

Index

A

Ages, apparent, 179
Alexandrov, A. D., 3, 25, 35
Arakelyan, M. A., 117
Arc, timelike, 27

B

Background, microwave, 193
Braccesi, A., 154, 159
Brightness, excess, 157

C

Case, limiting, 5, 88
Catalog, de Vaucouleurs, 120–121, 178
Causality, 2–5, 8, 37–41, 51
Chart, 45
Choquet-Bruhat, Y., 4, 28, 36, 41
Chronogeometry, 3, 8
Clock, 10
Compactification, 44
Cone, convex, 22
Conformality, 5–8, 37–41

Conoid, 24
Coordinates
 angular, 67
 space-time, 88
 sphere, 67
Correction, aperture, 104
Cosmos, 50
 universal, 12–14
Covariance, scale, 14
Covering, 64
Cutoff
 magnitude, 123–124
 in quasar numbers, 176

D

Deformation, group, 5
DeVeney, J. B., 142
Diameter, 98
 angular, 19
 double radio source, apparent, 100
 isophotal, 98
 metric, 99
Dispersion, 79
 expansion-theoretic, 154
 trend in, 144

Displacement, forward, 32
 Distribution, redshift, 96–98, 172

E

Einstein, A., 25
 Ellipticals, radio, 140
 Energy, 10, 21, 54, 68–75
 conservation of, 74
 positive, 72
 special relativistic, 70–73
 Equations, hyperbolic partial differential,
 4, 8
 Estimates, maximum-likelihood, 122, 123,
 127
 Evolution, 133, 151
 galactic, 192
 luminosity, 156
 unitemporal, 70
 Expansion
 rate of, 187–188
 virtual, 84
 Exponent, redshift-distance, 121–123, 125

F

Faddeev, L. D., 189
 Frame, Lorentz, 53, 57, 82–85
 Frequency, 75
 Function, luminosity, 133

G

Galaxies, 14–15
 brightest cluster, 99, 134–138
 cD, 138
 low-redshift, 184
 Markarian, 117
 N-, 115, 116
 Peterson, 107–108, 109–113
 Scl, 139
 Seyfert, 114
 Galaxy clusters, Holmberg's effect in, 180
 Geometry, 2–5
 Gravitation, 188–190
 Gross, L., 6
 Group
 automorphism, 25, 32

causal, 28
 conformal, 6, 38
 temporal, 53
 unitary, 61

H

Holmberg, E., 118, 138
 Homogeneity, 55
 spatial, 10, 56–57, 173
 Hubble, E. P., 183
 Humason, M. L., 15
 Hyperbolicity, global, 28
 Hypothesis
 local, 174
 testing, 129

I

Index, spectral, 100, 103
 Inversion, conformal, 72
 Isotropy, spatial, 55, 57

J

Jakobsen, H. P., 84

K

Kellerman, K. I., 168
 Kostant, B., 13, 29

L

Law
 Hubble, 104–105
 Lundmark, 104–105
 Reynolds-Hubble, 106
 Legg, T. H., 168
 Leray, J., 3, 28, 41
 Lichnerowicz, A., 4, 26, 190
 Lightlike, 27
 Luminosities
 bright extragalactic objects, 175
 intrinsic quasar, 152
 Luminosity, cluster background, 138
 Lynds, R., 154, 159, 169, 177

M

- Magnitude, limiting apparent, 132
- Manifold
 - Finsler, 59
 - linear Lorentzian, 24
 - Lorentzian, 58
- Matter, intergalactic, 193
- Maxwell, J. C., 8
- Miley, G. K., 168
- Minkowski, H., 5
- Model, elementary particle, 91
 - Hubble, 95
- Model-building, 129
- Morphism, Causal, 25, 34-37, 46

N

- Newton, I., 25
- Nicoll, J. F., 169, 194
- Nuclei, galactic, 191

O

- Objects
 - bright extragalactic, 183
 - quasarlike, 195-196
- Observer, 10
 - covariant, 46
 - local, 48-49, 60, 62
 - physical, 59
 - stationary, 52-53
- O'Raifeartaigh, L., 7, 191
- Orientation
 - finite globally causal, 23
 - infinitesimal causal, 22

P

- Parameter, Hubble, variation in, 178
- Parameters, galaxy, 123
- Particle, elementary, 7, 91, 190
- Peterson, B.A., 105
- Phenomenology, 118-135
- Photon, 80-81
- Picture
 - Heisenberg, 80
 - Schrödinger, 80-81

- Pooley, G. G., and Ryle, M., 168
- Postulates, 51
- Precedence, temporal, 60, 61
- Prefactorization, 44
- Procedure, maximum-likelihood, 119

Q

- Quadric, 41, 64
- Quasar classes, Setti-Woltjer, 170-174
- Quasars, 16-19, 116
 - apparent cutoff in, 18
 - apparent magnitude distribution, 152-154
 - energy requirements, 174
 - flat spectrum, 171
 - Kolmogoroff-Smirnov tests, 150-152, 161
 - $N(<m)$ relation, 153-154
 - N - z relation for, 147-151, 162, 163
 - optical, 171
 - preliminary discussion, 140
 - redshift-luminosity relation, 154-158
 - redshift-magnitude curve, 175
 - redshift-magnitude relation, 155, 157
 - redshift-number relation, 158
 - Schmidt V/V_m test, 163-167
 - spatial uniformity, 149
 - steep spectrum, 171

R

- Radiation
 - blackbody, 87
 - cosmic background, 19, 21, 85, 178-179
- Radius, Hubble core, 137
- Redshift, 14-19, 75
 - virtual, 188
- Redshift-magnitude, data, 145
- Relation
 - log N -Log S , 100
 - redshift-angular diameter, 98
 - redshift-magnitude, 94-98, 134-140, 146, 184-185
- Relativity, special, 88
- Robb, A. A., 3

S

- Sandage, A. R., 104, 115, 169

Sargent, W. L. W., 114
 Scales, cosmic time, 179-180
 Schmidt, M., 120, 154, 160, 168
 Selection, 108
 luminosity, 159
 statistical, 108
 Seyfert-like, 116
 Sky, selection by region of, 128
 Sources, radio, 19, 168
 double, angular diameter redshift
 relation, 167
 Space, 54
 conformal, 63-68
 conformal linear, 37
 Hermitian symmetric, 30, 48
 Hilbert, 80
 Minkowski, 41-44, 46, 58
 universal, 58, 61
 Space-time
 conformal, 44
 Minkowski, 44
 Sphere
 conformal, 63
 Lorentz, 66
 null, 66
 Submanifold, spacelike, 27
 Symmetries, causal, 68-75

T

Test, Schmidt V/V_m , 97, 120, 166, 173
 Tests, cosmological, 94-103
 Tifft, W. G., 180
 Time, 10, 54
 Tits, J., 57-58

Transform, Cayley, 61
 Transformation, conformal, 65
 Type, morphological, selection on, 126-129

U

Unienergy, 71
 Uniformity, spatial, 125, 163
 Unispace, 68
 symmetries, 89
 Universe
 density of, 189, 190
 radius of, 75

V

de Vaucouleurs, G., 106, 117, 118
 Veblen, O., 6, 190
 Vector, energy-momentum, 89
 Velocities
 peculiar, 96
 superlight, 177

W

Weyl, H., 190
 Wigner, E. P., 13

Z

Zeeman, E. C., 3