

**SCIENCE  
MUSEUM**



# THE SUN

## LIVING WITH OUR STAR

A touring exhibition from the Science Museum

On display at the Science Museum in London from October 2018 to May 2019



# LIFE, CULTURE AND SCIENCE

The Sun is a constant of human existence, but the way we see it has changed profoundly over the centuries. Early cultures had an intimate relationship with the Sun, using it to organise their days, chart their travels and often worshipping it as a deity of fire, life and rebirth. Modern technologies may have made the Sun appear less relevant to our lives, while science has relegated it to a mere star; yet the Sun remains fundamental to our existence and continues to influence human activity in new and unexpected ways.

The Sun may not be at the forefront of most people's concerns, but understanding and harnessing the Sun is becoming increasingly important in the modern world. Dwindling fossil fuel reserves and climate change are driving a revolution in solar energy, while solar storms threaten to severely disrupt the communications and electricity networks on which we all rely. Re-examining humanity's connection with the Sun may once again be key to our collective future.

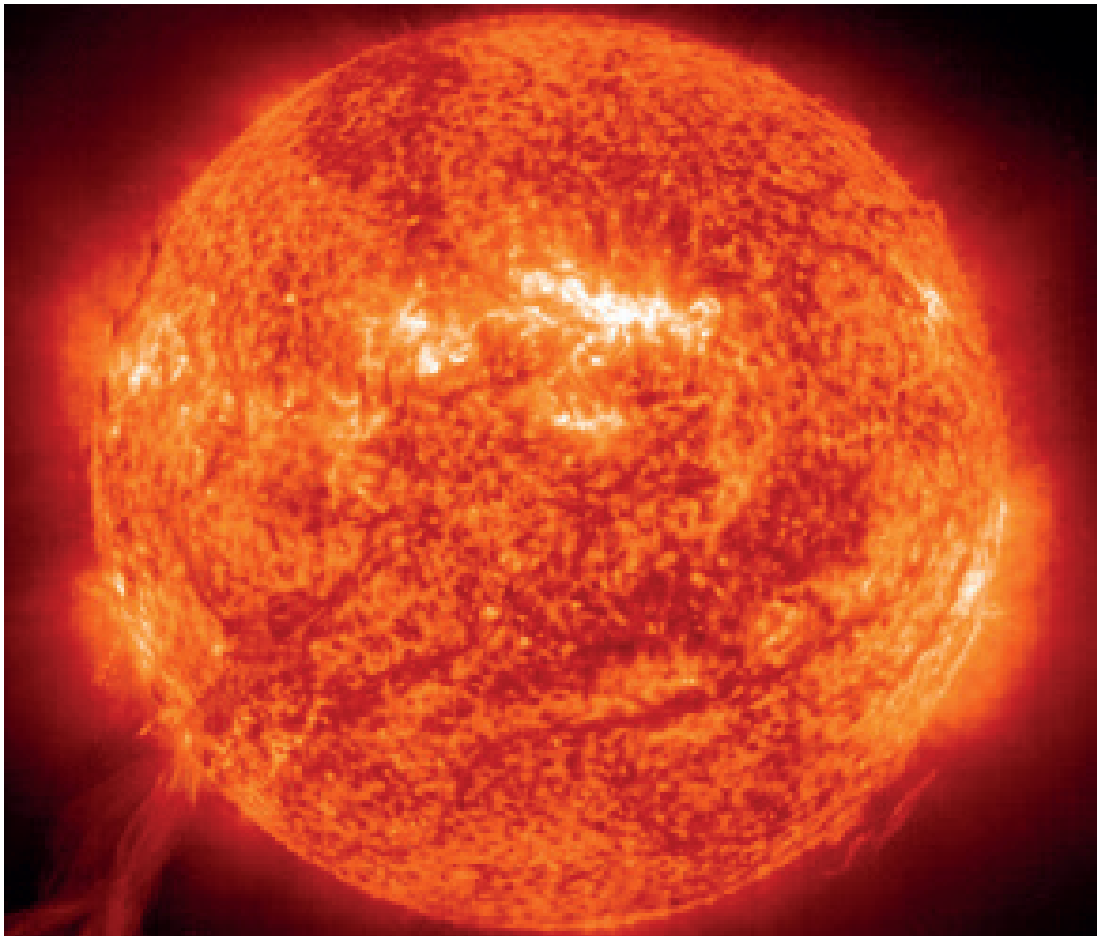
## COVER IMAGE

Diamond ring effect at the second stage of a total solar eclipse  
Image: Kevin Johnson/Science & Society Picture Library

## INSIDE COVER

Blended view of a sunspot in visible and extreme ultraviolet light, 2017  
Image: NASA/Goddard/SDO

# A TOURING EXHIBITION FROM THE SCIENCE MUSEUM IN LONDON



Extreme ultraviolet image of the Sun with a large prominence, 2000  
Image: SOHO-EIT consortium, ESA, NASA

*The Sun* is a fascinating turnkey exhibition that will tour nationally and internationally. The four sections will tell the story of how humanity's relationship with the Sun has changed through history, with a narrative that spans from early to modern societies.

This exhibition charts our ever-changing relationship with the Sun. It reveals how our ancestors used the Sun to define time and plan their lives, how modern beach culture has roots in medical sunlight therapy, and how pioneers during the Industrial Revolution dreamed of a world powered by sunlight.

Bringing together a unique collection of scientific instruments, technological innovations and beautiful artefacts from a wide range of cultures and periods, the exhibition brings the Sun to life and communicates its many qualities and immense power. The content is enhanced by digital interpretation and spectacular immersive elements, including an opportunity to experience the latest solar imagery on a massive scale.

*The Sun* will include the following features:

- Partial set structures, lighting and coordinated sound creating 5 distinct environments
- Over 100 historical and contemporary objects
- 5 interactive and 3 immersive experiences
- 7 videos and 5 animations
- Beautiful images and audiovisual projections

# EXHIBITION PRINCIPLES

## LEARNING OBJECTIVES

### Top-line message:

Throughout history, science and technology have transformed the way we understand and relate to one of the most powerful influences in our lives – the Sun.

### Overarching themes:

- The Sun has always inspired and fascinated people.
- Throughout history people have harnessed the Sun for timekeeping, medicine, heat and power.
- We have learnt a huge amount about the Sun and how it affects us, but there are still things we do not fully understand.
- Though science and technology have transformed our relationship with the Sun, understanding and harnessing it remains crucially important in the modern world.



Wooden sign, Europe, 1701–1900

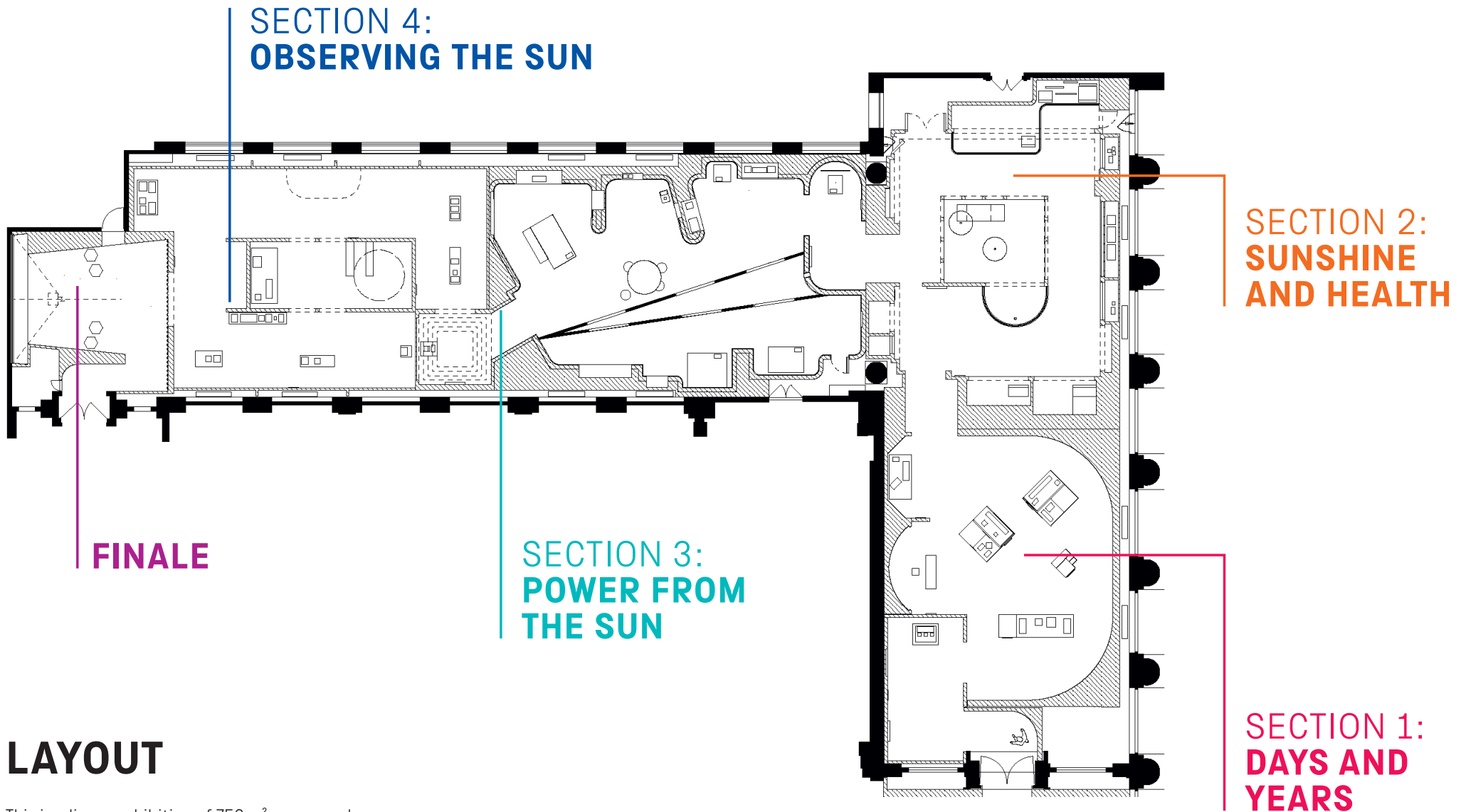
## TARGET AUDIENCE

*The Sun* is aimed at diverse audiences seeking experiential engagement and hands-on exploration as well as those interested in culture, art and scientific ideas. The exhibition will offer an opportunity for shared experiences and learning among friends, families and school groups. *The Sun* will provide answers to common questions with text and visual aids which can be used by parents and teachers to facilitate children's learning.



A compendium sundial  
by Christoph Schissler, 1566





## LAYOUT

This is a linear exhibition of 750 m<sup>2</sup> composed of four sections and a finale. It is reconfigurable to fit different gallery spaces.

## SECTION 1

# DAYS AND YEARS

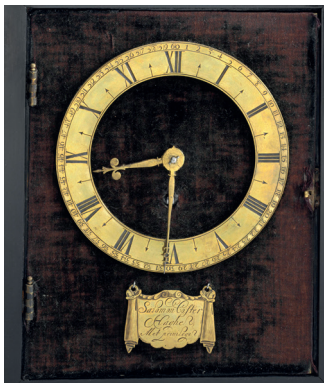
The Sun once played a significant role in people's lives. Before the invention of artificial light and heat, the rising and setting of the Sun dictated the hours of human activity. The Sun's position indicated the time of day, travellers navigated based on its place in the sky, and seasons and calendars were defined by the shortening and lengthening of daylight hours.

In many ancient cultures the Sun was a mysterious and supernatural phenomenon, worshipped as a deity that brought light, warmth and life. Many of the holidays and festivals celebrated around the world today have roots in solar worship. Attempts to predict the fortunes of rulers and realms by the movements of the Sun, Moon and planets led to the first accurate observations of celestial bodies, which laid the foundations for modern astronomy.

Using a rich array of intricate objects, this section explores how people have made sense of the motion of the Sun across the sky – including stories from the Norse Bronze Age to the Enlightenment, and how we have used that motion to define and measure time.

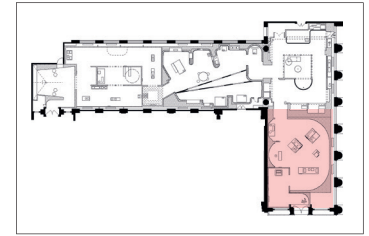
## HIGHLIGHTS

- 1 video and 1 animation
- Large-scale interactive experience that simulates the movement of the Sun in the sky at various locations and times of the year
- Interactive physical and digital exhibit enabling visitors to discover how sundials work
- Approximately 25 historic objects including a 16th-century brass armillary sphere and Islamic astrolabe



Pendulum clock made by Salomon Coster, 1659

Brass armillary sphere showing the earth-centred universe, 1500–1600



Brass Islamic planispheric astrolabe from Syria, 901–1100 CE





Before clocks, people used sundials to tell time. Sundials are a simple way to measure time, but they are also a beautiful piece of art. Sundials have been used for centuries and are still used today.

### Before Times

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### Clocks

The Sun has always been a source of fascination and wonder. For many cultures, it was a supernatural phenomenon, part of the divine heavenly realm, or even a god. People looked to the world around them for explanations of its daily motion across the sky and its heat, drawn by a chariot or even pushed from the sea each morning by a fish.



### Sundials

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Myths

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## SECTION 2

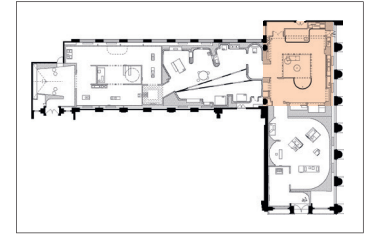
# SUNSHINE AND HEALTH

For centuries the Sun has been associated with good health and wellbeing, but since the late 19th century, our understanding of sunlight's effects on our bodies has changed significantly. This section explores how the bactericidal properties of sunlight were used to treat illnesses such as tuberculosis in clinics and sanatoriums, and how exposure to the Sun changed health and beauty standards in the 20th century.

This section will also show how the dangers of overexposure to sunlight have become more apparent and the ways in which we protect ourselves from the threats of skin cancer, heatstroke and eye damage. Through an immersive sun-basking experience, visitors will be encouraged to reflect on their own relationship with the Sun.

## HIGHLIGHTS

- Interactive allowing visitors to 'try on' digital versions of historic sunglasses on display
- 1 video
- Over 35 historic objects including an electric light bath by John Harvey Kellogg.
- Solarium that allows visitors the experience of basking in the sun



Electric light bath, 1890–1920



Child's spinal carriage,  
1890–1920



Pair of sunglasses,  
mid 20th century



## Light & Body

El Sol es la estrella en el centro del Sistema Solar. Es una esfera casi perfecta de plasma caliente, con vórtices de convección interno que genera un campo magnético a través de un proceso de dinamo.

Es, con mucho, la fuente más importante de energía para la vida en la Tierra. Su diámetro es aproximadamente 109 veces el de la Tierra, y su masa es aproximadamente 330,000 veces la de la Tierra, representando aproximadamente el 99.86% de la masa total del Sistema Solar.

Alrededor de tres cuartos de la masa del Sol consisten en hidrógeno; el resto es principalmente helio, con cantidades mucho más pequeñas de elementos más pesados, incluyendo oxígeno, carbono y hierro.

The Sun is the star at the center of the Solar System. It is nearly perfect sphere of hot plasma, with internal convective motion that generates a magnetic field via a dynamo process.

It is by far the most important source of energy for life on Earth. The "diamond" is about 109 times that of Earth, and its mass is about 330,000 times that of Earth, accounting for about 99.86% of the total mass of the Solar System.

About three quarters of the Sun's mass consists of hydrogen; the rest is mostly helium, with much smaller quantities of heavier elements, including oxygen, carbon, and iron.









## SECTION 3

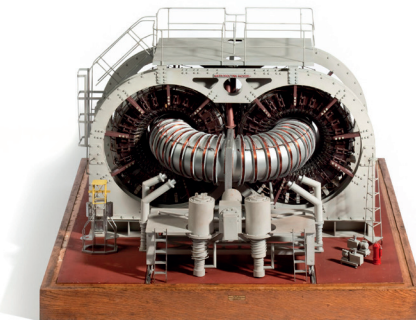
# POWER FROM THE SUN

The Sun provides nearly all energy on Earth. For thousands of years, people have developed ways of putting the limitless energy of our nearest star to use – capturing its heat, converting its light into electricity, and even attempting to reproduce the source of its power.

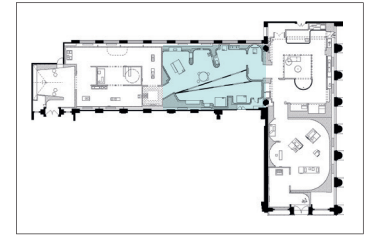
From ancient burning mirrors to some of the latest photovoltaic technologies, this section explores the varied and ingenious ways humanity has sought to harness the light and heat of the Sun and the impact they had on our world. Looking deep into the Sun itself, the section also examines the nuclear fusion reactions taking place in its core and which are the source of its radiant energy. Could researchers ever re-create and harness the vast power of the Sun here on Earth?

## HIGHLIGHTS

- 4 videos and 2 animations
- Hands-on multi-player physical interactive inviting visitors to experiment with ways of generating as much power as they can from a solar cell
- Over 35 historic objects including a model of the ZETA fusion reactor and one of the first solar-powered watches



ZETA fusion reactor model, 1958



Cristalonic Solar-Quartz Watch, about 1976



Silicon solar cell intended for use on sea buoys, Alan Bardsley, about 1963



## Energy & Power

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About three quarters of the Sun's mass consists of hydrogen (~73%); the rest is mostly helium (~25%), with much smaller quantities of heavier elements, including oxygen, carbon, and iron.



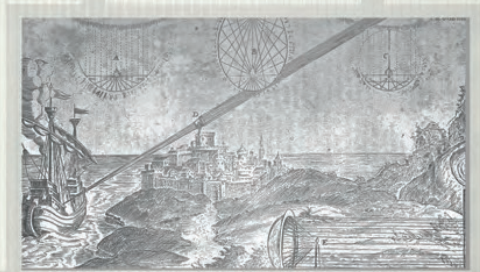


**Powering our world with Sunlight**

Since the 19th century, people have looked to the Sun as a potential source of power in times of scarcity.

The fossil fuels that we have relied on since the Industrial Revolution formed over millions of years, and will not last forever. Since the 1860s, inventors have looked to the free, unlimited, and clean energy of sunlight as a possible alternative.

From early sun powered steam engines to the solar panels on today's space stations, our ability to harness the power of sunlight continues to shape our world.



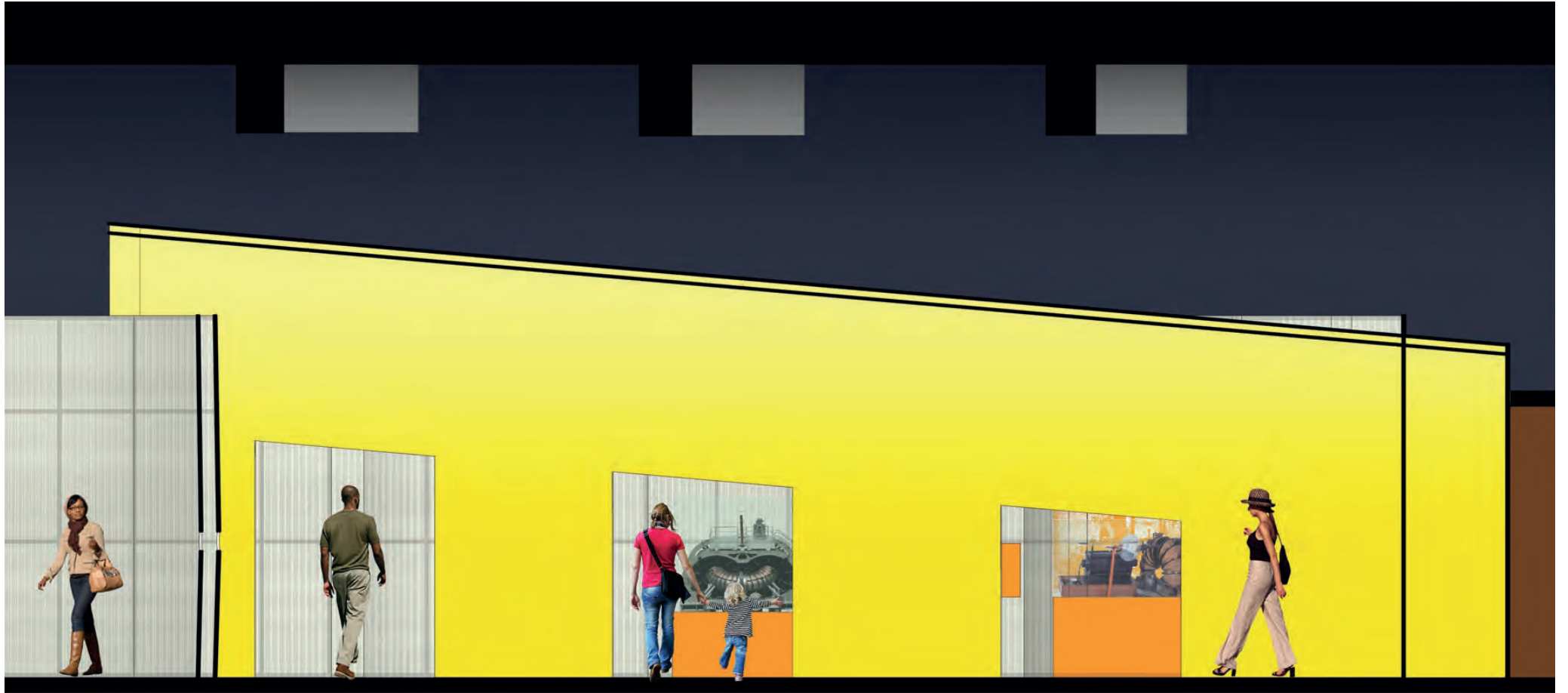
Using the Sun

Humans have used techniques for the use of the Sun for thousands of years, which continue to this day.

For example, the Mirror of the Sun, an ancient Chinese sun-mirror, used sunlight to ignite the moon-mirror, a device that could create dew by concentrating the sun's rays.

These two bronze mirrors are like the yin and yang of the 'yang-mirror' with the sun.





## SECTION 4

# OBSERVING THE SUN

The Sun has always been a source of fascination and yet for most of history its secrets were hidden behind its dazzling glare. The invention of the telescope at the start of the 17th century changed everything. Suddenly people began to see spots on its surface, triggering passionate debates over the nature of the Sun and firing the starting gun on four centuries of solar observations.

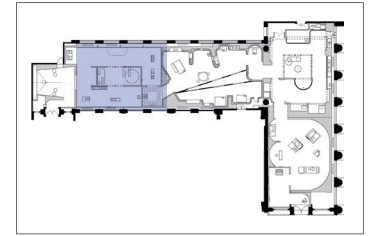
Then in 1859 a colossal solar storm bathed the Earth in stunning auroras and sent sparks flying from telegraph equipment, dramatically revealing the Sun's power to disrupt the technology on which we all rely. Today scientists are still trying to understand our nearest star, with the hope of being able to anticipate and prepare for the potentially catastrophic effects of space weather. As NASA and ESA launch the most ambitious solar missions ever attempted, we explore what we still do not understand about our nearest star and how scientists from all over the world are trying to unlock its secrets.

## HIGHLIGHTS

- Mass display of beautiful solar imagery, from the 17th century to the present day
- Large-scale retelling of the solar storm of 1859
- Interactive game that explores space weather forecasting
- 1 video and 2 animations
- Approximately 50 images and 15 historic objects including the Kew spectroheliograph used to photograph the solar corona and Norman Lockyer's seven-prism spectroscope



Painting of sunspots, by James Nasmyth, 1864



Pencil drawing of sunspots, by James Nasmyth, 1880



Photograph of the corona taken during a total solar eclipse, Brazil, 1919



Norman Lockyer's seven-prism spectroscope, 1868



The Kew Photoheliograph, 1857





# Sun & World

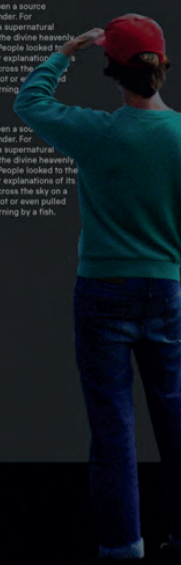
Every day the Sun rises, moves across the sky, and sets. This simple fact has profound consequences; day and night, the year, the seasons; phenomena so fundamental to our lives that we are almost unaware of them. Throughout history people have tried to make sense of the Sun's endless journey through the heavens, and used it to divide up their lives, create calendars and tell the time.



## Observing The Sun

The Sun has always been a source of fascination and wonder. For many cultures, it was a supernatural phenomenon, part of the divine heavenly realm, or even a god. People looked to the world around them for explanations of its daily motion: rowed across the sky on a boat, drawn by a chariot or even pulled from the sea each morning.

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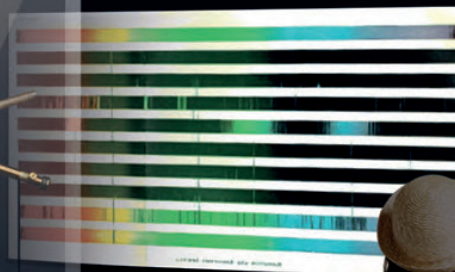




## Spectroscopy



Continuous spectrum  
emitted by a hot, dense  
object like a star or a  
glowing gas.



Discrete spectrum  
emitted by a hot, low-density  
gas.

Discrete spectrum  
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# FINALE

The final experience will be a visceral, awe-inspiring encounter with the Sun as revealed by the latest scientific imagery.





# EXHIBITION DETAILS

*The Sun* is primarily a turnkey exhibition requiring about 750 m<sup>2</sup>/8,000 ft<sup>2</sup> of indoor display space. The exhibition will tour with objects, display cases, audiovisual equipment and integrated lighting. To minimise shipping costs, the venue will be required to fabricate basic walls and structures and provide general gallery lighting. We will work with your venue to provide floor and design plans.

## **The hire fee includes:**

- Licence to display the exhibition
- Display cases, backdrops, props, open display plinths and partial set structure
- Audiovisual displays and hardware
- Objects from the Science Museum collections and external lenders
- Exhibition toolkits
- Touring Exhibitions Coordinator to manage the installation and deinstallation process
- Specialist Science Museum conservator/courier to undertake object handling, installation and deinstallation

## **Venues provide:**

- Basic walls and structures
- General gallery lighting
- Insurance
- Staff and equipment to assist with installation and deinstallation, depending on venue support facilities
- Storage for transport crates
- Gallery staff during operating hours
- Translation and production of graphics and digital components with text if not displaying in English
- Production of promotional and press material

## **CONTACT**

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