

Index

- absorption, 97
 - resonance, 111
- accelerators
 - Alvarez, 169
 - Cockcroft–Wolton, 168
 - Videroë, 168
- accumulation ring, 169
- Alfvén limit, 143
- ambipolar diffusion, 114
- angle of deflection, 45, 46
- annealing effect, 195

- back current 143
- banana path, 64
 - region, 64
- baseball field, 77
- beta value, 43
- Bethe equation, 163
- blanket (gas) *see* diverter
- blistering, 180
- Blumlein line, 138
- Bohm diffusion, 61
- Bohm–Gross wave *see* electron plasma wave
- Boltzmann constant, 13
- bremstrahlung, 19, 182
 - inverse, 97
- bumpy torus, 78
- burn fraction, 177
- burning time, 173

- cannonball target, 135
- central plasma, 175
- Child–Langmuir current, 142
- coefficient
 - classical, 59
 - diffusion, 58
 - neoclassical, 63
- collector, 206
- collision
 - cross-sectional area, 14
 - frequency, 15
 - rate, 16
- compact torus, 78
- confinement time, 22, 60

- Coulomb logarithm, 49
- critical number density, 97
 - surface, 97
- cusp field, 74
- cyclotron motion, 25
 - frequency, 26
 - radiation, 182

- Debye radius, 47
- deflagration wave, 117
- degeneracies, 124
- dielectric constant, 6
 - ratio of, 95
- dispersion relation, 67, 69
- displacement current, 34
- diverter, 174, 183–4
- Doppler shift, 105
- drift frequency, 67
 - motion, 27–30
- D–T reaction, 187

- eigenvalue problem, 69
- electric charge, 5
 - conductivity, 50
- electron, 6
 - beams, 136
 - plasma wave, 100
- elementary particles, 6
- energy
 - atomic, 6
 - driver, 86
 - heat, 4
 - kinetic, 4
 - pay rate, 3
 - potential, 4
 - renewable, 1
 - rest, 6
 - total, 4
- expander, 206

- first wall, 174, 178*ff*
- fission, nuclear, 9
- flux jump, 192

- fuel
 fossil, non-renewable, 2
 resources, 218
 supply, 175
- guiding centre, 27
 gyrofrequency *see* cyclotron frequency
- heat of reaction, 5
 heating
 alpha particle, 175
 internal, 175
 neutral-beam, 50
 primary, 50
 secondary, 51
 wave, 52
- heavy-ion beam, 167
 heliotron, 72
 hydrodynamic efficiency, 86
- implosion, 90, 113*ff*
 induced radio-activities, 187, 220
 induction equation, 34
 inertial confinement, 85
 instability
 absolute, 104
 backward-scattering, 106
 decay, 100
 drift-wave, 66
 exchange, 77
 flute, 65
 ion sound wave, 158
 kink, 38
 macro, 65
 micro, 65
 oscillative two-stream, 104
 parametric, 100
 Rayleigh-Taylor, 117
 sausage, 37
 spiral (screw), 42
 trapped-particle, 68
 two-stream, 145
 Weibel, 146
- inertial confinement 85*ff*
 inverse population, 123
 ion cyclotron resonance, 52
 isotopes, 5
- Kruskal-Shafranov limit, 43, 72
 KDP, 112
- large signal gain, 125
 Larmor frequency *see* cyclotron
 frequency
 radius, 27
- lasers, 121*ff*
 carbon dioxide, 128
 excimer, 132
 free-electron, 133
 hydrogen fluoride, 131
 iodine, 130
- Lawson criterion, 22, 88
 light-ion beam, 147
 limiter, 183
 Lorentz force, 33
 loss cone, 74
 lower hybrid wave, 52
- magnetic confinement, 25
 surface, 56
 magnetic insulation
 transmission line, 150
 diode, 152
 major radius, 43
 Marx generator, 137
 mass deficiency, 9
 Maxwell stress, 33
 equations, 33
 Maxwellian distribution, 15
 MHD generator, 205
 mean collision time, 49
 mean free path, 15
 minimum-B field, 77
- negative entropy, 2
 neodymium, 125
 neutron multiplication, 188
 nonlinear optical crystal, 113
 number density, 13
- Ohm's law, 33
- P-polarised, 108
 particle balance, 177
 Pfirsch-Schlütter factor, 63
 pinch effect, 36
 Planck's constant, 21
 plasma, 13
 channel, 155
 erosion opening switch, 139
 focus, 84
 oscillation, 92
 poloidal field, 44
 ponderomotive force, 103
 power density, 197
 primary knock-on atom, 185
 principal axis, 45
 probabilities, transition, 122
 projectile, 167, 169
 pulse operation, 194
 forming line, 139

- pusher, 89
 quasi-neutral field, 34
 radiation damage, 194
 Raman scattering, 107
 Rankin–Hugoniot relation, 83
 rational surface, 57
 reactors
 D–T, 172
 fast breeder, 10
 hybrid, 203
 laser fusion, 208
 light water, 9
 mirror, 202
 open-end, 172
 prototype, 201
 proving, 201
 pulsed, 173
 quasi-steady, 173
 steady, 173
 solase, 210
 test, 201
 torus, 172
 waterfall, 212
 remote handling, 195
 resonance conditions, 100
 resource materials, 219
 rest mass, 6
 rotational transfer angle, 56

 S-polarised, 108
 safety, 219
 factor, 56
 problems, 220
 scaling laws, 196
 scattering
 Brillouin, 101
 Raman, 101
 stimulated, 108
 self-heating, 21

 self-ignition temperature, 21
 separator, 206
 shear, 57
 shield layer, 174
 small signal gain, 124
 coefficient, 124
 sputtering, 179
 stellarator, 72
 stimulated emission, 124
 stopping power, 144
 storage ring, 169
 superconducting magnet, 191, 223
 suprathreshold electrons, 112
 surface, rational, 57
 irrational, 56
 susceptibility, 33
 swelling, 186

 T-breeding, 188
 tamper, 89
 target gain, 166
 temperature, 13
 thermal-pinch machine, 80
 theta-pinch machine, 80
 threshold, 105
 Tokamak, 43, 196*ff*
 toroidal field, 44
 magnet, 199
 transformer coils, 197
 tunnel effect, 14

 under-density plasma, 95

 velocity distribution functions, 13
 Vlasov equations, 67

 wall loading, 178

 Yin-Yang coil, 203

 z-pinch machine, 84