

Light Years

Photography and space

NGV International
8 May – 27 Sept 09

Education Resource

In 2009, the world celebrates the International Year of Astronomy. This year marks the 400-year anniversary of Galileo's first observations of the universe through a telescope, as well as forty years since Neil Armstrong first stepped on the moon.

The exhibition

The exhibition, *Light Years: Photography and space*, brings together works from the permanent collection of the National Gallery of Victoria that depict space travel (seen in archival images from NASA), imagined space allegories, and altered perceptions of reality inspired by ideas of outer space. These photographs also show a fascination with light, as both the means and the subject of the image. The exhibition focuses largely on the years 1960s and 1970s – an exciting time for the artistic and scientific exploration of worlds beyond our own. These were 'light years', in which people looked up to the skies, in a real and imagined sense, and through photography discovered new dimensions to reality.

The education resource

This education resource focuses on three themes: space travel, space allegories and science fictions, and altered perceptions. These themes are offered as starting points for viewing the exhibition, and for exploring the ideas and issues raised by the exhibition about art, photography, science and space.

Discussion, questions and activities in the resource relate to a range of learning areas, including the Visual Arts, Science, English, Philosophy, and the Thinking Curriculum, and are designed for students in years 10–12. However, teachers are encouraged to adapt this content to suit the particular needs and levels of their own students.

Further information and resources

This resource includes excerpts and information from the exhibition catalogue, *Light Years: Photography and space*. This catalogue is available for purchase from the NGV Bookshop or can be ordered online at <https://apps.ngv.vic.gov.au/shop/displayCategories/1/display>

See also the exhibition, *Shared Sky* (13 Mar – 2 Aug, NGV Australia), and the *Shared Sky* exhibition catalogue and education resource. The *Shared Sky* exhibition explores the cultural experience of the night sky over our southern continent. It includes prints and drawings by Indigenous and non-Indigenous artists and a diverse selection of works across other media. For more on *Shared Sky*, go to www.ngv.vic.gov.au/sharedsky_education

For details of school programs, go to www.ngv.vic.gov.au/ngvschools

To find out more about the International Year of Astronomy, go to www.astronomy2009.org.au

Space exploration

A significant number of the works in *Light Years: Photography and space* have been acquired by the NGV from NASA (National Aeronautics and Space Administration). The United States government established NASA on 29 July 1958 as the agency responsible for the development of the nation's new space program.

The 1950s and 1960s were a period of intense activity in space exploration, led by the US and the Union of Soviet Socialist Republics (USSR). The US and the Soviet Union emerged as the two most powerful forces in the world after the Second World War. During the Cold War that followed, these two superpowers competed for political, military and scientific dominance, fuelling a '**space race**'. The space race effectively began when the Soviet Union launched the first artificial satellite to orbit Earth, *Sputnik 1*, on 4 October 1957, and reached a milestone when NASA succeeded in landing humans on the moon on 20 July 1969 (in Australia, 21 July 1969).

The Apollo missions, in particular the *Apollo 11* mission of 1969 that saw Neil Armstrong become the first man to step foot on the moon, have assumed enormous importance in the popular imagination in relation to space travel.

However, since the late 1950s NASA has been involved in many different projects, involving numerous manned and unmanned missions. These projects have ranged from exploring Earth's orbit and mapping the lunar surface to penetrating greater and greater distances into space and exploring other planets in our solar system, including Mars, Mercury, Venus and Jupiter. These missions played a critical role in extending our knowledge of the solar system.

While information and photographs of the Russian space program were closely guarded and rarely released to the public, NASA strategically managed the publication of images drawn from its vast photographic archive, and this had a very positive impact on the public reception of the space program.

Interestingly, it was not a priority in the early days of NASA to take photographs during missions. However, the importance of photography was soon recognised and, along with rigorous flight training, astronauts who piloted the various space missions were given extensive photographic training. Unmanned probes were equipped with remotely operated cameras, allowing those back on Earth to see details of these voyages. Increasingly sophisticated technology, including advanced imaging techniques such as X-ray, ultraviolet and infrared photography, has also been employed to capture different phenomena.

The photographs in this exhibition include images taken on manned and unmanned space voyages, from the Gemini space walks of 1965 to the Pioneer missions of 1979.



NASA
United States est. 1958
Neil Armstrong (photographer)
American 1930–
Astronaut Edwin E. Aldrin Jr. walks on
the surface of the moon 1969

While these space photographs clearly serve a documentary purpose and are a tool of scientific research, they have a unique beauty and evoke something of the mystery and wonder of space.

The NGV acquired the NASA space photographs in two groups, the first in 1971 and the second in 1980. The acquisition submission of 1980, prepared by the former Curator of Photography, Jennie Boddington, noted:

Apart from the considerations of technology one cannot help but speculate on the philosophical and metaphysical questions which spring to mind when one sees so beautifully presented the form of nebulae which may be light years away from our small earth, or when we see spacemen performing strange exercises in a Skylab.

Space exploration

FOCUS WORKS AND QUESTIONS



This photograph by astronaut James McDivitt is taken from inside the spacecraft on the *Gemini 4* mission as it orbited Earth. It shows astronaut Edward White in his spacesuit and golden visor, 'floating' high above the Pacific Ocean. White is attached to the spacecraft by a twisting eight-metre tether and holds a manoeuvring unit. Below him is the extraordinary vision of the vivid blue curvature of Earth and, beyond, the black abyss of deep space.

What ideas or messages does this image communicate about space exploration?

How are these messages communicated? Consider aspects of the composition, such as scale, space and focal point, and the symbolism that might be associated with different elements.

Are the messages or ideas communicated scientific or emotional? Explain.

Above:
NASA
 United States est. 1958
James McDivitt (photographer)
 American 1929–
Astronaut Edward H. White, Gemini 4, June 1965 1965
 National Gallery of Victoria, Melbourne

Above right:
NASA
 United States est. 1958
Unknown (photographer)
The Earth showing Southern Hemisphere 1969
 National Gallery of Victoria, Melbourne



Project Apollo (1968–72) sent astronauts greater distances from Earth in the quest to land humans on the Moon. The further they travelled also, crucially, allowed for more complete photographic views of Earth. In this photograph, Earth is shown as a delicate, blue, cloud-covered dot hanging in infinite space.

The spectacle of Earth suspended in a black void had a profound effect on humanity. Earth was no longer seen to be our complete 'world' but was recognised as a small planet spinning in the solar system. As awareness of the vulnerability and limits of the planet grew, photographs such as this one formed a strong catalyst for environmental movements.

Photographs from the Apollo missions were also used to promote the inaugural Earth Day on 22 April 1970.

Imagine you are a designer proposing the use of this image in promotional material for an environmental campaign. Write a paragraph justifying your choice of this image, using descriptive and persuasive language.

Space exploration



NASA
United States est. 1958
Neil Armstrong (photographer)
American 1930–
Astronaut **Edwin E. Aldrin Jr.** walks on the surface of the moon 1969
National Gallery of Victoria, Melbourne

This photograph shows Edwin E. (Buzz) Aldrin, Jr, walking on the surface of the moon on 20 July 1969 (in Australia, 21 July 1969) during the initial phases of the *Apollo 11* extravehicular activity. It was taken by Neil Armstrong, the first man to step foot on the Moon. Visible in Aldrin's gold visor are the clearly defined reflection of Armstrong, the American flag and the spidery legs of the lunar module, *Eagle*.

This photograph soon became an iconic image representing the success of the Apollo missions and the NASA space program. It is recognised as one of the most well known photographs of the twentieth century.

What is an iconic image?

What factors have contributed to this image, more than others taken on the *Apollo 11* mission, becoming an iconic image?

Do you believe this image encourages an objective or subjective response – or both? Explain.



NASA
United States est. 1958
Voyager 1 (photographer)
Photo collage of Jupiter and its four largest moons 1979
National Gallery of Victoria, Melbourne

While Jupiter had been studied through telescopes for centuries, the Voyager robotic probes that were launched into space in 1977 revealed new information about the planet and its moon system. In March 1979, the *Voyager 1* mission took images of the four largest moons of Jupiter. These images were made into a photographic collage, so that the moons are seen in their relative positions (although not to scale). NASA's arrangement of images in this montage (and others) essentially created an aesthetic rendering of scientific reality.

How has NASA achieved an aesthetic rendering of scientific reality in this image?

Why might those involved in scientific research consider aesthetics important? Explain.

FURTHER ENQUIRY

What impact or value do the NASA space photographs have – scientific, documentary, aesthetic? To what extent are they propagandist? What other impact or value might be associated with these photographs? Do you believe one or more of these impacts or values is/are more or less important than others? Why?

Are you surprised to find NASA photographs in the collection of a major public art gallery? Explain. Suggest why the NGV identified these images as being important for our state art collection.

In 1962, NASA established an art program and began to commission artists to create works of art related to space exploration. The collection now includes several thousand artworks by such well-known artists as Robert Rauschenberg, Annie Leibovitz, William Wegman and Nam June Paik.

For a closer look at the collection, go to www.nasa.gov/multimedia/artgallery/index.html

Suggest why such an art collection is of value to an agency like NASA.

Space allegories and science fictions

While the NASA photographs revealed new astronomical information, they often raised more questions than they provided answers. Artists continued to imagine and speculate on the possibilities of the universe and extraterrestrial life forms, as they have been doing since time immemorial.

Indeed, many people's imaginations reached into outer space long before science and photography took us there. Their imaginings are often in the form of space-inspired fictions or allegories.

Fictions are creative works (including stories, films and still images) that have some basis in reality but which include imaginative elements that take us beyond the known and the real to what might be possible.

There are many different genres (types) of fiction, each of which has its own characteristics. Science fiction has some basis in scientific principles, discoveries and knowledge. Many science-fiction creators have been inspired by space travel and exploration. Space-inspired science fiction often explores themes involving extraterrestrial phenomena, aliens, intergalactic invasion and space technologies.

Even before humans had been to the Moon, sci-fi creators had dreamt up images of desolate terrains that often bore an uncanny resemblance to the lunar landscapes later documented by the space photographs of the Apollo missions.

Space travel and exploration have also inspired many allegorical works. **Allegories are images or texts in which characters, objects, actions or other elements are used to represent ideas beyond their literal meaning.**

Space-inspired allegories have been created to express many different beliefs, hopes and fears about space, space travel and our place in the universe.

FOCUS WORKS AND QUESTIONS



Raymond De Berquelle
Australian 1933–
Space man 1963
National Gallery of Victoria, Melbourne
Purchased, 1971
© Courtesy of Raymond De Berquelle

The photographs of Raymond de Berquelle reflect excitement about the possibilities of astronomy and a fascination for science fiction. The radio telescope was a particularly significant emblem of the exploration of the universe. The primary tool of astronomy, it allowed astronomers to see beyond visible light into the expansive electromagnetic spectrum. De Berquelle frequently visited observatories and radio telescopes, including the one at Parkes, outside Canberra, that was one of a network of radio antennas around the world used to receive images from the *Apollo 11* Moon landing in July 1969.

To create the fantastical photograph, *Space man*, Raymond de Berquelle combined different negatives to construct an image that expressed both his expectations of astronomy and his vision of a man in space. De Berquelle describes the process as beginning with an unexpected vision:

[one day] a radio telescope appeared on the horizon with a human being clinging to it as if caught in its net. It was a technician [working on] the huge instrument. In the darkroom later on the negative appeared stronger than the positive image ... and an earthy radio telescope technician became a space man.

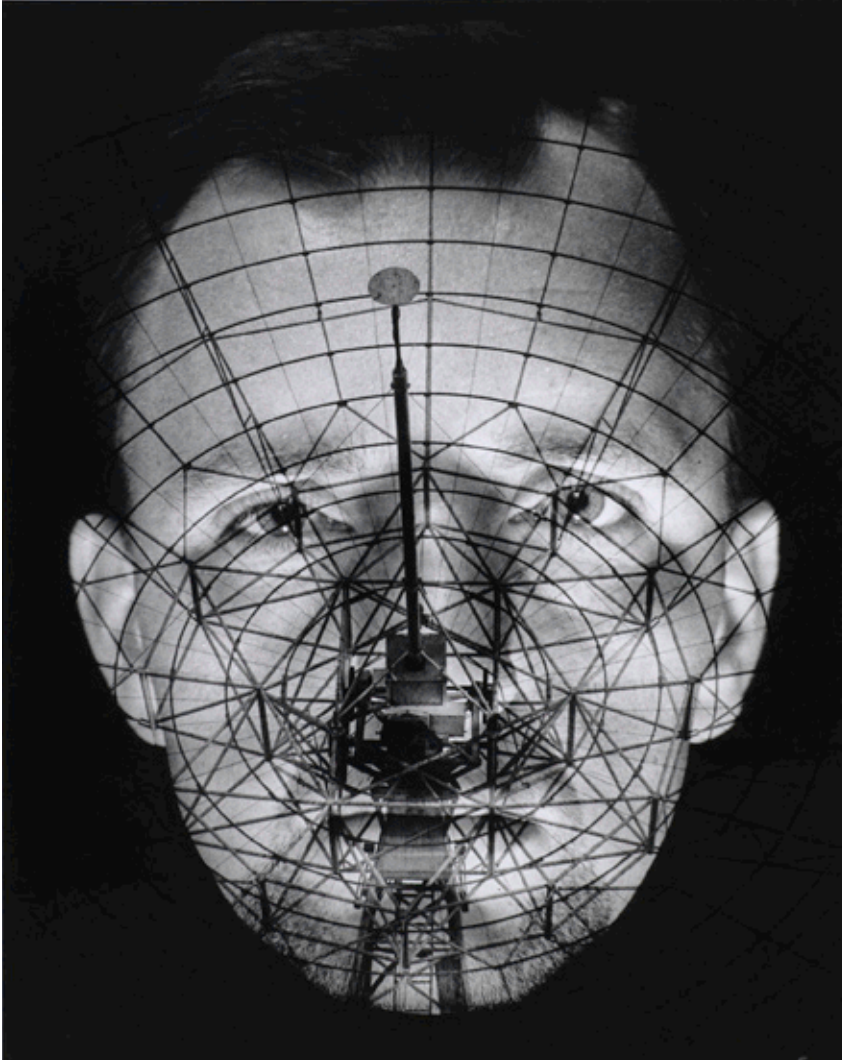
Raymond de Berquelle in correspondence with Maggie Finch, 12 November 2008, quoted in Maggie Finch, *Light Years: Photography and space* (exh. cat.), National Gallery of Victoria, Melbourne, 2009, p. 18.

What does de Berquelle's description of the process behind *Space man* reveal about the process of making photographic images, including the sources of ideas and the role of chance?

Why might this work be viewed as an 'allegory of space'? What ideas about space are evident in this allegory and how are they suggested?

Space allegories and science fictions

FOCUS WORKS AND QUESTIONS



Raymond De Berquelle
Australian 1933–
Where do you come from? Planet Earth
(Self-portrait with radio telescope) 1968
National Gallery of Victoria, Melbourne
© Courtesy of Raymond De Berquelle

In this image, we see the face of the artist, emerging from a deep black abyss, overlaid with the circular rings of the dish of a radio telescope.

What meanings and ideas related to space and space travel does the juxtaposition of different elements in this image suggest to you?

What evidence can you find of the influence of science fiction in this image?



Ronnie Van Hout
New Zealander 1962–,
worked in Australia 1998–
Visitation 1992
from the *Untitled* series 1992
National Gallery of Victoria, Melbourne
© Courtesy of the artist and Darren Knight Gallery, Sydney

In his *Untitled* series, 1992, Ronnie van Hout created models based on the mountains in New Zealand, shown as the sun was setting and they fell into silhouette, and placed a single word ('rejoice' or 'visitation') in the foreground. The influence of 1960s sci-fi aesthetics is clearly evident in the glowing lights, the desolate ground, and the potential for an otherworldly experience. As with much science fiction, van Hout's photographs create ambiguous narratives that allude to alien visitation set in a mystical landscape.

Use the description above, and your own observations, to create an annotated drawing of *Visitation* that identifies how different visual elements (for example, colour, light, line) and design principles (for example, focal point, scale, movement) create an image that alludes to alien visitation in a mystical landscape.

Space allegories and science fictions

FURTHER ENQUIRY

In the catalogue essay for *Light Years: Photography and space*, curator Maggie Finch writes that *Where do you come from? Planet Earth (Self-portrait with radio telescope)* by Raymond de Berquelle is reminiscent of the aesthetic features of Leonardo da Vinci's *Vitruvian Man* drawings of the late fifteenth century. Leonardo's drawings demonstrate the idea of perfect human proportion and reflect Leonardo's interest in relating the proportion of the human body to the workings of nature and, by extension, the universe.

Compare the two artworks and discuss what links you can find between them.

How does each work reflect the period in which it was made?

For more on *Vitruvian Man*, go to www.universalleonardo.org/work.php?id=448

The speculative ideas and imagined realities explored in science fiction are often prescient. They have often anticipated discoveries or ideas that later become reality.

What role does imagination have in science?

In your discussion, consider specifically what role imagination may have played in space exploration and travel.

Research the meanings of fiction, fantasy and allegory. What are the characteristics that define each of these genres?

Select an example of an artwork inspired by space that you believe to be a space fiction, fantasy or allegory. Explain why you would define this work as a fiction, fantasy or allegory.

Look at other examples of space-inspired science fiction (in visual images or writing) and find an example that interests you. Possible examples include the science-fiction films, *Destination Moon*, 1950, *Conquest of Space*, 1955, and Stanley Kubrick's *2001: A space odyssey*, 1968.

What aspects of this example of science fiction are based in reality and what aspects are speculative?

How does the representation of space in this work relate to knowledge of space current at the time the work was made, and how does it relate to more recent knowledge of space?

Altered perceptions

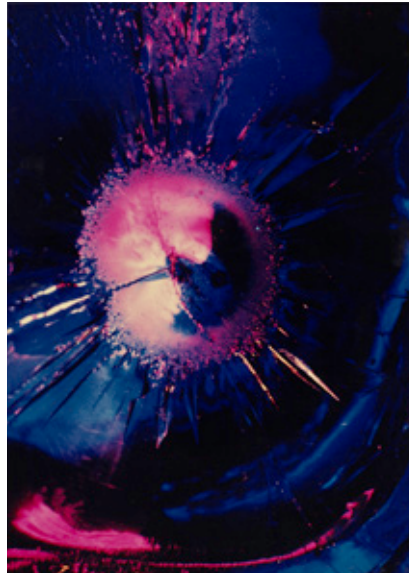
Space exploration opened up new ways of seeing and imagining the world and created new perceptions of our place in the universe.

Parallel to the exploration of outer space taking place under the auspices of science, explorations of space in other realms were contributing to new and altered perceptions of the world, and inspiring new forms of art and artmaking.

During the second half of the twentieth century, many artists rejected the illusionistic representation of three-dimensional space and form which had dominated western art for centuries and opted for a flattened pictorial space. In contrast to the closed compositions traditionally found in western art, artists such as Jackson Pollock (American, 1912–56) worked with 'open compositions' which created the idea that the visual elements in an image extended beyond the confines of the picture space.

The mysterious world of 'inner space', including the subconscious, and the senses, was also important territory for exploration, especially within the 'hippie' subculture that emerged in the US in the mid-1960s. Psychedelic patterns, inspired by the hallucinations and mind-altering experiences produced by drugs such as LSD, and characterised by wild patterning and colours and dazzling light effects, had a significant effect on the art and popular culture of the period.

FOCUS WORKS AND QUESTIONS



George F. Pollock
English 1928–
Galactic event 1966
National Gallery of Victoria, Melbourne
© Courtesy of Sir George Pollock

In 1962, English artist George Pollock commenced a conceptual photographic project comprising a series of abstract photographs that he called 'vitrographs'. This term referred to the process of creating images by photographing pieces of glass that have been lit by a number of coloured lights. Pollock used pieces of cullet, the thick lumps of glass left in a kiln at the end of a melt.

By lighting the cullet from different angles and photographing the pieces at close range, Pollock was able to produce patterned, abstract images with an ethereal quality reminiscent of solar eruptions and the nebulae of outer space.

Pollock was influenced by scientific studies, particularly in the field of biology, as well as the literature of science fiction and the abstraction found in the art of surrealism and abstract expressionism. He was interested in using photography to reveal things that otherwise may have been overlooked.

With reference to Pollock's work, discuss how the artist uses photography to reveal things that might otherwise have been overlooked.

Pollock has written about the importance of light in his work. In what ways does light play a significant role in his work? Consider its role as both medium and subject matter.

Altered perceptions



The photograms of John Wilkins reveal methods of abstraction and distortion (the hallmarks of psychedelia) to produce lush, exploding, organic forms. Wilkins uses the photogram technique to record the object (in this case, liquid) directly onto film, which was later enlarged and printed. Wilkins's photographs resemble cosmic worlds, and he has described how the chemical patterns were directly – influenced by the psychedelic patterns meant to simulate LSD trips – that were projected onto the walls of nightclubs in the 1960s and 1970s. They possess a mysterious quality that transcends a distinction between art and science.

John Wilkins
Australian 1946–
Alien icicle c. 1970
National Gallery of Victoria, Melbourne
© Courtesy of John Wilkins

Explain how you believe Wilkins's photographs can be seen as transcending a distinction between art and science.

FURTHER ENQUIRY

Consider the titles used by Pollock and Wilkins for their work in this exhibition.

Suggest reasons for the choice of these titles.

Are the titles important? Explain.

Compare and contrast the work of Pollock and Wilkins.

What similarities and differences can you identify?

What reasons can you suggest for these?

Research the visual qualities of psychedelia.

Identify an image from this exhibition, other than those illustrated here, that you believe reflects some of these visual qualities.

Explain your choice.

General ideas and questions to explore

ABOUT THE EXHIBITION

The title of an exhibition provides an important starting point for thinking about the exhibition.

Brainstorm different ideas suggested by the title, *Light Years: Photography and space*, and briefly discuss how each of these ideas provides a starting point for viewing the exhibition.

ABOUT PHOTOGRAPHY

Photography ... is a major force in explaining man to man.

Edward Steichen, 1879–1973, American photographer, painter and art gallery and museum curator

The two most engaging powers of [a photographer] are to make new things familiar and familiar things new.

William Makepeace Thackeray, 1811–63, English novelist

In America, the photographer is not simply the person who records the past, but the one who invents it.

Susan Sontag, 1933–2004, American author, philosopher and political activist

What do the quotes above suggest to you about the role and power of photography?

Can the same observations be made of other forms of art? Why or why not? Choose one of the quotes above and discuss in relation to one or more images in the exhibition.

ABOUT ARTISTS AND ARTMAKING

In response to photographs taken by astronauts of the *Apollo 8* mission, showing Earth 'rising' above the Moon, the well-known American photographer Walker Evans (1903–75) remarked:

Art as an unintentional by-product of technology is none-the-less art. We stand before this photograph dumbfounded, electrified and chilled to the marrow.

Consider the different ways in which the images in this exhibition have been produced. Some have been made by individuals who identify themselves as artists, others have been made by astronauts or space probes.

How do we define an artist?

Is it possible to have artworks that do not involve an artist (or does someone in the process of making an artwork assume this role, even if they do not identify as an artist)?

How have new technologies expanded our understanding of artists and artmaking?

Do you need to have an artistic intention before you create something for it to be considered art?

General ideas and questions to explore

ABOUT ART AND SCIENCE

There are parallels between artist, scientist and astronaut. They are all humans discovering new ways to interpret the unknown.

Bertram Ulrich, curator of the NASA Art Program, see also *NASA and the Exploration of Space: With works from the NASA Art Collection*, Stewart, Tabori & Chang, New York, 1998, p. 206, quoted in Maggie Finch, *Light Years: Photography and space* (exh. cat.), National Gallery of Victoria, Melbourne, 2009, p. 27.

The most beautiful thing we can experience is the mysterious. It is the source of all true art and all science. He to whom this emotion is a stranger, who can no longer pause to wonder and stand rapt in awe, is as good as dead: his eyes are closed.

Albert Einstein, 1879–1955,
German-born theoretical physicist

*Science disembodies;
art embodies.*

John Fowles, 1926–2005, English novelist and essayist

Art is science made clear.

Jean Cocteau, 1889–1963, French poet, novelist, designer, playwright and filmmaker

*Art is made to disturb.
Science reassures.*

Georges Braque, 1882–1963, French painter and sculptor

Every great advance in science has issued from a new audacity of the imagination.

John Dewey, 1859–1952, American philosopher, psychologist and educational reformer

With reference to works in the exhibition and the quotes above, discuss the following questions.

Is there art in science?
Is there science in art?

What are the differences, and the similarities, between these areas of knowledge?

Is there a difference between art made initially for scientific research and art made for aesthetic or expressive purposes?

ABOUT CONTEXT

Because each photograph is only a fragment, its moral and emotional weight depends on where it is inserted. A photograph changes according to the context in which it is seen.

Susan Sontag, *On Photography*

How is your response to the images in this exhibition informed by viewing them in an art gallery?

Do you believe you might view these images differently if you saw them in a science museum? Explain.

ABOUT TRUTH AND PHOTOGRAPHY

The photographs taken during the Apollo missions led to questions about photography's ability to tell the truth. Perhaps it was the uncanny combination of the strangely banal yet awe-inspiring qualities of the lunar surface that led some to doubt the veracity of the images. For many, they were just too colourful, too well lit, too 'composed', and as a result skeptics wondered if the images were an elaborate construction.

Why is there often an expectation that photography will 'tell the truth'?

How do we judge the veracity of a photograph?

What do you think led some people to doubt the veracity of the Apollo photographs?

Is it possible for a photograph to be truthful?

Is it possible that a manipulated image, such as NASA's *Photo-collage of Jupiter and its four largest moons, 1979*, could be more truthful than another photograph that captures a view through a lens at a given time?

ABOUT YOUR PERSONAL RESPONSE

Select an image in the exhibition that interests you.

What is it about this image that interests you?

What ideas and questions does it suggest to you?