

Index

- α_i : simple roots, 1–417
 additional series (A_1) , 231, 233, 251
 affine r -matrix, 112
 affine action $(wb)((z))$, 300
 affine Hecke algebra \mathcal{H} , 61, 312
 affine KZ equation (A_1) , 48
 affine pairing $([z, l], z' + d)$, 300
 affine quantum KZ (GL_n) , 78
 affine root system, 118, 295
 affine Weyl chamber \mathfrak{C}^a , 119, 300
 affine Weyl chamber $\bar{\mathfrak{C}}^a$, 125
 affine Weyl group $\widehat{\mathfrak{S}}_n$, 79
 affine Weyl group \widetilde{W} , 112, 262, 295
 affine Weyl group \widehat{W} , 112, 295
 AKZ, 48, 52, 55
 anti-involution ϕ , 95, 200, 318
 anti-involution ϕ , GL_n , 102
 anti-involution \star , 308
 anti-involution X -trivial, 380, 383
 anti-involution trivial, 57
 Appell function $A(k, \tau)$, 182
 AQKZ, 78
 asymptotically free solution, 63
 automorphism σ , 213, 272, 307
 automorphisms τ_{\pm} , 272, 307

 Baker function φ , 151
 basic hypergeometric function, 161
 Baxter–Belavin r -matrix, 151
 baxterization (affine), 90
 bilinear form (\ast -bilinear), 314
 boundary of δ , 360
 braid group (elliptic), 216
 braid group (pure), 104
 braid group (universal), 413

 \mathbb{C} : complex numbers, 1–417
 category \mathcal{O} , 343
 central extension $\widehat{\mathfrak{g}}$, 132
 central extension $(PGL(2, \mathbb{Z}))$, 392
 chain (integral formulas), 143
 characteristic functions χ_m , 221
 characteristic functions $\chi_{\widehat{w}}$, 327
 coinvariant $\pi(\widehat{\mathfrak{g}})$, 138
 coinvariant π (KZB), 153
 coinvariants ϖ (DAHA), 371, 372
 commutativity relations (Hecke), 77
 compact case, 164
 component of a diagram, 143
 composition of paths, 60, 217
 conjugation on polynomials, 199
 constant term CT , 168
 constituents of \mathcal{I}_{ξ} (DAHA), 385
 convex set of roots, 302
 coroot α^{\vee} , 262
 cospherical forms ϖ , 371, 372
 cospherical module (DAHA), 371
 Coxeter number h , 339
 Coxeter relations (Hecke), 61, 77
 creation operator (A_1) , 197
 cross-relations (Hecke), 77
 cutoffs, 68
 cyclic module (X, Y) , 344, 345

 DAHA, 100, 120, 306
 definite form for X, Y , 345, 346
 degenerate DAHA \mathcal{H}' , 120, 274
 degenerate DAHA \mathcal{H}'' , 190, 277
 degenerate DAHA \mathcal{H}'_0 , 115
 degenerate Hecke algebra \mathcal{H}'_n , 52
 degenerate Hecke algebra \mathcal{H}'_{A_1} , 49
 degenerate Hecke algebra \mathcal{H}' , 53, 109

- delta functions $\delta_m(A_1)$, 221
 delta functions $\delta_{\hat{w}}$, 327
 delta-representation Δ , 383
 Demazure–Lusztig operators \hat{T}_i , 310
 Demazure–Lusztig operators S_i , 122
 diagonal coinvariants, 279, 412
 diagram δ (generalized), 369
 diagram δ (periodic), 360, 362
 diagram (integral formulas), 143
 discretization δ (DAHA), 326
 discretization (A_1) , 97, 213
 double Hecke algebra, 100, 120, 306
 double Hecke algebra (A_1) , 95, 198
 double Hecke algebra (GL_n) , 100, 357
 double Hecke algebra (rational), 277
 double Hecke universal, 414
 duality formula (A_1) , 94, 200
 duality formula (GL_n) , 99
 duality formula (DAHA), 318, 396
 Dunkl operators (difference), 122, 273
 Dunkl operators (infinite), 113
 Dunkl operators (no shifts), 71, 111
 Dunkl operators (rational), 190, 277
 Dunkl operators (trig), 75, 121, 275
 Dunkl operators (universal), 415

 E_b, \mathcal{E}_b : nonsym polynomials, 314
 e_n, ε_n : nonsym polynomials, 197
 ε involution, 213, 272, 307
 η involution, 202, 308
 eigenvectors $v(X, Y)$, 343
 elliptic Weyl group (GL_n) , 101
 evaluation formula, 98, 100, 206
 evaluation formula (DAHA), 317, 319
 evaluation map (A_1) , 96, 200
 expectation value $\{H\}_0(A_1)$, 95
 extended Weyl group, 112, 262, 295

 Φ : solution of KZ, QKZ, 1–153
 φ : solution of QMBP, 1–153
 $\Phi_{\hat{w}}, S_{\hat{w}}, G_{\hat{w}}$: intertwiners, 281–417
 \mathfrak{F}, \mathbf{F} , 326, 383
 ϕ anti-involution, 95, 200, 318
 factorized KM algebra $(\hat{\mathfrak{g}})$, 132

 factorizing subalgebra $\tilde{\mathfrak{g}}_r$, 132
 Fourier transform $\mathbf{S}(A_1)$, 213
 Fourier transform $\mathbf{E}(A_1)$, 213
 Fourier transforms $\bar{\mathbf{S}}, \bar{\mathbf{E}}(A_1)$, 223
 Fourier transform φ_{\circ} , 328
 Fourier transform ψ_{\circ} (skew), 328
 Fourier transforms $\bar{\varphi}_{\circ}, \bar{\psi}_{\circ}$, 330
 Fourier–Jackson transform φ_{\bullet} , 335
 Fourier–Jackson transform ψ_{\bullet} , 335
 functional representation, 326, 383

 Gaudin model, 151
 Gaussian γ , 233, 331
 Gaussian γ (restricted), 393
 Gaussian sum τ (generalized), 163

 $\mathcal{H}, \mathcal{H}_n, \mathcal{H}^b$, 100, 306, 311
 $\mathcal{H}, \mathcal{H}_X, \mathcal{H}_Y$, 61, 312
 $\mathcal{H}'_{\Sigma}, \mathcal{H}'$, 54, 109
 $\mathcal{H}', \mathcal{H}''$, 120, 190, 277
 \mathbf{H}_n : nonaffine Hecke, 100, 359, 367
 \mathbf{H} : nonaffine Hecke, 308, 383, 409
 \heartsuit anti-involution, 318, 330, 397
 Hankel transform, 186, 188, 194
 Hankel transform $\mathbf{H}_{re,im}$, 162
 Harish-Chandra function σ , 122
 Harish-Chandra transform, 116
 Hecke algebra \mathbf{H} , 308, 383, 409
 Hecke algebra \mathbf{H}_n , 100, 359, 367
 Heckman–Opdam operators L'_p , 123
 hypergeometric function, 123

 induced module $\mathcal{I}_X[\xi]$ (DAHA), 344
 induced module $I_{\lambda}(\mathcal{H}'_{\Sigma})$, 57
 intermediate subalgebras \mathcal{H}^b , 311
 intertwiners f_w (degenerate), 58
 intertwiners $F_w(u)$ (affine, GL_n), 78
 intertwiners $\Psi'_{\hat{w}}$ (degenerate), 120
 intertwiners $\Phi_{\hat{w}}$ (DAHA), 320, 321
 intertwiners normalized, 274, 320
 intertwining operator $\Pi(A_1)$, 205
 invariance (AKZ, \mathbb{S}_n), 52
 invariance (AKZ, W), 54
 invariance (QAKZ, W), 78

- invariant form (\star -invariant), 345
 invariant module ($PGL^c(2, \mathbb{Z})$), 392
 invariants v (DAHA), 371, 372
 inverse order in δ , 359
 inversion (\mathcal{H}'), 125
 inversion (A_1), 162, 189, 224
 inversion (A_1 , truncated), 194
 inversion (DAHA), 268, 337–339
 involution η , 202, 308
 involution ε , 213, 272, 307
 involution $r \mapsto r^*$, 271
- Jackson master formula, 224
 Jackson sum, 176, 334
 Jucys–Murphy generators, 67
- k -function, 108, 306
 Kazhdan–Lusztig involution, 202, 308
 Kodaira–Spencer map, 35, 220
 KZ (r -matrix), 135
- λ regular (A_1), 238
 λ half-singular (A_1), 238
 λ singular (A_1), 238
 length $l(\hat{w})$, 119, 262, 296
 little Verlinde algebra, 260
 Lusztig map, 276, 278
- Macdonald operators, 84, 316
 Macdonald polynomials P_b , 316
 Macdonald polynomials p_λ , 99
 Macdonald problem, 84
 maximal root θ , 118
 maximal short root ϑ , 262, 295
 Mehta–Macdonald intg, 289, 332
 Mellin transform Ψ , 171, 174
 monodromy (AKZ), 62, 69
 monodromy cocycle (QAKZ), 81
 monomial functions, 316
- \mathbb{N} : natural numbers, 1–417
 new points (integral formulas), 142
 noncompact case, 165
 nonsymmetric polynomials E_b , 314
 nonsymmetric polynomials e_n , 197
- nonsymmetric Verlinde algebra, 248
 norm formula, 206, 325, 330
- old points (integral formulas), 142
 Opdam transform \mathcal{F} , 124
 Opdam transform \mathcal{G} (inverse), 125
- P_b, p_n : sym polynomials, 93, 316
 P : weight lattice, 1–417
 π_r : elements from P^\vee/Q^\vee , 1–417
 \mathcal{P} : polynomial rep, 1–280
 pair $\{\Delta, C\}$, 359
 pair $\{\Delta, C\}$ (generalized), 369
 pair $\{\Delta, C\}$ (new), 363
 pairs $\{\Delta, C\}$ (equivalent), 364
 partition of δ , 362
 partition increasing, 362
 partition of δ new, 363
 partition ordered, 363
 perfect module (DAHA), 399
 perfect representation (A_1), 248
 Pieri formula (A_1), 97, 98, 206
 Pieri formula (GL_n), 99
 Plancherel \mathcal{H} , 268, 336–338
 Plancherel A_1 , 190, 194, 221
 polynomial rep, 273, 310, 372
 polynomial rep A_1 , 96, 190
 polynomial rep (rational), 277
 primitive module (DAHA), 373
 primitive weight ξ_o , 382, 386, 388
 principal module (DAHA), 373
 principal-special (A_1), 238
 pseudo-hermitian form, 345
 pseudo-unitary module, 248, 345
- \mathbb{Q} : rational numbers, 1–417
 Q : root lattice, 1–417
 QMBP, 60, 74
 quadratic relations (Hecke), 77
 quantum many-body problem, 60
- \mathbb{R} : real numbers, 1–417
 R, r : r -matrices, 1–153
 R : root system, 281–417

- ρ , 294, 306
 radial part $L^{(k)}(SO_2)$, 92
 range $\Upsilon_+[\xi]$ (plus), 346
 range $\check{\Upsilon}_+[\xi]$ (boundary), 346
 range $\Upsilon_-(\xi)$ (minus), 347
 range $\Upsilon_*[\xi]$ (semisimple), 347
 range $\Upsilon_0[\xi]$ (zero), 347
 range $\Upsilon_+[-\rho_k]$ (sharp), 348
 reflection $r \mapsto r^*$, 271
 restricted category, 287
 rho ρ , 294, 306
 r -matrix (affine), 112
 r -matrix (extension of), 108
 r -matrix (invariant), 108
 r -matrix (unitary), 131, 140
 Rogers polynomials p_n , 93, 195
 root (extreme, η -identities), 339
 \mathbb{S}_n : permutation group, 1–417
 Σ : root system, 1–153
 s_i : simple reflections, 1–417
 σ automorphism, 213, 272, 307
 \star anti-involution, 308
 self-consistent (AKZ), 54
 self-dual module (DAHA), 392
 semi-classical limit (QAKZ), 79
 semisimple module (X, Y) , 345
 shift formula, 189
 shift operator S , 171
 skew diagram, 358
 skew paths in δ , 361
 spectrum (X, Y) , 345
 spherical irrep (A_1) , 248
 spherical module (DAHA), 371
 spherical polynomials \mathcal{E}_b , 317
 spherical rep Δ^+ , 263
 spherical vectors, 371, 372
 stabilizer $\widehat{W}^b[\xi]$, 343, 347
 standard invariant form (\mathfrak{g}) , 130
 standard roots α, β , 106
 standard subsystem (rk=2), 108
 subdiagram basic, 360
 subdiagram fundamental, 361
 subdiagram of δ , 360
 subpair fundamental, 363
 subpairs equivalent, 365
 Sugawara elements L_{-1}^i , 139
 symmetrizer, 263
 τ_{\pm} automorphisms, 272, 307
 τ -function, 45
 τ -function (r -matrix), 136
 trace on J_{λ} , 72
 truncated θ -function, 169, 316
 ultraspherical polynomials, 93
 unitary automorphism, 308
 unitary module for X, Y , 345, 346
 \mathcal{V} : polynomial rep, 372–417
 vacuum vector, 141
 Verlinde algebra (A_1) , 248
 Verlinde algebra (DAHA), 403
 Verlinde algebra (little), 260
 Verma module, 46
 $\widetilde{W}, \widehat{W}$: affine Weyl groups, 295
 weights ξ (GL), 359
 weights ξ (X, Y) , 343
 well-ordered diagram, 143
 Weyl group W , 53, 293
 Weyl module $M_V(\widehat{\mathfrak{g}})$, 138
 \mathbb{Z} : integers, 1–417