Index

A

Abel map .. 30, 140, 188, 406, **562**
Abelian differentials 187, 286, **559**
abelianization 36, 65
action–angle variables **10**, 164, 510
adjoint action **572**
adjoint linear system **138**, 345
adjoint representation **574**
Adler trace **340**, 459
AKS scheme **92**, 116, 341
Arnold theorem 10

B

Bäcklund transformations **71**
Baker–Akhiezer function **149**, 186, 188, 220, 227, 285, 329, 335, 344, 349, 387, 401
bihamiltonian structure .. **363**, 392
bilinear identities 346
Bloch solutions .195, **226**, 385, 408
bosonization **308**

C

Calogero–Moser model .. **206**, 214, 242, 244
canonical bundle **552**
canonical coordinates 161, 193, 197, **519**
canonical cycles **559**
canonical transformation 8, 11
Cartan matrix **579**
Cartan subalgebra .. 110, 445, **575**
Casimir operator . 45, 46, 102, 300, 307, **582**
Cauchy determinant **311**
central extension 63, 365
chiral fields 443, 470
classical double **537**
coadjoint action **41**, 94
coadjoint orbit 41, 44, 94, 103, 115, 127, 156
conformal invariance 392, **444**, 463, 468
coproduct **580**
cotangent bundle 233, **521**

D

Darboux theorem 10, **519**
degenerate Poisson bracket ... **517**
degree of divisor **553**
desingularization ... 133, 170, **546**, 548
divisor **553**
dressing transformation **74**, 76, 463, 471, 542
Drinfeld–Sokolov construction **364**, 450
dualization **87**
dynamical divisor .. 130, **135**, 141, 183, 193, 220, 403

E

eigenvector bundle . **130**, 153, 183, 218
elementary flows **49**
elliptic functions 206, **567**
equivalent divisors **553**
Euler top **19**, 33, 40, 48
exchange algebra **455**
exponential map **572**

F

factorization . **55**, 57, 96, 153, 463, 496
fermions **303**, 395
finite zone solutions **175**, 228, 408, 483
Fock space **303**
Fuchs relation **260**, 283

G

Gaudin model **240**
Gelfand–Dickey **38**, 68, 337
Gelfand–Levitan–Marchenko .. **498**
genus 126, **549**
geodesics 25, 110
Grassmannian **316**, 331

H

Hamilton–Jacobi equation 163
Hamiltonian reduction .....
24, 109, 118, 128, 207, 233, 244, 366, **529**
Hamiltonian vector field ... 9, **518**
hierarchy **53**, 74, 249, 341
highest root **579**
highest weight 448, **581**, 591
Hirota equation **280**, 302, **314**, 394, 452
Hirota operators **280**, 302, 313, 394
Hitchin systems **232**
hyperelliptic curve .. 181, 379, 400, 482, **547**

I

irregular singular points **252**
isomonodromic flows 265, **266**
isospectral **12**
Iwasawa decomposition **110**

J

Jacobi identity 15
Jacobi matrices **105**
Jacobi problem **25**
Jacobi–Trudy formula 326
Jacobian torus 145, **562**
Jacobian variety 30, **562**
Jost solutions **487**

K

Kac–Moody algebra 179, 468, **587**
KdV equation **356**
KdV Hamiltonians 356, **389**
KdV hierarchy **355**, **386**
Kepler problem **17**
Killing form **575**
Kirillov symplectic form **524**
Kostant–Kirillov bracket 43, 44, 88, 156, 207, 357, **523**, 534
Kowalevski top **22**, 120, 169
KP equation **344**
KP hierarchy .. 228, 281, 330, **341**

L

Lagrange top **20**, 34, 41
Lamé function 209, **568**
Lax connection ... **64**, 74, 446, 469
Lax equation .. **11**, 35, 42, 95, 142, 180, 209, 399
Lax pair .. **11**, 13, 95, 96, 121, 179
level of representation **592**
Lie–Poisson action **538**
line bundle **551**
linear system 53, **63**, 125, 186, 401, 484
linearization **143**, 406
Liouville equation **443**
Liouville theorem **7**, 10
Liouville tori **10**, 164, 203
loop algebra 42, 93, **587**

M

matrix of periods **559**
Miura transformation ... **360**, 449, 457
moment map .. 112, 233, 244, 366, **528**, 533
monodromy matrix **63**, 72, 79, 194, 259, 384, 467, 506

N

Neumann model **23**, 27, 34, 41, 49, 128, 137, 146, 162, 164
Noether theorem **528**
non–Abelian Hamiltonian .79, 467, **539**, 543
normal order **304**
null vectors **425**

O

operator ∇ 61, 277, 354, 390

P

Painlevé property **290**
path–ordered exponential 64
phase shift 398
Plücker relations **317**
point bundle **552**
Poisson bracket 6, **516**
Poisson manifold **517**
Poisson–Lie group ... 78, 465, **534**, 535

Poissonnian action **526**
polar part 35
product of bundles **552**
Prym variety 174
pseudo differential operators ..328, **338**, 386, 459

R

$R^{\pm}$ projectors 78, 181, 464
r–bracket **87**, 541
r–matrix ...**14**, 45, 72, 78, 87, 100, 102, 180, 210, 506
rank of an algebra **575**
reality conditions 200, 409
reduced Poisson bracket .114, **531**, 532
reduction group 40
regular singular points **251**
representation **574**
representation of Lie algebras . 108
Ricatti equations 277, 386
Riemann bilinear identity 155, 287, 436, **560**, 561
Riemann problem **261**
Riemann surface 30, **545**
Riemann theorem 222, **564**
Riemann's constants **564**
Riemann–Hilbert ...**54**, 57, 74, 80, 236, 261, 496, 568
Riemann–Hurwitz formula 126, 172, 182, 218, 284, **549**
Riemann–Roch 135, 186, 235, **556**, 557, 558
root 98, 110, **576**
Ruijsenaars–Schneider model . **480**

S

Sato's formula ...60, **279**, 335, 352
scattering data 487, **490**, 497
Schlesinger equations **269**, 273
Schlesinger transformation **270**
Schroedinger discrete **183**
Schroedinger equation 383
Schur polynomials **322**
Schwarzian derivative **445**
section of bundle **551**
Semenov–Tian–Shansky bracket .. 466, **541**
semi infinite wedge product ... **319**
semi–simple Lie algebra **575**
separation of variables . 18, 27, 28, 162, 418
Serre relations **579**, 590
sigma model **69**, 83
sine–Gordon hierarchy ... 471, 473
sine–Gordon model ...**70**, 467, 486
Sklyanin bracket **72**, 196, 454, 506, 540
soliton solutions **79**, 314, 395, 419, 471, 502
spectral curve ..**125**, 181, 216, 399
spectral parameter 33, **35**, 62
stationary flows 175, 399
Stokes matrix **256**
Stokes sectors 253, **256**
symmetric spaces 110, 118, 244
symplectic form . 44, 160, 191, 199, 224, 415, 423, 475, **516**
symplectic transformations ... **518**

T

tau function **59**, 109, 154, 189, 274, 288, 300, **311**, 322, 333, 352, 394, 422, 451, 472
tensor notation **14**
theta function . 145, 150, 188, 222, 402, **563**
Toda chain closed **178**
Toda chain open **97**
Toda field 445
topological charge **474**, 487
twisted algebra **589**

U

ultralocality **72**, 454

V

Verma module **582**
vertex operator 300, **310**, 472, 592
Virasoro algebra 363, 392, 456
Volterra group **341**

W

wave function **53**, 58, 64, 70, 150, 183, 226, 329, 344, 383, 447
weight **581**, 590
Weyl group 106, **578**
Weyl vector 446
Whitham average **374**, 433
Whitham equations 378, 440
Wick theorem **304**

Y

Yang–Baxter equation . 16, 47, **88**, 102, 213, 538
Yang–Baxter modified equation **88**, 92, 102
Young diagram **321**

Z

Zakharov–Shabat .. **35**, 65, 74, 249
zero curvature 51, 63, 250, 445
zones allowed 200, 409
zones forbidden 200, 409