
Index

- area, 50
- canonical fundamental domain, 85
- chaotic, 129
- closed geodesic, 42, 118, 124
- computation, 183, 216, 247
- congruence subgroup, 169, 178, 197
- conjugacy class, 44, 112
- cosmic microwave background, 257
- cosmology, 257
- curvature, 17, 108, 130, 152, 241
- cuspidal, 183, 198, 246
- discrete subgroup, 34, 155, 196, 242
- distance, 14, 53, 97
- eigenfunction, 114, 238, 257, 264
- eigenvalue, 116, 184, 202, 223, 229, 246, 252, 264
- elliptic type, 29
- Fenchel-Nielsen parameters, 75, 88
- Fourier
 - coefficient, 229, 246
 - expansion, 185, 204
 - series, 174, 186, 216, 246
- Fuchsian group, 32, 74, 108, 139, 183, 196
- fundamental domain, 32, 35, 110, 155, 196, 243
- genus, 51, 74, 84, 123
- geodesic, 12, 24, 27, 40, 54, 156, 241
- geodesic flow, 152, 157
- Green's function, 99
- Hecke
 - operator, 153, 208, 247
 - triangle group, 183
- horocycle, 29
- hyperbolic
 - geometry, 32, 97, 137
 - plane, 20, 29, 137
 - surface, 32, 37, 85, 110
 - type, 29
- isometry, 11, 29, 39, 53, 137, 138, 155, 241
- isometry group, 12, 26, 98
- K-Bessel function, 184, 188, 224, 246, 248
- Laplacian, 94, 98, 131, 152, 201, 237, 241, 264
- length, 42, 98, 131
- length spectrum, 116
- Lewis equation, 170
- Möbius transformation, 22, 26, 98, 137, 155, 196, 241
- Maass
 - cuspidal form, 171, 183, 184, 202, 246
 - wave form, 153, 172, 175, 202, 245, 265
- modular group, 152, 155, 166, 196
- octagon, 81, 84

272 Index

- parabolic type, 29
- periodic orbit, 131, 137, 140, 165, 166
- Picard group, 243
- Poincaré
 - section, 157
 - disc model, 23
 - map, 157, 160
- point-pair invariant, 102
- Prime Geodesic Theorem, 124, 144

- quantum chaos, 129, 153, 183, 238

- random matrix theory, 129, 146, 239
- random wave, 257
- resolvent, 120
- Riemannian
 - manifold, 114
 - metric, 11, 14
 - surface, 108, 130, 196
- Robertson-Walker metric, 261

- Selberg
 - trace formula, 115, 130
 - zeta function, 122, 152, 166, 167
- self-intersection, 136, 139
- semiclassics, 125, 129, 257
- spectral form factor, 130
- spectral statistics, 129
- spectrum, 108, 114, 238, 246
- symmetric octagon, 83, 88

- tiling, 36, 49
- trace formula, 92, 95, 115, 129, 131, 153
- transfer operator, 152, 161
- triangle, 17, 19, 50, 136

- upper half-plane, 26, 155, 196
- upper half-space, 241

- Weyl's law, 116, 131, 202, 255