

Index

- 陈永川, *see* Chen, William Yongchuan
- 邓玉平, *see* Deng, Eva Yuping
- 杜若霞, *see* Du, Rosena Ruoxia
- 侯江霞, *see* Hou, Sharon Jiangxia
- 胡扬舟, *see* Hu, Yangzhou
- 静安, *see* Jing An
- 罗见今, *see* Luo, Jianjin
- 明安图, *see* Ming'antu
- 韦帆, *see* Wei, Fan
- 辛国策, *see* Xin, Guoce
- 颜华菲, *see* Yan, Huafei
- 张研, *see* Zhang, Yan
- (a, b)-Catalan number, *see* Catalan number, (a, b)
- Abel's theorem, *see* theorem, Abel's
- Abramson, Morton, 166
- Acerbi, Fabio, 127
- Ackerman, Eyal, 166
- Aebi, Christian, 188
- Aguiar, Marcelo, 72, 100
- Aigner, Martin, 162, 187
- Albert, Michael Henry, 73
- algebra, Temperley-Lieb, 142
- algebraic language, *see* language, algebraic
- alternating Baxter permutation,
see permutation, Baxter, alternating
- alternating tree, *see* tree, alternating
- Ampère, André-Marie, 185
- Anderson, Jaclyn Ann, 77
- André, Désiré, 138, 184
- Andrews, George W. Eyre, 92, 153, 160
- animal, directed, 167
- arcs
 - noncrossing, 29
 - nonintersecting, 28
- Ardila, Federico, 168
- Armstrong, Drew, 147, 148
- arrangement, Catalan, *see* Catalan arrangement
- ascent sequence, restricted, 73
- Asinowski, Andrei, 60
- associahedron, 159
- asymptotic density, 135
 - upper, 135
- Athanasiadis, Christos A., 89, 95
- Aval, Jean-Christophe, 96, 142
- Bacher, Roland, 160
- Baek, Jineon, 152
- Baldoni-Silva, Maria Welleda, 97, 150
- ballot number, *see* number, ballot
- ballot problem, *see* problem, ballot
- ballot sequence, *see* sequence, ballot
- Banderier, Cyril, 61
- Barbier, Joseph Émile, 184
- Barucci, Elena, 63
- Barequet, Gill, 166
- Baxter permutation, *see* permutation, Baxter
- Becker, Harold W., 87, 168
- Beckwith, David, 89, 160
- Bell, Eric Temple, 186
- Berenstein, Arkady, 143
- Bergeron, Fran ois, 142
- Bergeron, Nantel, 142
- Berkolaiko, Gregory, 151
- Berlekamp, Elwyn Ralph, 153
- Bernardi, Olivier, 146
- Bernhardt, Frank, 56
- Bertram's ballot theorem, 139
- Bertrand, Joseph Louis Fran ois, 139, 184

- Bessenrodt, Christine, 96, 154, 160
 $\beta(1,0)$ -tree, *see* tree, $\beta(1,0)$
 Bétrêma, Jean, 95
 Bevan, David, 70
 bijective proof, 7
 Billera, Louis Joseph, 87, 99
 Billey, Sara Cosette, 71, 76, 78, 80, 91, 142,
 167
 binary tree, *see* tree, binary
 Binet, Jacques Philippe Marie, 182
 binomial coefficient, 3
 binomial theorem, generalized, 3
 Bisch, Dietmar Herbert, 147
 Bizley, Michael Terence Lewis, 148
 Björner, Anders, 158
 Bloom, David Michael, 139
 Bóna, Miklós, 58, 79, 167
 Bonin, Joseph Edmond, 165, 168
 bounce, 123
 bounce path, *see* path, bounce
 Bousquet, Michel, 58
 Bousquet-Mélou, Mireille, 61, 144, 167
 bracketing, 7, 16
 of a word, arbitrary, 127
 Brendsdal, Egil, 60
 Brenti, Francesco, 150
 Brown, William G., 185
 Bru, Bernard, 185
 Bruckman, Paul S., 149
 Bruhat order, *see* order, Bruhat
 de Bruijn, Nicolaas Govert, 9
 Brunvoll, Jon, 60
 Buckley, Mitchell, 94
- Cairns, Grant, 188
 Callan, David, 58–62, 65, 66, 69, 70, 72,
 74–76, 82, 89, 96
 Cameron, Peter Jephson, 187
 Can, Mahir, 96
 Carlitz, Leonard, 153, 160
 Catalan alternative tableau, *see* tableau,
 Catalan alternative
 Catalan arrangement, 95
 Catalan disease, *see* disease, Catalan
 Catalan matroid, *see* matroid, Catalan
 Catalan number
 (a,b) , 109
 algebraic interpretations, 103, 105
 asymptotic series, 169
 definition, 1
 fundamental recurrence, 3
 infinitely many interpretations, 69
 not always the solution, 152
 q -analogue, 121
 (q,t) , 83, 161
 super, 110
 ternary, 148
 Catalan simplicial set, 94
 Catalan tree, *see* tree, Catalan
 Catalan triangulation, *see* triangulation,
 Catalan
 Catalan, Eugène Charles, 139, 148, 181
 Catalonia, 56
 Cayley, Arthur, 160, 183
 Ceballos, Cesar, 159
 cell, Schubert, 167
 centered tunnel, 23, 63
 Chan, Clara Sophia, 141, 150
 Chan-Robbins-Yuen polytope, *see* polytope,
 Chan-Robbins-Yuen
 Chandon, Jean-Louis, 156
 Chapman, Robin, 63, 71, 145
 Chen, William Yongchuan, 64, 68, 170
 chess problem, 103
 chess tableau, *see* tableau, chess
 Choi, Suyoung, 148
 chords, nonintersecting, 28, 126
 Chow, Timothy Yi-Chung, 90
 Chung Graham, Fan-Rong King, 164
 Chung, Kai Lai, 139
 Chung-Feller theorem, *see* theorem,
 Chung-Feller
 Cigler, Johann, 160
 Ciucu, Mihai Adrian, 165
 Claesson, Anders Karl, 59, 64, 73, 81, 93
 code, *see* permutation, code of
 coins, ways to stack, 49
 complementary minors, *see* minors,
 complementary
 compositional inverse, 116
 Comtet, Louis, 168
 cone, Littlewood-Richardson, 93
 conjugacy class, 104
 conjugate (of a finite sequence), 12
 context-free language, *see* language,
 context-free
 continued fraction, 111, 122, 137
 convex $(n+2)$ -gon, 1
 convex position, probability of, 118
 convexotope, 118
 Conway, John Horton, 96
 core, 36

- Cori, Robert, 79, 80, 146
- Coxeter, Harold Scott MacDonald, 96
- cyclic plane forest, *see* forest, cyclic plane
- cyclic shift, 12
- Cyvin, Bjørg N., 60
- Cyvin, Sven Josef, 60, 98
- Davenport-Schinzel sequence, *see* sequence, Davenport-Schinzel
- De Saintes-Catherine, Myriam, 68
- Dean, Richard Albert, 92
- decomposable, *see* permutation, decomposable
- deformation, versal, 94
- Del Lungo, Alberto, 63
- Delest, Maylis, 67
- Deng, Eva Yuting, 64, 69, 83
- Denise, Alain, 61
- Deodhar, Vinay Vithal, 167
- depth first order, *see* order, depth first
- deque-sortable permutation, *see* permutation, deque-sortable
- Dershowitz, Nachum, 87
- Désarménien, Jacques, 143
- descent, 123
 - of a Dyck path, *see* path, Dyck, descent
- Deutsch, Emeric, 56, 57, 61–65, 70, 76, 83–86, 89, 93, 97, 99, 163, 168
- Dewji, Rian, 93
- diagram
 - Murasaki, 43
 - Puttenham, 87
 - Young, 44
 - paths inside, 116
- Dickins, Anthony Stewart Mackay, 141
- difference operator, 112
- dimer, 129
- Dimitrov, Ivan, 93
- direct sum decomposition, 124
- directed animal, *see* animal, directed
- Disanto, Filippo, 92, 94
- disease, Catalan, 56, 188
- dissection, of a convex polygon, 108, 119, 121, 128
- Djoković, Dragomir Z., 143
- Dokos, Theodore, 80
- dominance order, *see* order, dominance
- domino, 129
- Donaghey, Robert James, 162
- Donnelly, Robert Garvin, 92
- Došlić, Tomislav, 98
- Doubilet, Peter Michael, 143
- double rise (of a Schröder path), *see* path, Schröder, double rise
- doubly stochastic matrix, *see* matrix, doubly stochastic
- down step, *see* path, Dyck, down step
- Drake, Brian C., 148
- Dress, Andreas, 146
- Du, Rosena Ruoxia, 64, 69
- Dukes, William Marks B., 73
- Dulucq, Serge, 67, 79, 80, 146, 163, 167
- Dumitriu, Ioana, 146
- Dyck language, *see* language, Dyck
- Dyck path, *see* path, Dyck
- Dyson, Freeman John, 169
- Edelman, Paul Henry, 87, 147, 158, 167
- edge, superfluous, 107
- Egge, Eric Stephen, 83
- Eggleton, Roger Benjamin, 154
- Ehrhart polynomial, *see* polynomial, Ehrhart
- Elizalde, Sergi, 63, 70, 84, 85
- Eremenko, Alexandre, 151
- Eriksson, Henrik, 90
- Errera, Andrea, 67
- Etherington, Ivor Malcolm Haddon, 168
- Eu, Sen-Peng, 151
- Euler, Leonhard, 137, 178
- Euler-Segner number, *see* number, Euler-Segner
- excedance
 - of a path, *see* path, excedance
 - of a permutation, *see* permutation, excedance
- excedance set, 76
- Fan, Chenteh Kenneth, 90
- Feller, William, 138, 139
- Ferrari, Luca, 92, 94
- Fibonacci tree, *see* tree, Fibonacci
- Fishburn, Peter C., 92
- flag, 106
- flag variety, *see* variety, flag
- Flajolet, Philippe, 61, 148
- flow polytope, *see* polytope, flow
- f*-matching, *see* matching, *f*-
- Fomin, Sergey Vladimirovich, 80, 95, 96, 143
- Fonseca, Tiago, 143
- Forcey, Stefan, 60
- forest, cyclic plane, 170
- Françon, Jean, 81
- Frankel, Norman Edward, 169

Freund, John E., 92
 Friedmann, Tamar, 143
 frieze pattern, 96
 function
 Möbius, 110, 155
 quasisymmetric, 104
 Fürlinger, Johannes, 160
 von Fuss, Paul Heinrich, 178
 Fuss, Nicolaus Ivanovich, 146, 178, 180
 Fuss-Catalan number, *see* number,
 Fuss-Catalan
 Gabrielov, Andrei, 151
 Gao, Zhenguang, 169
 Gardner, Martin, 88, 187
 Gardy, Danièle, 61
 Garner, Richard Henry George, 94
 Garrabrant, Scott, 152
 Garsia, Adriano Mario, 83, 142
 Gelfand, Israil Moiseivich, 67, 157, 159
 generating tree, *see* tree, generating
 genus 0, *see* permutation, genus 0
 Gessel, Ira Martin, 58, 80, 89, 95, 138, 148,
 162
 Getu, Seyoum, 164
 Gewurz, Daniele A., 81
 Ghys, Étienne, 166
 Gili, Joan L., 141
 Gire, Sophie, 164, 167
 Glasser, M. Lawrence, 169
 Gobet, Thomas, 74
 Goldbach, Christian, 178
 Goldberg, Lisa Robin, 141
 Goodman, Frederick Michael, 78, 142
 Gould, Henry Wadsworth, 88, 185, 186
 Goulden, Ian Peter, 145, 167
 Gouyou-Beauchamps, Dominique, 61, 163,
 167
 Graev, Mark Iosifovich, 67, 157
 Graham, Ronald Lewis, 82, 164
 graph
 incomparability, 94
 noncrossing, 129
 unit interval, 94
 Grassmannian, degree, 104
 Grossman, Howard D., 148
 group
 Coxeter, 138
 symmetric, 104
 symplectic, 71, 103
 Grunert, Johann August, 182

Gudmundsson, Hilmar Haukur, 73
 Guibert, Olivier, 80, 163
 guillotine rectangulation, *see* rectangulation,
 guillotine
 Gutman, Ivan, 98
 Guy, Richard Kenneth, 66, 95, 154
 Hadamard product, *see* product, Hadamard
 Haglund, James, 161
 Haiman, Mark David, 83, 142, 159, 167
 half edge, 126
 Hall, Jr., Marshall, 186
 Hammersley, John Michael, 78
 de la Harpe, Pierre, 78, 142
 Harrison, Jonathan, 151
 Hausdorff, Felix, 168
 Heteyi, Gabor, 99
 Heubach, Silvia Petra, 147
 hexaflexagon, 82
 hexagonal lattice, *see* lattice, hexagonal
 hill, *see* path, Dyck, hill
 hill-free, *see* path, Dyck, hill-free
 Hipparchus, 127
 Hivert, Florent, 73
 Hofbauer, Josef, 160
 Hoggatt, Jr., Verner Emil, 149, 164
 Holm, Thorsten, 96
 Hopf algebra, 96
 Hopkins, Brian Preston, 87
 horizontally convex, *see* polyomino,
 horizontally convex
 Hou, Sharon Jiangxia, 148
 Hu, Yangzhou, 73
 Huang, Samuel, 158
 Humphreys, Katherine, 184
 Huq, Aminul, 139
h-vector, 121
 hyperplane, 50
 ideal, of algebra of upper triangular matrices,
 103
 incomparability graph, *see* graph,
 incomparability
 indecomposable, *see* permutation,
 indecomposable
 index, major, 122
 internal triangle, *see* triangle, internal
 internal vertex, 16
 intersection homology, 104
 invariant, of $\mathrm{SL}(2, \mathbb{C})$, 103
 inverse, of a bijection, 7

- inversion, Möbius, 155
 involution
 2143-avoiding, 127
 fixed-point free, 38
 vexillary, 127
- Jackson, David M. R., 79, 145
j-ary tree, *see* tree, *j*-ary
 Jiang, Maosen, 162
 Jing An, 177
 Jockusch, William, 71, 76, 78, 91, 142
 Johansson, Robert, 99, 166
 Jones, Michael Alan, 87
 Jones, Vaughan Frederick Randal, 78, 142,
 147
 Jonsson, Jakob, 146
 Jørgensen, Peter, 96
- Kafashan, Mohammadmehdi, 60
 Kapranov, Mikhail M., 159
 Kasraoui, Anisse, 68
 Kauers, Manuel, 169, 187
k-divisible noncrossing partition, *see* partition,
 k-divisible, noncrossing
 Keller, Gordon Ernest, 92
 Kellogg, Alta, 154
 Kepler tower, 31
 Kim, Jang Soo, 60
 king, on a chessboard, 131
 King, Ronald Curtis, 71
 Kirkman, Thomas Penyngton, 160, 182
 Kirkman-Cayley number, *see* number,
 Kirkman-Cayley
 Kitaev, Sergey Vladimirovich, 59, 73, 81
 Klarner, David Anthony, 9, 56
 Klazar, Martin, 72, 88, 163, 165, 167
 Kleiman, Mark, 164
 Knuth, Donald Ervin, 9, 71, 77–80, 92, 99, 165
 Koganov, Leonid M., 146
 Konvalinka, Matjaž, 149
 Kooken, Jack H., 146
 Körner, János, 152
 Koshy, Thomas, 169, 188
 Kostant partition function, 97
 Kotelnikow, Semën Kirillovich, 180
 Krattenthaler, Christian Friedrich, 66, 68, 169
 Kremer, Darla, 164
 Kreweras, Germain, 162
k-triangulation, 107
 Kube, Nate, 69
 Kummer’s theorem, *see* theorem, Kummer’s
 Kummer, Ernst Eduard, 168
 Kung, Joseph PeeSin, 143
 Kuznetsov, Alexander, 162
 Labelle, Gilbert, 58
 Lack, Stephen Geoffrey, 94
 Lagrange inversion formula, 153, 182, 183
 Lakshimbai, Venkatramani, 167
 Lamé, Gabriel Léon Jean Baptiste, 181
 language
 algebraic, 99
 context-free, 99
 Dyck, 99
 Larcombe, Peter J., 178
 Lascoux, Alain, 80
 lattice
 hexagonal, 19
 simplicial Eulerian, 119
 Tamari, 119
 Young’s, 89
 lattice path, *see* path, lattice
 Lee, Carl William, 159, 160
 Lee, Kyungyong, 96
 left child, in a binary tree, 6
 left subtree, in a binary tree, 5
 Lehmer, Derrick Henry, 169
 Leighton, Frank Thomson, 98
 Lemaire, Jacques, 156
 Leroux, Pierre, 58
 Levine, Jack, 67
 Levine, Lionel, 87
 Lewis, Joel Brewster, 86
 Li, Li, 96
 Li, Nelson Y., 147
 Lieb, Elliot Hershel, 67
 linear extension, 46
 Linusson, Svante, 64, 80, 93, 99, 166
 Liouville, Joseph, 181
 Liskovets, Valery Anisimovich, 145, 146, 168
 Littlewood-Richardson cone, *see* cone,
 Littlewood-Richardson
 Liu, Shu-Chung, 151
 Lloyd, E. Keith, 60
 Loday, Jean-Louis, 96, 159
 Loehr, Nicholas Anthony, 83, 96
 loop percolation, 143
 Louchard, Guy, 67
 Lucas, François Édouard Anatole, 185
 van de Lune, Jan, 154
 Luo, Jianjin, 178

- Macdonald, Ian Grant, 80
- MacMahon, Percy Alexander, 78, 160, 162, 185
- major index, *see* index, major
- Maleki, Mehdi, 60
- Malvenuto, Claudia, 152
- mania, Catalan, 56
- Mansour, Toufik, 60, 86, 147
- map
 - rational, 104
 - rooted planar, 106
- matching
 - f^- , 69
 - noncrossing, 28
 - nonnesting, 29
- matrix
 - alternating sign
 - 132-avoiding, 131
 - doubly stochastic, 113
 - positive definite, 53
 - tridiagonal, 53, 65
- matroid, Catalan, 134
- McCabe, Adam R., 93
- McCammond, Jonathan Paul, 188
- Mead, David Godfrey, 143
- de Médicis, Anne, 68
- Merola, Francesca, 81
- Mészáros, Karola, 87, 149, 157, 158, 165
- method of images, 184
- de Mier, Anna, 168
- Miner, Samuel, 84
- Ming'antu, 177
- Minggatu, 177
- minor, nonvanishing, 104
- minors, complementary, 105
- Mirmanoff, Dmitry Semionovitch, 184
- Möbius function, *see* function, Möbius
- Möbius inversion, *see* inversion, Möbius
- Möbius band, 131
- Mohanty, Sri Gopal, 138, 139
- Monsky, Paul, 143
- Moon, John W., 93
- Moreira, Walter, 72
- Morselt, B. J. M., 9
- Moser, William Oscar Jules, 166
- Moszkowski, Paul, 162
- Motzkin number, *see* number, Motzkin
- Motzkin path, *see* path, Motzkin
- Motzkin, Theodore Samuel, 162
- Moulton, Vincent, 146
- Müller, Thomas W., 169
- Mullin, Ronald Cleveland, 88, 146, 165
- Murasaki diagram, *see* diagram, Murasaki
- Murasaki, Lady, 88
- Myangat, Sharabiin, 177
- Nagy, Gábor V., 153
- Nakamigawa, Tomoki, 146
- Narayana number, *see* number, Narayana
- Narayana, Tadepalli Venkata, 138, 139, 162
- natural correspondence, 9
- near semiring, *see* semiring, near
- necklace, 43
- net (of chords), 114
- Netto, Eugen Otto Erwin, 185
- Newman, Morris, 98
- Newton, Isaac, 3
- Ngram chart, 187
- Nica, Alexandru Mihai, 87
- Nichols, Warren Douglas, 139
- Niederhausen, Heinrich, 70
- noncrossing graph, *see* graph, noncrossing
- noncrossing matching, *see* matching, noncrossing
- noncrossing partition, *see* partition, noncrossing
- noncrossing/nonnesting analogy, 60
- nonnesting matching, *see* matching, nonnesting
- nonnesting partition, *see* partition, nonnesting
- Novaes, Marcel, 151
- Noy, Marc, 168
- N-rational, 115
- number
 - ballot, 102, 183
 - Catalan, *see* Catalan number
 - Euler-Segner, 186
 - Fuss-Catalan, 108, 180, 183
 - Kirkman-Cayley, 183
 - Motzkin, 125, 132, 163
 - Narayana, 124, 158
 - ordered Bell, 183
 - Pfaff-Fuss-Catalan, 146
 - Schröder, 110, 127, 131
 - q -analogue, 165
 - Segner, 186
 - winding, 106
- Oakley, Cletus Odia, 82
- Odlyzko, Andrew Michael, 95
- Olsson, Jørn Børling, 78
- operation

- commutative nonassociative binary, 133
- nonassociative binary, 8
- order
 - Bruhat, 132
 - depth first, 10
 - dominance, 36
 - series-parallel interval, 92
 - unit interval, 92
 - weak (Bruhat), 49
- ordered Bell number, *see* number, ordered Bell
- ordered tree, *see* tree, ordered
- orthonormal basis, 117
- Pak, Igor Markovich, 80, 84, 139, 152, 162
- Pallo, Jean Marcel, 158
- parallelogram polyomino, *see* polyomino, parallelogram
- Parcheesi, 87
- parenthesization, 7, 16, 133
- Park, Hanchul, 148
- partition
 - 231-avoiding, 44
 - noncrossing, 43, 44, 127, 129
 - k -divisible, 109
 - strongly, 162
 - nonnesting, 44
 - for a reflection group, 89
 - plane, *see* plane partition
- pat, 40
- path
 - bounce, 123
 - Dyck, 20
 - ascent, 62
 - definition, 7
 - descent, 22, 62
 - down step, 11
 - elevated, 90
 - hill, 24
 - hill-free, 62
 - peak, 21
 - rotated, 123
 - up step, 11
 - valley, 62
 - excedance, 102
 - lattice, 7
 - in the plane, 20, 50, 126, 128
 - nonintersecting, 146
 - pair of, 27, 28
 - Motzkin, 24, 126
 - two-colored, 63, 96
 - Schröder, 25, 164
- double rise, 26
- small, 164
- valley, 25
- Paule, Peter, 187
- peak (of a Dyck path), *see* path, Dyck, peak
- Pearl, Paul, 61
- Pechenik, Oliver, 166
- Penaud, Jean-Guy, 67, 95
- Pergola, Elisa, 63, 163, 164
- permutation
 - 132-avoiding, 80
 - fixed point, 41
 - 2-stack sortable, 131
 - 213-avoiding, 72
 - 231-avoiding, 79
 - 312-avoiding, 37, 72, 79, 109
 - 321-avoiding, 37, 71, 90, 142
 - alternating, 42, 152
 - excedance, 41
 - fixed point, 41
 - 4231 and 3412-avoiding, 132
 - Baxter, 38, 90
 - alternating, 80
 - code of, 71
 - decomposable, 39
 - deque-sortable, 165
 - dominant, 80
 - excedance, 41
 - genus 0, 37, 40, 41, 127
 - indecomposable, 39
 - separable, 166
 - smooth, 133
 - sortable on two parallel queues, 38
 - stack-sortable, 37
- Pfaff, Johann Friedrich, 146
- Pfaff-Fuss-Catalan number, *see* number, Pfaff-Fuss-Catalan
- Pinter, Ron Yair, 166
- Pinzani, Renzo, 63, 92, 94, 163
- planar rhyme scheme, 87
- plane partition, 108
 - column-strict, 45
- plane ternary tree, *see* tree, plane ternary
- plane tree, *see* tree, plane
- planted tree, *see* tree, planted
- Plouffe, Simon, 188
- Pólya, George (György), 67
- polynomial
 - Ehrhart, 119
 - q -Catalan, 124
 - wheel, 143

- polyomino
 - enumeration, 67
 - horizontally convex, 52
 - parallelogram, 66, 84, 128
 - symmetric, 31
- polytope
 - Chan-Robbins-Yuen, 150
 - flow, 97
 - secondary, 159
- Pomerance, Carl Bernard, 169
- Pöschel, Reinhard, 168
- poset
 - of direct sum decompositions, 124
 - of intervals of a chain, 46
- Postnikov, Alexander Yevgenievich, 67, 77, 89, 95, 97, 99, 149, 150, 155, 157, 159, 162
- Pouget, Jean, 156
- Poupard, Yves, 162
- preorder, 10
- Préville-Ratelle, Louis-François, 158
- problem
 - ballot, 184
 - Wedderburn-Etherington commutative bracketing, 168
- Proctor, Robert Alan, 97
- Prodinger, Helmut, 87
- product, Hadamard, 118
- Propp, James Gary, 95
- Prouhet, Eugène, 160
- Pun, Siu Kei, 89
- Puttenham diagram, *see* diagram, Puttenham
- Puttenham, George, 87
- Puusa, Arto, 141
- q*-analogue, 121
- q*-binomial coefficient, 122
- q*-Catalan polynomial, *see* polynomial, *q*-Catalan
- (*q, t*)-Catalan number, *see* Catalan number, (*q, t*)
- quantum Knizhnik-Zamolodchikov equation, 143
- quasipolynomial, Ehrhart, 118
- quasisymmetric function, *see* function, quasisymmetric
- Radoux, Christian, 154
- Ramanujan, Srinivasa Aiyangar, 160
- Rassart, Étienne, 146
- rational map, *see* map, rational
- Reading, Nathan Paul, 81, 143
- rectangulation, 130
 - guillotine, 130
- reflection method, 184
- reflection principle, 138
- Reifegerste, Astrid, 70, 76, 85, 97
- Reiner, Victor Schorr, 158, 167
- relation, similarity, 93
- relative volume, *see* volume, relative
- Remmel, Jeffrey Brian, 73
- Renault, Marc S., 184
- representation, sign, 104
- restricted ascent sequence, *see* ascent sequence, restricted
- restricted growth function, 72
- Retakh, Vladimir Solomonovich, 143
- Reutenauer, Christophe, 80, 143, 160
- Rhoades, Brendon Patrick, 143
- Rice, John Michael, 141
- Richards, Dana Scott, 79
- right child, in a binary tree, 6
- right subtree, in a binary tree, 6
- Rinaldi, Simone, 92, 94
- Riordan, John F., 67, 185, 186
- Robbins, David Peter, 150
- Robertson, Aaron, 84
- Rodrigues, Benjamin Olinde, 181
- Rogers, Douglas G. E. D., 67, 93, 165
- Romik, Dan, 143
- Ronco, Maria, 96
- root system, 104
- root vertex
 - of a binary tree, 5
 - of a plane tree, 6
- rooted planar map, *see* map, rooted planar
- Rosas, Mercedes Helena, 97
- Roselle, David Paul, 88, 153
- Rota, Gian-Carlo, 143
- rotated Dyck path, *see* path, Dyck, rotated
- Rotem, Doron, 78
- Roth, Mike, 93
- Rowe, R. C., 183
- RSK algorithm, 78
- Ruskey, Frank, 69
- Ruškuc, Nikola, 73
- Ryan, Kevin M., 167
- Ryser, Herbert John, 185
- Sagan, Bruce Eli, 66, 149, 168
- Sam, Steven V., 93
- Sandhya, Baskhar, 167

- Santos Leal, Francisco, 159
- Saracino, Daniel Harrison, 84
- Schaeffer, Gilles, 144, 162
- Schlosser, Martin, 68
- Schmidt, Frank Whitney, 79
- Schröder, Friedrich Wilhelm Karl Ernst, 185
- Schröder number, *see* number, Schröder
- Schröder path, *see* path, Schröder
- Schubert cell, *see* cell, Schubert
- Schubert variety, *see* variety, Schubert
- Schur function, 141
- Schur ring, 133
- Schützenberger, Marcel-Paul, 80
- Scoville, Richard A., 153
- secondary polytope, *see* polytope, secondary
- von Segner, Johann Andreas, 178, 179
- Segner number, *see* number, Segner
- semicircle law, 168
- semiorder, 92, 119
- semiring, near, 55
- separable permutation, *see* permutation, separable
- sequence
 - ballot, 6, 32
 - strict, 12
 - convex, 118
- Davenport-Schinzel, 165
- unimodal, 123
- series-parallel interval order, *see* order, series-parallel interval
- serieselpmate, 103
- Serrano, Luis Guillermo, 146
- Seshadri, Conjeeveram Srirangachari, 167
- set, valid m -, 94
- Shapiro, Louis Welles, 56, 57, 59, 64, 67, 93, 98, 139, 141, 153, 162–166, 170
- Shi, Jian-yi, 142
- Shikibu, Murasaki, 88
- sign representation, *see* representation, sign
- sign type, \oplus , 104
- similarity relation, *see* relation, similarity
- Simion, Rodica Eugenia, 76, 79, 87, 163, 165
- Simonyi, Gábor, 152
- simplicial Eulerian lattice, *see* lattice, simplicial Eulerian
- Skandera, Mark Allan, 143
- Sloane, Neil James Alexander, 187, 188
- Smiley, Len, 58
- Smith Barnes, Camillia, 82
- Smith normal form, 122
- smooth permutation, *see* permutation, smooth
- Speicher, Roland, 87
- Stankova-Frenkel, Zvezdelina, 168
- Stanley, Richard Peter, 64, 69, 71, 75, 77, 78, 80, 85, 88, 91, 95, 97, 99, 127, 141–143, 145, 149, 150, 152, 154, 157, 158, 160–162
- Stanton, Dennis Warren, 78
- Stanton, Ralph Gordon, 88, 165
- Stein, Joel Alvin, 143
- Stein, Paul R., 186
- Steinberg, Robert, 88
- Steingrímsson, Einar, 59
- Stembridge, John Reese, 14, 80, 93
- Stephens, Arthur Brooke, 163, 164, 166
- Stevens, Jan, 73, 94
- Stigler's Law of Eponymy, 186
- Strayer, Michael, 60
- Street, Ross Howard, 94
- Strehl, Volker, 93
- strokes, minimum number, 106
- Stump, Christian, 73, 146
- subtree (of a plane tree), *see* tree, plane, subtree
- Sulanke, Robert A., 63, 67, 162, 164
- Sundaram, Sheila, 71
- Sunik, Zoran, 75
- super Catalan number, *see* Catalan number, super
- superfluous edge, *see* edge, superfluous
- symmetric group, *see* group, symmetric
- symplectic group, *see* group symplectic
- table, inversion, 71
- tableau
 - Catalan alternative, 96
 - chess, 90
 - standard Young
 - of shape (n,n) , 44
 - pair of, 45
- Takács, Lajos, 138, 184
- Tale of Genji, The*, 88
- Tamari lattice, *see* lattice, Tamari
- Tamari, Dov, 158
- Tamm, Ulrich, 182
- Tarjan, Robert Endre, 80
- Taylor, Henry Martyn, 183
- Temperley, Harold Neville Vazeille, 67
- Temperley-Lieb algebra, *see* algebra, Temperley-Lieb
- ternary Catalan number, *see* Catalan number, ternary

- Terquem, Olry, 181
 Tewari, Vasu, 148
 theorem
 Abel's, 136
 Chung-Feller, 139
 Kummer's, 134, 135
 Zaslavsky's, 96
 Thomas, Hugh Ross, 98
 Tischler, David D., 142
 Touchard, Jacques, 67
 tree
 alternating, 68, 157
 noncrossing, 68, 157
 $\beta(1,0)$, 59
 binary, 5, 16, 127
 complete, 16
 Hopf algebra, 96
 Catalan, 6
 Fibonacci, 109
 generating, 61, 164
 increasing
 noncrossing, 19
 nonnesting, 19
 j-ary, 108
 ordered, 6
 plane, 6, 16, 126, 127, 183
 bicolored, 18
 subtree, 6
 trivalent, 16
 plane ternary, 110
 planted, 16
 triangle, internal, 102
 triangulation
 Catalan, 131
 of a convex polygon, 1
 of a polygon, 15, 96
 of $\text{conv}\{0, e_i - e_j\}$, 157
 of the Möbius band, 131
 tridiagonal matrix, *see* matrix, tridiagonal
 Trotter, Jr., William Thomas, 92
 Tutte, William Thomas, 145
 two-colored Motzkin path, *see* path, Motzkin,
 two-colored
 Ullman, Daniel Howard, 87
 unimodal, 123
 unit interval graph, *see* graph, unit interval
 unit interval order, *see* order, unit interval
 up step, *see* path, Dyck, up step
 upper asymptotic density, *see* asymptotic
 density, upper
 Väisänen, Kauko, 141
 valid m -set, *see* set, valid m -
 valley (of a Dyck path), *see* path, Dyck,
 valley
 valley (of a Schröder path), *see* path, Schröder,
 valley
 Valtr, Pavel, 154, 156
 van Lint, Jacobus Hendricus, 73
 variety, flag, 167
 variety, Schubert, 104
 Vatter, Vincent Russell, 73
 Vauquelin, Bernard, 163
 Vergne, Michèle, 97, 150
 versal deformation, *see* deformation, versal
 Vetta, Adrian Roshan, 88
 vexillary involution, *see* involution, vexillary
 Viennot, Gérard Xavier, 67, 68, 71, 80, 81, 95,
 96, 146, 158, 167
 volume, relative, 119
 Wachs, Michelle Lynn, 158
 walk, on \mathbb{N} , 126
 Walsh, Timothy Robert Stephen, 146
 Wasanists, 88
 weak (Bruhat) order, *see* order, weak (Bruhat)
 Wedderburn, Joseph Henry Maclagan, 168
 wedge, 56
 Wehlau, David Louis, 93
 Wei, Fan, 166
 Welker, Volkmar, 161
 West, Julian, 61, 79, 164–167
 wheel polynomial, *see* polynomial, wheel
 Whitworth, William Allen, 139, 183
 Wigner, Eugene Paul (Jenő Pál), 73, 75, 168
 Wilf, Herbert Saul, 95
 Wilson, Jennifer, 93
 winding number, *see* number, winding
 Wine, Russell L., 92
 Wisner, Robert Joel, 82
 Woan, Wen-Jin, 61, 67
 Woo, Alexander, 96, 142
 Wormald, Nicholas Charles, 162
 Xin, Guoce, 144
 Yakoubov, Sophia, 147
 Yan, Catherine Huafei, 64, 69
 Yeh, Yeong-Nan, 151
 Young diagram, *see* diagram, Young
 Young, Benjamin J., 99
 Yuen, David ShunWing, 150

Index

215

- Zaks, Shmuel, 87
Zanello, Fabrizio, 78
Zang, Nan, 82
Zare, Douglas J., 168
Zaslavsky's theorem, *see* theorem, Zaslavsky's zebra, 164
Zeilberger, Doron, 84, 138, 143, 150, 166, 188
Zelevinsky, Andrei Vladlenovich, 159
Zeng, Jiang, 68
Zhang, Yan, 157
Ziegler, Günter, 159
Zinn-Justin, Paul, 143