adelic point, 224
(A., L)-module, 72
Alexander–Spanier cohomology, 58
algebraic group, 224
almost periodic compactification, 223
analytic index, 239
Anosov foliation, 240
approximation theorem, 39
relative, 40
arithmetic genus, 231
Arveson, William, xi, 13, 77
asymptotic expansion of the trace, 207
Atiyah, Michael, 13, 22, 122, 124, 157, 158,
173, 188, 189, 208, 217, 219, 221
$L^2$-index theorem, 235
Atiyah–Bott–Patodi index theorem, 217
d local index theorem, 214
Atiyah–Singer Index Theorem, 1, 22, 160,
255
atoms, (almost) periodic structure, 260
attractor, 224
Auslander, Louis, 79
average Euler characteristic, 226, 228
averaging sequence, 227
Baum–Connes conjecture, 166
Bedford, Eric, 54
Bellissard, Jean, x, 259, 260, 262
Benenbaum, Moulay-Tahar, 223, 259
Benedetti, Riccardo, 259
Betti measure, 213, 226, 253
Blackadar, Bruce, 157, 165
Bloch theory, 260
BOF $d$-manifold, 262
Bonnet, see Chern–Gauss–Bonnet
Borel, Armand, 252
field of Hilbert spaces, 170
groupoid, 77–80, 90, 132
set, $\nu$-null, 91
space, standard, 13
subset, bounded, 17
transversal, 78
trivialization, 15
Bott periodicity, 265
Bott Theorem, global, 221
Bott, Raoul, 63, 65, 123
bounded geometry, 168, 191, 199, 202, 227
Bourbaki, Nicholas, 77
Bowen, Rufus, 85
Breuer ideal, 201
Breuer’s theory of Fredholm operators, 165
Brillouin zone, 261
Brown, Lawrence, 140
Brylinski, Jean-Luc, 108
bundle
cotangent sphere, 167
fibre, 137
graded Clifford, 198
holomorphic, 229
| Page Dimension: 468.0x864.0 |

| Index | |

| of Clifford algebras, 198 |
| of densities of order $\alpha$, 170 |
| tangential Clifford, 198 |
| with discrete structural group, 34, 46, 106 |

$C^*$-algebra, see also under groupoid |

$C^*_r(G)$, 147 |

$C^*$-correspondence, 166 |

Calegari, Danny, 54 |

Cambridge University Press, ix |

Candel, Alberto, x, 4, 32, 33, 137 |

Cannas da Silva, Ana, 54 |

canonical coordinate system, 191 |

Cantor set, 36, 265 |

Cantwell, John, 228, 232, 246 |

Carey, Alan, 223 |

Cartan subalgebra, 135, 144 |

Čech (co)homology, 58, 122 |

centralizer of a weight, 152 |

characteristic class, 109 |

fundamental lemma for, 114 |

secondary, 223, 238 |

Cheeger, Jeff, 190 |

Chern character |

full, 160 |

partial, 160, 161, 186, 249, 263, 265 |

tangential, 70, 117, 118, 122 |

Chern class |

classical, 116 |

tangential, 70, 115 |

Chern–Gauss–Bonnet, 214, 226, 253 |

Chern–Weil, 109, 121 |

Chernoff, Paul, 190 |

Christoffel symbols, 191 |

classical |

Chern class, 116 |

connection, 116 |

curvature, 116 |

Sobolev space, 176 |

Todd class, 124 |

classifying space |

of codimension foliations, 237 |

of groupoid, 237 |

Clifford algebra, 198 |

Clifford multiplication, 256 |

Clifford–Klein form, 252 |

cohomology, see also under Alexander–Spanier, Čech, de Rham, Gelfand–Fuchs, Haefliger |

coarse, 28 |

for foliations, 73 |

cyclic, 127 |

Hopf cyclic, 224 |

tangential, 41, 55, 73 |

compact vertical, 65 |

Thom class/isomorphism, 123 |

transversely smooth, 101 |

vertical, 65 |

with compact support, 63 |

compactification, almost periodic, 223 |

compactly supported distribution, 170 |

complex foliation, 231 |

complexified Clifford algebra, 198 |

concordance, 238 |

conditional expectation, faithful, 135 |

Conlon, Lawrence, x, 4, 32, 33, 137, 228, 232, 246 |

connection, classical, 116 |

Connes, Alain, ix–xi, 2–263 |

Connes Index Theorem, 22, 210 |

Connes Signature Theorem, 251 |

Connes’ convolution algebra, 73 |

Connes–Skandalis Index Theorem, xi, 239 |

Connes–Takesaki, 142, 146 |

continuous hull, 260 |

covariant derivative, tangential, 109 |

Crainic, Marius, 73, 108 |

crossed product $C^*$-algebra, reduced, 133 |

current, see Ruelle–Sullivan and tangential curvature, see also under tangential |

classical, 116 |

Gaussian, 253 |

scalar, positive, 29 |

d-$\text{Index Theorem}, 226 |

de Rham cohomology, 57, 73 |

complex, 71, 238 |

operator, 226 |

decreases supports, 110 |

Delone set, 260 |

Deninger, Christopher, 223, 224 |

diagonal subalgebra, 135 |

dimension, local finite, 28 |

Dirac, see under operator |

direct integral, 14 |

discrete orbits, 134 |

distribution kernel, 21, 24, 171, 175 |

integrable, 24 |

distributions on a leaf, 170 |
divisor, 234
Dixmier, Jacques, 14, 16, 163
Dixmier–Douady invariant, 138, 141
Douglas, Ronald, xi, 223
dual group, 24
duality, Verdier, 73
dynamical system, 224
Effros, Edward, xi
Ehresmann, Charles, 4, 46
Eilenberg, Samuel, 58, 122
El Kacimi-Alaoui, Aziz, 55
elementary symmetric function, 115
elementary symmetric polynomial, 117
elliptic complex, 188
enlargeable manifold, 257
Epstein, David B. A., 44
equivalence relation
smooth, 89
standard Borel, 78
standard ergodic, 91
eta invariant, relative, 223
étale groupoid, 73, 108
euler characteristic
average, 225, 228, 233
tangential, 253
tangential, 253
Euler class,
see under
tangential
euler class, see under
tangential
equivalent relation
tangential
exponential growth, 227
\( J \)-homotopy, 61
Fack, Thierry, 138
factor
\( \mathbb{I}_1 \), 85
\( \mathbb{I}_0 \), 87
\( \mathbb{I}_2 \), 87
Feldman, Jacob, 78, 81, 91, 104, 134, 136, 144, 148, 149, 152
fibration, 137
Hopf, 33
locally trivial, 137
fibre bundle, 33
field of Hilbert spaces, 14
finite pattern condition, 260
finite projection, 163, 165, 187
finite propagation, 168
speed, 190, 195
flow, compact orbits, 224
foliated, see also foliation
atlas, 32
chart, 31

manifold, 33
space, 3, 32
equivalence relation, 50
foliation
amenable, 166
Anosov, 240
bundle, 34, see also tangent bundle of
foliated space
orientation, 99
from \( R^2 \)-action on a nilmanifold, 244
from locally free \( R^2 \)-action, 243
from solvable group action, 245
proper, 246
transversely \( C^r \)-differentiable, 237
with all leaves proper, 246
with nontrivial Godbillon–Vey class, 247
without holonomy, 244
formal degree, 26
Forrest, Alan, 265
Fourier series, 59, 86
Fourier transform, 24, 173
frame bundle, transverse, 224
Fredholm index, 160, 249
Fredholm triple, 208
free normalizer, 136
Friedrichs, Kurt O., 190
function, modular, see modular function
fundamental lemma for characteristic classes, 114
Furstenberg, Hillel, 85, 86
Gabai, David, 54
Gambaudo, Jean-Marc, 259
Gap Labeling Theorem, 223, 259
Gauss–Bonnet, 1, see Chern–Gauss–Bonnet
Gelfand–Fuchs
cohomology, 224
global asymptotics, 190
gerbe, 54
germe, 44, 46
Ghys, Étienne, 232, 242, 245, 246, 261
Gilkey, Peter, xi, 167, 173, 204
global Bott Theorem, 221
Godbillon–Vey class, 223, 247, 248
Godement, Roger, 55, 57, 58
graded vector space, 202
groupoid
holonomy
Grassmann manifold, 43, 116
Green, Philip, see under Brown
Gromov, Mikhael, 190, 223, 255, 257
group
  almost free action, 240
  infinite conjugacy class (i.c.c.), 148
  isotropy, 33, 46, 50
  locally free action, 240
  modular automorphism, 152
  nonunimodular, 27
  stable isotropy, 50
  unimodular, 26
groupoid, 76
  (standard) Borel, 77–80, 90, 132
  C*-algebra
    full, unreduced, 131
    of equivalence relation, 134
    of locally trivial fibration, 137
    of product of groupoids, 136
    of transformation group, 133
    reduced, 131
    related to $G^N$, 139
  classifying space, 237
  étale, 73, 108
  foliation, 108
  locally compact, 92
  measured, 141
  integrable function, 142
  regular representation, 142
  von Neumann algebra, 143
  of an equivalence relation, 75
  of transformation group, 132
  Poisson, 54
  principal, 76, 90
  proper, 166
  symplectic, 54
  topological, 92
  discrete orbits, 134
  growth, 227

Haagerup, Uffe, 16, 157
Haar system, 133
Haefliger, André, 55, 60, 140, 237
classifying space, 237
cohomology, 73, 101, 237
Hahn, Hans, 78
Hahn, Peter, 142, 146, 150, see also under Feldman
  half-spinors, 255
  Hannabuss, Keith, 223
  harmonic forms, 226, 249
  Hawkins, Jane, xi

INDEX

Hector, Gilbert, 44, 246
Heitsch, James, 55, 73, 223
Herrmann, D. J. L., 260, 262
Higson, Nigel, 166, 224
Hilbert, see also operator, Hilbert–Schmidt
  bundle, 14
Hilsum–Skandalis Theorem, 138, 139, 161
Hirsch, Morris, 38
Hirsch, Ulrich, 246
Hirzebruch, Friedrich, see also Atiyah
  $L$-polynomial, 216, 249
  class, 255
  Signature Theorem, 217, 249, 251
Hjorth, Greg, 79
Hochschild homology, 73, 108
holomorphic, 204
holonomy, 44
  graph, see holonomy groupoid
  group, 44, 77
  countable, 78
  groupoid, 43, 46, 236
  Hausdorff, 48
  non-Hausdorff, 49, 53, 54
  invariant, 81
  trivial, 46
homeomorphism
  ergodic, 86
  minimal, 86
  uniquely ergodic, 86
homology, see also under Čech, Hochschild
  cyclic, 73, 108, 160
  sheaf, 73
  tangential, 70
  homomorphism, tangentially smooth, 98
  $\varphi$-homotopy, 61
  Hopf fibration, 33
  horocycle flow, 85
  hull, 260
  Hunting, John, 265
  Hurder, Steven, x, xi, 73, 167, 223, 225
  Hurewicz, Witold, 137
i.c.c., 148
index
  analytic, 209
  formula, local, 224
  local, 22
  theorem, 226
  Atiyah’s $L^2$-, 235
  Atiyah–Singer, 1
<table>
<thead>
<tr>
<th>INDEX</th>
<th>289</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connes–Skandalis, 239</td>
<td></td>
</tr>
<tr>
<td>distributional, 224</td>
<td></td>
</tr>
<tr>
<td>for covering spaces, 22</td>
<td></td>
</tr>
<tr>
<td>tangential $\mathfrak{B}$, 230</td>
<td></td>
</tr>
<tr>
<td>topological, 209</td>
<td></td>
</tr>
<tr>
<td>transverse, 223</td>
<td></td>
</tr>
<tr>
<td>infinite torus, 36</td>
<td></td>
</tr>
<tr>
<td>integrable function, 142</td>
<td></td>
</tr>
<tr>
<td>integrable homotopy, 238</td>
<td></td>
</tr>
<tr>
<td>invariant polynomial, 113</td>
<td></td>
</tr>
<tr>
<td>transverse measure, 202</td>
<td></td>
</tr>
<tr>
<td>isolated leaf, 241</td>
<td></td>
</tr>
<tr>
<td>isotropy group, 77, 108</td>
<td></td>
</tr>
<tr>
<td>Jacob's ladder, 228</td>
<td></td>
</tr>
<tr>
<td>jail window, infinite, 229</td>
<td></td>
</tr>
<tr>
<td>join construction, 237</td>
<td></td>
</tr>
<tr>
<td>Julia set, 54</td>
<td></td>
</tr>
<tr>
<td>$K$-theory</td>
<td></td>
</tr>
<tr>
<td>for operator algebras, 158</td>
<td></td>
</tr>
<tr>
<td>for von Neumann algebras, 163</td>
<td></td>
</tr>
<tr>
<td>twisted, 238</td>
<td></td>
</tr>
<tr>
<td>with compact supports, 123, 188</td>
<td></td>
</tr>
<tr>
<td>Kamber, Franz, 55</td>
<td></td>
</tr>
<tr>
<td>Kaminker, Jerry, x, xi, 167, 223, 259</td>
<td></td>
</tr>
<tr>
<td>Karoubi, Max, 124, 157, 158</td>
<td></td>
</tr>
<tr>
<td>Kasparov, Gennadi, 208</td>
<td></td>
</tr>
<tr>
<td>stabilization theorem, 139</td>
<td></td>
</tr>
<tr>
<td>Kazdan, Jerry L., 258</td>
<td></td>
</tr>
<tr>
<td>Khalkhali, Masoud, x, 127</td>
<td></td>
</tr>
<tr>
<td>$KK$-groups, 208</td>
<td></td>
</tr>
<tr>
<td>Klein, Felix, see also under Clifford–Klein program, 224</td>
<td></td>
</tr>
<tr>
<td>Koszul complex, 72</td>
<td></td>
</tr>
<tr>
<td>Krieger, Wolfgang, 157</td>
<td></td>
</tr>
<tr>
<td>Kronecker flow/foliation, 58, 83, 88, 102</td>
<td></td>
</tr>
<tr>
<td>Kumjian, Alexander, 135, 166</td>
<td></td>
</tr>
<tr>
<td>Künneth pairing, 66</td>
<td></td>
</tr>
<tr>
<td>Kuratowski, Kazimierz, 78, 84</td>
<td></td>
</tr>
<tr>
<td>Lafforgue, Vincent, 166</td>
<td></td>
</tr>
<tr>
<td>Lagarias, Jeff, 260</td>
<td></td>
</tr>
<tr>
<td>lamination, 54, 261</td>
<td></td>
</tr>
<tr>
<td>Laplacian (classical), 173</td>
<td></td>
</tr>
<tr>
<td>Lawson, Blaine, 33, 244, 255, 257</td>
<td></td>
</tr>
<tr>
<td>Lazarov, Connor, 223</td>
<td></td>
</tr>
<tr>
<td>leaf, 33</td>
<td></td>
</tr>
<tr>
<td>distributions on, 170</td>
<td></td>
</tr>
<tr>
<td>proper, 246</td>
<td></td>
</tr>
<tr>
<td>Lefschetz theorems, 223</td>
<td></td>
</tr>
<tr>
<td>Leibnitz formula, 109</td>
<td></td>
</tr>
<tr>
<td>Levy, Silvio, x</td>
<td></td>
</tr>
<tr>
<td>Lichnerowicz, André, 256</td>
<td></td>
</tr>
<tr>
<td>Lie algebra cohomology, 71</td>
<td></td>
</tr>
<tr>
<td>Lie-associative pair, 72</td>
<td></td>
</tr>
<tr>
<td>Liouville number, 60, 86</td>
<td></td>
</tr>
<tr>
<td>local dimension, 20, 28</td>
<td></td>
</tr>
<tr>
<td>locally finite-dimensional, 230</td>
<td></td>
</tr>
<tr>
<td>Hausdorff, 49, 92, 131</td>
<td></td>
</tr>
<tr>
<td>symmetric space, 240</td>
<td></td>
</tr>
<tr>
<td>Loch Ness monster, 229</td>
<td></td>
</tr>
<tr>
<td>Loday, Jean-Louis, 127</td>
<td></td>
</tr>
<tr>
<td>Lück, Wolfgang, 223</td>
<td></td>
</tr>
<tr>
<td>Mac Lane, Saunders, 72</td>
<td></td>
</tr>
<tr>
<td>Mackey, George, 20, 77, 79, 81, 141</td>
<td></td>
</tr>
<tr>
<td>Mathai, Varghese, 223</td>
<td></td>
</tr>
<tr>
<td>Mathematical Reviews, x</td>
<td></td>
</tr>
<tr>
<td>Mathematical Sciences Research Institute, ix</td>
<td></td>
</tr>
<tr>
<td>May, J. Peter, 118</td>
<td></td>
</tr>
<tr>
<td>Mayer–Vietoris sequence, 65, 69</td>
<td></td>
</tr>
<tr>
<td>McCann, Paul, 223</td>
<td></td>
</tr>
<tr>
<td>McKean–Singer formula, 168, 197</td>
<td></td>
</tr>
<tr>
<td>measurable Teichmüller space, 232 measure $\phi$-invariant, 83</td>
<td></td>
</tr>
<tr>
<td>Dirac, 87</td>
<td></td>
</tr>
<tr>
<td>invariant, 82</td>
<td></td>
</tr>
<tr>
<td>quasi-invariant, 80, 82</td>
<td></td>
</tr>
<tr>
<td>Radon, 16, 17, 94</td>
<td></td>
</tr>
<tr>
<td>signed, 22</td>
<td></td>
</tr>
<tr>
<td>transverse, 98</td>
<td></td>
</tr>
<tr>
<td>tangential, see tangential measure transverse, see transverse metric</td>
<td></td>
</tr>
<tr>
<td>holomorphically equivalent, 232</td>
<td></td>
</tr>
<tr>
<td>measurably holomorphically equivalent, 232</td>
<td></td>
</tr>
<tr>
<td>Millett, Kenneth, 44</td>
<td></td>
</tr>
<tr>
<td>Milnor, John, 109, 114, 119, 120, 125</td>
<td></td>
</tr>
<tr>
<td>join, 237</td>
<td></td>
</tr>
<tr>
<td>Möbius strip, 34, 46, 52</td>
<td></td>
</tr>
<tr>
<td>modular automorphism group, 152</td>
<td></td>
</tr>
<tr>
<td>modular function, 28, 81, 82, 100, 145, 154</td>
<td></td>
</tr>
<tr>
<td>not continuous, 94</td>
<td></td>
</tr>
<tr>
<td>$(A, L)$-module, 72</td>
<td></td>
</tr>
<tr>
<td>module for a Lie-associative pair, 72</td>
<td></td>
</tr>
<tr>
<td>Modulus, 81, 82</td>
<td>Tangential, 171</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Möbius, see Möbius</td>
<td>$J$, 225, 229</td>
</tr>
<tr>
<td>Moerdijk, Ieke, 54, 73, 108</td>
<td>compactly smoothing, 177</td>
</tr>
<tr>
<td>Molino, Pierre, 55</td>
<td>de Rham, 172, 211</td>
</tr>
<tr>
<td>Moore, Calvin, 78, 79, 81, 91, 104, 134, 136, 144, 149, 152</td>
<td>differential, 168, 172</td>
</tr>
<tr>
<td>Morita equivalence, 73, 137, 237, 261</td>
<td>Dirac, 168, 255</td>
</tr>
<tr>
<td>strong, 140</td>
<td>Hodge–Laplace, 172, 212</td>
</tr>
<tr>
<td>Morita equivalent, 108</td>
<td>pseudodifferential, 167, 177–184</td>
</tr>
<tr>
<td>Moriyoshi, Hitoshi, 223, 248</td>
<td>pseudolocal, 177</td>
</tr>
<tr>
<td>Moscovici, Henri, 224</td>
<td>signature, 215, 249</td>
</tr>
<tr>
<td>Mrčun, Janez, 54</td>
<td>smoothing, 176, 201</td>
</tr>
<tr>
<td>Muhly, Paul, x, 108, 140, 166</td>
<td>support, 177</td>
</tr>
<tr>
<td>Natsume, Toshikazu, 223</td>
<td>tangentially elliptic, 184</td>
</tr>
<tr>
<td>Newton’s formula, 117</td>
<td>twisted signature, 218</td>
</tr>
<tr>
<td>Nistor, Victor, 108</td>
<td>transversely elliptic, 224</td>
</tr>
<tr>
<td>noncommutative Brillouin zone, 261</td>
<td>order of tangential differential operator, 172</td>
</tr>
<tr>
<td>nonexponential growth, 227</td>
<td>Oyono-Oyono, Hervé, 259</td>
</tr>
<tr>
<td>Novikov conjecture, 208</td>
<td>Palais, Richard S., 183, 220</td>
</tr>
<tr>
<td>operator</td>
<td>parametrix (classical), 174</td>
</tr>
<tr>
<td>closure, 190</td>
<td>partial Chern character, 249</td>
</tr>
<tr>
<td>differential, 21</td>
<td>Pask, David, 166</td>
</tr>
<tr>
<td>classical, 173</td>
<td>Pedersen, Alan, 166</td>
</tr>
<tr>
<td>Dirac, 197, 198, 208, 223, 225, 255, 264</td>
<td>Penington, M., 240</td>
</tr>
<tr>
<td>dual, 208</td>
<td>period mapping, 243</td>
</tr>
<tr>
<td>generalized, 29, 198</td>
<td>Pfaffian, 120</td>
</tr>
<tr>
<td>tangential, 168, 255</td>
<td>Phillips, Anthony, 228, 232</td>
</tr>
<tr>
<td>twisted, 255</td>
<td>Phillips, John, 46</td>
</tr>
<tr>
<td>domain, 22</td>
<td>Pimsner, Michael, 265</td>
</tr>
<tr>
<td>elliptic, 21</td>
<td>Plancherel trace, 153, 155</td>
</tr>
<tr>
<td>essentially self-adjoint, 190</td>
<td>Plante, Joseph F., 227, 242, 243</td>
</tr>
<tr>
<td>formal adjoint, 190</td>
<td>plaque, 31, 43</td>
</tr>
<tr>
<td>formal degree, 27</td>
<td>Poincaré Lemma, 56</td>
</tr>
<tr>
<td>Hilbert–Schmidt, 21</td>
<td>Poisson groupoid, 54</td>
</tr>
<tr>
<td>integral kernel, 24</td>
<td>polynomial automorphism, 54</td>
</tr>
<tr>
<td>local, 110</td>
<td>growth, 227</td>
</tr>
<tr>
<td>locally traceable, 13, 17, 18</td>
<td>invariant p., 113</td>
</tr>
<tr>
<td>relative to $s$, 15</td>
<td>Pontryagin class, 255</td>
</tr>
<tr>
<td>order zero, 20</td>
<td>tangential, 119, 121, 249</td>
</tr>
<tr>
<td>pseudodifferential, 167</td>
<td>positive scalar curvature, 255</td>
</tr>
<tr>
<td>algebra of, 183</td>
<td>on the leaf, 256</td>
</tr>
<tr>
<td>classical, 159, 174</td>
<td>propagation speed, 190</td>
</tr>
<tr>
<td>parametrix, 179</td>
<td>Pukánszky, Lajos, 27</td>
</tr>
<tr>
<td>principal symbol, 175</td>
<td>Purves, Roger, 78</td>
</tr>
<tr>
<td>tangentially elliptic, 179, 184</td>
<td>Putnam, Ian, 259</td>
</tr>
<tr>
<td>Schrödinger, 260, 261</td>
<td>quasi-isometry, 228</td>
</tr>
<tr>
<td>smoothing, 20</td>
<td>$r$-trivial, 69</td>
</tr>
</tbody>
</table>
INDEX

Radon measure, see under measure
Radon–Nikodým derivative, 81, 82, 97, 145, 154, 207
and weight, 153
Raeburn, Ian, 166
Ramsay, Arlan, 77, 79, 80, 134, 141
range map, 76
Reeb, Georges, 4, 46
foliation, 35, 46, 49, 53, 102, 155
non-Hausdorff, 49
stability theorem, 46
regular atlas, 32
regular averaging sequence, 227
regular covering, 44
relative approximation, 39–40
relative eta invariant, 223
Renault, Jean, 92, 129, 131, 135, 136, 140, 141, 166, see also under Muhly
repetitivity condition, 260
representation, regular
of $G(X)$, 170, 176
of groupoid, 171
Rieffel, Marc, xi, 137, see also under Brown
Riemann conjecture, 224
Riemann–Roch analogue, 225, 231, 234
Riesz convexity theorem, 24
Riesz Representation Theorem, 102
Roe, John, xi, 28, 73, 167, 190, 195
Rosenberg, Harold, 243
Rosenberg, Jonathan, xi
Roussarie, Robert, see under Rosenberg, Harold
Ruelle–Sullivan
class, 226, 230
current, 2, 9, 75, 100, 155, 249, 263
map, 7, 9, 102
pairing, 90
Rummel, Hansklaus, 247
Sacksteder’s Theorem, 244
Sadun, Lorenzo, 261
Sarkaria, K. S., 55
saturation of a set, 79
Schochet, Claude, 249, 259
Schrödinger, see under operator
Schreiber, Bertram, xi
Schwartz function, 195
Schwartz space, 201
secondary classes, 223, 238
sectional curvature, 240
Segal, Graeme, 173, 189
Sergiescu, Vlad, 242, 245, 246
Shanahan, Patrick, 217
sheaf of germs
of tangentially locally constant functions, 55
of tangentially smooth $k$-forms, 56
Shubin, Mikhail, 223
$s$-ring, 82
signature measure, 216
signature of manifold, 249
Silva, Ana, see Cannas da Silva
Singer, Isadore, see under Atiyah, McKean
Skandalis, Georges, xi, 8, 132, 138, 139, 160, 161, 166, see also under Connes and Hilsum
SL(2, $R$), 85, 87, 242, 245, 246
SL(2, $Z$), 243
small category, 76
small denominator problem, 59
Smillie, John, 54
snake, 35
Sobolev Embedding Theorem, 200
Sobolev field, tangential, 176
Sobolev space, 176
Solel, Baruch, x
solenoid, 36
solid state physics, 259
solvmanifold, 257
source map, 76
spectral invariants, 223
spectral triple, 208, 224
spin manifold, 255
square-integrable harmonic forms, 213, 226, 249
standard form, 145
star operator (Hodge), 172
Stasheff, James, see under Milnor
states, integrated density, 261
Steenrod, Norman, 58, 122, 137
Stone–Weierstrass analogue, 103
strong basic neighborhood, 38
strongly aperiodic, 260
subexponential growth, 227
submersion, 33
subspace, local dimension of, 20
Sullivan, Dennis, 7, 228, 232, 247, see also Ruelle–Sullivan
superoperator, 202
supertrace, 168, 202
support of a form, 63
support of an elliptic complex, 188
suspension of a homeomorphism, 34
symbol
complex, 203
homogeneous of order $k$, 204
of order $k$, 204
space, hull closure of, 223
symmetric connection, 120
symmetric space, 252

Takesaki, Masamichi, xi, 142–146, 153, 170
tangent bundle of foliated space, 36
tangential
$\delta$-Index Theorem, 230
$A$-genus, 256
Chern character, 70, 117, 118, 122
Chern class, 70, 115
Clifford bundle, 198
cohomology, see under cohomology
connection, 109, 110
flat, 111, 116
Levi-Civita, 120
Riemannian, 120
symmetric, 120
covariant derivative, 109
current, 70, 100
curvature tensor, 112
differential $k$-form, 56
Dirac operator, 168, 198
distributional section, 172
Euler characteristic, 213, 253
Euler class, 70, 121, 214
formal adjoint of operator, 171
Hodge $*$-operator, 172
homology, 70
injectivity radius, 191
Levi-Civita connection, 191
measure, 88, 133, 150, 169
Betti, 213
continuous, 94
homogeneous, 208
normal coordinate system, 191
Pontryagin class, 119, 121, 249
principal symbol, 173
Riemannian metric, 120, 169
with positive scalar curvature along the leaves, 255
Sobolev field, 176
superoperator, 168
symbol (principal, total), 173
Todd class, 124, 230
Todd genus, 125
total Chern class, 117
total Pontryagin class, 119
total symbol, 173
tangentially
elliptic, 173
locally constant functions, 55
smooth
$K$-theory, 43
function, 3, 31, 32
map, 38
partition of unity, 37
sections, 37
vector bundle, 37, 43
Taylor, Michael, xi, 21, 167, 173, 190, 195
Technion, x
Teichmüller space, 225, 232
tensors of type $(r, s)$, 230
Thom, René, 4, 46
class, 68
$K$-theory, 123
of the trivial bundle, 67
isomorphism, 263
in tangential cohomology, 123
theorem, 68
space, 187
Thom–Pontryagin map, 187
Thurston, William, 242
tight binding approximation, 260
tiling, 260
(strongly) aperiodic, 260
aperiodic, 259
Tischler, David, 44
Todd class, see under tangential
classical, 124
tangential, 124, 230
Todd genus, classical, 125
Tomita–Takesaki theory, 149, 152
Tondeur, Philippe, 55
topological index, 239
topologize $O^{\mathbb{Z}}_X(Y)$, 57
topology of covers, 223
Torpe, Anne Marie, 240
trace, 153
local, 17, 18
normal, 16
finite, 163
Plancherel, 153, 155

INDEX
<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>transversal</td>
<td>44, 78</td>
</tr>
<tr>
<td>complete</td>
<td>78</td>
</tr>
<tr>
<td>complete Borel</td>
<td>80, 90</td>
</tr>
<tr>
<td>open</td>
<td>95</td>
</tr>
<tr>
<td>open-regular</td>
<td>95</td>
</tr>
<tr>
<td>transverse measure</td>
<td>75, 80, 82, 100</td>
</tr>
<tr>
<td>ergodic</td>
<td>91</td>
</tr>
<tr>
<td>finite</td>
<td>95</td>
</tr>
<tr>
<td>invariant</td>
<td>100, 155</td>
</tr>
<tr>
<td>Radon</td>
<td>102, 164</td>
</tr>
<tr>
<td>regular</td>
<td>227</td>
</tr>
<tr>
<td>locally bounded</td>
<td>97</td>
</tr>
<tr>
<td>modular function</td>
<td>98</td>
</tr>
<tr>
<td>Radon</td>
<td>154</td>
</tr>
<tr>
<td>r-trivial</td>
<td>69</td>
</tr>
<tr>
<td>Tu, Jean-Louis</td>
<td>166</td>
</tr>
<tr>
<td>Tu, Loring</td>
<td>63, 65</td>
</tr>
<tr>
<td>twist</td>
<td>136</td>
</tr>
<tr>
<td>twisted</td>
<td></td>
</tr>
<tr>
<td>de Rham differential</td>
<td>218</td>
</tr>
<tr>
<td>Dirac operator</td>
<td>255</td>
</tr>
<tr>
<td>Signature Theorem</td>
<td>218</td>
</tr>
<tr>
<td>spin bundle</td>
<td>255</td>
</tr>
<tr>
<td>UCLA</td>
<td>xi</td>
</tr>
<tr>
<td>uniform C^r space</td>
<td>200</td>
</tr>
<tr>
<td>uroboros</td>
<td>35</td>
</tr>
<tr>
<td>Vaisman, Izu</td>
<td>55</td>
</tr>
<tr>
<td>Valette, Alain</td>
<td>166</td>
</tr>
<tr>
<td>Varadarajan, V. S.</td>
<td>157</td>
</tr>
<tr>
<td>vector bundle, see also</td>
<td></td>
</tr>
<tr>
<td>tangentially smooth</td>
<td></td>
</tr>
<tr>
<td>complex of –s</td>
<td>188</td>
</tr>
<tr>
<td>Hermitian</td>
<td>14</td>
</tr>
<tr>
<td>vector field, formal</td>
<td>224</td>
</tr>
<tr>
<td>Verdier duality</td>
<td>73</td>
</tr>
<tr>
<td>Vey, Jacques</td>
<td>238, see also</td>
</tr>
<tr>
<td>Godbillon–Vey</td>
<td></td>
</tr>
<tr>
<td>Voiculescu, Dan</td>
<td>265</td>
</tr>
<tr>
<td>volume form</td>
<td>99</td>
</tr>
<tr>
<td>von Neumann algebra</td>
<td></td>
</tr>
<tr>
<td>approximately finite</td>
<td>156</td>
</tr>
<tr>
<td>K-theory for</td>
<td>163</td>
</tr>
<tr>
<td>of a foliated space</td>
<td>156</td>
</tr>
<tr>
<td>projection in</td>
<td>163</td>
</tr>
<tr>
<td>purely infinite</td>
<td>156</td>
</tr>
<tr>
<td>W^s (G, \mu)</td>
<td>143, 145, 149</td>
</tr>
<tr>
<td>von Neumann selection theorem</td>
<td>21</td>
</tr>
<tr>
<td>Warner, Frank W.</td>
<td>258</td>
</tr>
<tr>
<td>weak(+) topology on MT(X), 105</td>
<td></td>
</tr>
<tr>
<td>weight</td>
<td>28</td>
</tr>
<tr>
<td>normal</td>
<td>16</td>
</tr>
<tr>
<td>normal semifinite</td>
<td>149, 150</td>
</tr>
<tr>
<td>Radon–Nikodým derivative</td>
<td>153</td>
</tr>
<tr>
<td>semifinite normal</td>
<td>28</td>
</tr>
<tr>
<td>Weil, Daniel, see under Rosenberg</td>
<td></td>
</tr>
<tr>
<td>Weinstein, Alan</td>
<td>54</td>
</tr>
<tr>
<td>Weitzenbock formula</td>
<td>199</td>
</tr>
<tr>
<td>Wells, Raymond O., 55</td>
<td></td>
</tr>
<tr>
<td>Williams, Dana, see also under Muhly</td>
<td></td>
</tr>
<tr>
<td>Williams, Robert F.</td>
<td>261</td>
</tr>
<tr>
<td>Winkelkemper, Horst Elmar</td>
<td>4, 46</td>
</tr>
<tr>
<td>Zarrouati, M.</td>
<td>260, 262</td>
</tr>
<tr>
<td>zeta function</td>
<td>224</td>
</tr>
<tr>
<td>Zimmer, Robert</td>
<td>xi, 13, 21, 249, 255</td>
</tr>
</tbody>
</table>