THOMSON

国际著名物理图书 —— 影印版系列 1

Principles of Physics
(Third Edition)

物理学原理（下）
（第3版）

Serway & Jewett

A Calculus-Based Text

基于微积分的读本

清华大学出版社

国际著名物理图书 —— 影印版系列 1

Principles of Physics

(Third Edition)

物理学原理（下）

（第3版）

Serway & Jewett

清华大学出版社

北京

Serway & Jewett
Principles of Physics, Third Edition
EISBN: 0-03-027157-6

981-254-193-4

北京市版权局著作权合同登记号　图字：01-2003-6418

图书在版编目(CIP)数据

物理学原理 = Principles of Physics：第 3 版（下）/ 赛尔维，朱厄特著. —影印本. —北京：清华大学出版社，2004.2
（国际著名物理图书. 影印版系列）
ISBN 7-302-07635-9

Ⅰ. 物…　Ⅱ. ①赛…　②朱…　Ⅲ. 物理学－英文　Ⅳ. O4

中国版本图书馆 CIP 数据核字（2003）第 106120 号

出 版 者：清华大学出版社　　**地　　址**：北京清华大学学研大厦
http://www.tup.com.cn　　**邮　　编**：100084
社 总 机：010-62770175　**客户服务**：010-62776969
责任编辑：朱红莲
印 刷 者：北京市世界知识印刷厂
装 订 者：北京市密云县京文制本装订厂
发 行 者：新华书店总店北京发行所
开　　本：210×248　**印张**：47.5
版　　次：2004 年 2 月第 1 版　2005 年 7 月第3 次印刷
书　　号：ISBN 7-302-07635-9/O·332
印　　数：4501～6500
定　　价：79.00 元(上、下册)

Pedagogical Color Chart

Mechanics

Displacement and position vectors

Linear (**v**) and angular (ω) velocity vectors

Velocity component vectors

Force vectors (**F**)

Force component vectors

Acceleration vectors (**a**)

Acceleration component vectors

Linear (**p**) and angular (**L**) momentum vectors

Torque vectors (τ)

Linear or rotational motion directions

Springs

Pulleys

Electricity and Magnetism

Electric fields

Magnetic fields

Positive charges

Negative charges

Resistors

Batteries and other dc power supplies

Switches

Capacitors

Inductors (coils)

Voltmeters

Ammeters

Galvanometers

ac Generators

Ground symbol

Light and Optics

Light rays

Lenses and prisms

Mirrors

Objects

Images

Some Fundamental Constants[a]

Quantity	Symbol	Value[b]
Atomic mass unit	u	$1.660\,540\,2(10) \times 10^{-27}$ kg
		931.494 32(2 8) MeV/c^2
Avogadro's number	N_A	$6.022\,136\,7(36) \times 10^{23}$ particles/mol
Bohr magneton	$\mu_B = \frac{e\hbar}{2m_e}$	$9.274\,015\,4(31) \times 10^{-24}$ J/T
Bohr radius	$a_0 = \frac{\hbar^2}{m_e e^2 k_e}$	$5.291\,772\,49\,(24) \times 10^{-11}$ m
Boltzmann's constant	$k_B = R/N_A$	$1.380\,658\,(12) \times 10^{-23}$ J/K
Compton wavelength	$\lambda_C = \frac{h}{m_e c}$	$2.426\,310\,58(2\,2) \times 10^{-12}$ m
Coulomb constant	$k_e = \frac{1}{4\pi\epsilon_0}$	$8.987\,551\,787 \times 10^9$ N·m^2/C^2 (exact)
Deuteron mass	m_d	$3.343\,586\,0(20) \times 10^{-27}$ kg
		2.013 553 214 (24) u
Electron mass	m_e	$9.109\,389\,7(54) \times 10^{-31}$ kg
		$5.485\,799\,03(1\,3) \times 10^{-4}$ u
		0.510 999 06(1 5) MeV/c^2
Electron-volt	eV	$1.602\,177\,33(4\,9) \times 10^{-19}$ J
Elementary change	e	$1.602\,177\,33(4\,9) \times 10^{-19}$ C
Gas constant	R	8.314 510 (70) J/K·mol
Gravitational constant	G	$6.672\,59(8\,5) \times 10^{-11}$ N·m^2/kg^2
Hydrogen ground state energy	$E_1 = -\frac{e^2 k_e}{2a_0}$	−13.605 698 (40) eV
Josephson frequency–voltage ratio	$2e/h$	$4.835\,976\,7(14) \times 10^{14}$ Hz/V
Magnetic flux quantum	$\Phi_0 = \frac{h}{2e}$	$2.067\,834\,61(6\,1) \times 10^{-15}$ T·m^2
Neutron mass	m_n	$1.674\,928\,6(10) \times 10^{-27}$ kg
		1.008 664 904 (14) u
		939.565 63(2 8) MeV/c^2
Nuclear magneton	$\mu_n = \frac{e\hbar}{2m_p}$	$5.050\,786\,6(17) \times 10^{-27}$ J/T
Permeability of free space	μ_0	$4\pi \times 10^{-7}$ T·m/A (exact)
Permittivity of free space	$\epsilon_0 = 1/\mu_0 c^2$	$8.854\,187\,817 \times 10^{-12}$ C^2/N·m^2 (exact)
Planck's constant	h	$6.626\,075\,(40) \times 10^{-34}$ J·s
	$\hbar = h/2\pi$	$1.054\,572\,66(6\,3) \times 10^{-34}$ J·s
Proton mass	m_p	$1.672\,623\,(10) \times 10^{-27}$ kg
		1.007 276 470 (12) u
		938.272 3(28) MeV/c^2
Rydberg constant	R_H	$1.097\,373\,153\,4(13) \times 10^7$ m^{-1}
Speed of light in vacuum	c	$2.997\,924\,58 \times 10^8$ m/s (exact)

[a] These constants are the values recommended in 1986 by CODATA, based on a least-squares adjustment of data from different measurements. For a more complete list, see E. R. Cohen and B. N. Taylor, *Rev. Mod. Phys.* 59:1121, 1987.

[b] The numbers in parentheses for the values above represent the uncertainties of the last two digits.

Solar System Data

Body	Mass (kg)	Mean Radius (m)	Period (s)	Distance from the Sun (m)
Mercury	3.18×10^{23}	2.43×10^{6}	7.60×10^{6}	5.79×10^{10}
Venus	4.88×10^{24}	6.06×10^{6}	1.94×10^{7}	1.08×10^{11}
Earth	5.98×10^{24}	6.37×10^{6}	3.156×10^{7}	1.496×10^{11}
Mars	6.42×10^{23}	3.37×10^{6}	5.94×10^{7}	2.28×10^{11}
Jupiter	1.90×10^{27}	6.99×10^{7}	3.74×10^{8}	7.78×10^{11}
Saturn	5.68×10^{26}	5.85×10^{7}	9.35×10^{8}	1.43×10^{12}
Uranus	8.68×10^{25}	2.33×10^{7}	2.64×10^{9}	2.87×10^{12}
Neptune	1.03×10^{26}	2.21×10^{7}	5.22×10^{9}	4.50×10^{12}
Pluto	$\approx 1.4 \times 10^{22}$	$\approx 1.5 \times 10^{6}$	7.82×10^{9}	5.91×10^{12}
Moon	7.36×10^{22}	1.74×10^{6}	—	—
Sun	1.991×10^{30}	6.96×10^{8}	—	—

Physical Data Often Used[a]

Average Earth–Moon distance	3.84×10^{8} m
Average Earth–Sun distance	1.496×10^{11} m
Average radius of the Earth	6.37×10^{6} m
Density of air (20°C and 1 atm)	1.20 kg/m^3
Density of water (20°C and 1 atm)	1.00×10^{3} kg/m^3
Free-fall acceleration	9.80 m/s^2
Mass of the Earth	5.98×10^{24} kg
Mass of the Moon	7.36×10^{22} kg
Mass of the Sun	1.99×10^{30} kg
Standard atmospheric pressure	1.013×10^{5} Pa

[a] These are the values of the constants as used in the text.

Some Prefixes for Powers of Ten

Power	Prefix	Abbreviation	Power	Prefix	Abbreviation
10^{-24}	yocto	y	10^{1}	deka	da
10^{-21}	zepto	z	10^{2}	hecto	h
10^{-18}	atto	a	10^{3}	kilo	k
10^{-15}	femto	f	10^{6}	mega	M
10^{-12}	pico	p	10^{9}	giga	G
10^{-9}	nano	n	10^{12}	tera	T
10^{-6}	micro	μ	10^{15}	peta	P
10^{-3}	milli	m	10^{18}	exa	E
10^{-2}	centi	c	10^{21}	zetta	Z
10^{-1}	deci	d	10^{24}	yotta	Y

List of Life Science Applications/Problems

Pedagogical Color Chart

Mechanics

Displacement and position vectors

Linear (**v**) and angular (ω) velocity vectors

Velocity component vectors

Force vectors (**F**)

Force component vectors

Acceleration vectors (**a**)

Acceleration component vectors

Linear (**p**) and angular (**L**) momentum vectors

Torque vectors (τ)

Linear or rotational motion directions

Springs

Pulleys

Electricity and Magnetism

Electric fields

Magnetic fields

Positive charges

Negative charges

Resistors

Batteries and other dc power supplies

Switches

Capacitors

Inductors (coils)

Voltmeters

Ammeters

Galvanometers

ac Generators

Ground symbol

Light and Optics

Light rays

Lenses and prisms

Mirrors

Objects

Images

Contents Overview

Contents

VOLUME 1