

Index

- ψ -function 288

- absolute 3
- absolute motion 195
- absolute simultaneity 286
- absolute space 5
- absolute time 5, 163, 195
- acceleration (and time) 131, 132
- anisotropy of space 162
- antiparticles 318
 - and gravity 320
- arrow of time 304
 - and black holes 310
 - and gravity 310, 311
 - cosmological 305, 310
 - evolutionary 305
 - psychological 305, 312
 - quantum mechanical 311
 - thermodynamic 305, 306
- atomic clock 26, 30, 191
 - Cesium clock 26
- atomic clocks
 - in GNSS 241
- atomic time 261, 263

- being and time 30
- Bell's inequality 298

- causality 283, 285
- centrifugal force 6, 173
 - as gravitomagnetic force 173

- Cesium atomic clocks 26, 203, 262
- Cesium fountain clocks 262
- charge asymmetry 175
- charge of gravity 8, 59, 70, 153, 176
- cinema (and time) 44
- clock comparison 104, 203, 206
- clock synchronization 105
 - Einstein protocol 111
 - light, by 109
 - Poincaré protocol 111
 - protocoles 107
 - transport, by 116
- clock transport
 - around the globe 203
- clocks 20
- CMBR 100, 178
- consciousness 1
- Coordinated Universal Time (UTC) 263
- Coriolis force 171
 - as gravitomagnetic force 172
 - as Lorentz force in gravity 172
- correlation 291
- cosmic clock 178
- cosmic gravity 147
- cosmic matter 156
- Cosmic Microwave Background Radiation 100
- cosmic potential 66, 158
 - in motion 186
 - velocity of light 160, 167
- Cosmic Relativity 102, 148, 160, 168

- and optical fiber links 275
 - Hafele–Keating experiment 208
 - in GNSS 245, 247
 - cosmological constant 157
 - critical Universe 9
 - curvature 63, 72
 - curvature (of space-time) 71
 - cyclical time 321
-
- dark energy 157
 - dark matter 157
 - dimensions
 - of space 324
 - of time 324, 326
 - dissemination of time 259
 - Doppler anisotropy
 - of CMBR 101, 102, 162
-
- earth-clock 34, 35
 - EEP 53, 68
 - Einstein Equivalence Principle 53, 68, 130
 - violation of 137, 175
 - Einstein locality 287, 300
 - Einstein's equation 73, 177
 - Vacuum 74
 - Einstein's error on
 - simultaneity 222
 - electromagnetic inertia 176
 - electromagnetism 10
 - elemental time 306
 - end of time 326
 - entanglement 293, 300
 - entropy 306
 - ephemeris clock 39
 - ephemeris second 40, 263
 - ephemeris time 38
 - EPR argument 290, 294, 296
 - EPR paradox 290
 - Equivalence
 - of inertia and mass 169
-
- ether 82, 92, 100, 161, 196, 228
-
- falsification
 - light hypothesis, of 235, 254
 - of the STR 188, 235
 - faster ageing
 - of transported clocks 207
 - flow of time 303
 - Fresnel drag 275
-
- Galilean light 96, 115, 236
 - Galilean relativity 90
 - Galilean Transformations 90
 - Galilean velocity of light 235
 - General Theory of Relativity 71, 161, 177
 - GLONASS 239
 - GNSS 239
 - evidence for Galilean propagation 247
 - factual corrections 249
 - non-STR formulae 249
 - range finding 246
 - range in Cosmic Relativity 247
 - GPS 239, 248, 252
 - GPS correction 242
 - GPS navigation 241
 - GPS satellites 242
 - gravitational charge 59, 67, 162
 - gravitational mass 60, 67, 169
 - gravitational potential 9, 63
 - Universe, of 57, 158
 - gravitational redshift 54
 - gravitational time dilation 11, 55, 130, 181, 207
 - Einstein's derivation of 55
 - of astronomical clocks 195
 - of atomic clocks 191
 - of GNSS clocks 242
 - of mechanical clocks 192
 - of quartz clocks 194
 - gravitational waves 73, 177

- gravitomagnetic field
 - cosmic 162
- gravitomagnetic potential 166
 - cosmic 166
- gravitomagnetism 11, 153, 169, 172, 276
- gravitons 73
- gravity 10, 53
 - force of 58
 - law of 59
- GTR 63, 68, 71, 73

- Hafele–Keating experiment 201
 - Cosmic Relativity 208, 210
 - data 205, 207
 - route map 205
- hidden variable theories 282, 298
- Hubble’s constant 155
- Hubble’s law 148
- hyperfine transition 261

- inertia 7, 59, 63, 150, 170, 193
 - electromagnetic 176
- inertial force 6, 171
- inertial mass 59
- inertial motion 82
- interactions 9
- International Atomic Time (TAI) 262

- Kennedy–Thorndike experiment 96

- leap seconds in UTC 263
- length contraction 83, 89
- LHVT 282, 298
- light hypothesis 93, 215
- line element 151
 - FLRW Universe 154
 - Minkowski 153
- locality 281, 283
- localization 241
- loop of time 321
- Lorentz factor 168
- Lorentz local time 92, 112, 201
- Lorentz Transformations 91
 - failure of 163
- Lorentz–Poincaré Relativity 95

- Mach’s principle 69, 173
- Machian paradigm 177
- mass 59
- metric 73, 120, 151
 - FLRW Universe 154
 - gravitational potentials 152
 - Minkowski 153
- metric tensor 152
- Michelson interferometer 87
- Michelson–Morley experiment 87, 89
- moon-clock 38
- motional time dilation 137, 183
 - Cosmic Relativity 245
 - GNSS clocks 244
 - in GNSS 243
 - STR vs Cosmic Relativity 245
- Navigational Satellite Systems 239
- Newton’s law of motion 169
- Newton’s Principia 4
- non-simultaneity
 - of Galilean waves 218
- nonlocality 283, 294, 297, 299

- one-way propagation 227
 - in rotating frames 228
 - Michelson–Gale experiment 229
 - with Mössbauer effect 227
- one-way relative velocity 230

- light, of 234
- sound, of 232
- one-way time transfer 268
- optical clocks 260
- optical fiber links
 - two-way transfer 273

- pendulum clock 23, 192
- phase (and time) 70
- Planck mass 333
- Planck units 332
- PoR 149, 168
 - derivation of 164
- potential
 - electric 61
 - gradient of 62
 - time-varying 62
- Principle of Relativity 82, 149
 - Galilean 86
- propagation of light 96
- psychological time 44
- puzzle of inertia 67

- quantum correlations 19, 280, 282
- quantum gravity 73, 331, 333
- quantum measurements 288

- relative time 5, 122, 131
- relative time dilation 119, 123, 134, 209
- relative velocity of light 93, 225
- relative velocity of sound 232
 - experiment 232
- relativity of simultaneity 104
- rotating frames 138
- Ruderfer incident 227, 270

- Sagnac effect
 - fiber-optical gyro 276
 - in GPS 251
- Sagnac's experiments 228
- satellite gravimetry 266
- Schrödinger equation 27, 279, 288
- siderial day 261
- simultaneities (with a clock) 15, 21, 50
- simultaneity 103
 - Einstein's train 216
 - H. Bergson's critique 223
 - in the STR 216, 285
 - of Galilean waves 218
 - of light signals 220
- space-time 33, 71
 - diagram 33, 107
- Special Theory of Relativity 81, 93
- standard time 259
 - drift UT1-TAI 263
 - ET (ephemeris time) 262
 - GPST 264
 - TAI 262
 - UT and UT1 261
- STR 81
 - in GNSS 240
 - inconsistency of 223, 225
- superposition 289
- synchronization
 - by clock transport 116, 227
- synchronization and convention 268
- synchronization of clocks 105, 226, 231, 265
- synchronization protocols 268

- telepathy in physics 282, 299, 302
- tidal forces 60, 71
- time
 - and positivity of energy 314
 - as a dimension 47, 71, 120
 - in quantum mechanics 279
 - psychological 44, 313
- time asymmetry 304, 307
 - in quantum measurements 311
- time dilation 11, 92, 118, 124

- and inertia 171
- and the Earth's motion 271
- anisotropic 200
- anomalous 207
- asymmetry 198
- cause of 118
- from GT 165
- gravitational 54, 65, 127, 206, 242
- in Cosmic Relativity 200, 208
- in one-way experiments 272
- in the STR 202
- motional 81, 170
- of flying birds 202
- real, yet unmeasurable 210
- time reversal 45, 48, 311, 314, 316
 - and expanding Universe 317
 - and gravity 318
- time reversal invariance 304
- time transfer
 - optical fiber links 273
- time travel 45, 316
- time-number 49, 50
- trilateralization 241
- twin-paradox 124, 125, 187, 207
- Einstein's resolution 127, 129
 - in LPTR (absence of) 196
 - Langevin's resolution 127
- two-way experiments
 - inability to demarcate 201
- two-way propagation 226
- two-way time transfer 268
- UFF 58, 150
- universal simultaneity 163, 179, 220
- universal time 281
- Universality of Free Fall 58, 150
- unobservables 18
- vector potential 166
- wavefunction 279, 288
 - collapse of 289
- Weak Equivalence Principle 23, 149
- WEP 23, 68, 71, 149, 151

