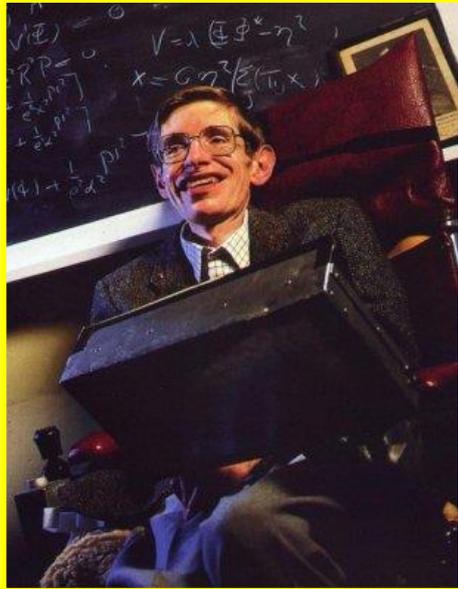


# An Introduction to: Stephen Hawking

Stephen William Hawking (1942-2018), theoretical physicist, cosmologist and author gives his name to Hawking House at The John Warner School. Hawking House represents the academic disciplines of *science and sport* and the school value of *endeavour*.



## Summary of Life

### A strong education

Stephen Hawking was born in Oxford on 8 January 1942. His parents, Frank and Isobel had both attended Oxford University and worked in medical research. They placed a strong emphasis on the importance of education.

In 1950, the family moved to St Albans in Hertfordshire where they were viewed as being rather eccentric. Stephen attended St Albans School and had a close group of friends with whom he enjoyed playing board games, making fireworks, model aeroplanes and boats.

Hawking was given the nickname 'Einstein' while at school, but was not always successful in his studies.

### University and research

Hawking started at Oxford University in 1959 at the age of 17 after receiving a scholarship to read physics and chemistry. To begin with, Hawking found the work far too easy and complained of being bored and lonely. By his second and third years Hawking had become a popular, witty and lively student who was interested in classical music and science fiction. He also joined the University Boat Club and proved to be a fearless cox in rowing teams.

Hawking later admitted that he didn't study hard enough at University and just managed to scrape through with a first class honours degree which allowed him to take a graduate position at The Department of Applied Mathematics and Theoretical Physics at the University of Cambridge where he conducted research into cosmology.

It was during this time at Cambridge that Hawking was diagnosed with motor neurone disease (known as ALS in the USA). He had experienced clumsiness, slurred speech and physical difficulties while studying at Oxford. At the age of 21 in 1963 Hawking was told it was likely that he would only live for another two years. Hawking very nearly gave up his research as he fell into a period of depression, but as it became clear that the development of the disease was progressing much slower than doctors initially thought, he was persuaded to continue his work – now very much focused on the debates surrounding the creation of the universe.

### Marriage

Hawking married Jane Wilde in 1965 having met her shortly after his diagnosis for motor neurone disease. Hawking would later say that this relationship gave him 'something to live for'. The couple would have three children together, but as his disease developed the relationship became very much based on Jane taking the responsibilities for managing the home and caring for Hawking. Jane also had to deal with the increasing celebrity status of Hawking as well as the intrusion of nurses and

assistants that were eventually required to care for him. Jane and Hawking divorced in 1995 after he told her that he was in a relationship with one of his nurses, Elaine Mason. Hawking married Elaine in 1995 and they divorced in 2006. Hawking maintained close relationships with Jane, his children and grandchildren.

### Black hole revelations

Hawking's illustrious career in cosmology emerged from his post graduate studies at the University of Cambridge. The early part of his career was focused on developing his theory that the universe might have started as a singularity (Big Bang Theory) and the explanation of black holes.

In the early 1970s he proposed four laws of black hole mechanics and established that black holes can be described by the properties of mass, electrical charge and rotation. His first book, 'The Large Scale Structure of Space-Time' was published in 1973. In 1974 he produced work to prove that black holes emit radiation – 'Hawking radiation' – seen as a significant breakthrough in theoretical physics.

By the mid-1970s Hawking was making regular appearances on TV and in newspapers as the public began to show an interest in the topic of black holes. He also began to be recognised for his ground-breaking work with awards such as the Albert Einstein Medal and Maxwell Prize as well as positions such as the Lucasian Professor of Mathematics at the University of Cambridge.

### The Master of the Universe

Hawking continued to engage in debate about the origins of the universe. In the early 1980s he worked on 'the very early universe' presenting work on cosmological inflation – the theory that the universe initially expanded rapidly before settling down to slower expansion.



In 1988 Hawking published perhaps his most famous work, 'A Brief History of Time: From the Big Bang to Black Holes' which was a popular science book on cosmology. Hawking wrote in non-technical terms to ensure the book had a wide audience and as a result it became an international bestseller introducing a the population to basic

concepts of space and time, the building blocks that make up the universe, such as quarks and the fundamental forces that govern it, such as gravity. The Big Bang and black holes feature heavily as the title of the book would suggest. The book would go on to sell over 9 million copies and Hawking was described as 'The Master of the Universe'.

It was during the completion of this book that Hawking first started to communicate using a speech-generating device. The program, called 'Equalizer' allowed him to press a switch to select phrases, words or letters from a bank of about 3,000. Hawking chose a voice with an American accent which he decided to keep for the rest of his life saying that he preferred it and identified with it. As his condition deteriorated, Hawking controlled communications with movements of his cheek muscle.

In the 1990s, Hawking built on his theories and his fame giving lectures on physics and publishing further works. He travelled widely in the 2000s visiting Chile, South Africa, Easter Island, Spain, Canada and the United States.

### To Infinity and Beyond!



In 2006, Hawking revealed that he had always wanted to travel in space. Richard Branson offered him a free flight into space with Virgin Galactic, which Hawking accepted, although this never came to pass. In 2007, Hawking flew aboard a specially-modified Boeing 727-200 operated by Zero-G Corp in which he could experience weightlessness.

Hawking, who had been born on the 300<sup>th</sup> anniversary of Galileo's death, died in March 2018 on the 139<sup>th</sup> anniversary of Einstein's birth.

### Contribution and Significance

Stephen Hawking was the most recognisable scientist of our age, and holds an iconic image. His book, 'A Brief History of Time' has been translated into 35 different languages, he appeared in TV dramas (The Simpsons, Star Trek, The Big Bang Theory) and was asked for his views on a whole range of scientific as well as social and political issues. Despite his illness he led a full and complete life inspiring generations of students to study the problems of gravity and quantum physics. Beyond the scientific world he inspired curiosity, knowledge and wisdom.

Hawking used his intellect and wit to open up the complex world of quantum physics to as wide an audience as possible. The questions that he raised, theories he developed and controversies he provoked have advanced scientific knowledge and awareness more than many others.