

Mr Chancellor,

For centuries, great minds have grappled with questions about the origins of life on earth and our place in the Universe. These profound intellectual endeavours are informed by a sense of wonder about our world and the desire to unravel its mysteries. Professor Paul Davies, whom we are honouring today, has explored some of the deepest questions in science, not only through his work as a theoretical physicist, but as a gifted exponent of the public understanding of science.

Paul Davies is a world-leading cosmologist. He has made a major contribution to quantum field theory in curved space time, including identifying the Fulling-Davies-Unruh effect and the Bunch-Davies vacuum state. This pioneering work is central to our understanding of the formation of the large scale structure of the Universe. Davies has clarified many aspects of the physics of black holes, developing Stephen Hawking's discovery that they must radiate.

His work has been recognised by many awards and prizes, including The Michael Faraday Award, the Kelvin Medal and Prize, and the Robinson Cosmology Prize. Paul is currently Regents' Professor at Arizona State University and Director of its Beyond Center for Fundamental Concepts in Science; an interdisciplinary research hub where scientists and philosophers explore some of the most fundamental questions about our existence. A major interest of the Center is cancer biology, which developed out of an initial request from The National Cancer Institute to get physicists involved in taking a new look at cancer. According to Paul's friend and colleague, Professor Charley Lineweaver, the theory they are currently working on has the potential to explain the origin of cancer at its most fundamental level.

Paul Davies was born in London on 22 April, 1946. This was post-war Britain: toys were scarce, no-one owned a TV and even books were deemed a luxury. Nothing exciting ever seemed to happen. Yet one evening, walking home from a cinema trip with his father, Paul remembers looking up at the night sky, when they suddenly saw a shooting star. Recalling the event in his essay, “Cosmology Calls”, Paul writes, “Now this was pure magic! Merely by looking up, I could escape into a wonderland of literally otherworldly objects.” Aged fourteen, Paul decided to build his own telescope. His brother Philip provides a wonderful description of its construction: “A large timber structure arose at the end of our garden, but this was just the beginning. He decided to grind his own mirrors. Our long-suffering mother returned home one day to find that her best saucepans had been purloined to boil pitch before grinding down the mirrors with carborundum powder on the kitchen table...The mirrors were installed. The magnification was extraordinary, and most nights Paul could be found lying in the shrubbery gazing at the stars. He never looked back.”

Despite his early commitment to astrophysics, Paul fleetingly considered an alternative career. Recalling a circus trip where a blindfolded knife-thrower hurled flaming blades at a glamorous assistant whilst she was strapped to a spinning board, Paul reflected that, “if I couldn’t make it as a physicist, then a job executed with that sort of panache would suit me fine.” He duly honed his skills throwing his brother’s scout knife at the potting shed door, having persuaded a brave young lady called Elizabeth, (who lived across the street), to be his assistant. Ultimately, the lure of theoretical physics proved stronger than that of the circus – at least for Paul, although I gather Elizabeth went on to become a famous actress and stage dancer who starred in the circus musical, Barnum. I hope she remembers where it all began!

Upon completing his BSc and PhD at University College London, Paul became a research fellow at the Institute of Theoretical Astronomy at Cambridge University. He worked under the supervision of the distinguished astronomer, Sir Fred Hoyle, whom he cites as one of three major physicists who inspired his career; the others being Freeman Dyson and John Wheeler. Coincidentally, John Wheeler is also an honorary graduate of Newcastle University, receiving his DSc in 1983.

Following a Lectureship in Mathematics at King's College, London, Paul was appointed Professor of Theoretical Physics at Newcastle University in 1980. Over the next decade, he published several of his highly popular science books, including *The Edge of Infinity*, *The Accidental Universe*, *God and the New Physics* and *Superforce*. Reflecting on his contribution to the public understanding of science, Professor Sir Michael Berry told me that, "We currently enjoy a great age of science communication, but Davies' position is unique. No other writer approaches the clarity with which he presents the most abstruse of ideas at the heart of contemporary science, in prose that is both simple and eloquent." In 1995, these skills were recognised by the award of the prestigious Templeton Prize, which honours outstanding individuals who have devoted their talents to expanding our vision of human purpose and ultimate reality. When he moved to the University of Adelaide as Professor of Mathematical Physics, Sir Michael recalls that Paul was installed in a prestigious office previously occupied by the future Nobel Prize winner, William Henry Bragg. However, Paul's residency in this room was relatively brief as it soon emerged that Bragg's experiments with radium half a century earlier had left an unwanted legacy- his desk was radioactive!

Paul has never been afraid of putting forward radical ideas. Professor Malcolm Walter, who worked with him at Macquarie University in Sydney, told me

PAUL DAVIES: DSc

about a meeting they attended on the subject of early life on Earth. Paul suggested that it might have started on Mars and been transported to Earth aboard a meteorite. His idea was not taken seriously at the time, but is now considered a significant possibility. Reflecting on this story, Professor Ian Moss, a former Newcastle colleague, told me that if there IS life on Mars, it's highly likely Paul Davies will be the one to confirm it.

Whilst Paul is completely at ease when tackling life's big questions, he is often frustrated by modern gadgets and gizmos. By his own admission, he has zero patience with remote controllers, especially when you seem to need three of them just to switch the TV on. I gather that new-fangled cars with no ignition keys and fancy window openers can also prove vexatious.

Paul's professional colleagues have described a man of outstanding intellect; a true polymath, generous with his time and dedicated to helping others succeed. I'm told he has also made huge efforts to remove the barriers that limit women's participation in science. All of these achievements resonate with the guiding principles and values of Newcastle University. We are rightly proud of our commitment to support Excellence, Creativity and Impact – and our honorary graduand is an outstanding exemplar of all of these qualities.

Mr Chancellor, in recognition of his exceptional contribution to the fields of cosmology, astrobiology and the public understanding of science, I present to you Paul Charles William Davies as a candidate for the degree of Doctor of Science, *honoris causa*.

Citation by Jill Taylor-Roe, Senior Public Orator

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