

NAMED CONSTANTS

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Department of Chemistry, York University
4700 Keele Street, Toronto, ONTARIO M3J 1P3, CANADA

For suggestions, corrections, additional information, and comments please send e-mails to c1000@careerchem.com

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Lorenzo Romano Amedeo Carlo Avogadro, Conte de Quaregno e Cerreto



9 August 1776 - 9 July 1856
Italian, b. Turin Italy

Avogadro's Number, $N = 6.023 \times 10^{23}$ molecules mole⁻¹

Avogadro, A. *J. Physique* **1811**, 73, 58
Perrin, J. *Compt. Rend. Acad. Sci.* **1908**, 146, 967
Perrin, J. *Compt. Rend. Acad. Sci.* **1908**, 147, 594
Paneth, F.A. *Nature* **1957**, 179, 145

Biographical References:

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Partington, J.R., *A History of Chemistry*, Vol. IV, Macmillan and Co., Ltd.: London, 1964, p. 213

Murrell, J.N. *Helv. Chim. Acta* **2001**, 84, 1314

Niels Hendrik David Bohr



7 October 1885 - 16 November 1962

Danish, b. Copenhagen, Denmark

Nobel Prize Physics 1922

Bohr magneton for electron, $9.274 \times 10^{-24} \text{ J T}^{-1}$

Bohr magneton for nucleus, $5.051 \times 10^{-27} \text{ J T}^{-1}$

First Bohr radius, $5.292 \times 10^{-11} \text{ m}$

Biographical references:

Cockcroft, J. *Biog. Memoirs Fellows Roy. Soc.* **1963**, 9, 37

Daintith, J.; Mitchell, S.; Tootill, E.; Gjersten, D., *Biographical*

Encyclopedia of Scientists, Institute of Physics Publishing: Bristol, UK, 1994

Rosenfeld, L. in *Dictionary of Scientific Biography*, Gillispie, C.C. ed.; Charles Scribner's Sons: New York, 1981, Vol. 2, p. 239

Wheeler, J.A. *Physics Today* **1985**, 38(10), 66

Heilbron, J.L. *Physics Today* **1985**, 38(10), 28

Roesenberg, U. *Niels Bohr: life and work of an atomic scientist (1885 – 1962)*, 2nd ed., Akademie Verlag: Berlin, 1987

Pauli, W. (ed.) *Niels Bohr and the Development of Physics*, McGraw-Hill Book Co.: New York, 1955

Craig, G.W. *Helv. Chim. Acta* **2013**, 96, 2304

Ludwig Edward Boltzmann



20 February 1844 - 5 September 1906

Austrian, b. Vienna, Austria

Boltzmann's constant, $k_B = 1.380 \times 10^{-23} \text{ J K}^{-1}$

Boltzmann, L., *Sitzungsberichte der Akademie Wissenschaften in Wien: Mathematisch-Naturwissenschaftliche Classe* **1877**, 76ll, 373

Biographical References:

Daintith, J.; Mitchell, S.; Tootill, E.; Gjersten, D., *Biographical Encyclopedia of Scientists*, Institute of Physics Publishing: Bristol, UK, 1994

Brush, S.G. in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific Biography*, Charles Scribner & Sons: New York, 1970, Vol. 2, 260

Arthur Holly Compton



10 September 1892 - 15 March 1962
American, b. Wooster, Ohio, USA

Nobel Prize Physics 1927

Compton wavelength of the electron, 2.426×10^{-12} m
Compton wavelength of the proton, 1.321×10^{-15} m
Compton wavelength of the neutron, 1.320×10^{-15} m

Compton wavelength

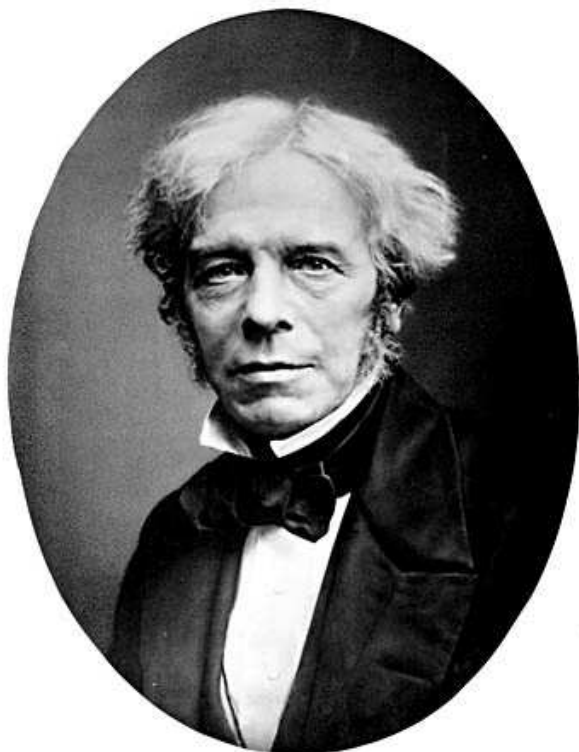
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Biographical references:

Allison, S.K., *Biog. Memoirs Natl. Acad. Sci.* **1965**, 38, 81

Michael Faraday



22 September 1791 - 25 August 1867

British, b. Newington Butts, Surrey, near London, England

Faraday Constant, $F = 9.65 \times 10^4 \text{ C}$

Biographical References:

Anon., *J. Chem. Soc.* **1868**, 21, xxi

Farber, Eduard (ed.), *Great Chemists*, Interscience Publishers: New York, 1961

Abbott, David (ed.), *The Biographical Dictionary of Scientists: Chemists*, Peter BedrickBooks: New York, 1983

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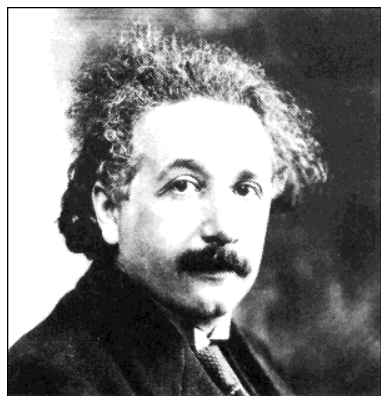
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Albert Einstein



14 March 1879 - 18 April 1955

German-American, b. Ulm, Bavaria, Germany

Physics Nobel Prize 1921

Einstein constant, $c_2 = 8.987 \times 10^{10} \text{ J/kg}$

Biographical references:

Wheeler, J.A. *Biog. Memoirs Natl. Acad. Sci.* **1980**, 51, 97

Whittaker, Sir E., *Biog. Mem. Fellows Roy. Soc.* **1955**, 1, 37

Balazs, N.L. in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific Biography*, Charles Scribner & Sons: New York, 1971, Vol. 4, 312

Brian David Josephson

4 January 1940 -

Welsh, b. Cardiff, Wales

Physics Nobel Prize 1973

Josephson frequency-voltage quotient, $4.836 \times 10^{-14} \text{ s}^{-1} \text{ V}^{-1}$

Biographical references:

Millar, D.; Millar, I.; Millar, J.; Millar, M., *Chambers Concise Dictionary of Scientists*, W. & R. Chambers: Edinburgh, 1989

Johann Joseph Loschmidt

15 March 1821 - 8 July 1895

German-Czech, b. Putshirn, near Carlsbad, Bohemia (now Karlovy Vary, Czech Republic)

Loschmidt number, $N = 6.023 \times 10^{23} \text{ molecules mole}^{-1}$ (number of molecules in 22.414 litres (1 mole) of any gas)

Loschmidt, J. *Sitzungsber. Akad. Wissensch. Wien, Math.-Natwiss. Klasse*, **1865**, 52(Abth. II), 395

Loschmidt, J. *Schlomilch's Z. für Math. Und Phys.* **1865**, 10, 511

Paneth, F.A. *Nature* **1957**, 179, 145

Biographical references:

Bohm, Walter in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific Biography*, Charles Scribner & Sons: New York, 1973, Vol. 8, 507

Wiswesser, W.J. *Aldrichimia Acta* **1989**, 22, 17

Fleischhacker, W.; Schonfeld, T. (eds.) *Pioneering Ideas for the Physical and Chemical Sciences*, Plenum Press: New York, 1997

Noe, C.R.; Bader, A. *Chem. Br.* **1993**, 29, 126

Rocke, A.J. *Chem. Br.* **1993**, 29, 401

Bader, A. *Bull. Hist. Chem.* **1998**, 22, 21

Erwin Madelung

18 May 1881 – 1 August 1972

German, b. Bonn, Germany

Madelung series, Madelung constant

Madelung, E., *Physik. Z.* **1910**, 11, 898

Madelung, E., *Physik. Z.* **1918**, 19, 524

Biographical References:

World Biographical Index, K.G. Saur Publishing,

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Pogg. **1926**, 5, 789

Schröder, U.E. in *Physiker und Astronomen in Frankfurt*, University of Frankfurt Department of Physics: Frankfurt, 1989

Personal communication, Prof. Dr. Christian Reichardt, November 2001

Sir Isaac Newton

25 December 1642 - 20 March 1727

British, b. Woolsthorpe, Lincolnshire, England

Newton's gravitational constant, $G = 6.670 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$

Biographical references:

Cohen, I.B. in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific Biography*, Charles Scribner & Sons: New York, 1974, Vol. 10, 42

Max Karl Ernst Ludwig Planck



23 April 1858 - 3 October 1947

German, b. Kiel, Germany

Planck's Constant, $h = 6.625 \times 10^{-34} \text{ J s}$

Planck, M., *Verh. Deut. Physik. Gesell.* **1900**, 2, 237

Planck, M., *Ann. Physik* **1900**, 1, 69

Planck, M., *Ann. Physik* **1901**, 4, 553

Millikan, R.A. *Phys. Rev.* **1916**, 7, 18; 355

Biographical References:

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Einstein, A., *Angew. Chem.* **1949**, 61, 113

von Laue, M., *Angew. Chem.* **1949**, 61, 114

Heisenberg, W., *Angew. Chem.* **1949**, 61, 115

Becker, R., *Angew. Chem.* **1949**, 61, 117

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Partington, J.R., *A History of Chemistry*, Vol. IV, Macmillan and Co., Ltd.: London, 1964, p. 956

Born, M., *Roy. Soc. Obit. Not. Fellows* **1948 - 1949**, 6, 161

Johannes Robert Rydberg



8 November 1854 - 28 December 1919
Swedish, b. Halmstad, Sweden

Rydberg constant, $R = 1.097 \times 10^7 \text{ m}^{-1}$

Rydberg, J.R., *Phil. Mag.* **1890**, 29, 331
Rydberg, J.R., *Compt. Rend.* **1890**, 110, 394
Rydberg, J.R., *Z. Physik. Chem.* **1890**, 5, 227
Rydberg, J.R., *Astrophys. J.* **1897**, 6, 233
Rydberg, J.R., *Wied. Ann. Physik* **1896**, 58, 674

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Maier, C.L. in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific Biography*, Charles Scribner & Sons: New York, 1975, Vol. 12, 42

Erwin Schrödinger



12 August 1887 - 4 January 1961
Austrian, b. Vienna, Austria

Nobel Prize Chemistry 1933

Schrödinger constant for a fixed nucleus, $1.638 \times 10^{38} \text{ J}^{-1} \text{ m}^{-2}$

Schrödinger constant for the hydrogen atom, $1.637 \times 10^{38} \text{ J}^{-1} \text{ m}^{-2}$

Biographical References:

Hermann, A. in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific Biography*, Charles Scribner & Sons: New York, 1975, Vol. 12, 217

Daintith, J.; Mitchell, S.; Tootill, E.; Gjersten, D., *Biographical Encyclopedia of Scientists*, Institute of Physics Publishing: Bristol, UK, 1994

Heitler, W. *Biog. Memoirs Fellows Roy. Soc.* **1961**, 7, 221

Josef Stefan



24 March 1835 - 7 January 1893
Austrian, b. near Klagenfurt, Austria

Stefan-Boltzmann Constant, $\sigma = 5.669 \times 10^{-8} \text{ J m}^{-2} \text{ s}^{-1} \text{ K}^{-4}$

Stefan, J., *Sitzungsberichte der Akademie der Wissenschaften in Wien* **1879**, 79(II), 391
Stefan, J., *Wiener Ber.* **1879**, 79, 391

Biographical References:

Daintith, J.; Mitchell, S.; Tootill, E.; Gjersten, D., *Biographical Encyclopedia of Scientists*, Institute of Physics Publishing: Bristol, UK, 1994

Sir Joseph John Thomson

18 December 1856 - 30 August 1940
British, b. Cheetham Hill, near Manchester, England

Physics Nobel 1906

Thomson cross-section, $6.652 \times 10^{-29} \text{ m}^2$

Biographical references:

Heibron, J.L. in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific Biography*, Charles Scribner & Sons: New York, 1976, Vol. 13, 362
Lord Rayleigh, *Roy. Soc. Fellows Obit. Not.* **1941**, 3, 587

Pieter Zeeman



5 May 1865 - 9 October 1943

Dutch, b. Zonnemaire, Zeeland, Netherlands

Nobel Prize Physics 1902

Zeeman displacement per gauss, $4.669 \times 10^{-3} \text{ m gauss}^{-1}$

Biographical references:

Daintith, J.; Mitchell, S.; Tootill, E.; Gjersten, D., *Biographical Encyclopedia of Scientists*, Institute of Physics Publishing: Bristol, UK, 1994

Lord Rayleigh, *Roy. Soc. Obit. Not.* **1942 - 1944**, 4, 591

Wilhelm Carl Werner Otto Fritz Franz Wien

13 January 1864 - 30 August 1928

German, b. Gaffken, East Prussia

Wien displacement law constant, $2.898 \times 10^{-3} \text{ m deg}$

Wien displacement law

Wien, W. *Ann. Physik* **1896**, 58, 662

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