

## Physical Constants

Speed of light	$c$	$2.997\,924\,58 \cdot 10^8 \text{ m s}^{-1}$
Planck's constant	$h$	$6.626\,069\,3 (11) \cdot 10^{-34} \text{ J s}$
	$\hbar = h/2\pi$	$1.054\,571\,68 (18) \cdot 10^{-34} \text{ J s}$ $= 6.582\,119\,15 (56) \cdot 10^{-22} \text{ MeV s}$
	$\hbar c$ $(\hbar c)^2$	$197.326\,967 (17) \text{ MeV fm}$ $0.389\,379\,323 (67) \text{ GeV}^2 \text{ mbarn}$
Atomic mass unit	$u = M_{12\text{C}}/12$	$931.494\,043 (80) \text{ MeV}/c^2$
Mass of the proton	$m_{\text{p}}$	$938.272\,029 (80) \text{ MeV}/c^2$
Mass of the neutron	$m_{\text{n}}$	$939.565\,36 (8) \text{ MeV}/c^2$
Mass of the electron	$m_{\text{e}}$	$0.510\,998\,918 (44) \text{ MeV}/c^2$
Elementary charge	$e$	$1.602\,177\,33 (49) \cdot 10^{-19} \text{ A s}$
Dielectric constant	$\varepsilon_0 = 1/\mu_0 c^2$	$8.854\,187\,817 \cdot 10^{-12} \text{ A s/V m}$
Permeability of vacuum	$\mu_0$	$4\pi \cdot 10^{-7} \text{ V s/A m}$
Fine structure constant	$\alpha = e^2/4\pi\varepsilon_0\hbar c$	$1/137.035\,999\,11 (46)$
Class. electron radius	$r_{\text{e}} = \alpha\hbar c/m_{\text{e}}c^2$	$2.817\,940\,325 (28) \cdot 10^{-15} \text{ m}$
Compton wavelength	$\lambda_{\text{c}} = r_{\text{e}}/\alpha$	$3.861\,592\,678 (26) \cdot 10^{-13} \text{ m}$
Bohr radius	$a_0 = r_{\text{e}}/\alpha^2$	$5.291\,772\,108 (18) \cdot 10^{-11} \text{ m}$
Bohr magneton	$\mu_{\text{B}} = e\hbar/2m_{\text{e}}$	$5.788\,381\,804 (39) \cdot 10^{-11} \text{ MeV T}^{-1}$
Nuclear magneton	$\mu_{\text{N}} = e\hbar/2m_{\text{p}}$	$3.152\,451\,259 (21) \cdot 10^{-14} \text{ MeV T}^{-1}$
Magnetic moment	$\mu_{\text{e}}$	$1.001\,159\,652\,187 (4) \mu_{\text{B}}$
	$\mu_{\text{p}}$	$2.792\,847\,351 (28) \mu_{\text{N}}$
	$\mu_{\text{n}}$	$-1.913\,042\,7 (5) \mu_{\text{N}}$
Avogadro's number	$N_{\text{A}}$	$6.022\,1415 (10) \cdot 10^{23} \text{ mol}^{-1}$
Boltzmann's constant	$k$	$1.380\,6505 (24) \cdot 10^{-23} \text{ J K}^{-1}$
		$= 8.617\,343 (15) \cdot 10^{-5} \text{ eV K}^{-1}$
Gravitational constant	$G$	$6.6742 (10) \cdot 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$
	$G/\hbar c$	$6.707\,11 (86) \cdot 10^{-39} (\text{GeV}/c^2)^{-2}$
Fermi constant	$G_{\text{F}}/(\hbar c)^3$	$1.166\,37 (1) \cdot 10^{-5} \text{ GeV}^{-2}$
Weinberg angle	$\sin^2 \theta_{\text{W}}$	$0.231\,20 (15)$
Mass of the $W^{\pm}$	$M_{\text{W}}$	$80.425 (38) \text{ GeV}/c^2$
Mass of the $Z^0$	$M_{\text{Z}}$	$91.1876 (21) \text{ GeV}/c^2$
Strong coupling const.	$\alpha_{\text{s}}(M_{\text{Z}}^2 c^2)$	$0.1187 (20)$

## Literature

S. Eideman et al., Phys. Lett. **B592** (2004) 1

Particle Data Group, D. E. Groom et al.: *Review of Particle Properties*  
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## Index

- Age of the universe 242  
 $\alpha$ -Helix 113  
 Antiferromagnetism 71  
 Antineutrinos 34  
 Antiquarks 34  
 Argon 9  
 Asteroids 191, 209, 211  
     Ceres 211  
 Atomic radius 9, 64  
  
 Baryons 78  
 $\beta$  decay 225  
 beta pleated sheet  $\beta$ -pleated  
     sheet 113  
 Big bang 239–241, 248  
 Binding 159  
 Binding energy  
     of atoms 64, 95  
     of metals 161  
     of nuclei 178, 179  
     of the deuteron 134, 135  
     of the helium atom 61  
     of the hydrogen atom 46  
 Black holes 207  
 Bohr magneton 255  
 Bohr radius 22, 46, 65, 255  
 Bond  
     covalent 95, 100, 110, 133  
     hydrogen bridge 109, 111–  
         113  
     ionic 95  
     metallic 95, 161  
     peptide 112  
  
 Bond energy  
     molecular 100, 102  
 Bose condensate 139, 152, 164,  
     167  
 Bose liquid 117  
 Bose–Einstein condensation 143  
     occupation number 146  
 Bose–Einstein statistics 127  
 Boson  
     Higgs 232  
     W 24, 213, 214, 216, 226  
     weak 229  
      $Z^0$  23, 226  
 Bosonic gas 143, 146, 152  
 Bosonic liquids 149, 152  
 Bottomium 76, 77  
 Bragg scattering 117  
 Bremsstrahlung 28  
     of gluons 34, 37, 39  
     of photons 39  
     spectrum 29  
 Brown dwarfs 196  
  
 Cabibbo 214, 217  
 Cabibbo-Kobayashi-Maskawa ma-  
     trix 215  
 Carbon 100  
     synthesis 203, 204  
 Casimir effect 105  
 Casimir force 108  
 Charge distribution 20, 22  
 Charge radius 21  
 Charmonium 75, 77

- Chiral symmetry breaking 143  
Chirality 81, 217  
Cobalt 70  
Cold neutrons 117  
Collective excitation 152, 182, 185  
Collective ground state 152  
Collective state 90, 93, 123, 156, 183, 184  
Colour 40  
Compton scattering 12, 14  
Compton wavelength 49  
Condensate 143, 145, 151  
Conductivity  
  electrical 159, 164  
  thermal 159, 173, 174  
Confinement 27, 41  
Confinement potential 76  
  in a trap 143, 145  
Constituent mass 84, 85  
Constituent quark 22, 75, 81, 82  
  masses 79, 84  
Cooper pairs 149, 156, 164, 166, 188  
Correlations 62  
Cosmic microwave background radiation 244  
Coulomb potential 46  
  effective 58  
  strong 76  
Coupling  
  electromagnetic 22  
  strong 22  
  weak 240  
Coupling constant 40  
  electromagnetic 16, 41, 45, 232, 234  
  gravitational 194, 252  
  running 233  
  strong 40, 43, 78, 234  
  weak 23, 25, 44, 225, 232, 234  
Covalent bond 162  
CP violation 218  
Critical density  
  of the universe 242  
Critical temperature 145  
Cross-section  
  electron-quark 34  
  photon-electron 34  
Crystal 117  
  defect 121  
Crystal lattice 159  
CsI 101  
Cubic crystal 119  
Curie law 72, 73  
Curie point 72  
Current density 164  
Cut-off 85  
Dark energy 248  
Dark matter 248, 250  
Darwin term 50  
de Broglie rule 46  
de Broglie wavelength 46, 134, 141–143, 151, 178  
  thermal 141  
Debye  
  approximation 127  
  formula 128  
  frequency 127, 165  
  model 12  
  speed 127  
  temperature 12, 127  
Debye–Waller factor 12  
Decoupling  
  of gravitation 249  
  of radiation 246  
Deep inelastic scattering *see*  
  Quasi-elastic scattering  
  ing  
Deformation 186, 188  
  energy 188  
Degeneracy pressure 195  
Degenerate fermion systems 191  
Deuteron 131, 134  
Diamagnetism 71

- Dipole moment 105  
  electric 103, 109, 110
- Dipole oscillations 105
- Dipole-dipole interaction energy 55
- Dirac sea 80, 89
- Dispersion curve 126  
  of glass 117  
  of Bose liquids 117  
  of crystals 117  
  of Fermi liquids 117  
  of liquid  $^3\text{He}$  150  
  of superfluid  $^4\text{He}$  152
- Dispersion relation  
  of amorphous substances 125  
  of crystals 118, 119
- DNA 112
- Doublet of weak isospin 229
- Drift velocity 164
- $e^+e^-$ -annihilation 37
- Earth  
  crust 210, 211  
  mantle 210
- Elastic scattering *see* Scattering
- Electron  
  magnetic moment 255
- Electron distribution 162  
  in the hydrogen molecule 97, 110
- Electron gas 174
- Electron radius  
  classical 2, 4, 8
- Electron scattering  
  off nuclei 178  
  off the nucleon 20
- Electron speed 165
- Electron-positron pairs 7, 8, 41
- Electron-nucleon scattering 20
- Electron-positron collider 213
- Electrons in metals 149
- Ellipsoid  
  oblate/lens shaped 187  
  prolate/cigar shaped 186
- Energy gap 164
- Energy production in the sun 191, 197
- Enzyme 115
- Equation of state  
  stellar 192
- Equilibrium  
  hydrostatic 192, 195  
  thermal 191
- Evaporation cooling 140
- Expanding universe 241
- Family 213, 214, 228
- Fermi  
  energy 141, 179  
  gas 141, 142, 159, 164  
  gas model 139  
  liquid 117, 135, 149, 177, 182, 188  
  momentum 141, 178  
  sea 89  
  surface 149, 164, 177  
  temperature 140, 141  
  velocity 164
- Fermi constant 26
- Fermion, mass 233
- Ferromagnetism 71
- Final stages of stars 191
- Fine structure constant 45
- Finite extension of the proton 53
- Flat universe 242
- Flavour 43
- Form factor 8, 20  
  dipole fit 21  
  dynamical interpretation 10  
  geometrical interpretation 8  
  of crystals 9  
  of the atom 8  
  of the proton 21

- Four-momentum transfer 17, 19
- Freeze out  
of neutrons 247
- Friedmann model 242, 243
- Fusion 191
- Gamow factor 197
- Gap equation 85
- Giant resonance 89, 181, 182
- Glashow, Iliopoulos, Maiani 215
- Glass 117
- Gluon structure function 39
- Gluon bremsstrahlung 37
- Gluon field 32
- Gluon structure function 39
- Gluons 27, 32, 34, 37, 40, 43
- Goldstone boson 92, 93
- Goldstone theorem 92
- Grand unified theory 233–235, 252
- Gravitation 191, 239, 252
- Gravitational constant 192, 194, 252
- Gravitational pressure 194, 196, 206, 207
- Hartree–Fock 177
- Helicity 18, 35, 81
- Helium  
 $^3\text{He}$ , liquid 149  
 $^4\text{He}$  149  
atom 61, 64  
nuclei 131, 135
- Helium burning 196
- Higgs boson  
decay 232, 233  
production 232
- Higgs field 229–232
- Higgs mechanism 233
- Higgs model 143, 233
- Hubble parameter 241
- Hubble time 242
- Hydrogen 64  
metallic 159
- Hydrogen atom  
Binding energy 46  
radius 47
- Hydrogen bridge bond 109, 111–113  
in biology 112
- Hydrogen burning 196
- Hydrogen molecule 95, 96, 161  
charge distribution 97  
electronic attraction 97  
protonic repulsion 97  
total energy 97
- Hydrogen-like atom 57
- Hyper-fine splitting 55
- Hyper-fine structure 47, 55
- Hypernuclei 180
- Hyperon 180
- Ice 109, 111
- Inelastic scattering of cold neutrons 117
- Interaction  
electromagnetic 239  
gravitational 239, 252  
mass generating 227  
strong 75  
Van der Waals 103  
weak 22, 213, 217
- Interstellar hydrogen 56
- Ionic bonds 101
- Iron 70
- Isospin  
weak 229
- Jets 37, 41
- $K^0$ - $\bar{K}^0$  Oscillations 218
- $^{40}\text{K}$  140
- Kamiokande detector 24
- Klein–Nishina cross-section 1, 13
- Lamb shift 47, 52
- Large Hadron Collider 230
- Laser cooling 139

- Last scattering surface 246  
Leptons 213  
LiF 101  
Localised vibrational mode 126  
    resonance 124  
  
Magic numbers 180  
Magnetic moment 55, 79, 97  
    anomalous 20  
Magnetisation 20  
Mass formula 79  
Mass generation 213, 233  
Mass terms 232  
Masses of the elementary particles 229  
Mean field 177, 178, 180  
Melting energy 210  
Mesons 78  
Metallic bond 161  
Metallic hydrogen 159  
Moment of inertia 187  
Momentum distribution 27  
Moon 211  
Mössbauer effect 12  
Mott  
    cross-section 19  
    scattering 16, 18, 19, 22, 23  
Muon 58, 59  
Muonic atoms 57  
  
NaCl 9, 101  
Nambu–Jona-Lasinio model 82  
Neon 9  
Neutrino 34, 229  
    experiments 15  
    mass 229  
    oscillations 220  
    scattering 22, 35  
Neutron  
    magnetic moment 255  
Neutron source 117  
Neutron stars 149, 191, 193, 206  
Neutrons, cold 117  
  
Nickel 70  
Noble gases 9  
Nonrelativistic quark model 78  
Normal metals 162  
Nuclear  
    magneton 255  
    matter 179  
    potential, effective 180  
    radius 58, 177  
    reactions 191, 206  
    volume 178  
Nuclear force 131, 135, 177  
    Attraction 133  
    range 134  
    repulsion 132  
Nucleon  
    constituents 27  
Nucleon radius *see* Radius  
Nucleon–nucleon interaction 131  
Nucleon–nucleon potential 131  
Nucleus 149  
  
*On the back of an envelope* 11, 23, 77, 83, 95, 118, 160, 199, 225, 235, 244, 246  
  
Optical absorption 124  
Orbital angular momentum 48  
Order parameter 72, 146, 230  
Oxygen 101  
    as an energy source 101  
    double bond 101  
Oxygen atom 110  
  
Pairing energy 188  
Paramagnetism 71  
Parity violation 216  
Particle families 252  
Particle pressure 194  
Particle–hole  
    excitation 185  
    interaction 183  
    states 183  
Particle–antiparticle asymmetry 249

- Particle-hole  
     excitation 150, 182  
 Particle-nucleus interaction 57  
 Parton model 15  
 Partons 27, 31, 32, 34, 37  
 Pauli pressure 196, 207  
 Pauli principle 132, 141, 162, 166  
 Phase transition 71, 72, 81, 82, 85, 113, 143, 145, 149, 229, 230, 234  
 Phonon excitation 152, 154, 155  
 Phonon gas 174  
 Phonon-roton branch 150  
 Phonons 118, 119, 153  
     longitudinal polarised 120  
     transversal polarised 120  
 Photon propagator 17  
 Photon scattering 1  
     off a free electron 1  
     off free electrons 12  
 Photon spectrum 29  
 Pion 87, 134  
     collective state 89  
     mass 87  
     propagator 87  
 Planck scale 251, 252  
 Planets 191, 209, 211  
     Jupiter 209  
     Pluto 211  
 Polarisation  
     of the vacuum 53  
 Polypeptide chain 112  
 Pontecorvo-Maki-Nakagawa-Sakata matrix 221  
 Positronium 75  
 Potential well 134, 177  
 Primordial abundance of the elements 246  
 Principal quantum number 46, 48  
 Production of cold gases 139  
 Propagator 83  
 Proteins 112  
 Proton  
     decay 235  
     form factor 21  
     lifetime 235  
     magnetic moment 255  
 Proton-neutron scattering 134  
 Pseudo-momentum 118  
 Pseudo-potential 162  
  
 QCD 28, 40, 41  
 QED 28, 41  
 Quadrupole moment 187  
 Quantum liquid 152  
 Quark antiquark pairs 43  
 Quark model, nonrelativistic 78  
 Quark spin 20  
 Quark stars 149  
 Quark-quark interaction 78  
 Quark-antiquark pairs 214  
 Quarkonia 75, 76  
 Quarks 32, 34, 40, 213  
 Quasi-elastic scattering 27, 31  
     lepton 37  
     neutrino 34  
  
 Radiation pressure 194  
 Radiative corrections 53  
 Radius  
     of the atom 9, 64, 68, 69  
     of the helium atom 61  
     of the hydrogen atom 47, 65  
     of the hydrogen molecule 97  
     of the nucleon 21  
     of the nucleus 58, 177  
 Random phase approximation 92  
 Red dwarf 196  
 Red giant 196  
 Relativistic corrections 48, 50  
 Relativistic dynamics 47  
 Relaxation time 166  
 Retardation 105

- Rosenbluth formula 20  
Rotational states 97, 186  
Rotons 152, 155  
Rutherford scattering 22, 23  
Rydberg constant 46
- SAHA equation 245  
Scaling 67  
Scattering  
    Bragg 117  
    cold neutrons 117, 150  
    Compton 1, 12, 14  
    electron-nucleon 20  
    Mott 16, 19, 23  
    neutrino 22, 34, 35  
    nucleon-nucleon 131  
    quasi-elastic 27, 31, 37  
    Rutherford 22, 23  
    Thomson 3, 7  
Schwarzschild radius 207  
Sea quarks 27  
Secular equation 89, 90, 123  
Self-consistence 67  
Self-coupling 43, 44  
Self-energy 84  
Shell model 177, 179  
Shells  
    2s,2p 63  
    d subshell 70  
Sigma meson 92, 133  
 $\sigma$  meson 92, 133, 134  
Single particle excitation 150,  
    152, 155, 180  
Single particle properties 180  
Singlet 217  
Sodium 120  
Sodium crystal 120  
Soft mode 92  
Solar neutrinos 24  
Specific heat 109, 112, 126  
Speed of sound 165  
Spin flip 20  
Spin-spin  
    interaction 156  
    splitting 76, 78  
Spin-orbit  
    coupling 50  
    potential 180  
    splitting 51  
Splitting function 37  
Spring constant 120  
Standard model 213, 229  
Strong charge 40, 43  
Structure function 29, 30, 32–  
    34  
    Coulombic part 33  
    gluon 29, 39  
    spin-flip part 33  
SU(2) $\times$  U(1) symmetry 227  
Subshell  
    d 71  
Sun 191  
    electron energy 195  
    proton energy 194  
Superconductivity 164  
Superconductors 167  
Superfluidity 153  
Supernova  
    collapse 24  
    SN1987A 24  
Surface oscillations 181  
Symmetry  
    chiral 81, 82, 93  
Symmetry breaking 81, 239,  
    240  
    chiral 84, 86  
    spontaneous 82, 230  
Thermal conductivity 173, 174  
Thomas factor 51  
Thomas-Fermi equation 68  
Thomas-Fermi model 66, 68  
Thomson  
    cross-section 14  
    formula 30  
    scattering 3, 7  
Time-of-flight measurement 139  
Top quark 225



- decay width 226
- Total angular momentum 48
- Tritium 131, 135
- Two pion exchange 133
  
- Uncertainty relation 46
- Unification 233, 252
- Unification scale 235, 236
  
- Vacuum fluctuations 106
- Vacuum polarisation 41, 43, 44
- Valence nucleon 180, 188
- Valence quark distribution 36
- Valence quarks 27
- Van der Waals interaction 103, 104, 107, 161
- Velocity distribution 140
- Vibrational states 89, 181
- Virial theorem 191, 193
- Virtual photons 30, 31, 34
- Virtual quanta 28
- Virtuality 16, 17
- Viscosity 155
  
- W boson 213, 226
- Water 109
- Water molecule 109
- Weak charge 216
- Weak decays 224
- Weak isospin 216
- Weak isospin doublet 217
- Weak potential 25
- Weinberg angle 227
- Weinberg mixing 232
- Weizsäcker–Williams method 28, 34
- White dwarfs 149, 191, 193, 195, 207
- Wiedemann–Franz ratio 175
- Woods–Saxon potential 177
- W boson 214, 216
  
- X-rays 9, 30, 65
  - recoilless scattering 11
  
- Yukawa coupling 233
- Yukawa form 25
- Yukawa potential 133
  
- $Z^0$  boson 226
- Zero-point
  - energy 53
  - fluctuations 108
  - oscillations 53, 105–107
- Zitterbewegung 49