

- Aberration, I-27-7, I-34-10
Absolute zero, I-1-5
Absorption, I-31-8 ff
 of light, III-9-14 f
Absorption coefficient, II-32-8
Acceleration, I-8-8 ff
 components of, I-9-3
 of gravity, I-9-4
Accelerator guide field, II-29-4 ff
Acceptor, III-14-5
Activation energy, I-42-7
Active circuit element, II-22-5
Adams, J. C., I-7-5
Adiabatic compression, I-39-5
Adiabatic demagnetization, II-35-9 f
Adiabatic expansion, I-44-5
Adjoint, III-11-22
Affective future, I-17-4
Aharanov, II-15-12
Air trough, I-10-5
Algebra, I-22-1 ff
Algebraic operator, III-20-6
Alternating-current circuits, II-22-1 ff
Alternating-current generator, II-17-6 ff
Alnico V, II-37-10
Amber, II-1-10
Ammeter, II-16-1
Ammonia maser, III-9-1 ff
Ammonia molecule, III-8-11 ff
 states of, III-9-1 ff
Ampere, A., II-13-3
Ampere's law, II-13-4
Amperian current, II-36-2
Amplitudes, III-8-1 f, III-2-1 ff
 interfering, III-5-10 ff
 of oscillation, I-21-3
 probability, III-3-1 ff
 space dependence of, III-54-1 ff,
 III-13-4
 time dependence of, III-7-1 ff
 transformation of, III-6-1 ff
Amplitude modulation, I-48-3
Analog computer, I-25-8
Anderson, C. D., I-52-10
Angle, of incidence, I-26-3
 of precession, II-34-4
 of reflection, I-26-3
Angstrom (unit), I-1-3
Angular frequency, I-21-3, I-29-2
Angular momentum, I-7-7, I-18-5 f,
 I-20-1, III-20-14 ff
 composition of, III-18-4 ff
 conservation of, I-4-7, I-18-6 ff,
 I-20-5
 of rigid body, I-20-8
Anomalous refraction, I-33-9 f
Antiferromagnetic material, II-37-11
Antimatter, I-52-10 f, III-11-16
Antiparticle, I-2-8, III-11-13
Antiproton, III-11-13
Argon, III-19-16
Aristotle, I-5-1
Atom, I-1-2
 metastable, I-42-10
 Rutherford-Bohr model, II-5-3
 stability of, II-5-3
 Thompson model, II-5-3
Atomic clock, I-5-5
Atomic currents, II-13-5 f
Atomic hypothesis, I-1-2
Atomic orbits, II-1-8
Atomic particles, I-2-9 f
Atomic polarizability, II-32-2
Atomic processes, I-1-5 f
Attenuation, I-31-8
Avogadro, A., I-39-2
Avogadro's number, I-41-10
Axial vector, I-52-6 f

Barkhausen effect, II-37-9
Baryons, III-11-13
Base states, III-5-8 ff, III-12-1 ff,
 of the world, III-8-5 ff
Battery, II-22-6
Becquerel, A. H., I-28-3
Bell, A. G., II-16-3
Benzene molecule, III-10-10 ff,
 III-15-7 ff
Bernoulli's theorem, II-40-6 ff
Bessel function, II-23-6
Betatron, II-17-5
Biot-Savart law, II-14-10
Birefringence, I-33-3 ff
Blackbody radiation, I-41-5 f
Blackbody spectrum, III-4-8 ff
Bohm, I-52-10
Bohm, II-7-7, II-15-12
Bohr, N., I-42-9, II-5-3
Bohr magneton, II-34-12
Bohr radius, I-38-6, III-2-6, III-19-3
Boltzmann, L., I-41-2
Boltzmann factor, III-14-4
Boltzmann's law, I-40-2 f
Bopp, II-28-8
Born, M., I-37-1, I-38-9, II-28-7,
 III-1-1, III-2-9, III-21-6
Boron, III-19-16
Bose particles, III-4-1 ff, III-15-6 f
Boundary layer, II-41-9
Boundary-value problems, II-7-1
Boyle's law, I-40-8
"Boys" camera, II-9-10
Bragg, L., II-30-9
Bragg-Nye crystal model, II-30-9 ff
Breaking-drop theory, II-9-9
Bremsstrahlung, I-34-6 f
Brewster's angle, I-33-6
Briggs, H., I-22-6
Brown, R., I-41-1
Brownian motion, I-1-8, I-6-5, I-41-1 ff
Brush discharge, II-9-9
Bulk modulus, II-38-3
Butadiene molecule, III-15-10

Calculus, differential, I-8-4, II-2-1 ff
 integral, II-3-1 ff
 of variations, II-19-3
Cantilever beam, II-38-10
Capacitance, I-23-5
 mutual, II-22-17
Capacitor, I-14-9, I-23-5, II-22-3 ff,
 II-23-2 ff
 parallel-plate, I-14-9, II-6-11 ff, II-8-3
Capacity, II-6-12
 of a condenser, II-8-2
Capillary action, I-51-8
Carnot, S., I-4-2, I-44-2 ff
Carnot cycle, I-44-5 f, I-45-2
Carrier signal, I-48-3
Carriers, negative, III-14-2
 positive, III-14-2
Catalyst, I-42-8
Cavendish, H., I-7-9
Cavendish's experiment, I-7-9
Cavity resonator, II-23-1 ff
Center of mass, I-18-1 f, I-19-1 ff
Centrifugal force, I-7-5, I-12-11
Čerenkov, P. A., I-51-2
Čerenkov radiation, I-51-2
Charge, conservation of, I-4-7, II-13-1 f
 on electron, I-12-7
 line of, II-5-3 f
 motion of, II-29-1 ff
 sheet of, II-5-4
 sphere of, II-5-4 f
Charge density, II-5-4
Charge separation, II-9-7 ff
Charged conductor, II-8-2 ff
Chemical energy, I-4-2
Chemical kinetics, I-42-7 f
Chemical reaction, I-1-6 ff
Chlorophyll molecule, III-15-11
Chromaticity, I-35-6 f
Circuits, alternating-current, II-22-1 ff
 equivalent, II-22-10 f
Circuit elements, II-23-1 f
 active, II-22-5
 passive, II-22-5
Circular motion, I-21-4

- Circulation, II-1-5, II-3-8 ff
 Classical electron radius, II-28-3
 Classical limit, III-7-10
 Clausius, R., I-44-2, I-44-3
 Clausius-Clapeyron equation, I-45-6 ff
 Clausius-Mossotti equation, II-11-6 f, II-32-7
 Cleavage plane, II-30-1
 Coaxial line, II-24-1
 Coefficient, absorption, II-32-8
 of coupling, II-17-14
 of friction, I-12-4
 gravitational, I-7-9
 of viscosity, II-41-2
 Collision, I-16-6
 elastic, I-10-7
 Colloidal particles, II-7-8 ff
 Color vision, I-35-1 ff
 physiochemistry of, I-35-9 f
 Commutation rule, III-20-15
 Complex impedance, I-23-7
 Complex numbers, I-22-7 ff, I-23-1 ff
 Complex variable, II-7-2 ff
 Compound eye, I-36-6 ff
 Compression, adiabatic, I-39-5
 isothermal, I-44-5
 Condenser, parallel-plate, I-14-9, II-6-11 ff, II-8-3
 Conduction band, III-14-1
 Conductivity, II-32-10
 thermal, II-2-8, II-12-2
 Conductor, II-1-2
 Cones, I-35-1
 Conservation, of angular momentum, I-4-7, I-18-6 ff, I-20-5
 of charge, I-4-7, II-13-1 f
 of energy, I-3-2, I-4-1 ff, II-27-1 f, II-42-10
 of linear momentum, I-4-7, I-10-1 ff
 of potential energy, III-7-6 ff
 of strangeness, III-11-12
 Contraction hypothesis, I-15-3
 Copernicus, I-7-1
 Coriolis force, I-19-8 f
 Cornea, I-35-1
 Cosmic rays, II-9-2
 Couette flow, II-41-10 ff
 Coulomb's law, I-28-2, II-4-2 ff, II-5-6
 Coupling, coefficient of, II-17-14
 Covalent bond, II-30-2
 Cross product, II-2-8, II-31-8
 Cross section for scattering, I-32-7
 Crystal, II-30-1 ff
 geometry of, II-30-1 f
 Crystal diffraction, I-38-4 f, III-2-4 f
 Crystal lattice, II-30-3 f
 propagation, III-13-1 ff
 imperfections, III-13-10 f
 Cubic cell, II-30-7
 Curie law, II-11-5
 Curie temperature, II-36-13
 Curie-Weiss law, II-11-9
 Curl operator, II-2-8, II-3-1
 Current, Amperian, II-36-2
 atomic, II-13-5 f
 eddy, II-16-6
 electric, II-13-1 f
 induced, II-16-1 ff
 Current density, II-13-1
 Curvature, intrinsic, II-42-5
 mean, II-42-6
 negative, II-42-4
 positive, II-42-4
 in three-dimensional space, II-42-5 f
 Curved space, II-42-1 ff
 Cutoff frequency, II-22-14
 D'Alembertian, II-25-8
 Debye length, II-7-9
 Dedekind, R., I-22-4
 definite energy, states, III-13-3 ff
 Degrees of freedom, I-25-2, I-39-12
 Demagnetization, adiabatic, II-35-9 f
 Density, I-1-4
 Derivative, I-8-5 ff
 partial, I-14-9
 Diamagnetism, II-34-1 ff
 diamond lattice, III-14-1
 Dicke, R. H., I-7-11
 Dielectric, II-10-1 ff, II-11-1 ff
 Dielectric constant, II-10-1 f
 Differential calculus, I-8-4, II-2-1 ff
 Diffraction, I-30-1 ff
 by screen, I-31-10 f
 Diffraction grating, I-29-5, I-30-3 ff
 Diffusion, I-43-1 ff
 of neutrons, II-12-6 ff
 Dipole, II-21-5 ff
 electric, II-6-2 ff
 magnetic, II-14-7 f
 Dipole moment, I-12-6, II-6-7
 Dipole potential, II-6-4 ff
 Dipole radiator, I-28-5 f, I-29-3 ff
 Dirac, P., I-52-10, II-2-1, II-28-7, III-8-2, III-12-6
 Dirac equation, I-20-6
 Dislocation, II-30-8, II-30-9
 Dispersion, I-31-6 ff
 Distance, I-5-5 ff
 Distance measurement, color brightness, I-5-6
 triangulation, I-5-6
 Divergence, II-25-7
 Divergence operator, II-2-7, II-3-1
 Domain, II-37-6
 Donor site, III-14-4
 Doppler effect, I-17-8, I-23-9, I-34-7 f, I-38-6, II-42-9, III-2-6, III-12-9
 Dot product, II-2-4, II-25-3
 Double stars, I-7-6
 Drag coefficient, II-41-7
 "Dry" water, II-40-1 ff
 Dyes, III-10-12
 Dynamical momentum, III-21-5
 Dynamics, I-7-2 f, I-9-1 ff
 relativistic, I-15-9 f
 Eddy current, II-16-6
 Effective mass, III-13-7
 Efficiency of ideal engine, I-44-7 f
 Eigenstates, III-11-22
 Eigenvalues, III-11-21
 Einstein, A., I-2-6, I-7-11, I-12-12, I-15-1, I-16-1, I-41-8, I-42-8, I-42-9, II-42-1, II-42-6, II-42-8, II-42-13 f
 Elastic collision, I-10-7
 Elastic constants, II-39-6, II-39-10 f
 Elastic energy, I-4-2, I-4-6
 Elastic materials, II-39-1 ff
 Elastica, II-38-12
 Elasticity, II-38-1 ff
 Elasticity tensor, II-39-4 ff
 Electret, II-11-8
 Electric charge density, II-2-8, II-4-3, III-21-6
 Electric current, II-13-1 f
 in the atmosphere, II-9-2 f
 Electric current density, II-2-8, III-21-6
 Electric dipole, II-6-2 ff
 Electric dipole matrix element, III-9-15
 Electric field, I-2-4, I-12-7 f, II-1-2, II-1-3, II-6-1 ff, II-7-1 ff
 relativity of, II-13-6 ff
 Electric flux, II-1-4
 Electric force, I-2-3 ff, II-1-1 ff, II-13-1
 Electric potential, II-4-4
 Electric susceptibility, II-10-4
 Electrical energy, I-4-2, II-15-3 ff
 Electrical forces, II-1-1 ff, II-13-1
 Electrodynamics, II-1-3
 relativistic notation, II-25-1 ff
 Electromagnet, II-36-9 ff
 Electromagnetic energy, I-29-2
 Electromagnetic field, I-2-2, I-2-5, I-10-9
 Electromagnetic mass, II-28-3 f
 Electromagnetic radiation, I-26-1, I-28-1 ff
 Electromagnetic waves, II-21-1 f
 cosmic rays, I-2-5
 gamma rays, I-2-5
 infrared, I-2-5, I-23-8, I-26-1
 light, I-2-5
 ultraviolet, I-2-5, I-26-1
 x-rays, I-2-5, I-26-1
 Electromagnetism, II-1-1 ff
 laws of, II-1-5 ff
 Electromotive force, II-16-2
 Electron, I-2-4, I-37-1, I-37-4 ff, III-1-1, III-1-4 ff
 charge on, I-12-7
 radius of, classical, I-32-4
 Electron cloud, I-6-11
 Electron configuration, III-19-15
 Electron-hole pairs, III-14-3
 Electron microscope, II-29-3 f
 Electron-ray tube, I-12-9
 Electron volt (unit), I-34-4
 Electronic polarization, II-11-1 ff
 Electrostatic energy, II-8-1 ff
 of charges, II-8-1 f
 of ionic crystal, II-8-4 ff
 in nuclei, II-8-6 ff
 of a point charge, II-8-12
 Electrostatic equations, II-10-6 f
 Electrostatic field, II-5-1 ff, II-7-1 f
 energy in, II-8-9 ff
 of a grid, II-7-10 f
 Electrostatic lens, II-29-2 f
 Electrostatic potential, equations of, II-6-1
 Electrostatics, II-4-1 ff, II-5-1
 Ellipse, I-7-1
 Emissivity, II-6-14
 Energy, II-22-11 f
 chemical, I-4-2
 of a condenser, II-8-2 ff
 conservation of, I-3-2, I-4-1 ff, II-27-1 f
 elastic, I-4-2, I-4-6

- electrical, I-4-2, II-15-3 ff
 electromagnetic, I-29-2
 electrostatic, II-8-1 ff
 in electrostatic field, II-8-9 ff
 gravitational, I-4-2 ff
 heat, I-4-2, I-4-6, I-10-7, I-10-8
 kinetic, I-1-7, I-4-2, I-4-5 f, I-39-4
 magnetic, II-17-12 ff
 mass, I-4-2, I-4-7
 mechanical, II-15-3 ff
 nuclear, I-4-2
 potential, I-4-4, I-13-1 ff, I-14-1 ff
 radiant, I-4-2
 relativistic, I-16-1 ff
 Energy density, II-27-2
 Energy diagram, III-14-1
 Energy flux, II-27-2
 Energy level diagram, III-14-3
 Energy levels, I-38-7 f, III-12-7 ff,
 III-2-7 f
 Energy theorem, I-50-7 f
 Enthalpy, I-45-5
 Entropy, I-44-10 ff, I-46-7 ff
 Eötvös, L., I-7-11
 Equation of motion, II-42-14
 Equilibrium, I-1-6
 Equipotential surfaces, II-4-11 f
 Equivalent circuits, II-22-10 f
 Ethylene molecule, III-15-8
 Euclid, I-5-6
 Euclidean geometry, I-12-3
 Euler force, II-38-11
 Evaporation, I-1-5 f
 of a liquid, I-40-3 f, I-42-1 ff
 Excess radius, II-42-4
 Exchange force, II-37-2
 Excited state, II-8-7, III-13-9
 Exciton, III-13-9
 Exclusion principle, III-4-12 ff
 Expansion, adiabatic, I-44-5
 isothermal, I-44-5
 Exponential atmosphere, I-40-1 f
 Eye, compound, I-36-6 ff
 human, I-35-1 f, I-36-3 ff
- Farad (unit), I-25-7, II-6-13
 Faraday, M., II-10-1
 Faraday's law of induction, II-17-2
 Fermat, P., I-26-3
 Fermi (unit), I-5-10
 Fermi, E., I-5-10
 Fermi particles, III-4-1 ff, III-15-7 f
 Ferrite, II-37-12
 Ferroelectricity, II-11-8 ff
 Ferromagnetic crystal, III-15-1
 Ferromagnetic insulators, II-37-12
 Ferromagnetism, II-34-1 f, II-36-1 ff,
 II-37-1 ff
 Feynman, R., II-28-8
 Fields, I-2-2, I-2-4, I-2-5, I-10-9,
 I-12-7 ff, I-13-8 f, I-14-7 ff
 in a cavity, II-5-8 f
 of a charged conductor, II-6-8
 of a conductor, II-5-7 f
 electric, I-2-4, I-12-7 f, II-1-2,
 II-1-3, II-6-1 ff, II-7-1 ff
 electrostatic, II-5-1 ff, II-7-1 f
 magnetic, II-1-2, II-1-3, II-13-1,
 II-14-1 ff
 magnetizing, II-36-7
- scalar, II-2-2 ff
 superposition of, I-12-9
 two-dimensional, II-7-2 ff
 vector, II-1-4 f, II-2-1 ff
 Field energy, II-27-1 ff
 of a point charge, II-28-1 f
 Field equation, II-42-14
 Field index, II-29-5
 Field-ion microscope, II-6-14
 Field lines, II-4-11
 Field momentum, II-27-9 ff
 of a moving charge, II-28-2 f
 Field strength, II-1-4
 Filter, II-22-14 ff
 Flow, fluid, II-12-8 ff
 irrotational, II-40-5
 viscous, II-41-4 f
 Fluid flow, II-12-8 ff
 Fluorine, III-19-16
 Flux, II-4-7 ff
 electric, II-1-4
 of a vector field, II-3-2 ff
 Flux quantization, III-21-10
 Flux rule, II-17-1 ff
 Focal length, I-27-1 ff
 Focus, I-26-5
 Force, centrifugal, I-7-5, I-12-11
 components of, I-9-3
 conservative, I-14-3 ff
 Coriolis, I-19-8 f
 electrical, I-2-3 ff, II-1-1 ff, II-13-1
 electromotive, II-16-2
 gravitational, I-2-3
 Lorentz, II-13-1, II-15-14
 magnetic, II-1-2, II-13-1
 molecular, I-1-3, I-12-6 f
 moment of, I-18-5
 nonconservative, I-14-6 f
 nuclear, I-12-12, III-10-6 ff
 pseudo, I-12-10 ff
 Fourier, J., I-50-2 f
 Fourier analysis, I-50-2 ff
 Fourier theorem, II-7-11
 Fourier transform, I-25-4
 Four-vectors, I-15-8 f, I-17-5 ff,
 II-25-1 ff
 Fovea, I-35-1
 Frank, I., I-51-2
 Franklin, B., II-5-6
 Frequency, angular, I-21-3, I-29-2
 of oscillation, I-2-5
 plasma, II-7-6, II-32-12
 Fresnel's reflection formulas, I-33-8
 Friction, I-10-5, I-12-3 ff
 coefficient of, I-12-4
- Galileo, I-5-1, I-7-2, I-9-1, I-52-3
 Galilean relativity, I-10-3
 Galilean transformation, I-12-11
 Gallium, III-19-17
 Galvanometer, II-1-8, II-16-1
 Garnet, II-37-12
 Gauss (unit), I-34-4
 Gauss, K., II-16-2
 Gauss' law, II-4-9 f, II-5-1 ff
 Gauss' theorem, II-3-5, III-21-4
 Gaussian surface, II-10-1
 Geiger, II-5-3
 Gell-Mann, M., I-2-9
 Generator, alternating-current, II-17-6 ff
- electric, II-16-1 ff, II-22-5 ff
 van de Graaff, II-5-9, II-8-7
 Geometrical optics, I-26-1, I-27-1 f
 Gerlach, II-35-3
 Gradient operator, II-2-4, II-3-1
 Gravitation, I-2-3, I-7-1 ff, I-12-2,
 II-42-1
 Gravitational acceleration, I-9-4
 Gravitational coefficient, I-7-9
 Gravitational energy, I-4-2 ff
 Gravitational field, I-12-8 ff, I-13-8 f
 Gravity, I-13-3 ff, II-42-8 ff
 acceleration of, I-9-4
 Green's function, I-25-4
 Ground state, II-8-7, III-7-2
 Gyroscope, I-20-5 ff
- Hall effect, III-14-7
 Hamiltonian matrix, III-8-10 f
 Hamilton's first principal function,
 II-19-8
 Harmonic motion, I-21-4, I-23-1 ff
 Harmonic oscillator, I-10-1, I-21-1 ff
 forced, I-21-5 f, I-23-3 ff
 Harmonics, I-50-1 ff
 Heat, I-1-3, I-13-3
 Heat conduction, II-3-6 ff
 Heat diffusion equation, II-3-8
 Heat energy, I-4-2, I-4-6, I-10-7,
 I-10-8
 Heat engines, I-44-1 ff
 Heat flow, II-2-8 f, II-12-2 ff
 Heisenberg, W., I-6-10, I-37-1, I-37-9,
 I-37-11, I-37-12, I-38-9, III-1-1,
 III-1-9, III-1-11, III-1-12,
 III-2-9, III-20-17
 Helium, III-19-14
 Helmholtz, H., I-35-7, II-40-10
 Henry (unit), I-25-7
 Hermitian adjoint, III-20-3
 Hess, II-9-2
 Hexagonal cell, II-30-7
 High-voltage breakdown, II-6-13 f
 Hooke's law, I-12-6, II-38-1 f
 Huygens, C., I-15-2, I-26-2
 Hydrodynamics, II-40-2 ff
 Hydrogen, III-19-14
 Hydrogen atom, III-19-1 ff
 Hydrogen, hyperfine splitting in,
 III-12-1 ff
 Hydrogen molecular ion, III-10-1 ff
 Hydrogen molecule, III-10-8 ff
 Hydrogen wave functions, III-19-12
 Hydrostatics, II-40-1 ff
 Hyperfine splitting in hydrogen,
 III-12-1 ff
 Hypocycloid, I-34-3
 Hysteresis curve, II-37-5 ff
 Hysteresis loop, II-36-8
- Ideal gas law, I-39-10 ff
 Identical particles, III-3-9 ff, III-4-1 ff
 Illumination, II-12-10 ff
 Image charge, II-6-9
 Impedance, I-25-8 f, II-22-1 ff
 complex, I-23-7
 Impure semiconductors, III-14-4
 Incidence, angle of, I-26-3
 Inclined plane, I-4-4

- Independent particle approximation, III-15-1 ff
- Index of refraction, I-31-1 ff
- Induced currents, II-16-1 ff
- Inductance, I-23-6, II-16-4 f, II-17-12 ff, II-22-2 f
mutual, II-17-9 ff, II-22-16
self-, II-16-4, II-17-11 f
- Induction, laws of, II-17-1 ff
- Inductor, I-23-6
- Inertia, I-2-3, I-7-11
moment of, I-18-7, I-19-5 ff
principle of, I-9-1
- Infeld, II-28-7
- Infrared radiation, I-23-8, I-26-1
- Integral, I-8-7 f
- Integral calculus, II-3-1 ff
- Insulator, II-1-2, II-10-1
- Interference, I-28-6, I-29-1 ff
two-slit, III-3-5 ff
- Interfering amplitudes, III-5-10 ff
- Interfering waves, I-37-4, III-1-4
- Interferometer, I-15-5
- Internal reflection, II-33-12
- Ion, I-1-6
- Ionic bond, II-30-2
- Ionic conductivity, I-43-6 f
- Ionic polarizability, II-11-8
- Ionization energy, I-42-5
- Ionosphere, II-7-5, II-9-3
- Irrotational flow, II-40-5
- Isotherm, II-2-3
- Isothermal atmosphere, I-40-2
- Isothermal compression, I-44-5
- Isothermal expansion, I-44-5
- Isothermal surfaces, II-2-3
- Isotopes, I-3-4 ff
- Jeans, J., I-40-9, I-41-6 f, II-2-6
- Johnson noise, I-41-2, I-41-8
- Josephson junction, III-21-14 ff
- Joule (unit), I-13-3
- Joule heating, I-24-2
- Junction, III-14-8 ff
- Kármán vortex street, II-41-9
- Kepler, J., I-7-1
- Kepler's laws, I-7-1 f, I-9-1, I-18-6
- Kerr cell, I-33-5
- Kilocalorie (unit), II-8-5
- Kinematic momentum, III-21-5
- Kinetic energy, I-1-7, I-4-2, I-4-5 f, I-39-4
rotational, I-19-7 ff
- Kinetic theory, I-42-1 ff
of gases, I-39-1 ff
- Kirchhoff's laws, I-25-9, II-22-7 ff
- Kronecker delta, II-31-6
- Krypton, III-19-17
- Lamb, II-5-6
- Lamé elastic constants, II-39-6
- Landé *g*-factor, II-34-4
- Laplace, P., I-47-7
- Laplace equation, II-6-1, II-7-1
- Laplacian operator, II-2-10
- Larmor frequency, II-34-7
- Larmor's theorem, II-34-6 f
- Laser, I-32-6, I-42-10, III-9-13
- Laughton, II-5-6
- Laws, of electromagnetism, II-1-5 ff
of induction, II-17-1 ff
of quantum mechanics, III-13-1
- Least action, principle of, II-19-1 ff
- Least time, principle of, I-26-3 ff, I-26-8
- Legendre functions, III-19-9
- Leibnitz, G. W., I-8-4
- Lens formula, I-27-6
- Lenz's rule, II-16-4, II-34-2
- Leverrier, U., I-7-5
- Liénard-Wiechert potentials, II-21-11
- Light, II-21-1 f
absorption of, III-9-14 f
momentum of, I-34-10 f
polarized, I-32-9
scattering of, I-32-5 ff
speed of, I-15-1, II-18-8 f
- Light waves, I-48-1
- Lightning, II-9-10 f
- Line of charge, II-5-3 f
- Line integral, II-3-1
- Linear momentum, conservation of, I-4-7, I-10-1 ff
- Linear systems, I-25-1 ff
- Liquid helium, III-4-12
- Lithium, III-19-14
- Lodestone, II-1-10
- Logarithms, I-22-4
- Lorentz, H. A., I-15-3
- Lorentz condition, II-25-9
- Lorentz contraction, I-15-7
- Lorentz force, II-13-1, II-15-14
- Lorentz formula, II-21-12 f
- Lorentz gauge, II-18-11
- Lorentz transformation, I-15-3, I-17-1, I-34-8, I-52-2, II-25-1
of fields, II-26-1 ff
- McCullough, II-1-9
- Mach number, II-41-6
- Magenta, III-10-12
- Magnetic dipole, II-14-7 f
- Magnetic dipole moment, II-14-8
- Magnetic energy, II-17-12 ff
- Magnetic field, I-12-9 f, II-1-2, II-1-3, II-13-1, II-14-1 ff
relativity of, II-13-6 ff
of steady currents, II-13-3 f
- Magnetocaloric force, II-1-2, II-13-1
on a current, II-13-2 f
- Magnetic induction, I-12-10
- Magnetic lens, II-29-3
- Magnetic materials, II-37-1 ff
- Magnetic moments, II-34-3 f, III-11-4
- Magnetic resonance, II-35-1 ff
- Magnetic susceptibility, II-35-7
- Magnetism, I-2-4, II-34-1 ff
- Magnetization currents, II-36-1 ff
- Magnetizing fields, II-36-7
- Magnetostatics, II-4-1, II-13-1 ff
- Magnetostriction, II-37-6
- Magnification, I-27-5
- Magnons, III-15-4
- Marsden, II-5-3
- Maser, I-42-10
ammonia, III-9-1 ff
- Mass, I-9-1, I-15-1
center of, I-18-1 f, I-19-1 ff
- electromagnetic, II-28-3 f
relativistic, I-16-6 ff
- Mass energy, I-4-2, I-4-7
- Mass-energy equivalence, I-15-10 f
- Matrix, III-5-5
- Maxwell, J. C., I-6-1, I-6-9, I-28-1, I-40-8, I-41-7, I-46-5, II-1-8, II-1-11, II-5-6, II-18-1 ff
- Maxwell's equations, I-15-2, I-25-3, I-47-7, II-2-1, II-2-8, II-4-1, II-6-1, II-18-1 ff, II-32-3 ff, II-42-14
currents and charges, II-21-1 ff
free space, II-20-1 ff
- Mayer, J. R., I-3-2
- Mean free path, I-43-3 f
- Mean square distance, I-6-5, I-41-9
- Mechanical energy, II-15-3 ff
- Meissner effect, III-21-8 ff
- Mendeléev, I-2-9
- Metastable atom, I-42-10
- Meter (unit), I-5-10
- Mev (unit), I-2-9
- Michelson-Morley experiment, I-15-3 ff
- Miller, W. C., I-35-2
- Minkowski, I-17-8
- Minkowski space, II-31-12
- Modes, I-49-1 ff
- Mole (unit), I-39-10
- Molecular attraction, I-1-3, I-12-6 f
- Molecular crystal, II-30-2
- Molecular diffusion, I-43-7 ff
- Molecular dipole, II-11-1
- Molecular motion, I-41-1
- Molecule, I-1-3
- Moment, dipole, I-12-6
of force, I-18-5
of inertia, I-18-7, I-19-5 ff
- Momentum, I-9-1 f, I-38-2 ff, III-2-2 ff
angular, I-7-7, I-18-5 ff, I-20-1, I-20-5, III-20-14 ff
dynamical, III-21-5
of light, I-34-10 f
kinematic, III-21-5
linear, I-4-7, I-10-1 ff
relativistic, I-10-8 f, I-16-1 ff
- Momentum operator, III-20-2, III-20-9 ff
- Momentum spectrometer, II-29-1
- Momentum spectrum, II-29-2
- Monatomic gas, I-39-5
- Monoclinic cell, II-30-7
- Mössbauer, R., I-23-9
- Mössbauer effect, II-42-11
- Motion, I-5-1, I-8-1 ff
of charge, II-29-1 ff
circular, I-21-4
constrained, I-14-3
harmonic, I-21-4, I-23-1 ff
parabolic, I-8-10
planetary, I-7-1 ff, I-9-6 f, I-13-5
- Motors, electric, II-16-1 ff
- Moving charge, field momentum of, II-28-2 f
- Music, I-50-1
- Mutual inductance, II-17-9 ff, II-22-16
- mv* momentum, III-21-5
- Negative carriers, III-14-2
- Neon, III-19-16

- Nernst heat theorem, I-44-11
 Neuman, J. von, II-12-9
 Neutral K-meson, III-11-12 ff
 Neutral pion, III-10-7
 Neutrons, I-2-4
 diffusion of, II-12-6 ff
 Neutron diffusion equation, II-12-7
 Newton, I., I-8-4, I-15-1, I-37-1,
 II-4-10, III-1-1
 Newton · meter (unit), I-13-3
 Newton's laws, I-2-6, I-7-3 ff, I-7-11,
 I-9-1 ff, I-10-1 ff, I-11-7 f, I-12-1,
 I-39-2, I-41-1, I-46-1, II-7-5,
 II-42-1, II-42-13
 Nishijima, I-2-9, III-11-12
 Nodes, I-49-2
 Noise, I-50-1
 Nonpolar molecule, II-11-1
 Nuclear cross section, I-5-9
 Nuclear energy, I-4-2
 Nuclear forces, I-12-12, III-10-6 ff
 Nuclear *g*-factor, II-34-4
 Nuclear interactions, II-8-7
 Nuclear magnetic resonance, II-35-10 ff
 Neutron, III-11-3
 Nucleus, I-2-4, I-2-8 ff
 Numerical analysis, I-9-6
 Nutation, I-20-7
 Nye, J. F., II-30-9
- Oersted (unit), II-36-6
 Ohm (unit), I-25-7
 Ohm's law, I-25-7, I-43-7
 One-dimensional lattice, III-13-1 ff
 Operator (s), III-8-5, III-20-1 ff
 curl, II-2-8, II-3-1
 divergence, II-2-7, II-3-1
 gradient, II-2-4, II-3-1
 Laplacian, II-2-10
 vector, II-2-6
 Operators, III-20-1 ff
 Optic axis, I-33-3
 Optic nerve, I-35-2
 Optics, I-26-1 ff
 geometrical, I-26-1, I-27-1 ff
 Orbital angular momentum, III-19-9
 Orbital motion, II-34-3
 Orientation polarization, II-11-3 ff
 Oriented magnetic moment, II-35-4
 Orthorhombic cell, II-30-7
 Oscillation, amplitude, of, I-21-3
 damped, I-24-3 f
 frequency of, I-2-5
 period of, I-21-3
 periodic, I-9-4
 phase of, I-21-3
 Oscillator, I-5-2
 harmonic, I-10-1, I-21-1, I-21-5 f,
 I-23-3 ff
- Pais, III-11-12
 Pappus, theorem of, I-19-4
 Parabolic antenna, I-30-6 f
 Parabolic motion, I-8-10
 Parallel-axis theorem, I-19-6
 Parallel-plate capacitor, I-14-9,
 II-6-11 ff, II-8-3
 Paramagnetism, II-34-1 ff, II-35-1 ff
 Paraxial rays, I-27-2
- Partial derivative, I-14-9
 Particles, Bose, III-4-1 ff
 Fermi, III-4-1 ff
 Identical, III-3-9 ff, III-4-1 ff
 spin-one, III-3-1 ff
 spin one-half, III-6-1 ff, III-12-1 ff
 "strange", II-8-7
 Pauli spin exchange operator, III-12-7
 Pauli spin matrices, III-11-1 ff
 Permalloy, II-37-11
 Permeability, II-36-9
 Pascal's triangle, I-6-4
 Passive circuit element, II-22-5
 Pendulum, I-49-6 f
 Pendulum clock, I-5-2
 Period of oscillation, I-21-3
 Periodic table, III-19-13 ff
 Periodic time, I-5-1 f
 Perpetual motion, I-46-2
 Phase of oscillation, I-21-3
 Phase shift, I-21-3
 Phase velocity, I-48-6
 Photon, I-2-7, I-26-1, I-37-8, III-4-7 f
 III-1-8
 polarization states of, III-11-9 ff
 Physiochemistry of color vision, I-35-9 f
 Piezoelectricity, II-11-8
 Pines, II-7-7
 Planck, M., I-41-6, I-42-8, I-42-9
 Planck's constant, I-5-10, I-6-10,
 I-17-8, I-37-11, III-1-11
 Plane lattice, II-30-5
 Plane waves, II-20-1 ff
 Planetary motion, I-7-1 ff, I-9-6 f,
 I-13-5
 Plasma frequency, II-7-6, II-32-12
 Plasma oscillations, II-7-5 ff
 Plimpton, II-5-6
p-momentum, III-21-5
 Poincaré, H., I-15-3, I-15-5, I-16-1
 Poincaré stress, II-28-4
 Point charge, electrostatic energy of,
 II-8-12
 field energy of, II-28-1 f
 Poisson's ratio, II-38-2
 Polar molecule, II-11-1, II-11-3 ff
 Polarization, I-33-1 ff, II-32-1 ff
 Polarization charges, II-10-3 ff
 Polarization states of photon, III-11-9 ff
 Polarization vector, II-10-2 f
 Polarized light, I-32-9
 Positive carriers, III-14-2
 Potassium, III-19-16
 Potential energy, I-4-4, I-13-1 ff,
 I-14-1 ff
 conservation of, III-7-6 ff
 Potential gradient of the atmosphere,
 II-9-2 f
 Power, I-13-2
 Poynting, J., II-27-3
 Precession, angle of, II-34-4
 of atomic magnets, II-34-4 f
 Pressure, I-1-3
 Priestly, J., II-5-6
 Principle of equivalence, II-42-8 ff
 Principle of least action, II-19-1 ff
 Principle of superposition, II-1-3,
 II-4-2
 Probability, I-6-1 ff
 Probability amplitude (s), III-3-1 ff,
 III-16-1 ff
- Probability density, I-6-8 f, III-16-6 ff
 Probability distribution, I-6-7 ff,
 III-16-6
 Propagation, in a crystal lattice,
 III-13-1 ff
 Propagation factor, II-22-14
 Proton, I-2-4
 Proton spin, II-8-7
 Pseudo force, I-12-10 ff
 Ptolemy, I-26-2
 Purkinje effect, I-35-2
 Pyroelectricity, II-11-8
 Pythagoras, III-11-1
- Quadrupole lens, II-7-4, II-29-6
 Quadrupole potential, II-6-8
 Quantized magnetic states, II-35-1 ff
 Quantum electrodynamics, I-2-7, I-28-3
 Quantum mechanical resonance, III-10-4
 Quantum mechanics, I-2-2, I-2-6 ff,
 I-6-10, I-10-9, I-37-1 ff, I-38-1 ff,
 III-1-1 ff, III-2-1 ff, III-3-1 ff
 Quantum numbers, III-12-14
- Rabi, I. I., II-35-4
 Rabi molecular-beam method, II-35-4 ff
 Radiant energy, I-4-2
 Radiation, infrared, I-23-8, I-26-1
 relativistic effects, I-35-1 ff
 synchrotron, I-34-3 ff, I-34-6
 ultraviolet, I-26-1
 Radiation damping, I-32-3 f
 Radiation resistance, I-32-1 ff
 Radioactive clock I-5-3 ff
 Radius excess, II-42-6
 Radius of electron, I-32-4
 Ramsey, N., I-5-5
 Random walk, I-6-5 ff, I-41-8 ff
 Ratchet and pawl machine, I-46-1 ff
 Rayleigh's criterion, I-30-6
 Rayleigh's law, I-41-6
 Rayleigh waves, II-38-8
 Reactance, II-22-11
 Reciprocity principle, I-30-7
 Rectification, I-50-9
 Rectifier, II-22-15
 Rectifying function, III-14-11
 Reflected waves, II-33-7 ff
 Reflection, I-26-2 f
 angle of, I-26-3
 internal, II-33-12
 of light, II-33-1 ff
 Refraction, I-26-2 f
 anomalous, I-33-9 f
 index of, I-31-1 ff
 of light, II-33-1 ff
 Refractive index, II-32-1 ff
 Relative permeability, II-36-9
 Relativistic dynamics, I-15-9 f
 Relativistic energy, I-16-1 ff
 Relativistic mass, I-16-1 ff
 Relativistic momentum, I-10-8 f,
 I-16-1 ff
 Relativity, of electric field, II-13-6 ff
 Galilean, I-10-3
 of magnetic field, II-13-6 ff
 special theory of, I-15-1 ff
 theory of, I-7-11, I-17-11
 Resistance, I-23-5

Resistor, I-23-5, II-22-4
Resonant cavity, II-23-6 ff
Resonant circuits, II-23-10 f
Resonant mode, II-23-10
Resonator, cavity, II-23-1 ff
Resolving power, I-27-7 f, I-30-5 f
Resonance, I-23-1 ff
 electrical, I-23-5 ff
 in nature, I-23-7 ff
Resonance interaction, I-2-9
Retarded time, I-28-2
Retherford, II-5-6
Retina, I-35-1
Reynolds' number, II-41-5 f
Rigid body, I-18-1
 angular momentum of, I-20-8
 rotation of, I-18-2 ff
Ritz combination principle, I-38-8,
 II-2-8
Rods, I-35-1, I-36-6
Roemer, O., I-7-5
Root-mean-square distance, I-6-6
Rotation, of axes, I-11-3 f
 plane, I-18-1
 of a rigid body, I-18-2 ff
 in space, I-20-1 ff
 in two dimensions, I-18-1 ff
Rotation matrix, III-6-4
Rushton, I-35-9
Rutherford, II-5-3
Rutherford-Bohr atomic model, II-5-3
Rydberg (unit), I-38-6, III-2-6
Rydberg energy, III-10-4, III-19-3

Scalar, I-11-5
Scalar field, II-2-2 ff
Scalar product, II-25-3 ff
Scattered amplitude, III-13-13
Scattering of light, I-32-5 ff
Schrödinger, E., I-35-6, I-37-1, I-38-9,
 III-1-1, III-2-9, III-20-17,
 III-21-1 ff, III-3-1
Schrödinger equation, II-15-12,
 III-16-4, III-16-11 ff, III-19-1 f,
 III-21-1 ff
Scientific method, I-2-1 f
Screw dislocation, II-30-9
Screw jack, I-4-5
Second (unit), I-5-5
Second (unit), I-5-5

Resistor, I-23-5, II-22-4
Resonant cavity, II-23-6 ff
Resonant circuits, II-23-10 f
Resonant mode, II-23-10
Resonator, cavity, II-23-1 ff
Resolving power, I-27-7 f, I-30-5 f
Resonance, I-23-1 ff
 electrical, I-23-5 ff
 in nature, I-23-7 ff
Resonance interaction, I-2-9
Retarded time, I-28-2
Retherford, II-5-6
Retina, I-35-1
Reynolds' number, II-41-5 f
Rigid body, I-18-1
 angular momentum of, I-20-8
 rotation of, I-18-2 ff
Ritz combination principle, I-38-8,
 II-2-8
Rods, I-35-1, I-36-6
Roemer, O., I-7-5

Smooth muscle, I-14-2
Snell, W., I-26-3
Snell's law, I-26-3, I-31-2, II-33-1
Sodium, III-19-16
Solenoid, II-13-5
Solid-state physics, II-8-6
Sound, I-2-3, I-47-1 ff, I-50-1
 speed of, I-47-7 f
Space, I-8-2
Space-time, I-2-6, I-17-1 ff, II-26-12
Special theory of relativity, I-15-1 ff
Specific heat, I-40-7 f, I-45-2, II-37-4
Speed, I-8-2 ff, I-9-2
 of light, I-15-1, II-18-8 f
 of sound, I-47-7 f
Sphere of charge, II-5-4 f
Spherically symmetric solution, III-19-2 f
Spherical harmonics, III-19-1
Spherical waves, II-20-12 ff, II-21-2 ff
Spinel, II-37-12
Spin one-half particles, III-6-1 ff,
 III-12-1 ff
 precession of, III-7-10 ff
Spin-one particles, III-5-1 ff
Spin orbit, II-8-7
Spin-orbit interaction, III-15-13
Spin waves, III-15-1 ff
Spontaneous emission, I-42-9
Standard deviation, I-6-9
State vector, III-8-1
 resolution of, III-8-3 ff
States of definition energy, III-13-3 ff
Statics, II-4-1 f
Stationary state, III-7-2, III-11-22
Statistical fluctuations, I-6-3 ff
Statistical mechanics, I-3-1, I-40-1 ff
Steady flow, II-40-6 ff
Step leader, II-9-10
Stern, II-35-3
Stern-Gerlach apparatus, III-5-1 ff
Stern-Gerlach experiment, II-35-3 ff
Stevinus, S., I-4-5
Stokes' theorem, II-3-10
Strain, II-38-2
Strain tensor, II-31-11, II-39-1 ff
"Strange" particles, II-8-7
Strangeness, III-11-12
 conservation of, III-11-12
"Strangeness" number, I-2-9
Streamlines, II-40-6
Streamlines, II-40-6

Smooth muscle, I-14-2
Snell, W., I-26-3
Snell's law, I-26-3, I-31-2, II-33-1
Sodium, III-19-16
Solenoid, II-13-5
Solid-state physics, II-8-6
Sound, I-2-3, I-47-1 ff, I-50-1
 speed of, I-47-7 f
Space, I-8-2
Space-time, I-2-6, I-17-1 ff, II-26-12
Special theory of relativity, I-15-1 ff
Specific heat, I-40-7 f, I-45-2, II-37-4
Speed, I-8-2 ff, I-9-2
 of light, I-15-1, II-18-8 f
 of sound, I-47-7 f
Sphere of charge, II-5-4 f
Spherically symmetric solution, III-19-2 f
Spherical harmonics, III-19-1
Spherical waves, II-20-12 ff, II-21-2 ff
Spinel, II-37-12
Spin one-half particles, III-6-1 ff,

Tensor, II-26-7, II-31-1 ff
Tensor field, II-31-11
Tetragonal cell, II-30-7
Theory of gravitation, II-42-13 f
Thermal conductivity, II-2-8, II-12-2
 of a gas, I-43-9 f
Thermal equilibrium, I-41-3 ff
Thermal ionization, I-42-5 ff
Thermodynamics, I-39-2, I-45-1 ff,
 II-37-4 f
 laws of, I-44-1 ff
Thompson, II-5-3
Thompson atomic model, II-5-3
Thompson scattering cross section,
 II-5-3
Three-body problem, I-10-1
Three-dimensional waves, II-20-8 f
Three-dimensional lattice, III-13-7 f
Thunderstorms, II-9-5 ff
Tides, I-7-4 f
Time, I-2-3, I-5-1 ff, I-8-1, I-8-2
 retarded, I-28-2
 standard of, I-5-5
 transformation of, I-15-5 ff
Time-dependent states, III-13-6 f
Torque, I-18-4, I-20-1 ff
Torsion bar, II-38-5 ff
Total internal reflection, II-33-12 f
Transformation, Fourier, I-25-4
 Galilean, I-12-11
 linear, I-11-6
 Lorentz, I-15-3, I-17-1, I-34-8,
 I-52-2, II-25-1, II-26-1 ff
 of time, I-15-5 ff
 of velocity, I-16-4 ff
Transformer, II-16-4 f
Transforming amplitudes, III-6-1 ff
Transient, I-24-1 ff
 electrical, I-24-5 f
Transient response, I-21-6
Transistor, III-14-11 ff
Translation of axes, I-11-1 ff
Transmission line, II-24-1 ff
Transmitted waves, II-35-7 ff
Travelling field, II-18-5 ff
Triclinic lattice, II-30-7
Trigonal lattice, II-30-7
Triphenyl cyclopropenyl, III-15-13
Twenty-one centimeter line, III-12-9
Twin paradox, I-16-3 f
Twin paradox, I-16-3 f

Tensor, II-26-7, II-31-1 ff
Tensor field, II-31-11
Tetragonal cell, II-30-7
Theory of gravitation, II-42-13 f
Thermal conductivity, II-2-8, II-12-2
 of a gas, I-43-9 f
Thermal equilibrium, I-41-3 ff
Thermal ionization, I-42-5 ff
Thermodynamics, I-39-2, I-45-1 ff,
 II-37-4 f
 laws of, I-44-1 ff
Thompson, II-5-3
Thompson atomic model, II-5-3
Thompson scattering cross section,
 II-5-3
Three-body problem, I-10-1
Three-dimensional waves, II-20-8 f
Three-dimensional lattice, III-13-7 f
Thunderstorms, II-9-5 ff
Tides, I-7-4 f
Time, I-2-3, I-5-1 ff, I-8-1, I-8-2

Vector analysis, I-11-5, I-52-2
 Vector field, II-1-4 f, II-2-1 ff
 flux of, II-3-2 ff
 Vector integrals, II-3-1 f
 Vector operator, II-2-6
 Vector potential, II-14-1 ff, II-15-1 ff
 Vector product, I-20-4
 Velocity, I-8-3, I-9-2 f
 components of, I-9-3
 transformation of, I-16-4 ff
 Velocity potential, II-12-9
 Vinci, Leonardo da, I-36-2
 Virtual work, principle of, I-4-5
 Viscosity, II-41-1 ff
 coefficient of, II-41-2
 Viscous flow, II-41-4 f
 Vision, I-36-1 ff
 binocular, I-36-4
 color, I-35-1 ff
 Visual cortex, I-36-4
 Visual purple, I-35-9
 Voltmeter, II-16-1
 Volume strain, II-38-3
 Volume stress, II-38-3
 von Neumann, J., II-40-3
 Vortex lines, II-40-10 ff
 Vorticity, II-40-5

 Wall energy, II-37-6
 Wapstra, I-52-10
 Watt (unit), I-13-3
 Wave, I-51-1 ff, II-20-1 ff
 electromagnetic, II-21-1 f
 light, I-48-1
 packet, III-13-6
 plane, II-20-1 ff
 reflected, II-33-7 ff
 shear, I-51-4, II-38-8
 sinusoidal, I-29-2 f
 spherical, II-20-12 ff, II-21-2 ff
 three-dimensional, II-20-8 f
 transmitted, II-33-7 ff
 Wave equation, I-47-1 ff, II-18-9 ff
 Wavefront, I-47-3
 Wave function, III-16-5 ff
 meaning, III-21-6
 Waveguides, II-24-1 ff
 Wavelength, I-19-3, I-26-1
 Wave nodes, III-7-9
 Wave number, I-29-2
 Weber, II-16-2
 Weber (unit), II-13-1
 "Wet" water, II-14-1 ff
 Weyl, H., I-11-1
 Wheeler, II-28-8

 Wilson, C. T. R., II-9-9
 Work, I-13-1 ff, I-14-1 ff

 X-rays, I-2-5, I-26-1
 X-ray diffraction, II-30-1

 Young, I-35-7
 Young's modulus, II-38-2
 Yukawa, H., I-2-8, II-28-13
 Yukawa potential, II-28-13, III-10-7
 Yustova, I-35-8

 Zeeman splitting, III-12-9 ff
 Zeno, I-8-3
 Zero, absolute, I-1-5
 Zero curl, II-3-10 f, II-4-1
 Zero divergence, II-3-10 f, II-4-1
 Zero mass, I-2-10
 Zinc, III-19-16