

Brian Greene, professor of physics at Columbia University and director of Columbia's Center for Theoretical Physics, is recognized for a number of groundbreaking discoveries in his field of superstring theory including the discoveries of mirror symmetry and topology change. Greene has written four New York Times bestsellers, exploring physics for general audiences, which have sold more than 2 million copies worldwide. The orchestral adaptation of Greene's novella, *Icarus at the Edge of Time*, premiered at Lincoln Center and has been performed over 65 times worldwide and his work for the stage, *Light Falls*, which traces Einstein's discovery of General Relativity, was broadcast as a primetime national special on PBS.

BRIAN GREENE

CURRICULUM VITAE

Departments of Physics and
Department of Mathematics
Columbia University

Positions Held:

Columbia University: Professor of Physics and Mathematics, 1996 - present.
Director, Center for Theoretical Physics, 2015—present.

Cornell University: Professor of Physics, 1996, Associate Professor of Physics, 1994 -1996, Assistant Professor of Physics, 1990 -1994.

Harvard University: Postdoctoral fellow in Departments of Mathematics and Physics, 1987-1990.

World Science Festival: Co-founder, Chairman of the Board, 2006 - present.

World Science U: Co-founder, Chairman, 2014.

Education:

Oxford University: Awarded D.Phil, 1987

Harvard University: Undergraduate with a concentration in physics, 1980 to 1984.
Awarded B.A. *Summa Cum Laude*.

Selected Honors:

Michael Pupin Medal for Service to the Nation in Science, 2022.

Finalist, Premio Cosmos Book Prize, 2021.

Board of Overseers, Harvard University, 2015—present.

Merck-Serono Book Prize for Literature and Science, for *The Hidden Reality*, 2013.

Gamow Lecturer, University Colorado Boulder, 2013.

Best Documentary, Jackson Hole Film Festival, *Fabric of the Cosmos*, 2013

AAPT Richtmeyer Memorial Award for Research and Teaching, 2012.

Cooper Union Urban Visionary Award, 2010.

Phi Beta Kappa Book Award, 2004.
George Foster Peabody Award for NOVA, The Elegant Universe, 2003.
Gemant Award, American Institute of Physics, 2003.
Finalist, Pulitzer Prize in General Nonfiction, 2000.
Winner, Aventis Prize, 2000.
Alfred P. Sloan Foundation Fellowship, 1993 - 1997.
NSF National Young Investigator Award, 1992 - 1997.
National Science Foundation Postdoctoral Fellowship in Mathematical Sciences, 1987-1990.
Rhodes Scholarship: For study at Oxford University, 1984 to 1986.

Publications

1. "Relativity and Non-Trivial Topology," B. Greene, J. Levin, and D. Kabat, in preparation.
2. "Mirror Symmetry: Thirty Years Later," B. Greene, in preparation.
3. "Coherent Bubble Collisions in Boom and Bust Inflation," A. Brainerd and B. Greene, in preparation.
4. "Numerical Evaluation of Acceleration-Assisted Entanglement Harvesting," A. Brainerd and B. Greene, in preparation.
5. "Computational complexity of the landscape II - Cosmological considerations
Frederik Denef , Michael R. Douglas, Brian Greene, Claire Zukowski . Annals Phys. 392 (2018) 93-127
6. "Random Field Theories in the Quintic Moduli Space," K. Eckerle and B. Greene, arXiv:1608.05189 [hep-th] 2016.
7. "Dark Energy in String Theory," B. Greene and G. Shiu Adv. Ser. Direct. High Energy Phys. 22 (2015) 385-410
8. "Kink Collisions in Curved Field Space," , P. Ahlqvist, K. Eckerle, B. Greene, e-Print: arXiv:1411.4631 [hep-th] 2014
9. "Bubble Universe Dynamics After Free Passage," P. Ahlqvist, K. Eckerle, B. Greene, JHEP 1503 (2015) 031.
10. "Exploring Spiral Inflation in String Theory," P. Ahlqvist, B. Greene, D. Kagan, e-Print: arXiv:1308.0538 [hep-th] (2013).
11. "Tumbling Through a Landscape," B. Greene, D. Kagan, A. Masoumi, D. Mehta, E. Weinberg, X. Xiao, Phys. Rev. D 88 (2013) 026005
12. "On Three Dimensions as the Preferred Dimensionality of Space," B. Greene, D. Kabat, S. Marnerides, Phys. Rev. D 88 (2013) 043527.
13. "On three dimensions as the preferred dimensionality of space via the Brandenberger-Vafa mechanism," B. Greene, D. Kabat, S. Marnerides, Phys.Rev. D88 (2013) 043527
14. "Warped Vacuum Statistics," P. Ahlqvist, B. Greene, D. Kagan, JHEP 1207 (2012) 066
15. "Brane-World Motion in Compact Dimensions, B. Greene, J. Levin, M. Parikh, arXiv: 1103.2174, Class. Quant. Grav. 28 (2011) 155013.
16. "Conifolds and Tunneling in the String Landscape," P. Ahlqvist, B. Greene, D. Kagan, E. Lim, S. Sarangi, I. Yang, JHEP 1103: 119, 2011.

17. "A Bulk Inflation from Large Volume Extra Dimensions," B. Greene, D. Kabat, J. Levin, D. Thurston. arXiv: 1001.1423, Phys. Lett. B694:485-490, 2011.
18. "Smooth Initial Conditions form Weak Gravity." B. Greene, K. Hinterichler, S. Judes, M. Parikh, Phys. Letter B697 (2011) 178-183.
19. "Dynamical Decompactification and Three Large Dimensions," B. Greene, D. Kabat, S. Marnerides. arXiv:0908.0955, Phys. Rev. D82:043528, 2010.
20. "The Origin of the Universe as Revealed Through the Polarization of the Cosmic Microwave Background," S. Dodelson, R. Easther, S. Hanany, L. McAllister, S. Meyer, L. Page, P. Ade, A. Amblard, A. Ashoorioon, C. Baccigalupi, et al., e-Print arXiv:0902.3796 [astro-ph.CO] (2009).
21. "Bouncing and cyclic string gas cosmologies," B. Greene, D. Kaba, S. Marnerides, Phys.Rev D80 (2009) 063526.
22. "Dark Energy and Stabilization of Extra Dimensions," B. R. Greene and J. Levin, ' JHEP 0711, 096 (2007).
23. "Cosmological moduli dynamics" B. Greene, S. Judes, J. Levin, S. Watson, A. Weltman, JHEP 0707 (2007) 060.
24. "Families of quantic Calabi-Yau 3-folds with discrete symmetries," C. Doran, B. Greene, S. Judes, Commun.Math,Phys. 280 (2008) 675-725.
25. "Universal correction to the inflationary vacuum," B. Greene, M. Parikh, J. Pieter van der Scharr, JHEP 0604 (2006) 057.
26. "An Effect of alpha' corrections on racetrack inflation," B. Greene, A. Weltman, JHEP 0603 (2006) 057.
27. "Extracting new physics from the CMB," B. Greene, K. Schalm, J. Pieter van de Schaar, G. Shiu, eConf C041213 (2004) 0001.
28. "Decoupling in an expanding universe: Backreaction barely constrains short distance effects in the CMB," B. Greene, K. Schalm, G. Shiu, J. Pieter van der Schaar, JCAP 0502 (2005) 001.
29. "String windings in the early universe", R. Easther, B. Greene, M. Jackson, D. Kabat, JCAP 04 (2004) 006.
30. "Brane gas cosmology in M theory: Late time behavior", R. Easther, B. Greene, M. Jackson, D. Kabat, Phys.Rev. d67 (2003) 123501.
31. "On the Hagedorn behavior of PP wave strings and N=4 SYM theory at finite R charge density", B. Greene, K. Schalm, C. Shiu, Nucl.Phys. B652 (2003) 105-126.
32. "A Generic estimate of transPlanckian modifications to the primordial power spectrum in inflation", R. Easther, B. Greene, W. Kinney, G. Shiu, Phys.Rev. D66 (2002) 023518.
33. "Cosmological string gas on orbifolds", R. Easter, B. Greene, M. Jackson, Phys.Rev. D66 (2002) 023502.
34. "Imprints of Short Distance Physics On Inflationary Cosmology", R. Easther, B. R. Greene, W. H. Kinney, G. Shiu, *Phys.Rev.D67:063508,2003*.
35. "Split attractor flows and the spectrum of BPS D-branes on the quintic", F. Denef, B.R. Greene, M. Raugas, JHEP 0105 (2001) 012.
36. "Remarks on inflation and noncommutative geometry", C. Chu, B.R. Greene, S. Shiu, Mod.Phys.Lett. A16 (2001) 2231-2240.
37. "Aspects of collapsing cycles", B. R. Greene, Int.J.Mod.Phys. A16 (2001) 767-779.
38. "Dynamical topology change in M theory", B.R. Greene, K. Schalm, G. Shiu, J. Math.Phys. 42 (2001), 3171-3187.

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41. "Collapsing D-branes in Calabi-Yau moduli space" B.R. Greene, C.I. Lazarou, Nucl.Phys. B604 (2001) 181-255.
42. "Nonperturbative Aspects of String Theory and Supersymmetric Gauge Theories; Proceedings of the Trieste Conference on Super-Five-Branes and Physics in 5 + 1 Dimensions", Trieste, Italy, March 23-April 3, 1998", M.J. Duff, E. Sezgin, C.N. Pope, B. Greene, J. Louis, K.S. Narain, S. Randjbar, G. Thompson, Singapore, Singapore: World Scientific (1999). 454 pp.
43. "D-3-branes on partial resolutions of Abelian quotient singularities of Calabi-Yau threefolds", C. Beasley, B.R. Greene, C.I. Lazarou, M.R. Plesser, Nucl. Phys. B566 (2000) 599-640.
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45. New constructions of mirror manifolds: Probing moduli space far from Fermat points", B.R. Greene, M.R. Plesser, S.S. Roan, In Yau, S.T. (ed.): Mirror symmetry I 347-389.
46. "An introduction to mirror manifolds", B.R. Greene, M.R. Plesser, In Yau, S.T. (ed.):Mirror symmetry I 1-30.
47. "D-branes on nonAbelian threefold quotient singularities", B.R. Greene, C.I.Lazarou, M. Raugas, Nucl. Phys. B553 (1999) 711-749.
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50. Fields, strings and duality. Proceedings, Summer School, Theoretical Advanced Study Institute in Elementary Particle Physics, TASI'96, Boulder, USA, June 2-28, 1996", C. Efthimiou, B. Greene, Singapore, Singapore: World Scientific (1997) 1069 p.
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53. "Brane Gases in the Early Universe: Thermodynamics and Cosmology", R. Easter, B. R. Greene, M. Jackson, D. Kabat, JCAP 0401 (2004) 006.
54. "Brane Gas Cosmology in M-Theory: Late Time Behavior", R. Easter, B. R. Greene, M. Jackson, D. Kabat, Phys. Rev. D67 (2003) 123501.
55. " Inflation as a Probe of Short Distance Physics", R. Easter, B. R. Greene, W. H. Kinney, G. Shiu, Phys.Rev. D64 (2001) 103502.
56. "Warped Compactifications in M and F Theory", B. Greene, K. Schalm, G. Shiu, Nucl.Phys. B584 (2000) 480.

57. "Constructing mirror manifolds", B.R. Greene, *Greene, B (ed.): Yau, S.T. (ed.): Mirror symmetry II* 29-69.
58. "F theory and linear sigma models", M. Bershadsky, T.M. Chiang, B.R. Greene, A. Johansen, C.I. Lazaroiu, Nucl.Phys. B527 (1998) 531-570.
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61. "Inflation decay and heavy particle production with negative coupling", B.R. Greene, T. Prokopec, T.G. Roos, Phys.Rev. D56 (1997) 6484-6507.
62. "Orbifold Resolution by D-branes", M. Douglas, B. Greene, D. Morrison, Nucl.Phys. B506 (1997) 84.
63. "Some features of (0,2) moduli space", T. Chiang, J. Distler, B.R. Greene, Nucl.Phys. B496 (1997) 590-616.
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65. "Small volumes in compacted string theory", B.R. Greene, Y. Kanter, Nucl.Phys. B497 (1997) 127-145.
66. "A Geometric realization of confinement", B.R. Greene, D.R. Morrison, C. Vafa, Nucl.Phys. B481 (1996) 513-58.
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69. Lectures on the quantum geometry of string theory", B.R. Greene, In Les Houches 1995, Quantum symmetries 387-471.
70. "Black hole condensation and the web of Calabi-Yau manifolds", T. Chiang, B.R. Greene, M. Gross, Y. Kanter, Nucl.Phys.Proc.Suppl.46 (1996) 82-95.
71. "Phases of mirror symmetry", T. Chiang, B.R. Greene, In Los Angeles 1995, Future perspectives in string theory (1995) 97- 199.
72. "Black Hole Condensation and the Unification of String Vacua", B.R. Greene, D.R. Morrison and A. Strominger Nucl. Phys. B451 (1995) 109.
73. "Lectures on quantum geometry", B.R. Greene, Nucl.Phys.Proc.Suppl. 41 (1995) 92-150.
74. "Space-time topology change and stringy geometry", P.S. Aspinwall, B.R. Greene, Nucl.Phys. B437 (1995) 205-230.
75. "What can we do with string theory?", B.R. Greene, AIP Conf. Proc. 302 (1993) 489-529.
76. "Mirror manifolds in higher dimension", B.R. Greene, D.R. Morrison, M. Ronen Plesser, Commun.Math.Phys. 173 (1995) 559-598.
77. "The Monomial divisor mirror map", P.S. Aspinwall, B.R. Greene, D.R. Morrison, Adv. Stud. Princeton - IASSNS-HEP-93-43 (93/09,rec.Oct.) 22 p. Cornell Univ. Ithaca - CLNS-93-1237 (93/09,rec.Oct.) 22 p. e: LANL alg-geom/9309007
78. "Space-time topology change: The Physics of Calabi-Yau moduli space", P.S. Aspinwall, B.R. Greene, D.R. Morrison, In Berkeley 1993, Proceeding, Strings '93 and Inst. Adv.Stud.Princeton - IASSNS-HEP-93-081 (1993).

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81. "Multiple mirror manifolds and topology change in string theory", P.S. Aspinwall, B.R. Greene, D.R. Morrison, Phys.Lett B303 (1993) 249-259.
82. "A Brief survey of mirror symmetry", B.R. Greene and M.R. Plesser, In Goeteborg 1992, Proceedings, Pathways to fundamental theories 267-288.
83. "Eluding the no hair conjecture: Black holes in spontaneously broken gauge theories", B.R. Greene, S.D. Mathur, C.M. O'Neill, Phys.Rev. D47 (1993) 2242-2259.
84. "Inverse phase transitions: Does baryogenesis lead to dark matter?" S. Dodelson, B.R. Greene, L.M. Widrow, (1992).
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86. "Mirror manifolds: A Brief review and progress report", B.R. Greene, M.R. Plesser, In Boston 1991, Proceedings, Particles, strings and cosmology 648-666 (1991).
87. "Superconformal compactifications in weighted projective space", B.R. Greene, Commun.Math.Phys. 130 (1990) 335-355.
88. "Lectures on string theory in four-dimensions", B.R. Greene, Lectures fivenat Trieste HEP Cosmology 1990: 0334-420.
89. "Mirror manifold in $N=2$ string compactification" B.R. Greene, In Boston 1990, Proceedings, Particles, strings and cosmology 402-425 and Cornell Univ. Ithaca-CLNS-90-1015.
90. "Gauge symmetry breaking in superconformal orbifolds", B.R. Greene, M.R. Plesser, E. Rusjan, X. Wang, Mod.Phys.Lett. A6 (1991) 591-604.
91. "Lectures on compactified string theory", B.R. Greene, Prepared for XIII International School OConferece: C89-09-19.1. 363-406.
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93. "Special Points in Three Generation Moduli Space" B.R. Greene, PhysRev. D40 (1989) 16-45-1652.
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95. "Duality in Calabi-Yau Moduli Space", B.R. Greene and M.R.Plesser, Nucl. Phys. B338 (1990) 15-20.
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97. "Calculating Endomorphism Valued Cohomology: Singlet Spectrum in Superstring Models", J. Distler, B.R. Greene, K.H. Kirklin, P.J. Miron, Commu.Math.Phys. 122 (1989) 117-124.
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99. "Calabi-Yau Manifolds and Renormalization Group Flows", B.R.Greene, C.Vafa and N.P.Warner, Nucl.Phys. B324 (1989) 371.
100. "Some Exact Results on the Superpotential from Calabi-Yau Compactifications", J. Distler, B.R. Greene, Nucl.Phys. B309 (1988) 295.

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115. "Supersymmetric Cosmology With a Gauge Singlet", B.R. Greene, P.J. Miron, Phys.Lett. B168 (1986) 226.

Books:

1. *Until the End of Time; Mind, Matter, and Our Search for Meaning in an Evolving Universe.* A. A. Knopf, 2020.
2. *The Hidden Reality: Parallel Universes and the Deep Laws of the Cosmos.* A.A. Knopf, 2011.
3. *The Fabric of the Cosmos: Space, Time, and the Texture of Reality.* A.A. Knopf, 2004.
4. *The Elegant Universe: Superstrings, Hidden Dimensions, and the Deep Laws of the Cosmos.* W. W. Norton, 1999.
5. *Icarus at the Edge of Time.* A. A. Knopf, 2008.

Documentaries:

1. *Light Falls: Space, Time, and an Obsession of Einstein*, PBS (with Great Performances), 2019.
2. *The Fabric of the Cosmos*, Host and Executive editor, 4-part NOVA mini-series, 2011.
3. *The Elegant Universe*, Host, 3-part NOVA mini-series, 2003.

Stage & Musical Works:

1. *Icarus at the Edge of Time*. Orchestral, filmic adaptation of book. Music by Philip Glass, film by AI and AI, adaptation by Brian Greene and David Henry Hwang. World Premiere, June, 2010 at Alice Tully Hall, Lincoln Center. UK Premier July 2010, Southbank Centre, London. Subsequently performed in 50 cities worldwide.
2. *Light Falls: Space, Time and an Obsession of Einstein*. Written by B. Greene, music by Jeff Beal, visuals by 59 Productions. National PBS broadcast, May, 2019. Live performances in New York, Princeton, Brisbane.
3. *Time, Creativity and the Cosmos*. Written by B. Greene, Choreography by Pilobolus. Premiered at Lincoln Center, 2017, performed in Australia, March 2019.

Virtual Reality:

1. *String Theory and Hyperspace*. Co-created live communal virtual reality experience for 58 students in 13 countries, to explore ideas of string theory and to build and explore higher dimensional shapes.
2. *Visceral Physics*: Leading team from Columbia University and World Science Festival to create VR experience leveraging Verizon 5G network for middle school students to gain deeper experience and appreciation of essential scientific concepts. Experiences created to date:
 - a. Stars and Planets
 - b. The Gravity Simulator
 - c. Near the Speed of Light
3. *Richness of Reality*: With Unity and Evil Eyes production, a VR experience of scales in the cosmos.