

Index

A

ADE classification, 25
Admissible boundary condition, 54
Affine Lie algebra, 30
Altitude, 71
Amplitude-exponent relation, 7, 42
Anomaly, 12
Atom, 105

B

Background electric charge, 154
Bessel process, 92
Bieberbach conjecture, 76
Blob algebra, 173
Boltzmann weight, 1, 65
Boson, 152
 compactified, 152
 free, 27, 152
Boundary, 54, 77
Boundary CFT, 38
Boundary condition, 43
 admissible, 54
Boundary condition changing operator, 43, 163
Boundary conditions
 fluctuating, 118
Boundary conformal field-theory, 40, 160
Boundary hexagon, 55
Boundary operator, 162
Boundary primary operator, 97
Boundary state, 44
Brownian motion, 53, 125

C

Capacity, 79
Cardy's formula, 45, 108, 162
Casimir effect, 13
Cayley function, 123

Central charge, 12–15, 20, 30, 31, 34, 42, 97
Character, 21, 24
Charge, 32
Chordal SLE, 102, 113, 121
Cluster, 143
Cluster algorithm, 120
Compactification, 34
Compactification radius, 34
Compactified boson, 152
Complex loop ensemble, 148
Configuration, 65
Conformal, 56
Conformal boundary condition, 161
 Jacobsen and Saleur, 178
Conformal field-theory, 8
 boundary, 40
Conformal invariance, 9, 88, 121–123
 correlators, 26
 Laplace equation, 4
Conformal transformation, 3
 analytic, 4
 Cayley, 78, 123
 energy-momentum tensor, 13
 generator, 4
 logarithmic, 6, 42, 123
 projective, 4
 Schwarz-Christoffel, 123
Conformal Ward identity, 8
 surface, 42, 161
Conformal weight, 4, 97
Coordination number, 68
Correlation function, 142
 and martingales, 104
 surface, 41
 three-point, 5
 two-point, 2, 5
Coset construction, 20

- Coulomb gas, 27, 36
 - boundary, 159
 - bulk, 151
 - screening in, 155
- Coupling, 60
- Critical exponent, 3
 - surface, 39
- Critical phenomena, 2
 - surface, 38, 160
- Critical point, 1
- Critical value, 56
- Crossing probability, 63
- Current, 28
- Current algebras, 30
- Curve, 121
- Cycle, 72

- D**
- De Branges' theorem, 76
- Dedekind function, 178
- Diagonal model, 44, 163
- Diffusion constant, 52, 91, 125, 128, 130, 132–134
- Diffusion-limited aggregation, 75
- Dilatation, 2
- Disjoint cycles, 72
- DLA, 75
- Domain, 54, 121
- Domain Markov property, 89, 90, 121
- Driving function, 85, 125
- Dual graph, 143
- Dual state, 17
- Duality, 93
- Dynamical exponent, 127

- E**
- Edge, 65
- Edwards-Anderson model, 133
- Energy-momentum tensor, 8, 30, 37
 - conformal transformation, 13
 - improved, 9
 - mode expansion, 15
 - OPE, 12
 - properties, 9
- Euler pentagonal number theorem, 177
- Exploration hull, 59
- Exploration process, 57, 59
- Extraordinary transition, 160

- F**
- Filtration, 105
- Finite-size scaling, 7, 14, 43
- Fjord, 120
- Fluctuating boundary conditions, 118

- Fluctuation-dissipation theorem, 2
- Fortuin-Kasteleyn
 - $O(n)$ model, 146
 - Potts model, 143
- Fortuin-Kasteleyn cluster, 118, 142
- Fractal dimension, 58, 92, 128, 132, 134, 158
 - percolation cluster, 159
 - percolation hull, 158
 - percolation red bonds, 158
- Free boson, 14, 26–28, 152
 - compactified, 35
- Free fermion, 14
- Fusion algebra, 23, 45
- Fusion coefficient, 45

- G**
- Gibbs potential, 1
- Graph, 141
 - connected component, 143
 - dual, 143
 - edge set, 141
 - medial, 143
 - vertex set, 141
- Graphene, 14
- Growth phenomena, 61
- Growth process, 81

- H**
- Harris criterion, 131
- Height model, 150
- Hermiticity condition, 17
- Hexagonal domain, 54
- Highest-weight representations, 97
- Highest-weight state, 15, 16
- Highest-weight vector, 97
- Hitting probability, 99
- Hull, 79, 89
- Hydrodynamic normalisation, 79
- Hyperscaling, 2

- I**
- Ideal states, 152
- Increasing property, 60
- Inner hexagon, 55
- Interface, 56, 64, 115, 117
- Interior point, 54
- IRF model, 150
- Irrelevant, 3
- Ishibashi state, 44
- Ising antiferromagnet
 - surface criticality, 39
- Ising model, 1, 20, 25, 65, 114, 128, 129
 - defect line, 46
 - surface, 45
- Itô's formula, 102, 103

J

Jacobi triple product formula, 178

K

Kac determinant, 18

Kac formula, 19

 Coulomb gas, 37

Kac table, 20, 99

 non-unitary, 27

Kac-Moody algebra, 29

Kac's labels, 99

Kagomé lattice, 144

Kennedy algorithm, 127

L

Ladder operator, 15, 16

Left-passage probability, 128

LERW, 113

Level, 16, 30

Linking, 145

Liouville field-theory, 153, 154

 marginality requirement, 155

Liouville term, 154

Liouville's theorem, 10

Local growth, 85

Locality, 93

 exploration process, 57

Locality property, 93

Loewner chain, 82, 83

Loop, 147

Loop algebra, 4

Loop description, 65

Loop ensemble

 complex, 148

 real, 147

Loop representation, 143, 145

$O(n)$ model, 146

 Potts model, 145

Loop-erased random walk, 66, 68, 113

 simulation, 69

Loop-erased sequence, 67

Loop-erasing algorithm, 67

M

Marginal, 3, 33, 155

Martingale, 98, 104

Measure space, 60

Measure theory, 104

Medial graph, 143

Medial lattice, 117

Method of images, 161

Minimal model, 123

 non-unitary, 27

 unitary, 20

Mirror operator, 161

Modular group, 24

Modular invariance, 24, 35

Modular invariant partition function, 24, 35

 diagonal, 25

Modular parameter, 24, 35

Modular transformation, 24, 26

N

Neutrality condition, 32

Non-renormalisation theorem, 12

Normal ordering, 30

Normal transition, 38, 160

Null operator, 20, 26

Null state, 20

O

$O(-2)$ model, 73

$O(n)$ model, 65, 145, 152, 156

Operator content, 25

 surface, 45

Operator product algebra, 23

Operator product expansion, 12, 28, 31, 32

Ordinary transition, 38, 160

Oriented loop, 73

P

Partition function, 1, 24, 66, 73, 74, 101, 104, 119, 142, 175–177, 180

 coarser, 104

 finer, 104

 surface, 44

Partition of a set, 104

Partitions of integers, 21

Path, 54

Pentagonal formula, 26

Percolating cluster, 115

Percolation, 27, 59–61, 63, 65, 115, 158, 177

 crossing, 177

Pivotal, 60

Pivotal edge, 158

Pivotal hexagon, 62

Poincaré-Birkhoff-Witt theorem, 97

Point-splitting, 30

Poisson resummation, 26

Potts model, 21, 25, 114, 117, 118, 124, 128,

 141, 142, 148, 152, 156

 random bond, 131, 132

Primary, 6

 Kac-Moody, 32

Primary operator, 11, 16

Probability space, 60

Profile, 43

Projective Ward identity, 5

Q

Quantum algebra, 173
 Quantum dimension, 173
 Quantum hamiltonian, 13, 17
 Quasi-primary, 5

R

Radial ordering, 17, 28
 Random walk, 53, 62
 loop-erased, 66
 Random-bond Potts model, 131
 Random-field Ising model, 136
 Rational CFT, 27
 Real loop ensemble, 147
 Recurrence, 69, 92
 Red bonds, 158
 Reduced state, 169
 Regularity criterion, 85
 Relevant, 3
 Renormalisation group, 105
 Renormalisation-group eigenvalue, 2
 Reversibility, 92
 Riemann's theorem, 77
 Rocha-Caridi formula, 22, 27
 Rough phase, 152
 Russo's formula, 60

S

Scale-invariance, 2
 Scaling, 2
 Scaling dimension, 2, 4
 surface, 39
 Scaling field, 2
 Scaling operator, 2
 irrelevant, 3
 marginal, 3, 33
 primary, 6
 quasi-primary, 5
 relevant, 3
 secondary, 16
 Schramm-Loewner Evolution, 51, 113
 Schramm's formula, 128, 129, 132
 Schwarz-Christoffel transformation, 43, 123
 Schwarzian derivative, 13
 Screening charge, 156
 Screening current, 37
 Seam, 151
 Seam edge, 151
 Secondary state, 16
 Segment of curve
 final, 89
 initial, 89
 Self-duality, 131
 Shadow, 68

σ -algebra, 104
 Simple walk, 54
 Six-vertex model, 148, 149
 SLE, 51, 104, 113
 chordal, 102
 duality, 93
 reversibility, 92
 test, 125, 127–129, 132–134, 136, 138
 SLE traces, 113
 SLE-CFT correspondence, 96, 98, 99, 104, 123
 SLE $_{\kappa}$, 91
 Solid-on-solid model, 150
 SOS model, 133, 150
 random, 133
 Spanning cluster, 115
 Special transition, 160
 Spin, 4, 142
 Spin glass, 133
 Stochastic Loewner evolution, 51, 53, 87, 91
 curves, 91
 String, 169
 Strip geometry, 6, 13, 17, 42
 Sub-lattice
 even, 149
 odd, 149
 Sugawara construction, 30, 34, 37
 Surface critical phenomena, 38

T

Teflon effect, 167
 Temperley-Lieb algebra, 145, 167, 168
 one-boundary extension, 173, 174
 two-boundary extension, 180
 Three-point function, 5
 Threshold function, 56
 Tie-breaking algorithm, 116
 Tiling, 54
 Torus, 24
 Total mass, 79
 Trace, 85
 Transfer matrix, 168, 173
 Twisted vertex model, 150
 Two-point function, 2, 5, 6, 17, 66
 surface, 41

U

Uniformisation, 124
 Unitarity, 18, 20
 Unitary minimal model, 20, 26
 Universal, 2, 7
 Universality class, 2

V

Verma module, 23, 97
 Vertex, 54, 72, 149

Vertex model, 148
 twisted, 150
Vertex operator, 32, 154
Virasoro algebra, 15, 20, 97
 generic character, 21, 22, 176

W

Walk, 72
Ward identity
 conformal, 8, 10, 11, 161
 projective, 5, 41

 surface, 42, 161
Watermelon exponent, 157
Weight, 69
 cycle, 72
 walk, 72

X

XY model, 34, 36

Y

Yang-Lee singularity, 27