

# Author Index

## A

Ali, Ahmed Farag 38  
Anscombe, Elizabeth 134  
Aquinas, Thomas 42, 85, 86, 97–99  
Aristotle 62, 65, 66, 76, 87, 102,  
154  
Aspect, Alain 131  
Atkins, Peter 2, 5, 7  
Audi, Robert 87

## B

Bacciagaluppi, Guido 130  
Barnes, Luke A. 178, 185  
Barr, Stephen 36, 166  
Baum, Lauris 37  
Beebee, Helen 102  
Bell, John 131, 132  
Bersanelli, Marco 50  
Bobier, Christopher 154, 155

Bojowald, Martin 37  
Bussey, Peter 39, 128, 137  
Butterfield, Jeremy 129

## C

Cantor, Geog 54  
Capes, Justin 152  
Carroll, Sean 38, 114, 116  
Casati, Roberto 89  
Churchland, Paul M. 18  
Clarke, Randolph 152  
Cohoe, Caleb 98, 100  
Craig, William Lane 23–25, 34, 35,  
38–45, 47, 48, 54, 60–64, 67,  
75–77, 86–89, 97, 99, 100,  
115, 117, 125, 134, 136–142,  
154, 155, 160–162, 167–172,  
174–176, 178, 179, 189, 190  
Crisp, Oliver 16

## D

Daintith, John 127, 166  
 Das, Saurya 38  
 Date, Ghanashyam 37  
 Davies, Brian 101  
 Dawkins, Richard 1, 14, 19, 20, 25,  
 159, 189, 190  
 Dedekind, Richard 54  
 Dorato, Mauro 103  
 Dowden, Bradley 102, 110

## E

Earman, John 112, 114, 116  
 East, James 54  
 Einstein, Albert 30, 185  
 Ellis, George 5, 6, 30, 37, 38, 47, 50,  
 51, 74, 75, 127, 170  
 Esfeld, Michael 103

## F

Fang, L.Z. 162, 165  
 Faye, Jan 115, 118  
 Feferman, Solomon 53  
 Feser, Edward 100  
 Feynman, Richard 131  
 Fine, Kit 40  
 Ford, Kenneth 47, 129  
 Frampton, P.H. 37  
 Freddoso, Alfred 178  
 Frederick, Danny 7, 178  
 Friedmann, Alexander 30–32  
 Frisch, Mathias 90, 91

## G

Gambini, Rodolfo 51  
 Garrett, Don 103

Gasperini, Maurizio 37

Gendler, Tamar 40  
 Gödel, Kurt 112  
 Goldstein, Sheldon 11, 129, 131,  
 132  
 Gott, Richard III 24, 37, 112–115,  
 120, 170  
 Grünbaum, Adolf 17, 18, 31, 33–35,  
 75, 126, 162  
 Guminski, Arnold 60

## H

Halvorson, Hans 31, 50, 170  
 Hanley, Richard 121  
 Hartle, James 25, 33, 37, 162–165,  
 170  
 Hawking, Stephen 2, 8, 25, 33, 37,  
 115, 162–165, 170  
 Hawthorne, John 40, 104  
 Hedrick, Landon 44, 46, 55  
 Hilbert, David 43  
 Hitchcock, Christopher 92  
 Holder, Rodney 130  
 Hooker, Clifford A. 18  
 Hossain, Golam Mortuza 37  
 Howson, Colin 126, 159  
 Huemer, Michael 76, 77  
 Hume, David 91, 103, 133, 154

## J

Jastrow, Robert 31

## K

Kant, Immanuel 1, 16, 171  
 Keller, Simon 110  
 Kirchner, Ulrich 74

Kitcher, Philip 14  
Koons, Robert 75, 135  
Kragh, Helge 50, 170  
Krauss, Lawrence 39, 127, 137, 166,  
186

## L

Leftow, Brian 176  
Leibniz, Gottfried Wilhelm 86, 141  
Lemaître, Georges 30–32  
Lennox, John 165, 166, 170  
Le Poidevin, Robin 46, 111  
Levy, Neil 152  
Lewis, David 45, 113, 117, 121  
Li, Li-Xin 24, 37, 112, 114, 119,  
120, 170  
Linde, Andrei 37  
Lloyd, Seth 115  
Loke, Andrew 77, 104, 190  
Lombard, Lawrence 89  
Lowe, E.J. 152  
Lucas, John 88  
Lyth, Peter 76

## M

Maartens, Roy 37  
Mackie, John Leslie 89, 102, 134  
Maddy, Penelope 52, 53  
Marenbon, John 98  
Maudlin, Tim 103  
McGrath, Alister 15  
McKenna, Michael 152  
Menzies, Peter 103  
Meyer, Ulrich 103, 111–113, 118,  
119  
Mlodinow, Leonard 8, 163–165, 170

Monton, Bradley 50, 110, 111, 113  
Moore, Adrian William 53  
Moreland, James Porter 46, 77, 100,  
173, 175, 190  
Morrison, Wes 39, 49, 51, 55, 160,  
175  
Morton, Bradley 111  
Mumford, Stephen 92

## N

Naeye, Robert 91  
Nelson, Michael 110  
Nowacki, Mark 76, 138

## O

Oaklander, Nathan 33, 69, 89  
O'Connor, Timothy 174  
Oderberg, David 101  
Oppy, Graham 41, 51, 54, 58, 60,  
69, 76, 121, 133, 139, 140,  
143, 150, 155

## P

Padgett, Alan 97, 160, 171  
Parsons, Keith 18  
Pérez, Daniela 118  
Perlmutter, Julian 77  
Philipse, Herman 8, 54, 126  
Phillips, Richard Percival 94  
Philoponus, John 85, 102  
Pinsent, Andrew 8  
Pitts, Brian 34, 60  
Plantinga, Alvin 20  
Polkinghorne, John 4, 7, 15, 128,  
129, 130

Poplawski, Nikodem Janusz 37  
 Potter, Karl 86  
 Pruss, Alexander 103  
 Psillos, Stathis 93, 103  
 Pullin, Jorge 51  
 Puryear, Stephen 64–66  
 Putnam, Hilary 131

## R

Rea, Michael 16  
 Reichenbach, Bruce 35, 36, 85, 96,  
 97, 135  
 Reid, Thomas 125, 153  
 Rickles, Dean 115  
 Romero, Gustavo 118  
 Rowe, William 174  
 Russell, Bertrand 69, 89, 135

## S

Schaffer, Jonathan 116, 178  
 Sidelle, Alan 187  
 Silk, Joseph 35  
 Sinclair, James 25, 34–36, 39–42,  
 44, 45, 48, 62–64, 67, 87, 97,  
 115, 134, 136, 138, 141, 160,  
 167, 168, 172, 174, 178, 189  
 Smith, Quentin 31, 33, 69, 75, 86,  
 125, 160, 165, 174, 178  
 Smith, Sheldon 89  
 Sobel, Jordan 71  
 Steinhardt, Paul Joseph 37  
 Stenger, Victor 127, 133  
 Stenmark, Mikael 3, 4  
 Stoeger, William 17, 32, 33, 128,  
 130, 153, 163

Strawson, Galen 90, 93  
 Stump, Eleonore 101  
 Swinburne, Richard 16, 17, 136

## T

Tooley, Michael 103  
 Towler, Mike 132, 133  
 Tremblay, Francois 175  
 Trigg, Roger 5, 7  
 Turok, Neil 37

## V

Valentini, Antony 130  
 Van Bendegem, Jean Paul 47  
 van Fraassen, Bas 18  
 Varzi, Achille 89  
 Veneziano, Gabriele 37  
 Vilenkin, Alexander 37, 115, 127,  
 166  
 Von Wright, Georg Henrik 89

## W

Wall, Aaron 38, 39, 166  
 Waters, Ben 75  
 Weinberg, Steven 21, 36  
 Wolchover, Natalie 49  
 Wüthrich, Christian 112, 116  
 Wu, Yue-Liang 52  
 Wu, Zhong Chao 162

## Y

Yates, John 176

# Subject Index

## A

- Acausal fine-tuning [39](#)
- Actual infinite temporal regress [23](#),  
[29](#), [37](#), [39](#), [40](#), [46](#), [50](#), [58](#), [60](#),  
[61](#), [70](#), [75](#), [76](#), [96](#), [160](#), [161](#).  
*See also* Infinities
- definition [29](#)
- metaphysical issues [39](#), [96](#), [160](#)
- Agent causation [161](#), [168](#), [173](#), [174](#)
- Aquinas's regress argument [100](#)
- Atheism [19](#), [165](#), [177](#)

## B

- Big Bang
  - issues [31](#)
  - singularity [31](#), [32](#)
  - theories [21](#), [30](#), [75](#)
- Black Hole model [37](#)
- Bohmian mechanics [131](#)

- Bootstrap Paradoxes [24](#), [117](#), [120](#)

## C

- Casual Principle
  - conceptual argument [134](#), [161](#)
  - philosophical doubts [134](#)
  - reductio ad absurdum argument  
[161](#)
  - scepticism [24](#), [126](#)
- Causality
  - theories [102](#), [175](#)
- Causal loop
  - closed [24](#), [111](#)
  - open [24](#), [111](#), [119](#)
- Causal priority [153](#), [161](#), [162](#)
- Causation
  - efficient [89](#), [102](#)
  - final [102](#)
  - formal [102](#)

- material 102
- Singularist theory 103
- Suarez's analysis 178
- theories of 102
- Cause
  - definition 87, 174, 175, 179
  - timeless 9, 18, 22, 25, 36, 162, 171
- Changes
  - spatial series 88
  - temporal series 40, 62, 88, 110
- Closed circular loop 38, 142
- Closed timelike curves (CTCs) 37, 112, 116
- Consistency paradoxes 117, 121
- Cosmological argument
  - Kalam 86, 99, 100, 102, 126, 141, 148, 154, 167, 184
  - Leibnizian 86, 99, 101, 184
  - Thomist 24, 86, 87, 97, 99–101, 103
- Creatio ex nihilo 102
  
- D
- Decoherence 129, 153
- Delayed Choice Quantum Eraser 115
- Divine Cause 17, 18, 20–22, 31, 75, 161, 175
- Doctrine of divine infinity 43
  
- E
- Ekyroptic model 33
- Epistemic ignorance 128
- Eternal inflation model 37
- Extended simples 76
  
- F
- Finite past 35, 37, 38
- Friedmann-Lemaître-Robertson-Walker model 31, 32
  
- G
- General Theory of Relativity 30, 32, 112
- God-of-the-gaps fallacy 22
- Grim Reaper Paradox 104
  
- H
- Hartle–Hawking model 25, 33, 154, 162, 163
- Hidden variable 130, 131
- Hilbert's Hotel 40, 43, 44, 46, 54
- Hume-Edwards–Campbell Principle 103
- Hume's principle 44
  
- I
- Infinities
  - abstract, definition of 45, 46, 50, 51, 56, 59, 60, 62, 70, 168, 169
  - actual, definition of 13, 19, 23, 24, 29, 33, 38
  - arguments against concrete actual 86
  - concrete, definition of 24, 40, 43, 46, 48, 50–53, 55, 56, 58–63, 69, 70, 72, 73, 76, 87, 101, 110, 111, 171, 183, 184
  - metaphysical possibility 45, 54, 55, 68, 147, 149, 152
  - paradoxes 40, 43, 46, 54

- potential, definition of 40, 42, 48, 49, 63, 66, 76  
renormalization 52  
the impossibility of traversing  
  actual 23, 40, 62, 75, 171, 184, 188  
Initial singularity 32, 163
- K**  
Kalam Cosmological Argument 118, 125, 126, 148, 154, 167
- L**  
L'Hospital's view 53  
Libertarian free choice 25, 152  
Loop Quantum Gravity model 37
- M**  
Modal realism view of possible worlds 45  
Motion  
  paradoxes of 34, 62  
M-theory 165, 170
- O**  
Omnipotence 76  
Ontological indeterminism 128  
Oscillating Universe Theory 170
- P**  
Phantom bounce cosmologies 37  
Philosophical reasoning  
  importance 6
- Pilot-wave theory. *See* Bohmian mechanics  
Potentially infinite divisibility of a line  
  Morrison's Rule 50  
  objection 46, 48  
Pre-Big Bang theory 37  
Priority of the Whole with respect to Events (PWE) 63  
Priority of the Whole with respect to Time (PWT) 63
- Q**  
Quantum Eternity Theorem (QET) 38  
Quantum Gravity 30, 38, 47, 75, 116, 170  
Quine-Putnam indispensability argument 52
- R**  
Radical postmodernism 14, 17  
Reasoning  
  deductive 5, 10, 11, 14, 16–18, 136, 187  
  inductive 5, 8, 11, 14, 16–18, 134, 161, 187
- S**  
Science  
  limitations of 5, 13  
  scepticism about 22, 153  
Scientism  
  forms of 3, 4, 17  
  objections to 87, 184

Second Law of Thermodynamics 39  
Spacetime continuum 47  
Space-time manifold 36, 88  
Standard Model of particle physics  
    47, 127  
String theory 37, 47, 116

**T**

Temporal priority 36, 92, 153, 162

Theory of time

    dynamic (A-) 42, 67, 68

    static [B-] 42

Time

    definition 3, 18

    first cause of 24, 75

    imaginary 53, 169

    travel of 110, 112

time

    first cause of 184

Truth Regress 76

**U**

Uncaused beginnings 145, 152

Universe

    asymptotically static 37  
    geometrically flat accelerating 50  
    initial timeless state 173  
    quantum creation 164, 166

**V**

Verificationism 5

**W**

Wheeler–DeWitt equation 163, 166

Wormhole 114

**Z**

Zermelo–Fraenkel axiomatic set  
    theory 54

Zero-point energy 127, 170

Zero universe state 166