

Curriculum Vitae
Paul C.W. Davies, AM



Beyond Center for Fundamental Concepts in Science
Arizona State University
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Name: Paul Charles William Davies

Date of birth: 22 April 1946

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Current and previous Appointments

Current:

Regents' Professor, Arizona State University (since 2012)
Professor of Physics, Arizona State University (since 2006)
Director, Beyond Center for Fundamental Concepts in Science, Arizona
State University (since 2006)
Visiting Professor, University of New South Wales (since 2015)

2001 – 2006: Professor of Natural Philosophy, Macquarie University
1998 – 2001: Adjunct Professor, Department of Physics, University of Queensland
1993 – 1997: Professor of Natural Philosophy, The University of Adelaide
1990 – 1993: Professor of Mathematical Physics, The University of Adelaide
1980 – 1990: Professor of Theoretical Physics, University of Newcastle upon Tyne

1972 – 1980: Lecturer in Mathematics, King's College, University of London
1970 – 1972: Research Fellow, Institute of Theoretical Astronomy, University of Cambridge

Awards and honours

Member of the Order of Australia
Nominated Australian of the Year (2002)
Asteroid 1992 OG renamed (6870) Pauldavis
2013 Adelaide Festival of Ideas dedicated to Paul Davies
Australian Academy of Science, 'From Stars to Brains' – conference in honour of Davies's 60th birthday, 2006
Academician, International Academy of Astronautics
DSc *honoris causa*, Macquarie University
DSc *honoris causa*, Chapman University
DSc *honoris causa*, University of Newcastle upon Tyne
Fellowship of University College London
Designated Regents' Professor, Arizona State University
Fellow, Australian Institute of Physics
Fellow, American Physical Society
Fellow, UK Institute of Physics
Chartered Physicist (CPhys), UK Institute of Physics
Fellow, Royal Literary Society
Member, Royal Society of Medicine
The Templeton Prize
Michael Faraday Award of The Royal Society
Kelvin Medal and Prize of the Institute of Physics
Robinson Cosmology Prize
Advance Australia Award for outstanding contributions to science
Eureka Prize for the Promotion of Science in Australia
Eureka Book Prize
Templeton - CTNS Book Prize
Klumpke-Roberts Prize, Astronomical Society of the Pacific
Trotter Prize, Texas A & M University
American Institute of Physics Science Writing Award
Bicentenary Medal of Chile
Patron, the Gravity Discovery Centre, Western Australia
The Demon in the Machine named Book of the Year by UK Institute of Physics (2019)

Academic record and qualifications

BSc First Class in Physics, University College London, 1967
PhD, Physics Department, University College London, 1970
DSc *honoris causa*, Macquarie University, Sydney (2006)
DSc *honoris causa*, Chapman University, California (2009)
DSc *honoris causa*, University of Newcastle upon Tyne (2019)

Teaching, mentoring and research supervision

During his career, Davies has taught most subjects in theoretical physics and cosmology, as well as delivering hundreds of inspirational lectures to students in universities, schools, clubs and professional societies. He has written a textbook on quantum mechanics and a research monograph on quantum field theory in curved spacetime, both of which have been used extensively for teaching at the undergraduate and graduate level. He has devised several novel lecture courses and served on numerous academic curriculum and research strategy committees. At ASU he directed a \$9 million physics and cancer research programme, overseeing 6 research projects involving about 30 researchers at ASU, The Mayo Clinic and the Fred Hutchinson Cancer Research Center. In addition to teaching a course on physics and cancer, he ran fortnightly seminars, devised and hosted 4 workshops per year, implemented a junior researcher forum and supervised undergraduate and postgraduate students. He is currently working with senior management ASU to implement strategic initiatives in quantum biology, molecular assembly theory and complexity theory. He has also extended the reach of his teaching through many television and radio presentations. Some notable examples are his two Australian TV series *The Big Questions* and *More Big Questions*, his BBC documentary *The Cradle of Life*, commissioned by The Royal Society to mark his Faraday Prize, and a series of BBC Radio 3 documentaries on various foundational topics in physics. In the various universities, he has supervised or co-supervised about 40 postgraduate students and junior postdoctoral assistants. He currently directs the overall research agenda for The Beyond Center at ASU and personally supervises two postgraduate students. He has intensively mentored his junior colleague Sara Walker, and assisted her in building up one of largest and most innovative physics of life research groups in the United States. Davies has for many years been active in promoting the cause of underrepresented groups in physics in particular and science in general.

Academic and research leadership

In a career spanning five decades and three continents, Davies has inspired two generations of scientists, many of whom have gone on to lead distinguished careers themselves. He has been extraordinarily influential in the physics, cosmology and astrobiology communities, through his many research publications, by promoting science through his 31 books with translations into over 20 languages, as well as through magazine and newspaper articles, TV and radio productions, serving on numerous university, national and international committees, and

through the many focused workshops he has hosted. He has built up and run several research groups, in some cases from scratch. At King's College London in the 1970s he greatly expanded the small quantum gravity group and helped establish the theoretical cosmology programme in the Mathematics Department that persists to this day. At the age of only 34, he moved to the University of Newcastle upon Tyne University as Professor of Theoretical Physics and head of the Department of Theoretical Physics, and again built a lively and renowned quantum gravity group. As Head of Mathematical Physics at the University of Adelaide, he broadened the existing gravitational research to include quantum gravity. He lobbied intensively for the equivalent of the Royal Institution to be located in South Australia, something that eventually came to fruition many years after he left. He negotiated and secured a \$250,000 grant from the Government of South Australia to create what became the Centre for the Subatomic Structure of Matter. He played a key role in founding the Adelaide Festival of Ideas, and served for some years on the organizing committee, a commitment recognized in 2013 when the Festival was dedicated to him. On moving to Macquarie University in 2000, he helped found the Australian Centre for Astrobiology, widening the research agenda to include a focus on the origin of life and the theory of panspermia. Since moving to Arizona State University in 2006, he founded the Beyond Center for Fundamental Concepts in Science, of which he is Director. His designation as Regents' Professor is described by the Arizona Board of Regents as "the highest academic honour made to faculty who have made pioneering contributions in their areas of expertise, achieved a sustained level of distinction and enjoy national and international recognition for these accomplishments". In 2007, he was approached by the Deputy Director of the US National Cancer Institute, Dr. Anna Barker. Inspired by the ethos of The Beyond Center, Dr. Barker asked for Davies's help to create a new national programme aimed at bringing insights from the physical sciences into cancer research. Davies gave the keynote opening address in Washington, D.C. at the inaugural physical science and oncology conference, and the following year the NCI created 12 Physical Science Oncology Centers (PSOCs). Davies was selected as Principal Investigator to administer one such Center, located at ASU: the Center for the Convergence of Physical Science and Cancer Biology. It received \$9 million (US) in NCI grants. During the 5 years of Davies's tenure as PI, the Center accommodated 6 research projects and about 30 researchers; he was responsible for the overall direction generally, and the physical science programme specifically. The initiative continues at ASU as the Arizona Cancer Evolution Center. Davies also assisted the National Cancer Institute in establishing the nationwide network of Physical Science Oncology Centers, with an annual budget of \$35 million (US), serving on the Steering Committee. In the Beyond Center he has established an internationally renowned programme of specialist workshops (several per year), which he devises, organizes and hosts. They have proved immensely influential, receiving worldwide acclaim. The most recent workshop, held virtually in May 2021, was on 'Beyond Laws'. Workshops in the advanced planning stage are on COVID-19 modelling (September 2021) and 'The Information Pathway from Molecules to Cells' in October 2021. Davies has also exercised leadership through his terms on the Boards of Trustees and Advisors of several philanthropic foundations, which collectively support fundamental research to the value of several hundred million dollars per year. He helped establish a \$10 million (US) initiative of the Templeton World Charity Foundation on applications of information theory to physics and biology that has supported two Australian research groups. On the Board of Advisors of Breakthrough Listen, chaired by

Lord Martin Rees, he helps direct science policy on SETI and related topics. As a founding member of the UQ-based Big Questions Institute, he has been a tireless advocate and fund-raising campaigner.

Professional service

Professional societies, national and international committees, editorial boards & refereeing

Current service only

Board of Advisors, Leverhulme Quantum Biology Centre, University of Surrey
Board of Trustees, Templeton World Charity Foundation
Grants and Programs Committee, Templeton World Charity Foundation
Board of Advisors, Templeton World Charity Foundation
Board of Advisors, John Templeton Foundation
Advisory Committee, Breakthrough Listen
Advisory Board, Institute for Cross-Disciplinary Engagement, Dartmouth College
Editorial Board, *Oncogene* (journal)
Editorial Board, *Astrobiology* (journal)
Visiting Professor of Physics, UNSW
PLuS Alliance Fellow

Davies is a long-time reviewer for many professional journals in physics, astronomy and astrobiology, receiving about 30 requests per year. He has also assessed many research grant applications and has served on a number of prize committees including, in Australia, the Eureka Prizes. Past service includes a term on the editorial board of *Journal of Physics A*, two different visiting professorships at Imperial College London, one at the University of Queensland, and several international conference organizing committees.

Public lectures

Davies is in constant high demand to give special lectures, receiving several invitations per month to speak at conferences, festivals, scientific societies, commercial organizations, think tanks and educational institutions. Over the years he has given literally hundreds of conference

presentations, special lectures and keynote addresses. Many of these are recorded for radio, podcast or television. Notable venues at which he has given major addresses include:

Westminster Abbey
The Vatican
The United Nations
The European Commission
The Chilean Senate
The Library of Alexandria
The Australian Parliament
The World Economic Forum
UNESCO
The International Physics Olympiad (Singapore)
The Solvay Conference
Sydney Opera House
The Royal Society
The Royal Institution
The Smithsonian Institution

Research grants

For reasons of space, the listed grants are restricted to the period at ASU only

Grants for which Davies is Principal Investigator:

Sponsor	Amount (USD)	Year
Foundational Questions Institute	\$113,747	2018
National Cancer Institute (NCI)	\$556,558	2013
National Cancer Institute (NCI)	\$52,981	2013
National Cancer Institute (NCI)	\$74,851	2013
National Cancer Institute (NCI)	\$1,545,020	2013
National Cancer Institute (NCI)	\$1,680,677	2012
National Cancer Institute (NCI)	\$1,715,390	2011
National Cancer Institute (NCI)	\$1,712,847	2010
National Cancer Institute (NCI)	\$1,696,840	2009
John Templeton Foundation	\$13,000	2008
Foundational Questions Institute	\$70,000	2008
Foundational Questions Institute	\$15,000	2008
NASA: Ames Research Center	\$15,000	2008
Foundational Questions Institute	\$12,000	2007

Grants for which Davies is co-I

John Templeton Foundation, with University of Surrey, 'Life on the Edge: quantum thermodynamics, quantum biology and the arrow of time' (\$40,901 allocated to Davies)	\$2,983,532
With Parikh, Maulik, John Templeton Foundation, 'The Matter with Gravity'	\$554,125
With Walker, Sara, 'Exploring the Informational Transitions Bridging Inorganic Chemistry and Minimal Life'	\$1,992,427

Negotiated in 2019 by Davies to support The Beyond Center:

Sponsor	Amount
Moogsoft	\$87,843
Melanie Brose Archelon Fellowship	\$70,000

Full List of Publications

Books

What's Eating the Universe?

Allen Lane, the Penguin Press; University of Chicago Press (2021)

The Demon in the Machine

Allen Lane, the Penguin Press; University of Chicago Press (2019)

The Eerie Silence: Are we alone in the universe?

Penguin Press (2010)

The Goldilocks Enigma: Why is the universe just right for life?

Allen Lane, the Penguin Press (2006)

Published in hardcover in the USA by Houghton Mifflin under the title Cosmic Jackpot (April 2007)

How to Build a Time Machine

Penguin/Viking (2001)

More Big Questions

(with Phillip Adams)

Penguin Australia (1998)

One Universe or Infinite Universes?

Di Renzo Editore (1998)

The Fifth Miracle: The search for the origin of life

Allan Lane (1998)

Simon & Schuster (1998)

Revised ed. published under the title *The Origin of Life*, Penguin (2003)

Are We Alone? The philosophical basis of the search for extraterrestrial life

Basic Books (1995)

Penguin (1995)

The Big Questions

(with Phillip Adams)

Penguin Australia (1996)

About Time: Einstein's unfinished revolution

Simon & Schuster (1995)

Viking (1995)

Quantum Mechanics, second edition

(with D. Betts)

Chapman & Hall (1994)

The Last Three Minutes

Basic Books (1994)

Weidenfeld & Nicolson (1994)

The Mind of God

Simon & Schuster (1992)

Penguin (1993)

The Matter Myth

(with J. Gribbin)

Simon & Schuster (1991)

Penguin (1991)

Superstrings: a theory of everything?

(with J.R. Brown)

Cambridge University Press (1988)

The Cosmic Blueprint

Heinemann (1987)

Simon & Schuster (1988)

Revised edition, Templeton Foundation Press (2004)

The Ghost in the Atom

(with J.R. Brown)

Cambridge University Press (1986); Canto edition (1993)

Quantum Mechanics

Routledge & Kegan Paul (1984)

Superforce

Heinemann (1984)

Simon & Schuster (1983)

God and the New Physics

J.M. Dent (1983)
Simon & Schuster (1983)

Quantum Fields in Curved Space (with N.D. Birrell)

Cambridge University Press (1982)

The Accidental Universe

Cambridge University Press (1982)

The Edge of Infinity

J.M. Dent (1981)
Simon & Schuster (1981)
Revised ed. Penguin (1994)

The Search for Gravity Waves

Cambridge University Press (1980)

Other Worlds

J.M. Dent (1980)
Simon & Schuster (1980)

The Forces of Nature

Cambridge University Press (1979)
Second ed. (1986)

The Runaway Universe

J.M. Dent (1978)
Harper & Row (1978)
Fontana (under the title *Stardoom* 1979)

Space and Time in the Modern Universe

Cambridge University Press (1977)

The Physics of Time Asymmetry

Surrey University Press (1974)
University of California Press (1974)

Books edited

From Matter to Life

(with George Ellis and Sara Walker)
Cambridge University Press (2017)

Complexity and the Arrow of Time

(with C.H. Lineweaver and M. Ruse)
Cambridge University Press (2013)

A One Way Mission to Mars: Colonizing the Red Planet

(with D. Schulze-Makuch, *Cosmology*)
Science Publishers (2011)

Information and the Nature of Reality: From Physics to Metaphysics
(with Niels Henrik Gregersen)
Cambridge University Press (2010)

Quantum Aspects of Life
(with Derek Abbott and Arun Pati)
Imperial College Press (2008)

Instruments, Methods, and Missions for Astrobiology XIV
(with Richard Hoover, Gilbert Levin and Alexei Rozanov)
SPIE Publications (2007)

Instruments, Methods, and Missions for Astrobiology X
(with Richard Hoover, Gilbert Levin and Alexei Rozanov)
SPIE Publications (2007)

The Re-Emergence of Emergence
(with Philip Clayton)
Oxford University Press (2006)

Science and Ultimate Reality
(with John D. Barrow & Charles Harper)
Cambridge University Press (2004)

The New Physics
Cambridge University Press (1989)

Audio books

The Last Three Minutes
Orion Audio Books
Orion Media (London)

The Big Questions
Louis Braille Books
South Yarra, Vic., Australia

Forewords, prefaces and introductions to the following books

From Matter to Life, with George F.R. Ellis and S.I. Walker, Cambridge University Press (2017).

Complexity and the Arrow of Time, with C. H. Lineweaver and M. Ruse, Cambridge University Press (2013).

A One Way Mission to Mars: Colonizing the Red Planet, P.C.W. Davies and D. Schulze-Makuch (Eds.), Cosmology Science Publishers (2011).

Information and the Nature of Reality: From Physics to Metaphysics, with N. H. Gregersen, Cambridge University Press (2010).

Thinking About Gödel and Turing: Essays on complexity, 1970-2007 by Gregory Chaitin, Singapore: World Scientific (2007).

The Parallel Bang by Jack Bacon, Houston: Normandy House (2006).

The Re-Emergence of Emergence, P. Clayton (Ed.), Oxford: Oxford University Press (2006).

Fred Hoyle: A life in science by Simon Mitton, London: Arum Press (2005).

To Mars and Beyond: Search for the Origins of Life, Sydney: Art Exhibitions Australia (2001).

The God Experiment by Russell Stannard, New Jersey: Paulist Press (2000).

The Search for Life on Mars by Malcolm Walter, Sydney: Allen & Unwin (1999).

Eclipse by Duncan Steel, London: Headline (1999).

Wizards of Oz by Peter Spinks, Sydney: Allen & Unwin (1999).

Ball Lightning - An Unsolved Problem in Atmospheric Physics by Mark Stenhoff, New York: Kluwer/Plenum (1999).

Sharing the Universe by Seth Shostak, Berkeley: Berkeley Hills Books (1998).

Patterns in the Sand by Terry Bossomaier and David Green, Sydney: Allen & Unwin (1998).

Ripples on a Cosmic Sea by David Blair and Geoff McNamara, Sydney: Allen & Unwin (1997).

Cosmic Bullets by Roger Clay & Bruce Dawson, Sydney: Allen & Unwin (1997).

Quantum Technology by Gerard Milburn, Sydney: Allen & Unwin (1996).

Six Easy Pieces by Richard Feynman, Massachusetts: Addison-Wesley (1995).

Riddles in Your Teacup by Partha Ghose and Dipankar Home, Bristol: Institute of Physics Publishing (1994).

The Character of Physical Law by Richard Feynman, London: Penguin (1992).

Physics and Philosophy by Werner Heisenberg, London: Penguin (1989).

Research papers in peer-reviewed professional journals

1. Davies, P.C.W., McKay, C., Worden, S.P. 2(021). Directed panspermia using interstellar comets. (In review).
2. Davies, P.C.W., Logan, T. & Zahariade, G. (2021). The harmonic quantum Szilard engine. *American Journal of Physics* **89**(12), 1123-1131.
3. Davies, P.C.W., Logan, T. & Zahariade, G. (2021). A heat shield for de Sitter space. *Physical Review D*. **103**(12-15), 125010.
4. Lineweaver, C.H., Bussey, K.J., Blackburn, A.C. & Davies, P.C.W. (2021). Cancer progression as a sequence of atavistic reversions. *Bioessays* **43**(7), 1-12.
5. Davies, P.C.W. (2020). Is new physics lurking inside living matter? *Physics Today* **73**(8), 34-40.
6. Davies, P.C.W., A. Louis, A., Paulson, S. & Walkowicz, L. (2019). A touch of awe: crafting meaning from the wonder of the cosmos. *Annals of the New York Academy of Sciences*, **1432**(1), 46-62.
7. Zhou, J.X., Cisneros, L., Knijnenburg, T., Trachana, K., Davies, P.C.W. & Huang, S. (2018). Phylostratigraphic analysis of tumor and developmental transcriptomes reveals relationship between oncogenesis, phylogenesis and ontogenesis. *Convergent Science: Physical Oncology*, **4**(2), 025002, 1-29.
8. Adams, A., Berner, A., Davies, P.C.W. & Walker S.I. (2017). Physical universality, state-dependent dynamical laws and open-ended evolution. *Entropy* **19**(9), 461-481.
9. Cisneros, L., Bussey, K.J., Orr, A.J., Miočević, M., Lineweaver, C.H. & Davies, P.C.W. (2017). Ancient genes establish stress-induced mutation as a hallmark of cancer. *PLoS One*, **12**(4), e0176258, 1-15.
10. Bussey, K.J., Cisneros, L.H., Lineweaver, C.H. & Davies, P.C.W. (2017). Ancestral gene regulatory networks drive cancer. *Proceedings of the National Academy of Sciences*, **114**(24), 6160-6162.
11. Adams, A., Zenil, H., Davies, P.C.W. & Walker, S.I. (2017). Formal definitions of unbounded evolution and innovation reveal universal mechanisms for open-ended evolution in dynamical systems. *Scientific Reports*, **7**, 997-1012.
12. Davies, P.C.W. & Walker, S.I. (2016). The hidden simplicity of biology. *Reports on Progress in Physics*, **79**(10), 102601, 1-18.
13. Davies, P.C.W. & Agus, D.B. (2016). Stochasticity and determinism in cancer creation and progression. *Convergent Science: Physical Oncology*, **1**(2), 026003, 1-4.

14. Walker, S.I., Kim, H. & Davies, P.C.W. (2016). The informational architecture of the cell. *Phil. Trans. R. Soc. A*, **374**, 2063, 1-20.
15. Kim, H., Davies, P.C.W. & Walker, S.I. (2015). New scaling relation for information transfer in biological networks. *Journal of the Royal Society Interface*, **12**(113), 20150944, 1-11.
16. Wu, A., Zhang, Q., Lambert, G., Khin, Z., Gatenby, R.A., Kim, H.J., Pourmand, N., Bussey, K., Davies, P.C.W., Sturm, J.C. & Austin, R.H. (2015). Ancient hot and cold genes and chemotherapy resistance emergence. *Proceedings of the National Academy of Sciences*, **112**(33), 10467-10472.
17. Coventry, B.J., Ashdown, M., Henneberg, M. & Davies, P.C.W. (2015). The immune system and responses to cancer: coordinated evolution. *F1000 Research* **4**(552), 1-12.
18. Davies, P.C.W. (2014). The arrow of time. *Euresis*, **7**, 25-37.
19. Walker, S. I., Davies, P.C.W. Samantray, P. & Aharonov, Y. (2014). Quantum non-barking dogs. *New Journal of Physics*, **16**(6), 063026, 1-14.
20. Lineweaver, C.H., Davies, P.C.W. & Vincent, M.D. (2014). Targeting cancer's weaknesses (not its strengths): Therapeutic strategies suggested by the atavistic model. *BioEssays*, **36**(9), 827-835.
21. Davies, P.C.W. (2013). Implications of read-write genomics for cancer biology. Comment on "How life changes itself: The Read-Write (RW) genome" by James A. Shapiro. *Physics of Life Reviews*, **10**(3), 338-340.
22. Schulze-Makuch, D. & Davies, P.C.W. (2013). Destination mars: colonization via initial one-way missions. *Journal of the British Interplanetary Society*, **66**, 11-14.
23. Davies, P.C.W. (2013). The nature of the laws of physics and their mysterious bio-friendliness. *Euresis*, **5**, 15-37.
24. Davies, P.C.W., Rieper, E. & Tuszynski, J. A. (2013). Self-organization and evolution reduction in a living cell. *Biosystems*, **111**(1), 1-10.
25. Walker, S.I. & Davies, P.C.W. (2013). The algorithmic origins of life. *Journal of the Royal Society Interface*, **10**(79), 20120869, 1-9.
26. Cisneros, L., Walker, S.I. & Davies, P.C.W. (2013). Evolutionary transitions and top-down causation. *Proceedings of Artificial Life* **13**, 283-290.
27. Davies, P.C.W. & Moss, I.G. (2012). Cosmological bounds on tachyonic neutrinos. *Astroparticle Physics*, **35**(10), 679-680.

28. Davies, P.C.W., Demetrius, L.A. & Tuszynski, J.A. (2012). Implications of quantum metabolism and natural selection for the origin of cancer cells and tumor progression. *AIP Advances*, **2**(1), 011101, 1-14.
29. Nandakumar, V., Kelbauskas, L., Hernandez, K.F., Lintecum, K.M., Senechal, P., Bussey, K.J., Davies, P.C.W. & Meldrum, D.R. (2012). Isotropic 3D nuclear morphometry of normal, fibrocystic and malignant breast epithelial cells reveals new structural alterations. *PLoS One*, **7**(1), e29230, 1-9.
30. Davies, P.C.W. & Wagner, R.V. (2013). Searching for alien artifacts on the moon. *Acta Astronautica*, **89**, 261-265.
31. [Davies, P.C.W. \(2012\)](#). Footprints of alien technology. *Acta Astronautica*, **73**, 250-257.
32. Davies, P.C.W., Demetrius, L. & Tuszynski, J.A. (2011). Cancer as a dynamical phase transition. *Theoretical Biology and Medical Modelling*, **8**(30), 1-16.
33. [Davies, P.C.W. \(2011\)](#). [Epigenetics and top-down causation](#). *Journal of the Royal Society Interface*, **2**(1), 42-48.
34. Fuhrmann, A., Staunton, J.R., Nandakumar, V., Banyai, N., Davies, P.C.W. & Ros, R. (2011). AFM stiffness nanotomography of normal, metaplastic and dysplastic human esophageal cells. *Physical Biology*, **8**(1), 015007, 1-10.
35. Wolfe-Simon, F., Blum, J.S., Kulp, T.R., Gordon, G.W., Hoefft, S.E., Pett-Ridge, J., Davies, P.C.W. & Anbar, A. D. (2011). A bacterium that can grow by using arsenic instead of phosphorus. *Science*, **332**(6034), 1163-1166.
36. Davies, P.C.W. & Lineweaver, C.H. (2011). Cancer tumors as Metazoa 1.0: tapping genes of ancient ancestors. *Physical Biology*, **8**(1), 010201, 1-7.
37. Davies, P.C.W. (2011). Searching for a shadow biosphere on Earth as a test of the 'cosmic imperative'. *Philosophical Transactions of the Royal Society of London A* **369**, 624-632.
38. Schulze-Makuch, D. & Davies, P.C.W. (2010). To boldly go: a one-way human mission to Mars. *Journal of Cosmology*, **12**, 3619-3626.
39. Davies, P.C.W. (2009). Time-dependent quantum weak values: decay law for post-selected states. *Physical Review A*, **79**(3), 032103, 1-6.
40. Davies, P.C.W., Benner, S.A., Cleland, C.E., Lineweaver, C.H., McKay, C.P. & Wolfe-Simon, F. (2009). Signatures of a shadow biosphere. *Astrobiology*, **9**(2), 241-249.
41. Wolfe-Simon, F., Davies, P.C.W. & Anbar, A.D. (2009). Did nature also choose arsenic?

International Journal of Astrobiology, **8**(2), 69-74.

42. Davies, P.C.W. (2008). Constraints on the value of the fine structure constant from gravitational thermodynamics. *International Journal of Theoretical Physics*, **47**(7), 1949-1953.
43. Davies, P.C.W. (2007). The implications of a cosmological information bound for complexity, quantum information and the nature of physical law. *Fluctuation and Noise Letters*, **7**(04), C37-C50.
44. Davies, P.C.W. & Lineweaver, C.H. (2005). Finding a second sample of life on Earth. *Astrobiology*, **5**(2), 154-163.
45. Davies, P.C.W. (2005). Quantum vacuum friction. *Journal of Optics B: Quantum and Semiclassical Optics*, **7**(3), S40-S46.
46. Davies, P.C.W. (2005). Quantum tunneling time. *American Journal of Physics*, **73**(1), 23-27.
47. Davies, P.C.W. (2005). A quantum recipe for life. *Nature*, **437**(7060), 819-819.
48. Davies, P.C.W. (2004). Emergent biological principles and the computational properties of the universe: explaining it or explaining it away? *Complexity*, **10**(2), 11-15.
49. Davies, P.C.W. (2004). Does quantum mechanics play a non-trivial role in life? *Biosystems*, **78**(1), 69-79.
50. Davies, P.C.W. (2004). Transit time of a freely falling quantum particle in a background gravitational field. *Classical and Quantum Gravity*, **21**(10), 5677-5683.
51. Davies, P.C.W. (2004). Quantum mechanics and the equivalence principle. *Classical and Quantum Gravity*, **21**(11), 2761-2772.
52. Davies, P.C.W. (2004). Multiverse cosmological models. *Modern Physics Letters A*, **19**(10), 727-743.
53. Davies, P.C.W. (2004). Tachyonic dark matter. *International Journal of Theoretical Physics*, **43**(1), 141-149.
54. Davies, P.C.W. (2004). Does life's rapid appearance imply a Martian origin? *Astrobiology*, **3**(4), 673-679.
55. Davis, T.M., Davies, P.C.W. & Lineweaver, C.H. (2003). Black hole versus cosmological horizon entropy. *Classical and Quantum Gravity*, **20**(13), 2753-2775.
56. Davies, P.C.W. (2003). How bio-friendly is the universe? *International journal of astrobiology*, **2**(2), 115-120.

57. Davies, P.C.W. & Davis, T.M. (2002). How far can the generalized second law be generalized? *Foundations of Physics*, **32**(12), 1877-1889.
58. Abbott, D., Davies, P.C.W. & Shalizi, C.R. (2002). Order from disorder: the role of noise in creative processes. *Fluctuation and Noise Letters*, **2**(4), C1-C12.
59. Davies, P.C.W., Davis, T.M. & Lineweaver, C. H. (2002). Cosmology: Black holes constrain varying constants. *Nature*, **418**(6898), 602-603.
60. Davies, P.C.W. & Ottewill, A. C. (2002). Detection of negative energy: 4-dimensional examples. *Physical Review D*, **65**(10), 104014, 1-10.
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