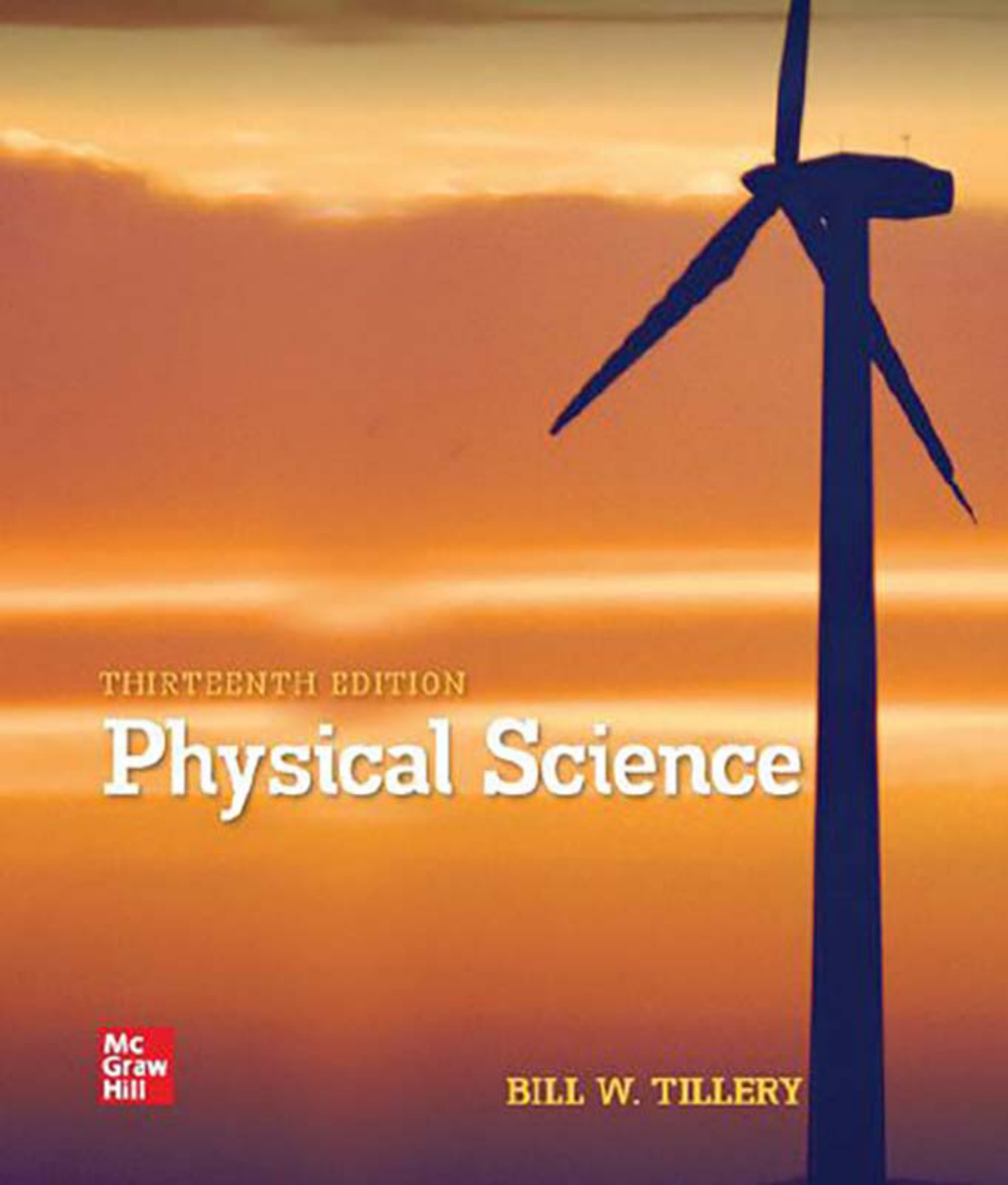
THIRTEENTH EDITION
Physical Science
Mc Graw Hill
BILL W. TILLERY

THIRTEENTH EDITION

PHYSICAL**SCIENCE**

BILL W. TILLERY

ARIZONA STATE UNIVERSITY

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CENTER FOR ASTRONOMY & PHYSICS EDUCATION RESEARCH

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PHYSICAL SCIENCE

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Conversion Factors

Length

1 in = 2.54 cm
1 cm = 0.394 in
1 ft = 30.5 cm
1 m = 39.4 in = 3.281 ft
1 km = 0.621 mi
1 mi = 5,280 ft = 1.609 km
1 light-year = 9.461×10^{15} m

Mass

1 lb = 453.6 g (where $g = 9.8$ m/s^2)
1 kg = 2.205 lb (where $g = 9.8$ m/s^2)
1 atomic mass unit u = 1.66061×10^{-27} kg

Volume

1 liter = 1.057 quarts
1 in^3 = 16.39 cm^3
1 gallon = 3.786 liter
1 ft^3 = 0.02832 m^3

Energy

1 cal = 4.184 J
1 J = 0.738 ft·lb = 0.239 cal
1 ft·lb = 1.356 J
1 Btu = 252 cal = 778 ft·lb
1 kWh = 3.60×10^6 J = 860 kcal
1 hp = 550 ft·lb/s = 746 W
1 W = 0.738 ft·lb/s
1 Btu/h = 0.293 W
Absolute zero (0K) = –273.15°C
1 J = 6.24×10^{18} eV
1 eV = 1.6022×10^{-19} J

Speed

1 km/h = 0.2778 m/s = 0.6214 mi/h
1 m/s = 3.60 km/h = 2.237 mi/h = 3.281 ft/s
1 mi/h = 1.61 km/h = 0.447 m/s = 1.47 ft/s
1 ft/s = 0.3048 m/s = 0.6818 mi/h

Force

1 N = 0.2248 lb
1 lb = 4.448 N

Pressure

1 atm = 1.013 bar = 1.013×10^5 N/m^2 = 14.7 lb/in^2
1 lb/in^2 = 6.90×10^3 N/m^2

Metric Prefixes

Prefix	Symbol	Meaning	Unit Multiplier
exa-	E	quintillion	10^{18}
peta-	P	quadrillion	10^{15}
tera-	T	trillion	10^{12}
giga-	G	billion	10^9
mega-	M	million	10^6
kilo-	k	thousand	10^3
hecto-	h	hundred	10^2
deka-	da	ten	10^1
unit			
deci-	d	one-tenth	10^{-1}
centi-	c	one-hundredth	10^{-2}
milli-	m	one-thousandth	10^{-3}
micro-	μ	one-millionth	10^{-6}
nano-	n	one-billionth	10^{-9}
pico-	p	one-trillionth	10^{-12}
femto-	f	one-quadrillionth	10^{-15}
atto-	a	one-quintillionth	10^{-18}

Physical Constants

Quantity	Approximate Value
Gravity (Earth)	$g = 9.8$ m/s^2
Gravitational law constant	$G = 6.67 \times 10^{-11}$ N·m^2/kg^2
Earth radius (mean)	6.38×10^6 m
Earth mass	5.97×10^{24} kg
Earth-Sun distance (mean)	1.50×10^{11} m
Earth-Moon distance (mean)	3.84×10^8 m
Fundamental charge	1.60×10^{-19} C
Coulomb law constant	$k = 9.00 \times 10^9$ N·m^2/C^2
Electron rest mass	9.11×10^{-31} kg
Proton rest mass	1.6726×10^{-27} kg
Neutron rest mass	1.6750×10^{-27} kg
Bohr radius	5.29×10^{-11} m
Avogadro's number	6.022045×10^{23}/mol
Planck's constant	6.62×10^{-34} J·s
Speed of light (vacuum)	3.00×10^8 m/s
Pi	$\pi = 3.1415926536$

Greek Letters

Alpha	Α	α	Nu	Ν	ν
Beta	Β	β	Xi	Ξ	ξ
Gamma	Γ	γ	Omicron	Ο	ο
Delta	Δ	δ	Pi	Π	π
Epsilon	Ε	ε	Rho	Ρ	ρ
Zeta	Ζ	ζ	Sigma	Σ	σ
Eta	Η	η	Tau	Τ	τ
Theta	Θ	θ	Upsilon	Υ	υ
Iota	Ι	ι	Phi	Φ	φ
Kappa	Κ	κ	Chi	Χ	χ
Lambda	Λ	λ	Psi	Ψ	ψ
Mu	Μ	μ	Omega	Ω	ω

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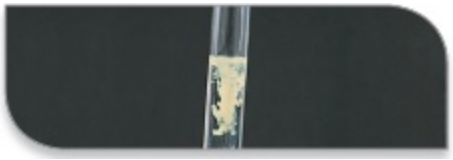

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