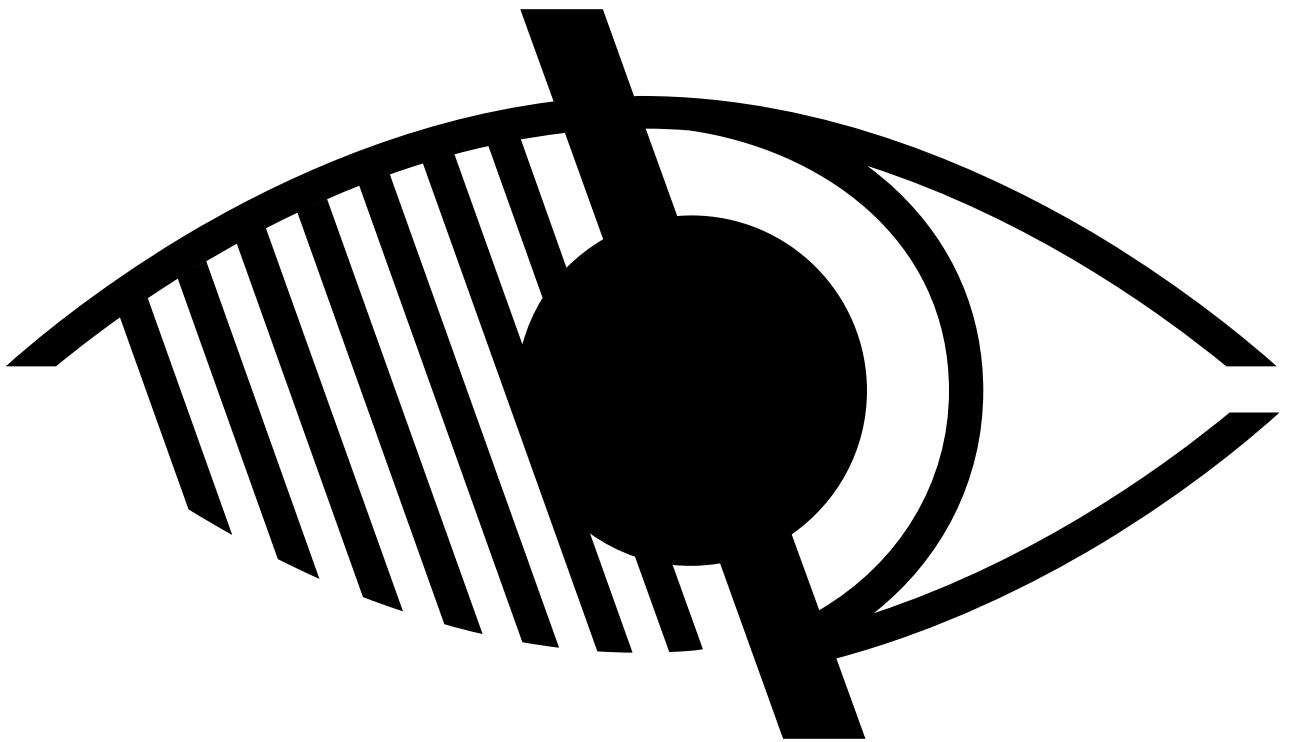


Large-print book







Hawking at work

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Introduction to accessible features

Features for blind and partially sighted visitors

There is one film point and one animation, each with a voice-over or interviews playing on a loop. Audio is played via speakers and projected into the gallery.

Features for D/deaf and hard of hearing visitors

All films featuring a voice-over or interviews have subtitles.

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Gallery layout

The gallery is located on Level 2, next to the lift from the foyer, and is laid out over a single level. It is approximately 5 metres wide and 21 metres in length. There are electric double doors at the entrance, which open outwards and operate with a push button. To enter, the button is located outside the gallery on the left-hand wall next to the exit from the lift, and next to the door on the left hand side within the gallery for exit.

There is a large graphic of a blackboard displayed approximately half-way up the wall on the right-hand side, accompanied by a label with white text on a dark grey background.

In the middle of the gallery are two freestanding full-length display cases on the left-hand side. Each display case has a large text panel with yellow and white text on a dark grey background. Inside each display case are objects, each object is accompanied by a label with white text on a dark

grey background or black text on a white background.

On the right-hand side, opposite the cases, is a screen showing a film accompanied by a voice-over, an interview and music

At the far end of the gallery there is an animation projected at large scale accompanied by a voice-over. There are benches in the middle of the gallery, opposite the projection, to sit upon.

Introduction: Stephen Hawking at Work

Stephen Hawking inspired millions of people around the world. He transformed thinking about the universe and captured the public imagination. Hawking's Cambridge University office gives us a glimpse into his scientific work, relentless drive and sense of fun. Take a look at some of its contents.

Wall Graphic: Blackboard covered with graffiti

1980

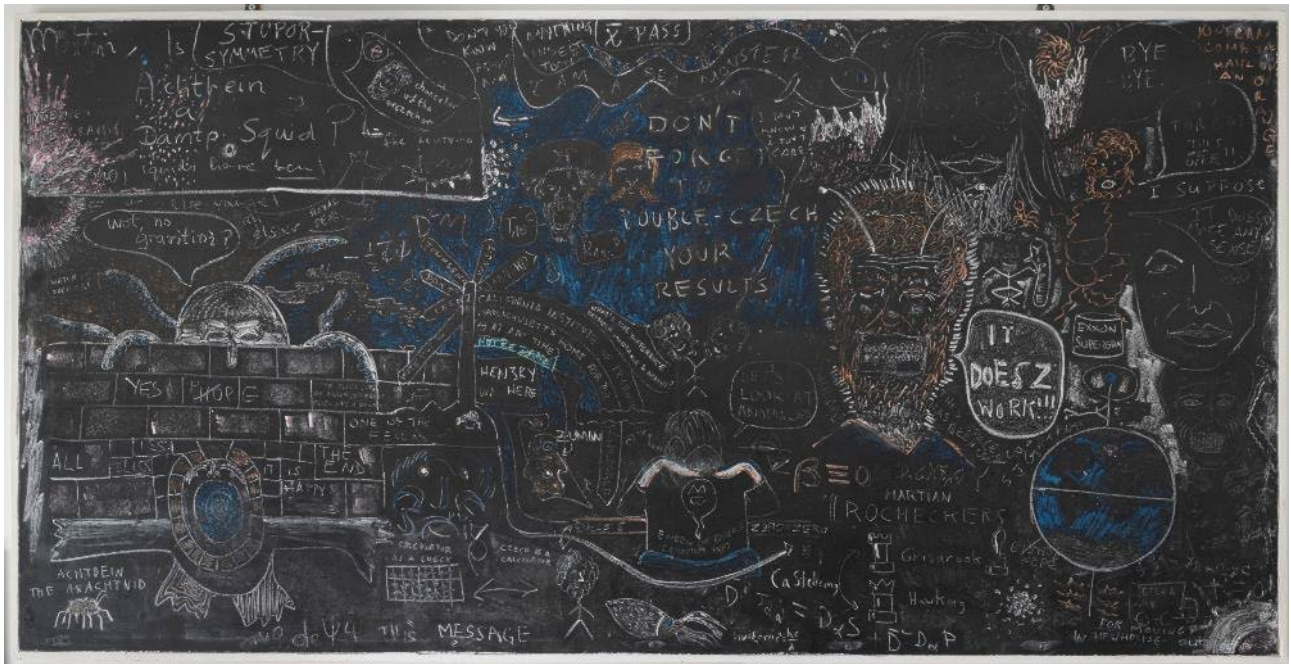


Image: Science Museum Group

Hawking kept this blackboard as a treasured souvenir of an international conference he organised in Cambridge. Guests at the event covered the blackboard in equations, cartoons and jokes about each other, and creatures named after mathematical tools.

At the conference, Hawking and his colleagues thought they were on the verge of a 'theory of everything' that would combine the two cornerstones of physics: general relativity, which describes the universe on its largest scales, and quantum theory, which explains the very small. The search goes on.

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Stephen Hawking's Office

Stephen Hawking was one of the most influential scientists of our generation, and the most famous. In his work he explored the origins and fate of the universe, and revealed new insights about black holes: objects with such strong gravity that not even light can escape them.

Hawking spent most of his career in Cambridge. His office was a hive of activity, a place for debate and discussion, and the centre of his global network.

Object: Bet on the 'black hole information paradox'

1997

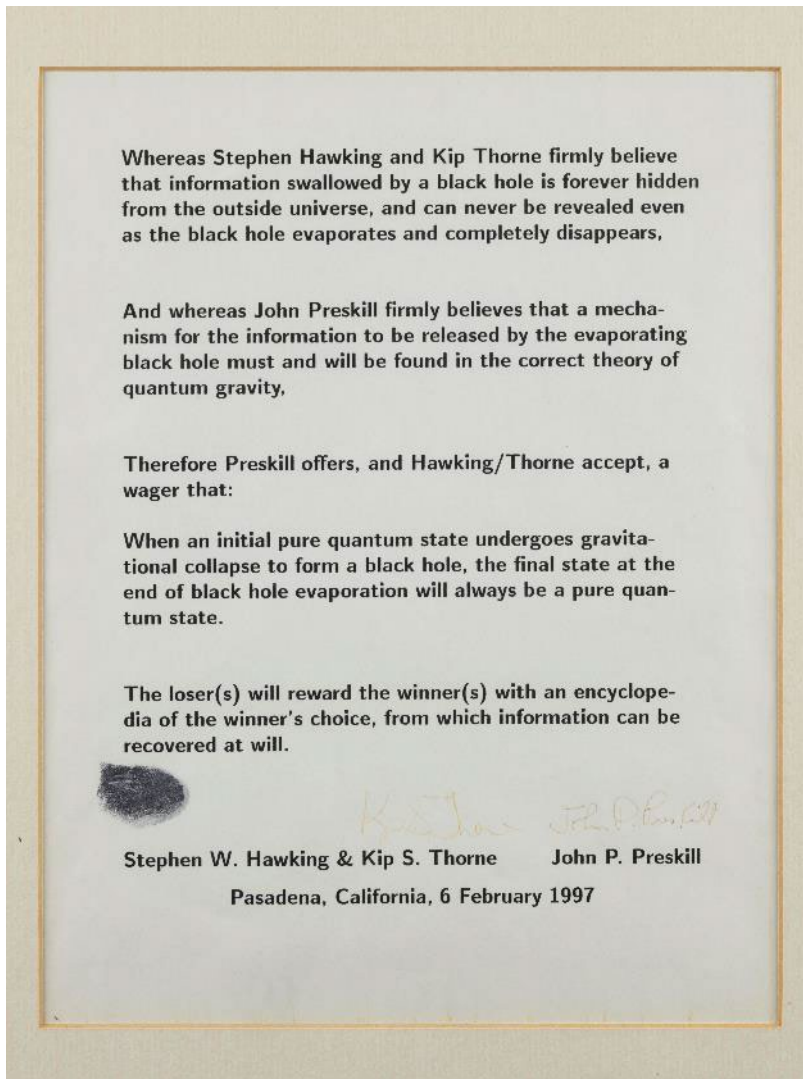


Image: Science Museum Group

Hawking collaborated with scientists from around the world and spiced up their disagreements by making bets. In 1997 he wagered that information entering black holes would get lost for ever, contradicting the expectation held by most physicists that it should be preserved.

In 2004 Hawking conceded the bet, agreeing that information would be scrambled but could theoretically be retrieved – although scientists continue to debate exactly how.

Watch the animation to find out more about Hawking's scientific work.

**Object: 'Time Travellers' invitation
2013**

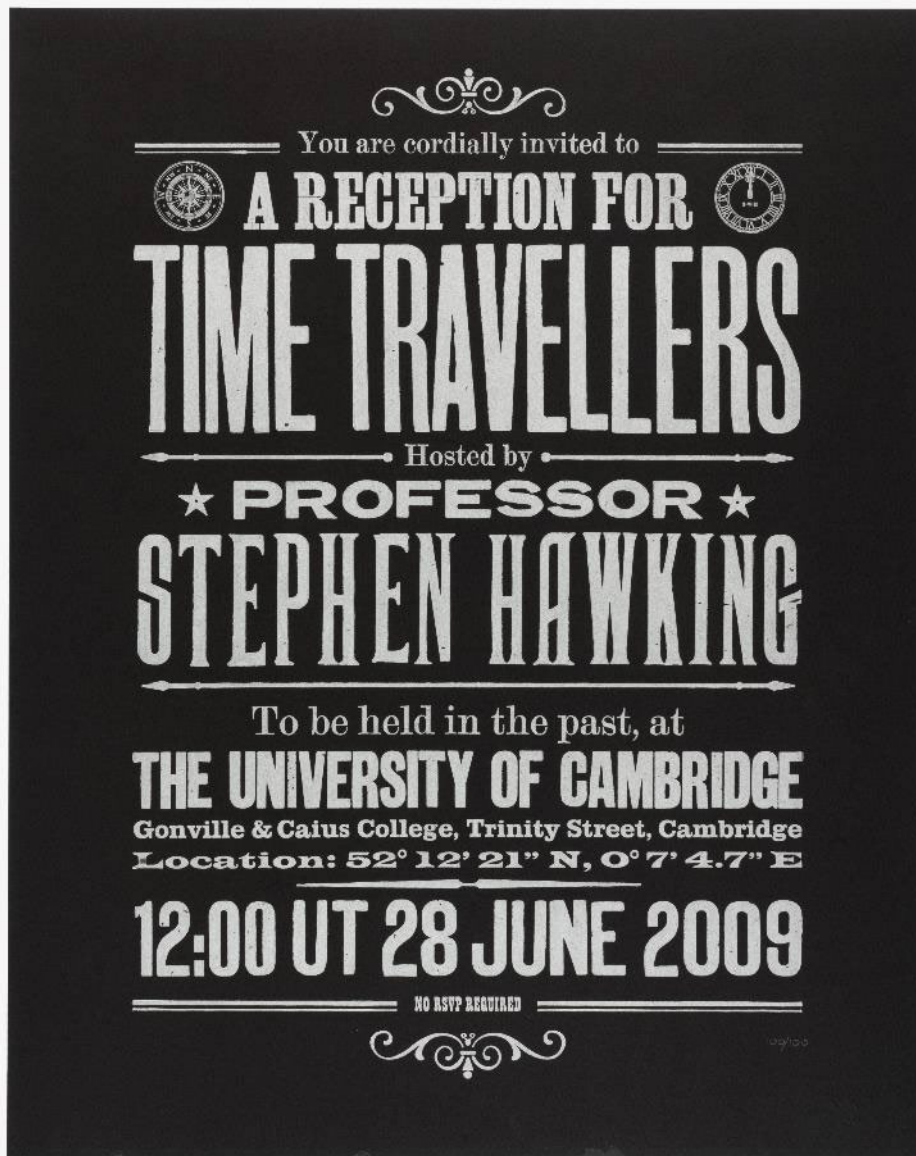



Image: Science Museum Group

Hawking frequently grappled with the concept of time travel, arguing that it should be impossible. In 2009, for a TV documentary, he held a party for time travellers from the future – but only issued invitations afterwards. Hawking sat alone at his party, gleeful that no guests had arrived from the future to prove him wrong.

Object: *The Simpsons* jacket
1999-2010



Image: Science Museum Group



While he worked, Hawking was surrounded by mementos from his many public appearances, including this jacket gifted by the creators of The Simpsons. Alongside scientific talks and documentaries, he enjoyed appearing as himself in fiction. He made several appearances in The Simpsons, including a 1999 episode in which he considered stealing Homer's theory of a 'doughnut-shaped universe'.



**Object: Wheelchair with communication
system**
2016



Image: Science Museum Group

Hawking kept up his ambitious schedule of scientific work, public appearances and international travel while living with motor neurone disease, a condition that affects the nerves and brain. To do so he was supported by technical innovations and a team of colleagues.

Jonathan Wood, Hawking's technical assistant, notes that this was far more than a wheelchair – it was Hawking's mobile office and communication system, and carried ventilation support to help him breathe. On the back you can see the black box for Hawking's voice synthesiser.

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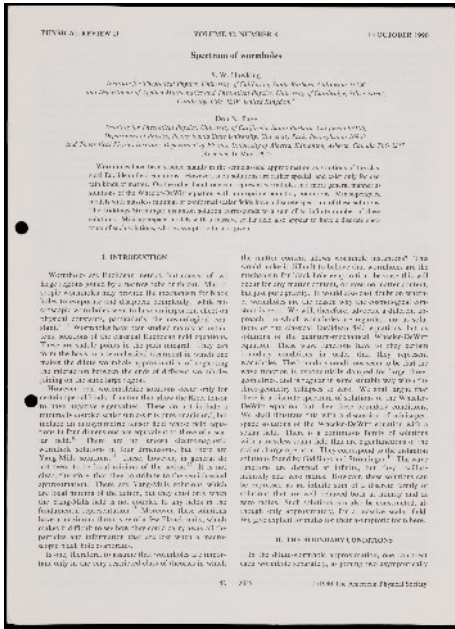
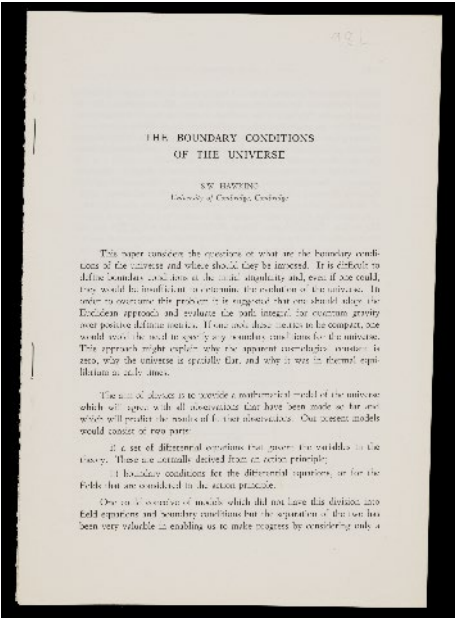
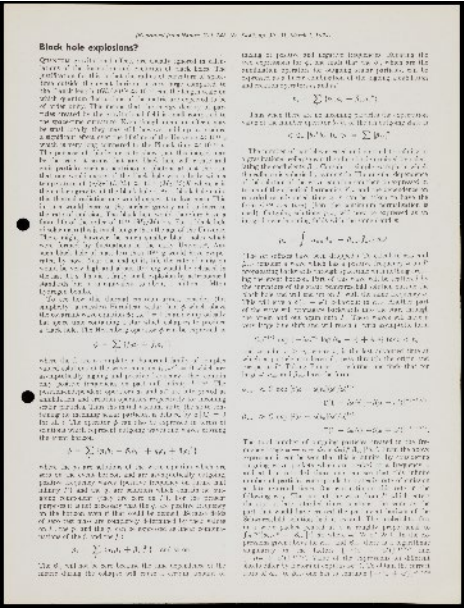
Stephen Hawking's Collection

The objects Hawking collected during his long career help paint a picture of his working life and personality. His office library traces his ambitious attempts to create a complete theory of the universe.

Evolving communication equipment shows how he and his team adapted to his changing needs as motor neurone disease increasingly affected his speech and movement. He also kept many mementos of his public and celebrity appearances.

Object: Scientific publications

1960-1990



Images: Science Museum Group

From early in his career, Hawking showed a daring approach and a flair for communication. His 1966 PhD thesis provided crucial support for the big-bang theory. Hawking ran the theory of the collapse that forms black holes in reverse, showing that the universe must explode into being from a single point in space and time.

His 1974 paper 'Black Hole Explosions' disproved the conventional notion that nothing could ever escape from a black hole. It boldly blended quantum theory, which describes the very small scales of the atomic world, with general relativity, the large-scale theory of gravity.

Watch the animation to find out more about Hawking's scientific work.

Object 1: Case for voice synthesiser

1985-1995



Image: Science Museum Group

In 1985 Hawking completely lost his voice after emergency windpipe surgery. Shortly after, he began to try a voice synthesiser and software that allowed him to select letters or preprogrammed words and phrases. The synthesiser hardware was adapted into a portable system hanging on his wheelchair.

With practice, Hawking was able to say about 20 words per minute (most people reach about 150). His synthetic voice became famous, and he later refused offers to 'humanise' it.

**Object 2: Commander of the Order of the
British Empire (CBE) badge
1982**



Image: Science Museum Group

Hawking's daughter, Lucy, remembers a letter from Buckingham Palace arriving at the family home one morning with news of an unexpected award for her father. Hawking joked that he had gone from being an anti-establishment figure to being a pillar of the establishment. He was keenly aware of the power of such high-profile awards to improve the visibility and recognition of disabled people.

Object 3: Membership insignia of the Pontifical Academy of Sciences 1986



Image: Science Museum Group

Hawking became a member of the Vatican's prestigious scientific academy in 1986. Membership of the academy, which gathers 80 of the world's leading scientists, is based on merit rather than religious beliefs.

Hawking was not religious, although he provocatively wrote in his book *A Brief History of Time* that if we could answer why we and the universe exist 'we would know the mind of God'.

Object 4: Facsimile cast photo from *Star Trek: The Next Generation*
1993



Image: Science Museum Group

In an episode of Star Trek, the android Data invites Hawking, Isaac Newton and Albert Einstein to play a poker game. Data hopes to witness meaningful conversations about humanity, but instead the three scientists poke fun at each other.

The playful portrayal of Hawking as one of history's 'greatest minds' is a recurring theme throughout his numerous cameo appearances in series such as *The Simpsons*, *Futurama* and *The Big Bang Theory*.

Object 5: Spectacles with sensor (test pair) 2014



Image: Science Museum Group

At first, Hawking controlled his voice software using a clicker. When he could no longer move his fingers, he and his team developed a custom-built system controlled by twitching his cheek muscles. A sensor mounted on his spectacles picked up these tiny movements.

In his later years, Hawking's cheek movements had slowed his speech to 1–2 words per minute, and he was experimenting with systems to read his brain activity.

Object 6: Glass apple

2017



Image: Science Museum Group

The hand-painted pattern on this glass apple was inspired by a map of the 'microwave background', the afterglow from the big bang which still fills the universe. Hawking called this pattern the 'fingerprints of creation'.

The apple was a 75th birthday gift from Intel, Hawking's collaborator on communications software and scientific visualisations. Its shape is a nod to Isaac Newton, who formulated the first laws of gravity.

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In 2021 the Science Museum Group acquired Stephen Hawking's Cambridge University office for the nation. The entire contents of the office will be available on our Collections Online website, inspiring people with Hawking's intellect, curiosity, determination and achievements.

Object no. 2021-561

Accepted in lieu of Inheritance Tax by HM Government from the Estate of Stephen Hawking and allocated to the Science Museum, 2021

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