

Index

- AIDS 15
 Aldous' theorem 60
 annealed environment 151
- Barabási-Albert model 12, 90
 contact process 128
 degree distribution 93
 diameter 116
 intentional damage 125
 maximum degree 101
 pairwise distances 109
 trees 105
 urn representation 102
- Bacon, Kevin 7
- big world 140, 149
- binomial coefficient bound 161
- Bollobás-Chung small world 9, 134
 contact process 148
 Ising model 146, 152
 random walk 163, 177, 180
 voter model 182
- Borel-Tanner distribution 52
- branching process 27, 112
 conditioned on extinction 31
 conditioned on nonextinction 33
 limiting behavior 30, 112
 total progeny 52
- branching random walk 106, 148
- broadcasting on trees 147
- C. elegans neural network 133
- Cheeger's constant 157
- CHKNS model 23, 187
 critical regime 195, 200
 critical value 189, 190
 Kosterlitz-Thouless transition 189, 197
 mean size of components 188
 subcritical regime 195, 200
- Chung and Lu model 6, 15, 82
 pairwise distances 114
 subcritical regime 83
- citation network 12
- collaboration network 12, 13
- conductance 21, 156
- conductance profile 159
- contact process 19, 125, 128, 148, 151
- copying model 99
- critical exponents 143
- Dirichlet form 154
- dual transition probability 155
- eigenvalues 153
- email network 12
- epidemics 15, 34, 85
- Erdős number 8
- Erdős-Rényi model 3, 27
 CLT for giant component 50
 cluster size 53
 complex components 51, 58
 critical regime 56
 dangling ends 44
 diameter 67
 pairwise distance 43
 random walk 169, 180
 threshold for connectivity 63, 65
 tree components 52
 unicyclic components 54, 58
- exponential, converge to 178
- fixed degree distribution see Chung-Lu, Newman-Strogatz-Watts, Molloy-Reed
- Galton-Watson process 28
- Guare, John 8
- Internet 11
- Ising model 18, 144, 147, 152
- isoperimetric constant 21, 58
- isothermal random walk 23, 185
- Karinty, Frigyes 8
- Kingman's coalescent 182
- large deviations
 Binomial 40, 66, 67
 Poisson 40
- Milgram, Stanley 8
- mini-vertices 165
- mixing time 159

212

Molloy-Reed model 5, 79
 movie actor network 7, 11, 133
 multiplicative coalescent 61

Newman-Strogatz-Watts model 5, 70
 cluster size 73, 76, 77
 contact process 128
 critical regime 74
 epidemics 85, 87
 giant component 77, 80
 pairwise distances 10, 84, 114
 percolation 88, 123
 phase transition 72, 76, 79
 random walk 160
 self-loops 71
 subcritical regime 82

Newman-Watts small world 10, 134
 Ising model 144, 147
 pairwise distance 136
 percolation 140
 random walk 171, 180
 voter model 182

percolation 15, 88, 123, 140
 Poisson approximation 136
 Poisson clumping heuristic 179
 Poisson convergence 71
 Polya urn 102
 Potts model 18, 144
 power grid 133
 power-law random graph 11, 114, 121, 125
 preferential attachment 13, 90, 93, 99
 see also Barab-si-Albert

Index

quenched environment 151

random cluster model 145
 random regular graph 5, 160, 164
 recursive tree 105
 relative pointwise distance 153
 relaxation time 22, 178
 reversible stationary distribution 153

scale-free random graph
 see power-law random graph

sexual network 12, 13
 six degrees of separation 7, 132
 small world: see Bollobás-Chung,
 Newman-Watts, Watts-Strogatz

spectral gap 153
 spin glass 147
 star graph 129

Tauberian theorem 122
 time reversed Markov chain 155
 total variation distance 153
 transition kernel 153

unicyclic components 51

voter model 22, 181

Watts-Strogatz small world 9, 132
 word usage in books 98
 World Wide Web 9, 11

Yule process 135
 Yule's genera model 13, 98