looks across the water to a rising Sun with a long glitter path reflected in the fjord. We recognized, just to the left of the glitter path, the same group of trees seen in *Starry Night* and the roof of the Kiøsterud house. The small building below and to the right of the glitter path served as a boathouse.
The right side of the painting shows the house now known as Russellgården, with its roof almost exactly superposed on the distant horizon. We found that this view is possible only from the upper floor of the nearby Soelberggården house.

![Figure 34: Donald Olson in front of the Soelberggården house. The circled window indicates the room from which Munch saw the scene of Sunrise in Åsgårdstrand.](image)

The current owners of Soelberggården kindly allowed us into their home.

![Figure 35: Ava Pope, Marilynn Olson, Donald Olson, and owners of the Soelberggården house](image)

We could match Munch’s view of the bend in the road only from a specific room in the upper story. In one of the most moving moments of our trip, we realized that we were standing on the same floorboards by the same window where the artist himself had looked out to watch the rising Sun, more than a century before.
Our modern photographs reveal several changes: the trees have grown taller, and Russellgården has undergone some structural modifications, most notably a dormer added to the roof. Knut Christian Henriksen showed us a historical photograph of Russellgården with no dormer, just as painted by Munch.

Figure 36: Photograph from Munch’s window in the Soelberggården house, taken by Russell Doescher in 2008.

Figure 37: Historical photograph shows that the Russelgården house (c. 1900) closely resembles the house in Munch’s painting.
Based on our survey we determined that the rising Sun in the painting was near azimuth 80° (that is, 10° north of east).

Using the angular width of the boathouse to set the scale, we estimated the Sun to be about 2° to 4° above the horizon, an altitude consistent with the long glitter path in the fjord. Munch could have observed the rising Sun near this position only during the second week of April (ruled out because Munch was then in Germany) or during the first five days of September.

Weather records show many mornings in Norway plagued by overcast skies and rain. In 1893 the only date and time consistent with the Sun and the sky in the painting is September 3 at 5:30 a.m.\(^30\)

The early history of the sunrise painting is somewhat uncertain, and scholars at the Munch Museum tell us that this work may date from a year or even a few years after 1893. A later date consistent with the position of the rising Sun and the weather records
is September 2, 1895 at 5:31 a.m. Local historical records indicate that the doctor Wilhelm Grimsgaard, a friend of Munch, was living in Åsgårdstrand at the Soelberggården house by 1895. This raises the intriguing possibility that Munch was visiting his friend or possibly renting a room in the Soelberggården. Regardless of the year, the sunrise painting must be from the first five days of September, which confirms that Munch was in the habit of visiting Åsgårdstrand in late summer.

CONCLUSIONS

*Starry Night* shows an evening twilight scene, with Jupiter and the Pleiades rising into the eastern sky on a date in the second half of August 1893.

*The Storm* shows an evening twilight scene looking west, with Arcturus setting next to the Grand Hotel, near 9:15 p.m. on August 19, 1893.

*Sunrise in Åsgårdstrand* looks east to a rising Sun and a glitter path in the fjord at a time near 5:30 a.m. on a morning in the first five days of September.

The three paintings studied here have been dated independently – one using stars and a planet, another using a storm and meteorological records, and the last using the Sun – and all three dates fall within a three-week period between mid-August and early September.

Starting from observations of nature during his visit to Åsgårdstrand in 1893, Munch showed his artistic genius by expressing emotional content that goes beyond literalism. Knowing the details of the celestial scenes in these paintings only increases our admiration of the artist’s skill at portraying the mystery of the Norwegian summer skies.

ACKNOWLEDGEMENTS

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NOTES


3 Edvard Munch’s Åsgårdstrand Starry Night exists in two versions, one at the Getty Center in Los Angeles and the other at the Von der Heydt-Museum in Wuppertal, Germany.

4 Johan Langaard and Reidar Revold, A Year by Year Record of Edvard Munch’s Life, 1961. Starry Night was first exhibited in Berlin in December 1893.

5 Langaard and Revold (1961), pp. 22-23.


16 We agree with art historian Thomas Messer who saw the flagpole and wrote in 1973 that “the tree group with the white fence in front and even the white flagpole that stands out against the foliage like a mysterious light reflection may still be found in their places today.” (Edvard Munch, 1985 reprint of 1973 edition, p. 76).

17 Louise Lippincott (1988, pp. 67-69) identifies Venus in Starry Night as “the red star on its horizon.” Lippincott was influenced by a passage in the famous account Farthest
North by polar explorer Fridtjof Nansen, in part because Nansen was an early private owner of Munch’s *Starry Night*.

Nansen describes the first appearance of Venus for the winter season in a journal entry written near latitude 78° North (far above the Arctic Circle) on January 8, 1894. Nansen recalls how he, “came on deck and saw a strong red light just above the edge of the ice in the south.” Nansen quickly realized that the spectacular object was, “Venus, which we see to-day for the first time, as it has till now been beneath the horizon. It is beautiful with its red light.” (*Farthest North*, 1898 edition, Volume I, pp. 368-369.) A Venus apparition like this, with the planet slowly rising nearly parallel to the horizon and remaining within one or two degrees of the horizon during the planet’s entire travel from rising to setting, is possible above the Arctic Circle but cannot occur at the latitude of Åsgårdstrand (59° 21’ North).

We suggest that the red light on the horizon in *Starry Night* may be a harbor light near the town of Larkollen on the east side of the Oslofjord.

18 In the exhibition catalogues, the titles in the original languages are *Die Sterne* (Berlin, 1893), *Stjernor* (Stockholm, 1894), *Stjerner* (Oslo, 1897), *Abendstern* (Berlin, 1902), *Aftenstjernen* (Oslo, 1904), *Nat* (Copenhagen, 1906), *Stjernehimmel* (Copenhagen, 1908), *Stjernenat* (Stockholm, 1917), and *Sternennacht* (Berlin, 1927).


21 *Morgenbladet*, November 6, 1904.

22 Norway in 1893 had not adopted modern time zones or daylight saving time. Åsgårdstrand (longitude 10° 28’ East) used local mean time, 42 minutes ahead of Universal Time. For example, on July 9, 1893, Jupiter rose at 23:16 UT = 11:58 p.m. local mean time at Åsgårdstrand.

23 *Gjengangeren*, August 20, 1893.

24 The bright star in *The Storm* is missing from some book reproductions, for example, *Edvard Munch: The Modern Life of the Soul*, Museum of Modern Art, 2006, p. 113. The star may have been mistakenly identified as a defect and removed from the digital file using Photoshop or an equivalent program. The bright star, above and to the right of the hotel, is clearly visible in the unretouched digital photographs taken by visitors to the Museum of Modern Art in New York, as can be verified at [www.flickr.com](http://www.flickr.com) by using the search terms: moma munch storm.


26 *Dagbladet*, August 20, 1893.

27 *Aftenposten*, August 22, 1893.
28  Arcturus had declination +19° 44' in 1893.

29  20:33 UT = 9:15 p.m. local mean time; see note 22.

30  4:48 UT = 5:30 a.m. local mean time; see note 22.
Appendix

Our research was published in 2 magazine articles and several articles written about our work were published in a variety of newspapers and web pages. The following are a few publications of our work:

Griffith Observer, August 2009  Pages 38–56
Astronomi, August 2009  Pages 57–66
Science, 2009  Page 67
Smithsonian.com, July 2009  Page 68
Gjengangeren, July 24, 2009  Page 69
Dagens Naeringsliv, July 2009  Page 70
Edvard Munch's Starry Nights, Stormy Skies, and Summer Sunrises

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With singular astronomical murals by Hugo Ballin, A.B. Heinsbergen, and Don Dixon and Robert Kline, Griffith Observatory has always been and continues to be affiliated with the intersection of astronomy and art. In 1983, renowned U.C.L.A. astronomer Dr. George O. Abell and I collaborated with U.C.L.A. art history professor Albert Boime in Griffith Observatory's previous planetarium to reconstruct the astronomical configurations depicted in three paintings by Vincent van Gogh: Starry Night, Café Terrace at Night, and Starry Night over the Rhône. When professor Boime subsequently published the results of the study in the December, 1984, issue of Arts Magazine, he emphasized van Gogh's deliberate observation and studied use of the real sky and discounted the prevailing view, which classified van Gogh's work as hallucinatory and visionary.

Dr. Donald Olson, astronomer at Texas State University, and his collaborators—particularly Russell Doescher—have been energetically examining the celestial circumstances embedded in celebrated paintings, photographs, history, and literature since 1987. The Olson team's bibliographic record now totals nine articles on astronomy in art, ten articles on astronomy in literature, and 22 articles on astronomical modulation of historical events.

Dr. Olson and his work were spotlighted nationally in the April, 2009, issue of Smithsonian. The article "Celestial Sleuths" details his forensic astronomy.


Now, readers of the Griffith Observer are privileged to read a firsthand report of original research on Norwegian skies painted by the famous artist Edvard Munch. It is a tale of mystery, astronomical interpretation so wrong it makes you want to scream, and detective work at the scene of the time. Dr. Olson and the rest of the team show what really caught Munch's eye and demonstrate his capacity for accurate observation.

—E.C.K.
Visitors come to the hills overlooking Hollywood to observe the stars and planets through the telescopes at Griffith Observatory and to enjoy the night sky simulations in the Samuel Oschin Planetarium. Ten miles west of Griffith Park, on another hill with a spectacular view of the Los Angeles basin, they can be awed by a different kind of starry night—a painting at the Getty Center titled *Starry Night*.

Edvard Munch (1863-1944), the Norwegian artist best known for *The Scream*, created the Getty Center’s *Starry Night*. A white fence and a group of linden trees dominate the foreground. A curving shoreline borders the waters of the Oslofjord, which reflects the blue skyglow of a night in the summer resort town of Åsgårdstrand. One especially bright celestial object stands out among the stars that fill the heavens.1

The Skies of Edvard Munch
Our Texas State University group has long had an interest in the way Edvard Munch portrayed the sky. We linked the blood-red sky of *The Scream* to the cloud of volcanic aerosols and other debris that spread worldwide following the eruption of Krakatoa, in Indonesia. As part of our research, we traveled to Norway and found the exact location depicted in *The Scream*. We verified that the artist was facing to the southwest, the direction where the Krakatoa twilights appeared when at their most spectacular during the winter following the eruption.2

On that same trip we visited the site of Munch’s *Girls on the Pier* in Åsgårdstrand. We determined the artist’s direction of view and showed that the yellow disk in the sky of this painting was setting in the southwest and therefore must be a summer full moon—not the sun, as some had claimed.3

FRONT COVER
Cosmic Conjunction: Astronomy and Art
Almost two years ago, after some of the dust from reopening Griffith Observatory had settled, the Observatory management team developed an agenda of priorities and development for the next several years. Griffith Observatory Director Dr. E.C. Krupp included in the programming initiatives an effort to link the arts and astronomy in a series of specially conceived performances and events. The plan was presented to the Board of Friends Of The Observatory (FOTO) on 27 March 2008, and subsequently the FOTO Board selected some of the objectives for primary FOTO support. The Board was especially interested in the notion of linking the arts and astronomy through independent Griffith Observatory activities and through cooperative ventures with other institutions. An effort to stage a live performance of *Observations*, music composed by Symphony in the Glen conductor Arthur Rubenstein for the International Year of Astronomy, as part of an astronomical concert program on Observatory grounds, is now underway. Observatory staff are now also developing *Light of the Valkyries*, a new planetarium show designed to complement the staging of Richard Wagner’s entire Ring Cycle by the Los Angeles Opera in 2010. In the meantime, however, this issue of the *Griffith Observer* brings astronomy and art together in an article by Dr. Donald Olson and the Texas State University forensic astronomy team on three paintings by the famous Norwegian artist Edvard Munch. One of these paintings, *Starry Night*, belongs to the collection of the J. Paul Getty Museum, Los Angeles. Our front cover this month pairs the Getty Museum with *Griffith Observer*, the other hilltop fortress of civilization in southern California, to acknowledge an unexpected alliance of astronomy and art in your August *Griffith Observer*. (photograph of Getty Center by Atwater Village Newbie, photograph *Griffith Observer* by Anthony Cook, cover design by Grace Ramos)
Edward Munch captured the sky for *Starry Night* in Åsgårdstrand, a coastal town in southern Norway, south of Oslo, on the west side of Oslofjord. Details of interpretive interest include the bright “star” on the left and its glitter path on the water, the red light on the horizon, and the white dot and vertical line in front of the silhouetted linden tree. (Edward Munch, *Starry Night*, 1893 oil on canvas, 135.6 x 140 cm. The J. Paul Getty Museum, Los Angeles © 2009 The Munch Museum/The Munch-Ellegardt Group/Artists Rights Society (ARS), New York)

As a starting point for a similar analysis of the Getty Center’s *Starry Night*, we consulted biographies of Munch, exhibition catalogues, and a detailed year-by-year Munch chronology, which date this painting to 1893. We were intrigued to see that the list of 1893 works included two other Åsgårdstrand paintings with astronomical content. In *The Storm*, a bright star shines in the twilight sky above Åsgårdstrand’s Grand Hotel. *Sunrise in Åsgårdstrand* features the sun just above the horizon, with a glitter path stretching across the fjord.4

Astronomical dating of these three paintings has some importance because the precise
days when Munch visited Åsgårdstrand during 1893 are unknown. Some authors even question whether the artist traveled there at all during that year and imply that he must have created these works from memories of previous visits to the resort.

**Munch's Visit to Åsgårdstrand in 1893**

We checked two of the most detailed chronologies of Munch’s life, and neither of these makes any mention of a visit to Åsgårdstrand in 1893.⁵ ⁶

Author Ketil Bjørnstad goes further and explicitly states for the year 1893 that Munch was not on the scene in Åsgårdstrand,

**During the summer Munch does not go to Åsgårdstrand. Instead, he remains in Germany, paints landscapes with deeply atmospheric, smouldering colour, paints *Starry Night, Moonlight and The Storm.*⁷**

A recent biography by Sue Prideaux discusses Munch’s stay in Germany in 1893 and likewise concludes,

**Summer came, and Munch had neither the money nor the inclination to go to Norway.⁸**

But these biographies and chronologies are incomplete. Our research turned up a first-person account that was apparently overlooked by these authors. Jens This, a long-time director of the National Gallery in Oslo, visited Åsgårdstrand in 1893 with several friends, including Edvard Munch and the poet Helge Rode. This wrote,

**I happened to meet Helge again in Åsgårdstrand. It was his friend Edward Munch who had invited him there…One day in August, when we were sitting together on the hotel veranda, I had the desire to sketch Helge Rode…**⁹

This drawing bears the date of August 17, 1893, handwritten by This in the corner. Because this account definitely places Munch in Åsgårdstrand, where he could be inspired by the Norwegian skies, we realized that we could possibly identify the celestial objects in Munch’s paintings and determine dates for these works.
Venus in *Starry Night*

In the articles and books that we consulted, the art historians who comment on the sky of *Starry Night* all agree that Munch included the planet Venus.

The Getty sponsored a book devoted entirely to an analysis of *Starry Night*. The author, art historian Louise Lippincott, asserts that

The pink “star” on the horizon in *Starry Night is actually the planet Venus...* "10"

Lippincott also refers to the “appearance of Venus” in the painting as “the red star on its horizon.” 20

Arne Eggum, former chief curator of the Munch Museum, was apparently the first to make this Venus identification. Lippincott acknowledged that she was “deeply indebted to A. Eggum for pointing out the star symbolism in *Starry Night* during his visit to Malibu...” 10 Eggum explained his reasoning,

The first title Munch gave the painting *Starry Night was Evening Star. As we know, the evening star is the planet Venus...* 11

Later authors adopted the planetary identification made by Eggum and Lippincott. For example, Marit Lande asserts that the “light on the horizon is the reflection of the planet Venus...” 12 Dieter Buchhart states that this painting includes “the bright evening star and its prominent swath of light...the planet of Venus...” 13

These descriptions are somewhat confusing—some seem to be referring to the red light on the horizon and others to the bright object up in the sky—but all of these art historians agree that Munch’s *Starry Night* includes Venus.

Moon in *Starry Night*

Louise Lippincott provides an astronomical explanation for the vertical white column visible in the garden:

The view depicted in *Starry Night* looks down from the Grand Hotel window and across this enclosed private garden. The great linden trees form a mound silhouetted against the night sky, and their bulk shape is pierced by a dot and a streak of light from the moon hidden behind them. 14
She argues that her lunar theory is reasonable.

...Munch already had developed the dot and streak as a way of representing a light source and its reflection; it seems plausible to identify the motif in the Getty Museum's Starry Night as the moon and its reflection seen through the trees.\(^{15}\)

To check these planetary and lunar identifications, we wanted to carry out our own astronomical analysis.

**Trip to Norway**

Accordingly, our Texas State group, accompanied by *Sky & Telescope* editor Roger Sinnott, traveled to Åsgårdstrand during August, 2008. For *Starry Night* and also for *The Storm* and *Sunrise in Åsgårdstrand*, we hoped to answer several questions: Where was Munch standing? Which way was he facing and therefore which part of the sky did he depict? Could we determine the dates and times? Could we identify the celestial objects in these works?

We began by making a topographic survey of the town, using a surveyor's chains and transit to measure distances and angles. Next, Åsgårdstrand resident Knut Christian Henriksen kindly shared his immense local history collection, which includes hundreds of photographs showing Åsgårdstrand as it appeared in Munch's time. By studying the historical photographs, we could see that many of the town's buildings from 1893 are still standing, and we could see where changes had occurred.

The white fence visible in Munch's *Starry Night* is easy to find today, and the original group of linden trees is still standing in the garden of the Klosterud estate. To obtain the view for *Starry Night*, Munch must have been somewhere in the nearby Grand Hotel.

The analysis is complicated, however, because the hotel burned down in 1930 and was rebuilt. We used the historical photographs, along with our own topographic survey, to determine the precise location of the original hotel. The southeast corner of the modern hotel is now farther from the Klosterud estate (by about 10 feet) and closer to the fjord (by about 30 feet). We used a 3-dimensional computer model to simulate Munch's view from the veranda, the balcony, and the windows of the original hotel. We found that we could reproduce the view of *Starry Night* only from near the center of the upper floor of the old hotel.
The settings of both *Starry Night* and *The Storm* are preserved in this postcard view of Åsgårdsstrand from about 1910. The white fence on the left encloses the linden trees and a pole flying the Norwegian flag. The fence, the trees, and the pole are all seen in *Starry Night*. The Grand Hotel, near the center, is partially obscured by the birch tree, as it is in *The Storm.* (Collection of Knut Christian Henriksen, Åsgårdsstrand)

Flagpole

Louise Lippincott argues that *Starry Night*’s vertical white column with the round dot on the top is “the moon and its reflection seen through the trees.” With assistance from Knut Christian Henriksen’s resources, we can offer a different explanation.

It is true that Munch depicted summer full moons and their glitter paths in the fjord in dozens of other works, but glitter paths are reflections in the water and cannot extend up higher than the horizon. In Munch’s other works showing glitter paths, the columns of light stop at the horizon. The vertical white column in *Starry Night* extends well above the horizon and cannot be a glitter path.

More than 20 historical photographs, taken from almost all possible directions, show a flagpole with a round ball at the top standing in the Kisserud garden. The flagpole no longer exists, but our computer model shows that it stood exactly where Munch painted it and had the correct height (about 45 feet) relative to the group of linden trees. We discovered a depression in the grass where the flagpole’s base had been.\(^\text{16}\)
The hypothetical “moon” and reflection in *Starry Night* turns out to be a flagpole. What about Venus? Did Munch see Venus during the summer of 1893?

**Was Venus Visible in 1893?**

During our visit to Asgårdstrand we took photographs from the hotel by day, during evening and morning twilight, and at night. We verified that Munch’s direction of view for *Starry Night* was generally to the east. The stars on the left side of the painting would lie somewhat north of east, while the trees on the right side are south of east.

Our computer calculations show that Venus was never visible at or above the eastern horizon during morning twilight or at sunrise on any date in the spring or summer of 1893. At sunset and in evening twilight, Venus was to the west of the hotel (the side away from the fjord), and the planet was never higher than 5° above the geometric horizon at sunset. A steep hill behind the hotel rises with a slope that we measured to be 8°. This hill would have blocked the view of Venus at sunset.

Therefore Munch could not have seen Venus from the Asgårdstrand Grand Hotel whether from the front or back of the hotel, whether looking east toward the fjord or west toward the hill behind the hotel, whether at morning or evening twilight, on any date in the spring or summer of 1893.17

But a very bright “star” is clearly visible in *Starry Night*. What did Munch see? The blue skyglow of *Starry Night* suggests a Norwegian twilight. Is this morning twilight or evening twilight?

**Starry Night = Evening Star**

The composition now called *Starry Night* was exhibited by Edvard Munch in his lifetime with a variety of titles. According to Arne Eggum and other experts at the Munch Museum, the alternate titles used for this work include *The Stars*, *Evening Star*, *Night*, *Starry Heavens*, and finally *Starry Night*.18 We realized that the title *Evening Star* provokes an important astronomical clue, telling us that the bright “star” was observed between sunset and midnight.

But like so much else about *Starry Night*, even this use of the title *Evening Star* is hotly disputed by some art historians. Several scholars identify the title *Evening Star* with a composition now known as *The Voice*, which shows a woman standing in a forest along the coastline near Asgårdstrand, with a yellow glitter path of moonlight reflecting in the fjord.
Roger Sinnott uses shadows cast by the sun to measure the slope of Hamnegata, the road between the Grand Hotel and the Kleveland estate in Åsgårdstrand, as part of a topographic survey of the town. (photograph Ava Pope)

For example, Munch biographer Sue Prideaux discusses an early exhibition and makes the judgment:

The first big question of identity concerns whether...Evening Star in the catalogue, was Starry Night or The Voice. I have come down on the side of The Voice... 11

The catalogue for a recent major Munch exhibition at the Museum of Modern Art comes to the same conclusion. 20

With help from librarians at Texas State University, the National Library of Norway, and the Munch Museum Library, we located two primary sources that help to resolve this title controversy.

A newspaper critic gave the following eyewitness description of a Munch exhibition in Oslo.

And turning to his exhibition in the Diorama Hall, I want people to focus their attention on number 1 in the catalogue—“Evening Star.”

What in the world should prevent people from understanding that this is a beautiful picture? The poetry of the summer night, the great tree standing there slumbering in the garden, the fence shinin...
The Bright “Star” in Starry Night

During summer evenings in 1893 did any especially brilliant celestial body shine in the eastern sky over the Oslafjord?

Computer calculations provided the answer. The planet Jupiter, dazzling at apparent magnitude -2.4, was by far the brightest object visible to an observer looking out from Åsgårdstrand’s Grand Hotel.

Above the bright object in the painting is a distinctive asterism that we recognized as the Pleiades. Computer simulations show that the Pleiades star cluster was in fact located just above Jupiter as the planet rose into the evening sky in 1893.

Jupiter appears in the painting somewhat north of east, but the lack of topographic landmarks along the coastline makes it difficult to assign a precise azimuth. Because long and narrow glitter paths like those seen in the painting occur only for objects near the horizon, Munch must have observed Jupiter at a low altitude, not long after the planet rose.

The scene cannot be from the early part of the summer because, before July 9, Jupiter rose after midnight and would not reasonably have been called an “evening star” by Munch.22 A postcard in the Munch Museum archives proves that Munch had left Åsgårdstrand and was receiving mail at Nordstrand by September 24, 1893. The view in Starry Night must correspond to a date between July 9 and September 24.

Determining a more precise date astronomically is difficult, because Jupiter’s position among the background stars remains nearly the same for many consecutive nights. We therefore consulted weather records of the Norwegian Meteorological Institute. Rain and overcast skies were common, and most nights could be ruled out as a match for the painting. We found two especially clear nights.

Describing the night of August 16-17, 1893, the local Åsgårdsstrand paper recorded that the clouds present near sunset quickly disappeared and,

Until late in the night the heavens were clear with twinkling stars.23

The night of August 23-24, 1893, was likewise clear.

We conclude that Starry Night shows Jupiter and the Pleiades during evening twilight, most likely on August 16 or August 23, 1893.

The Storm

We realized that The Storm might provide an independent way to determine when Munch visited Åsgårdstrand.

CENTER

Moonlight in the Starry Night

Despite earlier claims to the contrary, the moon does not appear in Edvard Munch’s 1893 painting Starry Night. The actual astronomical circumstances of the art have now been established by Dr. Donald W. Olson, Russell L. Doescher, Joseph C. Herbert, Robert H. Newton, and Ava G. Pope. Their original research, incorporating on-site examination of Åsgårdsstrand, Norway, the town where Munch designed his painting, appears this month in their article “Edvard Munch’s Starry Nights, Stormy Skies, and Summer Sunrises.” Their approach includes photographic documentation of the point of view of the painting, and that perspective is illustrated in this picture, shot to the east, over a recognizable white fence and past the same linden trees shown in Starry Night. This fieldwork was undertaken just a year ago this month, and the photograph captures the moon climbing out of Oslofjord on 18 August 2008 and laying a glitter path on its waters. The light reflected on the fjord in Munch’s painting belongs to an entirely different celestial object. (photograph Russell Doescher)
A woman in white dominates the foreground of *The Storm*, while a cluster of women in the middle distance stands near the same fence depicted in *Starry Night*. A tree bends in the wind in front of lighted yellow windows of the Grand Hotel, the same building from which Munch observed the view for *Starry Night*. Beyond these connections to *Starry Night*, *The Storm* is also of special interest to astronomers because it includes a bright star visible in the sky just to the north (to the right) of the hotel.24

An actual storm inspired the painting, according to the same eyewitness account that places Munch in Asgårdstrand during August of 1893. The memoir by Jens This mentions some “beautiful sun-filled late summer days” during this visit to the resort but goes on to describe a sudden change in the weather.

One sultry evening...there suddenly began a rustling in the air and a quaking in the tree in front of the hotel...a gale broke out...the fjord stood heavy as lead in a foaming uproar...fishermen's wives huddled together in a group. All were looking out through the dusky twilight for the fishing boats that were out there—would they all manage to get home safely?

The next day, Munch painted the events in his famous picture *The Storm*...The house with the illuminated windows...
is the hotel where we stayed, and the
woman in white in the foreground is my
future wife.\textsuperscript{23}

The weather records for July, August, and
September list many days with rain but only
one "strong thunderstorm"—a spectacular event
on the evening of August 19, 1893.

The Oslo paper for the next day confirms
that the storm hit during evening twilight.

A thunderstorm with magnificent lightning passed over the city around 9 o'clock yesterday evening.\textsuperscript{25}

Another newspaper writer was impressed
by the almost unprecedented strength of this storm.

...there was a downpour so heavy and
lightning so frequent and strong, in a
manner that we can scarcely remember.\textsuperscript{27}

What bright star did Munch observe as
the storm began to rage? To answer this question,
we needed to know which direction the artist
was facing.

The painting shows the corner of the white
fence aligned with the house of the Kjøsterud
estate and a birch tree aligned with the center
of the Grand Hotel. (Although the tree has
recently been cut down, the stump is still easy to
find.)\textsuperscript{28} Munch's view is possible from only one
location, which our survey determined within
a few feet.

We found that the bright star in \textit{The Storm}
had an azimuth near 267° (slightly south of
west) and an altitude near 25°. For the latitude
of Åsgårdstrand (59° 21' north) we calculated
a stellar declination near +20°. The star must
therefore be Arcturus, an especially plausible
candidate because it has the distinction of being
the second brightest star (after Sirius) in the
night sky of Norway.\textsuperscript{29}

Sky simulations show that the time depicted
in \textit{The Storm} must be during evening twilight,
within a few minutes of 9:15 p.m.\textsuperscript{30} The time
derived from the position of the bright star is in
excellent agreement with the times mentioned
by Thiis and the newspaper stories.

We conclude that \textit{The Storm} shows Arcturus
in the western sky as the tempest began on the
evening of August 19, 1893.

Arcturus is well-known to astronomers
worldwide as a prominent star during August
evenings. Readers of this issue of the \textit{Griffith
Observer} can confirm this by consulting the sky
chart showing the Evening Sky in August, on
page 22, or, better yet, by observing this brilli-
ant star in the western sky during evening
twilight this month.

\textit{Sunrise in Åsgårdstrand}

We also found a way to use the sun to deter-
mine the time of year when Munch visited
Åsgårdstrand. The point on the horizon where
the sun rises varies seasonally, with the sun ris-
ing farthest to the northeast at the summer
solstice, farthest to the southeast at the winter
solstice, and directly east at the spring and fall
equinoxes.

\textit{Sunrise in Åsgårdstrand} looks across the water
to a rising sun with a long glimmer path reflected
in the fjord. We recognized, just to the left of
the glitter path, the same group of trees seen in *Starry Night* and the roof of the Krierud house. The small building below and to the right of the glitter path served as a boathouse.

The right side of the painting shows the house now known as Russellgården, with its roof almost exactly superposed on the distant horizon. We found that this view is possible only from the upper floor of the nearby Soelberggården house.

The current owners of Soelberggården kindly allowed us into their home. We could match Munch’s view of the bend in the road only from a specific room in the upper story. In one of the most moving moments of our trip, we realized that we were standing on the same floorboards by the same window where the artist himself had looked out to watch the rising sun, more than a century before.

Our modern photographs reveal several changes: The trees have grown taller, and Russellgården has undergone some structural modifications, most notably a dormer added to the roof. Knut Christian Henriksen showed us a historical photograph of Russellgården with no dormer, just as painted by Munch.

Based on our survey we determined that the rising sun in the painting was near azimuth 80° (that is, 10° north of east). Using the angular width of the boathouse to set the
The building on the right side of Munch's Sunrise in Åsgårdstrand is Russelgården. In this historical photograph, it looks just as it did painted by Munch. (collection of Knut Christian Henriksen)

A 2008 photograph of the scene in Sunrise in Åsgårdstrand, obtained from the upper story of Soelberggården house, records taller trees. Also, more recent structural modifications to Russelgården house add a dormer to the roof. This feature is absent in the Munch painting and in the historical photograph. (photograph Russell Deescher)

scale, we estimated the sun to be about 2° to 4° above the horizon, an altitude consistent with the long and narrow glitter path in the fjord. Munch could have observed the rising sun near this position only during the second week of April (ruled out because Munch was then in Germany) or during the first five days of September.

Weather records show many mornings in Norway plagued by overcast skies and rain. In 1893 the only date and time consistent with the sun and the sky in the painting is September 3 at 5:30 a.m.24

The early history of the sunrise painting is somewhat uncertain, and scholars at the Munch Museum tell us that this work may date from a year or even a few years after 1893. A later date consistent with the position of the rising sun and the weather records is September 2, 1895, at 5:31 a.m. Local historical records indicate that the doctor Wilhelm Grimsgaard, a friend of Munch, was living in Åsgårdstrand at the Soelberggården house by 1895. This raises the intriguing possibility that Munch was visiting his friend or possibly renting a room in the Soelberggården. Regardless of the year, the sunrise painting must be from the first five days of September, which confirms that Munch was in the habit of visiting Åsgårdstrand in late summer.

Reconstruction of the view for Sunrise in Åsgårdstrand places Munch in a window in the upper floor of Soelberggården house. (photograph Donald Olson)

Conclusions

Starry Night shows an evening twilight scene, with Jupiter and the Pleiades rising into the eastern sky on a date in the second half of August, 1893.

The Storm shows an evening twilight scene looking west, with Arcturus setting next to the Grand Hotel, near 9:15 p.m. on August 19, 1893.
Sunrise in Åsgårdstrand looks east to a rising sun and a glitter path in the fjord at a time near 5:30 a.m. on a morning in the first five days of September.

The three paintings studied here have been dated independently—one using stars and a planet, another using a storm and meteorological records, and the last using the sun—and all three dates fall within a three-week period between mid-August and early September.

Starting from observations of nature during this visit to Åsgårdstrand, Munch showed his artistic genius by expressing emotional content that goes beyond literalism. Knowing the details of the celestial scenes in these paintings only increases our admiration of the artist’s skill at portraying the mystery of the Norwegian summer skies.

Acknowledgments

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Notes

1 Edward Munch’s Åsgårdstrand Starry Night exists in two versions, one at the Getty Center in Los Angeles and the other at the Von der Heydt-Museum in Wuppertal, Germany.


4 Johan Langgaard and Reidar Revold, A Year by Year Record of Edward Munch’s Life, 1961.


16 We agree with art historian Thomas Messer who saw the flagpole and wrote in 1973 that “the tree group with the white fence in front and even the white flagpole that stands out against the foliage like a mysterious light reflection may still be found in their places today.” (Edward Munch, 1985 reprint of 1973 edition, p. 76).

17 Louise Lippincott (1988, pp. 67-69) identifies Venus in Starry Night as “the red star on its horizon.” Lippincott was influenced by a passage in the famous account Farthest North by polar explorer Fridtjof Nansen, in part because Nansen was an early private owner of Munch’s Starry Night.

Nansen describes the first appearance of Venus for the winter season in a journal entry written near latitude 78° north (far above the arctic circle) on January 8, 1894. Nansen recalls how he “came on deck and saw a strong red light just above the edge of the ice in the
south.” Nansen quickly realized that the spectacular object was “Venus, which we see to-day for the first time, as it has till now been beneath the horizon. It is beautiful with its red light.” (Farthest North, 1898 edition, Volume I, pp. 368-369.)

We suggest that the red light on the horizon in Starry Night may be a harbor light near the town of Larkollen on the east side of the Oslofjord.

18 In the exhibition catalogues, the titles in the original languages are Die Sternen (Berlin, 1893), Stjerner (Stockholm, 1894), Stjerner (Oslo, 1897), Abendstern (Berlin, 1902), Aftenstjernen (Oslo, 1904), Nat (Copenhagen, 1906), Stjernehimmel (Copenhagen, 1908), Stjernesat (Stockholm, 1917), and Sternennacht (Berlin, 1927).


21 Morgenbladet, November 6, 1904.

22 Norway in 1893 had not adopted modern time zones or daylight saving time. Local mean time at Åsgårdstrand (longitude 10° 28' east) was 42 minutes ahead of Universal Time. For example, on July 9, 1893, Jupiter rose at 23:16 UT = 11:58 p.m., local mean time.

23 Gjengangeren, August 20, 1893.

24 The bright star in The Storm is missing from some book reproductions, for example, Edward Munch: The Modern Life of the Soul, Museum of Modern Art, 2006, p. 113. The star may have been mistakenly identified as a defect and removed from the digital file using Photoshop or an equivalent program. The bright star, above and to the right of the hotel, is clearly visible in the untouched digital photographs taken by visitors to the Museum of Modern Art in New York, as can be verified at www.flickr.com by using the search terms: moma munch storm.


26 Dagbladet, August 20, 1893.

27 Aftenposten, August 22, 1893.

28 Several authors mistakenly identify the tree in The Storm as a poplar. Knut Christian Henriksen and several other Åsgårdstrand residents are certain that it was a birch, and the caption to an early photograph describes it as the birch tree (“bjørketreet”) painted by Munch.

29 Arcturus had declination +19° 44’ in 1893.

30 20:33 UT = 9:15 p.m., local mean time; see note 22.

31 4:48 UT = 5:30 a.m., local mean time; see note 22.

BACK COVER

The Space Shuttle Endeavors to Leave

Disruptive weather at Cape Canaveral, Florida, on Sunday, 30 November 2008, diverted the Space Shuttle Endeavour to a California touchdown. The Space Shuttle can land at NASA’s Dryden Space Flight Research Center at Edwards Air Force Base, near Palmdale, 65 miles northeast of Los Angeles, but it can’t return to space from there. The Space Shuttle must be carried piggyback on a Boeing 747 across the country for its next liftoff, and it left California on 10 December 2008. Griffith Observatory Astronomical Observer Anthony Cook was credentialed for press access and on hand to document the endeavor. Three weeks later, Anthony Cook reported the Endeavour’s departure for Florida to the audience assembled in the Leonard Nimoy Event Horizon for Griffith Observatory’s monthly astronomical accounting. “All Space Considered,” hosted by Griffith Observatory Curator Dr. Laura Danly, (photograph: John Woodbury, Griffith Observatory)
To use: Hold the chart over your head and orient it so that the directions on the outside of the chart match the directions on the ground. The chart shows the entire sky from horizon to horizon at the time indicated.

This chart is set for the latitude of Los Angeles (34° north), but it is useful throughout the continental United States and around the world at a similar latitude.

Planet positions are plotted for the 15th of the month. Sidereal times are Evening chart, 18°45'; Morning chart, 0°45'.

<table>
<thead>
<tr>
<th>Chart Times</th>
<th>Evening Sky</th>
</tr>
</thead>
</table>
| 11:00 p.m.  | P.D.T. August 1
| 10:00 p.m.  | P.D.T. August 16
| 9:00 p.m.   | P.D.T. August 31

<table>
<thead>
<tr>
<th>Morning Sky</th>
</tr>
</thead>
</table>
| 1:00 a.m.   | P.D.T. August 1
| 4:00 a.m.   | P.D.T. August 15
| 7:00 a.m.   | P.D.T. August 31
Universet er blitt yngre!

En reise i tid:
Greenwich-observatoriet

Med Planck til tidens begynnelse

Røde dvergstjerner likevel ikke uegnet for liv

Tycho Brahe: Astronomiens nøyaktige mester

Russisk kjempeteleskop skal jakte på ormhull

Aktive Merkur

Bli med på Teleskopets dag!

Edvard Munchs astronomiske malerier
Stjernenetter, stormer og sommerlige soloppganger

Den geniale kunstneren Edvard Munch (1863-1944) hentet mye inspiration i lyse, norske sommeretter. Det finnes talrike kopieringer til astronomiske objekter i hans malerier. Et av de viktigste er Stjernenett.

Bilde: Eva Pope, Joseph Herbert og Donald Olson (med flere) har fulgt Edvard Munches fotspor i Åsgårdsstråen. Og de har gått grundig til verk for å finne ut mer om våre Kunstkatter.

En reise i tid
Greenwich observatoriet i London ble i sin tid opprettet for å bygge engelsk sjøfart. I dag er det et flott besøkssted og en stor turistattraksjon.

Universet er blitt yngre
Universet utvikler seg radikalt enn vi så langt i tiden. Nå ser vi at Universets begynnelsen da det er blitt lavere.

Nytt om Merkur
Romansendingen Messenger har gitt oss uventet kunnskap om Soleystemets innerste planet. Den viser oss at vi må overveie mer om forskerne har vært klare over.

Skal jakte på ormhull
Russland vil bygge et 12 meter stort romteleskop som skal samvirke med andre teleskoper. Hvis de lykkes, vil det gi uforutsigbare bilder av astronomiske objekter. Teleskoptankene opp som brukt til å sende ekstreme oppgavene.

Nyhrefter:
Læs artikkelen i denne utgaven:
Birger Andresen, Anthony Aykoonfjord, Inge Lars Birkelund, Per-Jenny Brøndum, Arne Danielsen, Per-Erik Døsschert, Trygve Dyvik, Årild Fiskum, Magne Fjærestad, Bjørn Håkon Grønli, Bjarne Gran, Arne Victor Bøye Hansen, Knut Christian Henrikson, Joseph C. Herbert, Terje Helte, Leslie Hauk, Lewis Hauk, Tom Vikkel Kallik, Andreas Jaurerud, Henning Krudseid, Per Barth Lille, Hege Linstad, Jan Peter Løder, Per-Otto R. Næssen, Donald W. Olson, Marthyn Olson, Jan-Erik Ølvestad, Martin Peksta, Ana G. Pope, Runar Sandnes, Bjørn Egil Stavang, Mikkel Steine, Odd Trumpelt, Kjell W. Tveden, David A. Wright

Kommende utgivelser:
6-9: 18. sep.
1-10: 27. nov.
2-10: 5. feb.

Bidrag:


Foto: Morten Birkeland.
Edvard Munch:

Stjernenetter, stormer og sommerlige soloppganger

Selv om Edvard Munch (1863-1944) er best kjent for *Skrik*, laget han også tallrike malerier av himmelen og astronomiske objekter. Et av de vakreste er *Stjernenatt*.

Av Donald W. Olson, Russell L. Doak, Howard C. Hebbert, Robert H. Newton og Ava G. Pope.

Et hvitt plankjørde og en gruppe lindetræer dominerer forgrunnen. En kystlinje bører seg langs Oslofjorden, som reflekterer den blå natthimlen over hans feriested Åsgårdstrand. Ett av himmelslyksena påskiller vår oppmerksomhet blant alle stjernene som titter himmelen. Men hvilket?

Vår undersøkelse av *Stjernenatt* begynte med en detaljert gjenopptagelse av Munchs verker, som det ser ut til at han har malt til 1903. Til vår frasjinasjon oppdaget vi at Munch hadde laget ytterligere to malerier med astronomisk innsikt fra Åsgårdstrand dette året. I Stjernen etter en klar stjerne over Grand Hotel i skomuren, *Soloppgang i Åsgårdstrand* viser Selen like over horizonen, der et gyllende vannspeilet strekker seg over fjorden.

En astronomisk datering av disse tre maleriene vil ha en viss verdi, siden det ikke er kjent eksakt når Munch besøkte Åsgårdstrand i 1893. Enkelte stiller faktisk spørsmål ved om hun overhodet var der dette året, og antyder at Munch må ha laget bildene i Tyskland etter tidligere måner.

**Munches besøk til Åsgårdstrand i 1893**

Under undersøkelsen vår fant vi et forstørret oseveritt i fort. Thuis, som lenger var direktør ved Nasjonalgal-
...traff jeg Helge igjen i Åsgårdstrand. Det var vennen Edvard Munch som hadde lokket ham dit... En dag i august, da vi satt på hotellet under solen, fikk jeg høst til å tegne Helge Rode... I et av hjørnene på tegningen finner vi datoen 17. august 1893, skrevet med Thuis' hanskekritt. Dette viser at Munch definitivt besøkte Åsgårdstrand dette året, der han kunne få seg inspirere av den norske himmelen. Vi så at det kunne være gode muligheter for å identifisere himmelobjektene i Munchs malerier og ut fra dette bestemme datoene for når de ble malt.

**Venus i Stjernenatt?**

Getty-stiftenes sponset i sin tid en bok av kunsthistorikeren Louise Lippincott (Edvard Munch: *Starry Night*, 1988), som skriver at:

Den rosor-stjernen på horisonten i Stjernenatt er i virkeligheten planet Venus...

Lippincott henviser også til "tilsynskomsten til Venus" i maleriet som "den røde stjernen på horisonten.

Arne Eggum, tidligere førstekonservator ved Munch-museet, har trodd at Munchs malerier stilte den første som identifiserte objektet som Venus. Lippincott skriver at han var "dypt takknemlig overfor A. Eggum som pekte på stjernesymbolikken i Stjernenatt..." Eggum forklarer seg slik:

Den første tittelen Munch ga maleriet Stjernenatt var Aftenstjernen. Aftenstjernen er som kjent den samme som planeten Venus... (Eggum, fra Maleri til Grafikk, 1999)

Senere forfattere har adoptert denne identifiseringen. I en utstillingsskatulje fra 2003 sier for eksempel Dieter Buchhart at Stjernenatt innebø...
Månen i Stjernenatt?
Louise Lippincott gir en astronomisk forklaring også for den lyse, vertikale streken som er synlig i himmelen.


Hun argumenterer for at måneteorien er fornuftig:

...Munch hadde allerede utviklet lyspunktt og striper som en måte å representere en lysefrakt og slynken fra der, det videre planulat å identifisere motivet i Getty-museets Stjernenatt som Månen og en refleksjon sett gjennom trærne.

Vi satte i gang vår egen astronomiske undersøkelse for å sjekke denne identifiseringen av planetene og Månen.

Reisen til Norge

Skrik og Pikene på broen
Forskergruppen vår ved Texas State University har lenger interessert seg for hvordan Edvard Munch nebbet himmelen. I et artikkel som vi publiserte i tidsskriftet Sky & Telescope satte vi den blodrøde himmelen i Stjernenatt sammen med månen, og andre parader som ble kastet ut da den indonesiske vulkanen Krakatau eksploderte i august 1883. Som en del av undersøkelsen reiste vi til Norge og fikk få tette utsnitt av hvor Munch sto da han malt bildet. Vi kunne også verifisere at utsikten han viser var mot sørvest. Dette var den retningen vi forventet at vulkanen ville gi nede offer, tatt i betraktning av at sluppet fra Krakatau først kom til Norge vinteren etter.

Vi besøkte også Åsgårdstrand under den samme turen, der Munch malt Pikene på broen. Vi klarte å bestemme hans synsregning og kunne dermed vide at den gule Sloan han hadde malt på himmelen, befant seg i sørvest. Derfor måtte det være unødvendig å si Solen — som enkelte hadde hevdet.
hvilken del av himmelen malte han? Klarer vi å identifisere himmelfobjektene i bildene?
Det hvite gjerdet som er synlig i Sjørenelli er lett å finne også i dag, mens den originale gruppen av linjene fortsatt står i hagen til Kosterud-villa.

Flagstang
Louise lyste oss etter argumenter for at den hvite stripen med en rund søk på toppen er "Månen og en refleksejon sett gjennom trærne." Vi har en annen forklaring.
Rett nok var Munch svært fascinert av nattetid og glimtningen i gjenstander fordi vi ser det ut fra vann og ser derfor ikke strekkjoett som høyrer em horisonten. Andre malerier som viser vannsflak stanser glimtningen i vannet. Det hvite strekkjoet i Sjørenelli strekker seg høyt over horisonten og kan derfor ikke være vannflak.

Over lyse historiske fotografier, som er tatt fra omtrent alle mulige retninger, viser en flagstang mot kule på toppen i Kosterudene. Flagstangen eksisterer ikke lenger, men datamodellering gjør at vi ser et eksempel der Munch malte den, og at den hadde riktig høyde (omtrent 14 meter) i forhold til linjene. Vi oppdaget dessuten en fordypning i grenset flaggstangen hadde stått.

Den hypotetiske "månen" og refleksejonen i Sjørenelli viser sig allerede å være en flagstang. Men hva med Venus? Kan Venus sette av Munch som sommeren 1893?

Var Venus synlig i 1893?
Under vårt besøk i Åsgårdsstrand fotograferte vi fra hotell på dagtid, i skumring og dømning, og on nat. Vi fant at Munchs synsforgjøring generelt var mot øst da han malte Sjørenelli. Sjørenellis vann og side ble derfor liggende i nord og ned for øst, mens trærne på høyre side ble sette for øst.

Munch kan aldri ha sett Venus fra Åsgårds strand Grand Hotel på noen dato i løpet av våren og sommaren 1893, verken fra forstaden eller bakside av hotellet, umot en heller over fjorden mot øst eller mot åsen bak hotellet i vest, eller om han lette i morgengrytet eller skummningen.

Det røde lyset som er helt nede ved horisonten i Stjernenatt er arkaologisk et havnafyr nær Лондисполис på østenden av Oslosjøen. Likevel? En hysterek "stjerne" er tydelig synlig oppe på himmelen. Hva var det Munch så? Den bli himmelskilderen gis en antydning om nordisk skumningslys. Men er det på horisonten eller kvelden?

**Stjernenatt og aftenstjerne**


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**Lokal midlere tid**


---

**Fotografier:**

Glade Munch-forsker: Roger Sinnott, Joseph Herbert, Russell Dorscher, Donald Olson, Robert Newton, Ava Pope og Marilyn Olson. Bildet er tatt i samme retning som maleren Stjernenatt.

**Stormen**

Vi innvendig denne at maleriet Stormen kan gi en bra handling metodet før å fløte når Munch besøkte Åsgårdstrand.

Et kvinnen i blått dominær forgrunnen i dette maleriet, mens en gruppe kvinner står litt lenger unna, når det samme hvite jordisk som ble avbildet i Sjøferds. Etter noen av de viktige punktene: Munch malte Stormen av interesse av astronomen fordi det viser byggek stjerne som nord (når etterfor for hotellet.

Maleriet er inspirert av en fiktisk storm, ifølge det samme omtalen av Munch i Åsgårdstrand i august 1893. Månen av et stort blått jordisk med noen av melankolin hevet.

Kjømme i blått er alt fra Regina Veilleux i denne, som sjekk av et stort blått jordisk med noen av melankolin hevet.

Vardata for juli, august og september opplyser om mange dager med regn, men bare ett "stort verdens" - et spektakulært hendelse som inntraff på kvelden 19. august 1893. Oslo-arven Daglelaude kunne neste dag bekrette at stormen inntraff i skauen:

Et Tordernevør med plagtfylte Lyn gikk i høyden ved 9-Tiden over fjorden.

En skriftet i Aftenposten var imponert over den nærmest uovertruffene styrken i stormen:

... der var et stort regnskall som var helt imot ørken og Lyn som opplevte vekker og står der lille, men det er åpne å høre det frem.

Hvilen klar stjerner som Munch da stormen begynte å rase! For å beskrive dette må vi se hvilken retnings

Vi fant at den klare stjernen i Stormen hadde en amplitud noe 267" (litt sett for vest) og en albedo på når 25°. Et fra Åsgårdsstrands hovedgade (59° 21' North) beregnet vi en declinering på ca. 26°. Stjernen må derfor ha vært i Øst, et meget plussiale kandidat siden dette er den mest lysbare stjernen (etter Sirius) på nattetleломen sett fra Norge.

Planetturfprogrammer viste oss at tidspunktet for Stormen må ha vært i kveldskjerminga, innenfor noen få minutter fra 21.15 lokal tid. Dette beregnet tidspunktet sterret innmerkende med tiderne som angis av Thaar og aviserådene.

Vi kaller det derfor at Stormen viser Arcturus på vesentligum idet stormen brakt las på kvelden den 19. august 1893.

Soloppgang i Åsgårdsstrand
Vi klarte også å bruke Solen for å bestemme når på året Munch var i Åsgårdsstrand.

I Soloppgang i Åsgårdsstrand ser vi utover vannet mot en oppstigende sol og et langt solgritter vatnet. Like til venstre for solgitteret dro vi kjetten på den samme gruppen av fjell som vises i Stormen, samt taktet på Klandoft-bukta. Denne bygningen under og til høyre for solgitteret varierer som byttet.

På fjorden ved i materien set vi et hus som nå er kjent som Russettgarden, der taket fløy mot nesten perfekt med den fjøre horisonten. Vi fant at denne utsikten kan en utleie fra øvre etasje i den nærmeste Odderberggården.

De nærmeste elene av Stordgården slapp oss verdt inn i sitt hus. Fra et speilit rum i øvre etasje fikk vi utsikten til å stemme perfekt med Munchs maleri. Dette var faktisk et av de mest nærmeste øynebildene uten helt vart borte, idet vi enkelt jeg at vi støt på de samme gullplakettene og så helt gjennom det samme vinduet som den store kunstneren hadde gjort det, men en familie var tidligere.


Med hulindikatørstykket fant vi at Solens himmelhøyrettighet var ca. 50° (dvs. 10° nord for øst). Vi gikk av fra vinduets utstikkere på himlen og fikk opp en av de mest nærmeste øynebildene med disse vingene. Dette skytene stemmer godt overens med det lange og smale solgritteret i fjorden. Munch kan ha haet en utsikt fra huset mot denne positionen, selet av åpen vate, have tro det er utelukket fordi Munch da var i Tyskland eller en av de fem første dagene i september.

Nedlegjengere av været viser at mange morgenverdier ble overvåket høstet med regn. Det første tidspunktet Munch kan ha malt et slikt bilde i 1893, var den 3. september kl. 05.30 lokal tid.

Den tidlige historien til maleriet er imidlertid litt usikker. Lande ved Munch-museet kunne fortelle oss at maleriet kan datere seg fra året etter, eller til og med flere år etter 1893. En senere dato som både opplyses er krav til solens position og vorepåskytingene, er 2. september 1895 kl. 05.31. Lokalhistoriske nedlegjengere viser at doctor Wilhelm Gringsgaard, en venn av Munch, bodde i Odderberggarden i 1895. Det er godt mulig at Munch besøkte sin venn eller kanske leide rom i Odderberggarden.

Uansett stått må maleriet ha blitt laget av en av de fem første dagene i september måned, noe som bekrefter at Munch hadde for vare å besøke Åsgårdsstrand på sensommeren.

Oppsummering

Stormen viser en scene fra kveldskjerminga med Jupiter og Venus som stiger opp på nattetleломen, noe der det andre halvdalet av august 1893.

Stormen viser en scene fra kveldskjerminga i retning vest, med Arcturus i nedgang like ved Grand Hotel, rundt kl. 21.15 den 19. august 1893.

Soloppgang i Åsgårdsstrand viser utsikten mot øst, et oppstigende sol og glitter i vatnet. Tidspunktet er når 05.30 og datoen er av de fem første dagene i september.

De tre maleriene vi har studert denne gangen, er delt dateret uavhengig av hverandre – det ene ved å bruke et draper og et plan, det andre ved å bruke en storm og meteorologiske fenomener, og det tredje ved å bruke Solen. Alle tre daterer ligger innenfor en trehundretals periode fra midten av august til tidlig i september.

Vi først å observere naturen under sitt besøk til Åsgårdsstrand, viser Munch sitt kunstneriske geni og har fått fem kunstnerisk analogi innenfor maleriene som strekker seg langt utendørs, og det er også å bruke en viss smertfor det at vi kan beskrive. År tette detaljene på disse himmelbildeene er stort sett vare, bortsett fra denne kunstnerens dyktighet når det gjelder å avsløre den norske sommerhimlen.

Takk til

Artikkelforfatterne vil gjerne takke Lasse Jacobsen ved Munch-museets bibliotek for assistansen med å gammelte litenfor, Torv Dahl Johannsen ved Nasjonalbiblioteket i Oslo, Knut Christian Henriksen, Vidar Lund Iversen, Randi Brettevold og Sven Arne Torsvoll i Åsgårdsstrand, samt Margret Være

Foto: Munch-Museum
Norway’s Summer Skies

Astrophysicist Donald Olson and colleagues at Texas State University, San Marcos, have been finding ties to study in the paintings of Norwegian artist Edvard Munch. Their latest accomplishment: Identifying the celestial objects in three canvases Munch painted in Asgårdstrand, Norway. After locating a memoir that placed Munch in Asgårdstrand in August 1893, the researchers traveled to Norway to find the exact sites of the paintings.

In Stormy Night (right), scholars in the past have identified the bright star as Venus. But Venus was out of sight then, the Texans say.

A photo (left) they took from the same perspective shows it had to be Jupiter. They also figured out, with the help of 19th-century photos of the town, that the vertical white line in the trees, which some have identified as a hidden moon and its reflection, was in fact a flag pole with a ball on top.
Forensic Astronomer Tackles Three More Munch Paintings

July 22, 2009

Edvard Munch's
Starry Night, 1893

Forensic astronomer Don Olson solves puzzles. He looks at pieces of art, passages of literature and stories from history and uses science to answer questions like: Why is the sky red in Edvard Munch’s painting The Scream? (Gas and ash from the 1883 eruption of Mount Krakatoa produced colored skies worldwide.) Olson consulted personal accounts of Munch acquaintances, contemporary newspaper articles and historical photographs. He and his colleagues visited Åsgårdsstrand to make a topographical survey of the town and to check out the views from various buildings. And they created computer simulations of the sky and parts of the town during Munch’s supposed time there.
Prikket inn hvor Munch malte
Munchs stjernebilder


Maren Nøss Olsen

**Kunst**

**MUNCHS STJERNEBILDER**

Et amerikansk astronomiteam har studert stjerner og planeter for å finne historien bak Edvard Munch-maleriet «Sjøenatt». Og alt kunstneriske meter på planeten Venus. Eller? Etter et uthevelse i Norge har en team fra USA, ledet av astronomen David Olson, kommet frem til at kunsthistorikere tidligere har tatt feil. For lilleeksemplaret som lyser opp bildet er planeten Jupiter.

OG ikke nok med det. Lynet som strekker seg opp mot stjernet i luften, er det ikke månen, som tidligere antatt, men en flaggølning i himmelen.

Ifølge forskerne er der flere stjerner med samme navn. Men har ikke eksisteret på de store sjøene.

**BILDBÅT**

Tidligere har det vært svært å finne stjerner og planeter med detektorål for å finne stjerner.

**OLSON**

Olson har blant annet utforsket astronomi, tenkemønster og kunsthistorien da de er tjent å en studie, og har vært interessert i Munchs eneste. En undersøkelse av Munchs bilder viser viktige biler. Han mener fra naturen, ikke i fantasi på et at hendes, stor Olsen.

Dette gjør han har kunstneriske bruks melde, stjerner, en planet og en stjerne for å finne nye stjerner. Resultatet av forskningen, som er gjennomført sammen med en ny gruppe utledet, er publisert i det blant annet av stjerneforskeren og den bedriftsleder for bladet Astronomisk Selskap.

**DETEKTERER I FEIL**


**SJØENATT**

Munchs stjernebilder, med hjelp av Warrens målere og en småteckning av astronomen Don Olsen, og hans team sluttet fast at «Sjøenatt» er en planeter af Vikingen.

**MUNCHS STJERNEBILDER**

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