### SUBJECT INDEX

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Π-coherent ring</td>
<td>FGT-injective dimensions of Π-coherent rings and almost excellent extension</td>
<td>149</td>
</tr>
<tr>
<td>2-Complexes</td>
<td>On the complexity of labeled oriented trees</td>
<td>11</td>
</tr>
<tr>
<td>Atiyah bundle</td>
<td>The Atiyah bundle and connections on a principal bundle</td>
<td>299</td>
</tr>
<tr>
<td>Automorphism group</td>
<td>Semisymmetric cubic graphs of order $16p^2$</td>
<td>19</td>
</tr>
<tr>
<td>AF-algebra</td>
<td>$AT$-algebras and extensions of $AT$-algebras</td>
<td>199</td>
</tr>
<tr>
<td></td>
<td>Equivalence relations of AF-algebra extensions</td>
<td>209</td>
</tr>
<tr>
<td>Age-dependent</td>
<td>Critical age-dependent branching Markov processes and their scaling limits</td>
<td>363</td>
</tr>
<tr>
<td>Ahlfors regular curves</td>
<td>Eigenvalue estimates of positive integral operators with analytic kernels</td>
<td>333</td>
</tr>
<tr>
<td>Algebraic curves</td>
<td>A very simple proof of Pascal’s hexagon theorem and some applications</td>
<td>619</td>
</tr>
<tr>
<td></td>
<td>Splittings of free groups, normal forms and partitions of ends</td>
<td>217</td>
</tr>
<tr>
<td>Almost excellent extension</td>
<td>FGT-injective dimensions of Π-coherent rings and almost excellent extension</td>
<td>149</td>
</tr>
<tr>
<td>Ancestral times</td>
<td>Critical age-dependent branching Markov processes and their scaling limits</td>
<td>363</td>
</tr>
<tr>
<td>Apollonian metric</td>
<td>John disks, the Apollonian metric, and min-max properties</td>
<td>83</td>
</tr>
<tr>
<td>Asphericity</td>
<td>On the complexity of labeled oriented trees</td>
<td>11</td>
</tr>
<tr>
<td>Asymptotic behavior</td>
<td>Uniqueness of singular solution of semi-linear elliptic equation</td>
<td>583</td>
</tr>
<tr>
<td>$AT$-algebra</td>
<td>$AT$-algebras and extensions of $AT$-algebras</td>
<td>199</td>
</tr>
<tr>
<td>$AT$-algebra</td>
<td>$AT$-algebras and extensions of $AT$-algebras</td>
<td>199</td>
</tr>
<tr>
<td>Bernoulli polynomial</td>
<td>On the general Dedekind sums and its reciprocity formula</td>
<td>1</td>
</tr>
<tr>
<td>Betti numbers</td>
<td>Deficiently extremal Cohen–Macaulay algebras</td>
<td>163</td>
</tr>
<tr>
<td>Binomial identity</td>
<td>$n$-Colour even self-inverse compositions</td>
<td>27</td>
</tr>
<tr>
<td>Bounded-input bounded-output stability</td>
<td>Stabilization for the vibrations modeled by the ‘standard linear model’ of viscoelasticity</td>
<td>495</td>
</tr>
<tr>
<td>Branching</td>
<td>Critical age-dependent branching Markov processes and their scaling limits</td>
<td>363</td>
</tr>
<tr>
<td>$C^*$-algebra</td>
<td>Homomorphisms between $C^*$-algebra extensions</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>$K$-theory for certain extension algebras of purely infinite simple $C^*$-algebras</td>
<td>409</td>
</tr>
<tr>
<td>Cannon–Thurston maps</td>
<td>Relatively hyperbolic extensions of groups and Cannon–Thurston maps</td>
<td>57</td>
</tr>
<tr>
<td>Cartesian product graphs</td>
<td>Gromov hyperbolicity in Cartesian product graphs</td>
<td>593</td>
</tr>
<tr>
<td>Catenoid</td>
<td>Rigidity of minimal submanifolds with flat normal bundle</td>
<td>457</td>
</tr>
<tr>
<td>Cauchy–Davenport theorem</td>
<td>Zero-sum problems with subgroup weights</td>
<td>259</td>
</tr>
<tr>
<td>Chevalley–Warning theorem</td>
<td>Zero-sum problems with subgroup weights</td>
<td>259</td>
</tr>
</tbody>
</table>

Total Pages: 631
### Subject Index

- **Clifford algebra**
  - Orthogonal symmetries and Clifford algebras 535
- **Clifford map**
  - Orthogonal symmetries and Clifford algebras 535
- **Closed analytic curves**
  - Eigenvalue estimates of positive integral operators with analytic kernels 333
- **Complex hyperbolic space**
  - Discreteness criteria in $PU(1, n; C)$ 243
- **Complexity**
  - On the complexity of labeled oriented trees 11
- **Conic sections**
  - A very simple proof of Pascal’s hexagon theorem and some applications 619
- **Conjugacy class sizes**
  - A note on two Camina’s theorems on conjugacy class sizes 139
- **Connection**
  - The Atiyah bundle and connections on a principal bundle 299
- **Connectivity**
  - Gromov hyperbolicity in Cartesian product graphs 593
  - Geometric structures on loop and path spaces 417
- **Cowling–Price theorem**
  - A heat kernel version of Cowling–Price theorem for the Laguerre hypergroup 73

### Delay systems

- **On qualitative analysis of delay systems and $x^\lambda = f(t, x, x^\sigma)$ on time scales** 249

### Density of states

- **Regularity of the interband light absorption coefficient** 351
- **Lifshitz tails for the interband light absorption coefficient** 465

### Differential equation

- **On the complex oscillation of differential polynomials generated by meromorphic solutions of differential equations in the unit disc** 481

### Differential identities

- **Power cocentralizing generalized derivations on prime rings** 285

### Dirichlet character

- **Dirichlet L-series**
  - Dirichlet expression for $L(1, \chi)$ with general Dirichlet character 7
  - Discreteness criteria
    - Discreteness criteria in $PU(1, n; C)$ 243
- **Distributions**
  - On the Iwasawa algebra associated to a normal element of $\mathbb{C}_p$ 45
- **Distributive module**
  - Weakly distributive modules. Applications to supplement submodules 525

### Edge-transitive graph

- **Semisymmetric cubic graphs of order $16p^2$** 19

### Eigenvalue problems

- **Eigenvalue estimates of positive integral operators with analytic kernels** 333
- **Elliptic integral**
  - Theta function identities associated with Ramanujan’s modular equations of degree 15 267

### Embedding theorems

- **Embedding relations connected with strong approximation of Fourier series** 563

### Empirical distribution

- **Critical age-dependent branching Markov processes and their scaling limits** 363
- **Even Clifford algebra**
  - Orthogonal symmetries and Clifford algebras 535
- **Exceptional symmetries**
  - Symmetries, integrals and solutions of ordinary differential equations of maximal symmetry 113
- **Existence**
  - On qualitative analysis of delay systems and $x^\lambda = f(t, x, x^\sigma)$ on time scales 249
- **Explicit formula**
  - $n$-Colour even self-inverse compositions 27
  - Exponential energy decay estimate
    - Stabilization for the vibrations modeled by the ‘standard linear model’ of viscoelasticity 495
- **Extension**
  - Homomorphisms between $C^*$-algebra extensions 97
  - $AT$-algebras and extensions of $A^T$-algebras 199
Equivalence relations of AF-algebra extensions 209
K-theory for certain extension algebras of purely infinite simple C*-algebras 409
Extremal algebras
Deficiently extremal Cohen–Macaulay algebras 163

FGT-injective dimension
FGT-injective dimensions of Π-coherent rings and almost excellent extension 149
Filter regular sequence
On the Matlis duals of local cohomology modules and modules of generalized fractions 35
Finite groups
On s-semipermutable subgroups of finite groups and p-nilpotency 141
Fixed-point theorem
On qualitative analysis of delay systems and $x^\lambda = f(t, x, x_{\sigma})$ on time scales 249
Flat normal bundle
Rigidity of minimal submanifolds with flat normal bundle 457
Fourier expansion
On the general Dedekind sums and its reciprocity formula 1
Fourier series
Embedding relations connected with strong approximation of Fourier series 563
Free groups
Splittings of free groups, normal forms and partitions of ends 217
Gauss sum
Mean value estimates of the error terms of Lehmer problem 507
General Dedekind sums
On the general Dedekind sums and its reciprocity formula 1
Generalized derivations
Power cocentralizing generalized derivations on prime rings 285
Generating function
$n$-Colour even self-inverse compositions 27
Geodesics
Gromov hyperbolicity in Cartesian product graphs 593

Graphs of trees
Splittings of free groups, normal forms and partitions of ends 217
Gromov hyperbolicity
Gromov hyperbolicity in Cartesian product graphs 593

Hardy spaces
Eigenvalue estimates of positive integral operators with analytic kernels 333
Herman ring
The rational maps $F_\lambda(z) = z^n + \lambda/z^d$ have no Herman rings 403
Homogeneous space
A note on the tangent bundle of $G/P$ 69
Homomorphism
Homomorphisms between $C^*$-algebra extensions 97
Hurwitz zeta function
Dirichlet expression for $L(1, \chi)$ with general Dirichlet character 7
Hydrodynamic stability
On short wave stability and sufficient conditions for stability in the extended Rayleigh problem of hydrodynamic stability 387

Index map
$A^T$-algebras and extensions of $A^T$-algebras 199
Infinite graphs
Gromov hyperbolicity in Cartesian product graphs 593
Injective
Nuclearity for dual operator spaces 105
Integral inequalities
Integral inequalities for self-reciprocal polynomials 131
Integral operators
Eigenvalue estimates of positive integral operators with analytic kernels 333
Interband light absorption coefficient
Lifshitz tails for the interband light absorption coefficient 465
Internal distance
John disks, the Apollonian metric, and min-max properties 83
Involution
Orthogonal symmetries and Clifford algebras 535
Isomorphism
Equivalence relations of AF-algebra extensions 209

Iterated order
On the complex oscillation of differential polynomials generated by meromorphic solutions of differential equations in the unit disc 481

Iwasawa algebra
On the Iwasawa algebra associated to a normal element of $\mathbb{C}_p$ 45

John disk
John disks, the Apollonian metric, and min-max properties 83

Julia set
The rational maps $F_\lambda(z) = z^m + \lambda/z^d$ have no Herman rings 403

Kemnitz’ conjecture
On zero sum subsequences of restricted size 395

Kloosterman sum
Mean value estimates of the error terms of Lehmer problem 507

K-theory
K-theory for certain extension algebras of purely infinite simple $C^*$-algebras 409

$L_p$-intersection bodies
$L_p$-mixed intersection bodies and star duality 429

$L_p$-mixed intersection bodies
$L_p$-mixed intersection bodies and star duality 429

Labeled oriented trees
On the complexity of labeled oriented trees 11

Laguerre hypergroup
A heat kernel version of Cowling–Price theorem for the Laguerre hypergroup 73

Law of the iterated logarithm
An almost sure invariance principle for trimmed sums of random vectors 611

Lehmer problem
Mean value estimates of the error terms of Lehmer problem 507

Lie symmetry
Symmetries, integrals and solutions of ordinary differential equations of maximal symmetry 113

Lie triple system
On split Lie triple systems II 185

Light absorption coefficient
Regularity of the interband light absorption coefficient 351

Local cohomology module
On the Matlis duals of local cohomology modules and modules of generalized fractions 35

Local fields
On the Iwasawa algebra associated to a normal element of $\mathbb{C}_p$ 45

Locally compact abelian group
Some equivalent multiresolution conditions on locally compact abelian groups 317

Loop space
Geometric structures on loop and path spaces 417

Mapping of integrals and solutions
Symmetries, integrals and solutions of ordinary differential equations of maximal symmetry 113

Matlis dual functor
On the Matlis duals of local cohomology modules and modules of generalized fractions 35

Measure-valued
Critical age-dependent branching Markov processes and their scaling limits 363

Meromorphic function
On the complex oscillation of differential polynomials generated by meromorphic solutions of differential equations in the unit disc 481

Minimal submanifolds
Rigidity of minimal submanifolds with flat normal bundle 457

Min-max property
John disks, the Apollonian metric, and min-max properties 83

Mixed norm
Mixed norm estimate for Radon transform on weighted $L^p$ spaces 441

Modular equation
Theta function identities associated with Ramanujan’s modular equations of degree 15 267
<table>
<thead>
<tr>
<th>Subject index</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Module of generalized fractions</td>
<td></td>
</tr>
<tr>
<td>On the Matlis duals of local cohomology modules and modules of generalized fractions</td>
<td>35</td>
</tr>
<tr>
<td>Multiplier</td>
<td></td>
</tr>
<tr>
<td>Theta function identities associated with Ramanujan’s modular equations of degree 15</td>
<td>267</td>
</tr>
<tr>
<td>Multiquaternion algebra</td>
<td></td>
</tr>
<tr>
<td>Orthogonal symmetries and Clifford algebras</td>
<td>535</td>
</tr>
<tr>
<td>Multiresolution analysis</td>
<td></td>
</tr>
<tr>
<td>Some equivalent multiresolution conditions on locally compact abelian groups</td>
<td>317</td>
</tr>
<tr>
<td>n-Colour even self-inverse compositions</td>
<td></td>
</tr>
<tr>
<td>n-Colour even self-inverse compositions</td>
<td>27</td>
</tr>
<tr>
<td>Nonhomogeneous semilinear elliptic equation</td>
<td></td>
</tr>
<tr>
<td>Uniqueness of singular solution of semilinear elliptic equation</td>
<td>583</td>
</tr>
<tr>
<td>Nuclear</td>
<td></td>
</tr>
<tr>
<td>Nuclearity for dual operator spaces</td>
<td>105</td>
</tr>
<tr>
<td>Operator space</td>
<td></td>
</tr>
<tr>
<td>Nuclearity for dual operator spaces</td>
<td>105</td>
</tr>
<tr>
<td>Orthogonal symmetry</td>
<td></td>
</tr>
<tr>
<td>Orthogonal symmetries and Clifford algebras</td>
<td>535</td>
</tr>
<tr>
<td>Paley–Wiener theorem</td>
<td></td>
</tr>
<tr>
<td>Segal–Bargmann transform and Paley–Wiener theorems on $M(2)$</td>
<td>169</td>
</tr>
<tr>
<td>Parseval frame</td>
<td></td>
</tr>
<tr>
<td>Some equivalent multiresolution conditions on locally compact abelian groups</td>
<td>317</td>
</tr>
<tr>
<td>Pascal’s hexagon theorem</td>
<td></td>
</tr>
<tr>
<td>A very simple proof of Pascal’s hexagon theorem and some applications</td>
<td>619</td>
</tr>
<tr>
<td>Pitt’s inequality</td>
<td></td>
</tr>
<tr>
<td>Mixed norm estimate for Radon transform on weighted $L^p$ spaces</td>
<td>441</td>
</tr>
<tr>
<td>p-nilpotent groups</td>
<td></td>
</tr>
<tr>
<td>A note on two Camina’s theorems on conjugacy class sizes</td>
<td>139</td>
</tr>
<tr>
<td>On s-semipermutable subgroups of finite groups and p-nilpotency</td>
<td>141</td>
</tr>
<tr>
<td>Poisson integrals</td>
<td></td>
</tr>
<tr>
<td>Segal–Bargmann transform and Paley–Wiener theorems on $M(2)$</td>
<td>169</td>
</tr>
<tr>
<td>Positive solutions</td>
<td></td>
</tr>
<tr>
<td>Uniqueness of singular solution of semilinear elliptic equation</td>
<td>583</td>
</tr>
<tr>
<td>Prime rings</td>
<td></td>
</tr>
<tr>
<td>Power cocentralizing generalized derivations on prime rings</td>
<td>285</td>
</tr>
<tr>
<td>Primitive character</td>
<td></td>
</tr>
<tr>
<td>Dirichlet expression for $L(1, \chi)$ with general Dirichlet character</td>
<td>7</td>
</tr>
<tr>
<td>Principal bundle</td>
<td></td>
</tr>
<tr>
<td>The Atiyah bundle and connections on a principal bundle</td>
<td>299</td>
</tr>
<tr>
<td>Purely infinite</td>
<td></td>
</tr>
<tr>
<td>$K$-theory for certain extension algebras of purely infinite simple $C^*$-algebras</td>
<td>409</td>
</tr>
<tr>
<td>$q$-Dual mixed volumes</td>
<td></td>
</tr>
<tr>
<td>$L_p$-mixed intersection bodies and star duality</td>
<td>429</td>
</tr>
<tr>
<td>Quadratic form</td>
<td></td>
</tr>
<tr>
<td>Orthogonal symmetries and Clifford algebras</td>
<td>535</td>
</tr>
<tr>
<td>Quasihyperbolic metric</td>
<td></td>
</tr>
<tr>
<td>John disks, the Apollonian metric, and min-max properties</td>
<td>83</td>
</tr>
<tr>
<td>Radon transform</td>
<td></td>
</tr>
<tr>
<td>Mixed norm estimate for Radon transform on weighted $L^p$ spaces</td>
<td>441</td>
</tr>
<tr>
<td>Random operators</td>
<td></td>
</tr>
<tr>
<td>Regularity of the interband light absorption coefficient</td>
<td>351</td>
</tr>
<tr>
<td>Lifshitz tails for the interband light absorption coefficient</td>
<td>465</td>
</tr>
<tr>
<td>Range function</td>
<td></td>
</tr>
<tr>
<td>Some equivalent multiresolution conditions on locally compact abelian groups</td>
<td>317</td>
</tr>
<tr>
<td>Reciprocity formula</td>
<td></td>
</tr>
<tr>
<td>On the general Dedekind sums and its reciprocity formula</td>
<td>1</td>
</tr>
<tr>
<td>Recurrence formula</td>
<td></td>
</tr>
<tr>
<td>n-Colour even self-inverse compositions</td>
<td>27</td>
</tr>
<tr>
<td>Reflection</td>
<td></td>
</tr>
<tr>
<td>Orthogonal symmetries and Clifford algebras</td>
<td>535</td>
</tr>
</tbody>
</table>
Regular cover
  Semisymmetric cubic graphs of order $16p^2$ 19
Relatively hyperbolic groups
  Relatively hyperbolic extensions of groups and Cannon–Thurston maps 57
Resolution
  FGT-injective dimensions of $\Omega$-coherent rings and almost excellent extension 149
  Integers without large prime factors in short intervals: Conditional results 515
Root space
  On split Lie triple systems II 185

Sea straits
  On short wave stability and sufficient conditions for stability in the extended Rayleigh problem of hydrodynamic stability 387
Segal–Bargmann transform
  Segal–Bargmann transform and Paley–Wiener theorems on $M(2)$ 169
Self-reciprocal polynomials
  Integral inequalities for self-reciprocal polynomials 131
Semisymmetric graph
  Semisymmetric cubic graphs of order $16p^2$ 19
Sequence sums
  On zero sum subsequences of restricted size 395
Shear flows
  On short wave stability and sufficient conditions for stability in the extended Rayleigh problem of hydrodynamic stability 387
Shift invariant space
  Some equivalent multiresolution conditions on locally compact abelian groups 317
Singular solutions
  Uniqueness of singular solution of semilinear elliptic equation 583
Smirnov classes
  Eigenvalue estimates of positive integral operators with analytic kernels 333
Smooth numbers
  Integers without large prime factors in short intervals: Conditional results 515
Solvable groups
  A note on two Camina’s theorems on conjugacy class sizes 139
Special kernels
  Eigenvalue estimates of positive integral operators with analytic kernels 333
Spectral function
  Some equivalent multiresolution conditions on locally compact abelian groups 317
Sphere complex
  Splittings of free groups, normal forms and partitions of ends 217
Split Lie algebra
  On split Lie triple systems II 185
  $s$-Semipermutable subgroups
    On $s$-semipermutable subgroups of finite groups and $p$-nilpotency 141
Stability
  A note on the tangent bundle of $G/P$ 69
  ‘Standard linear model’ of viscoelasticity
    Stabilization for the vibrations modeled by the ‘standard linear model’ of viscoelasticity 495
Stanley–Reisner rings
  Deficiently extremal Cohen–Macaulay algebras 163
Star dual of $L_p$-mixed intersection bodies
  $L_p$-mixed intersection bodies and star duality 429
Stein–Weiss potential
  Mixed norm estimate for Radon transform on weighted $L^p$ spaces 441
Strong approximation
  Embedding relations connected with strong approximation of Fourier series 563
Strong invariance principle
  An almost sure invariance principle for trimmed sums of random vectors 611
Structure theory
  On split Lie triple systems II 185
  Subgroup in $PU(1, n; C)$
    Discreteness criteria in $PU(1, n; C)$ 243
Supplement submodule
  Weakly distributive modules. Applications to supplement submodules 525
Symplectic structures
  Geometric structures on loop and path spaces 417
### Subject index

**System of roots**  
- On split Lie triple systems II 185

**Tangent bundle**  
- A note on the tangent bundle of $G/P$ 69

**The unit disc**  
- On the complex oscillation of differential polynomials generated by meromorphic solutions of differential equations in the unit disc 481

**Theta function**  
- Theta function identities associated with Ramanujan’s modular equations of degree 15 267

**Time scales**  
- On qualitative analysis of delay systems and $x^\Delta = f(t, x, x^\sigma)$ on time scales 249

**Trimmed sums**  
- An almost sure invariance principle for trimmed sums of random vectors 611

**Uncertainty principle**  
- A heat kernel version of Cowling–Price theorem for the Laguerre hypergroup 73

**Uniform stabilization**  
- Stabilization for the vibrations modeled by the ‘standard linear model’ of viscoelasticity 495

**Uniqueness**  
- On qualitative analysis of delay systems and $x^\Delta = f(t, x, x^\sigma)$ on time scales 249

**Universal property of Clifford algebra**  
- Orthogonal symmetries and Clifford algebras 535

**Variable bottom**  
- On short wave stability and sufficient conditions for stability in the extended Rayleigh problem of hydrodynamic stability 387

**Vertex-transitive graph**  
- Semisymmetric cubic graphs of order $16p^2$ 19

**Zero sum problems**  
- Zero-sum problems with subgroup weights 259
- On zero sum subsequences of restricted size 395