

LA-UR-23-25450

Approved for public release; distribution is unlimited.

Title: Particle Physics Q&A

Author(s): Durocher, Mora

Intended for: Science Education Outreach for the Dennis Chavez Elementary School
(Albuquerque)

Issued: 2023-05-19



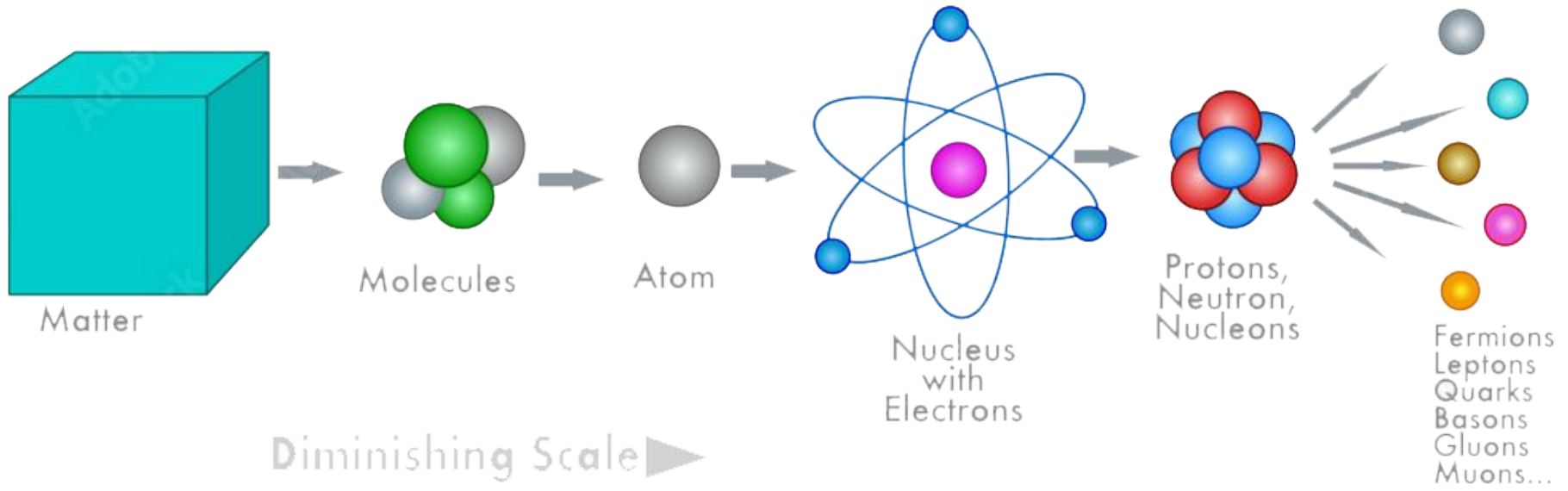
Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by Triad National Security, LLC for the National Nuclear Security Administration of U.S. Department of Energy under contract 89233218CNA000001. By approving this article, the publisher recognizes that the U.S. Government retains nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy. Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness.

Particle Physics Q&A

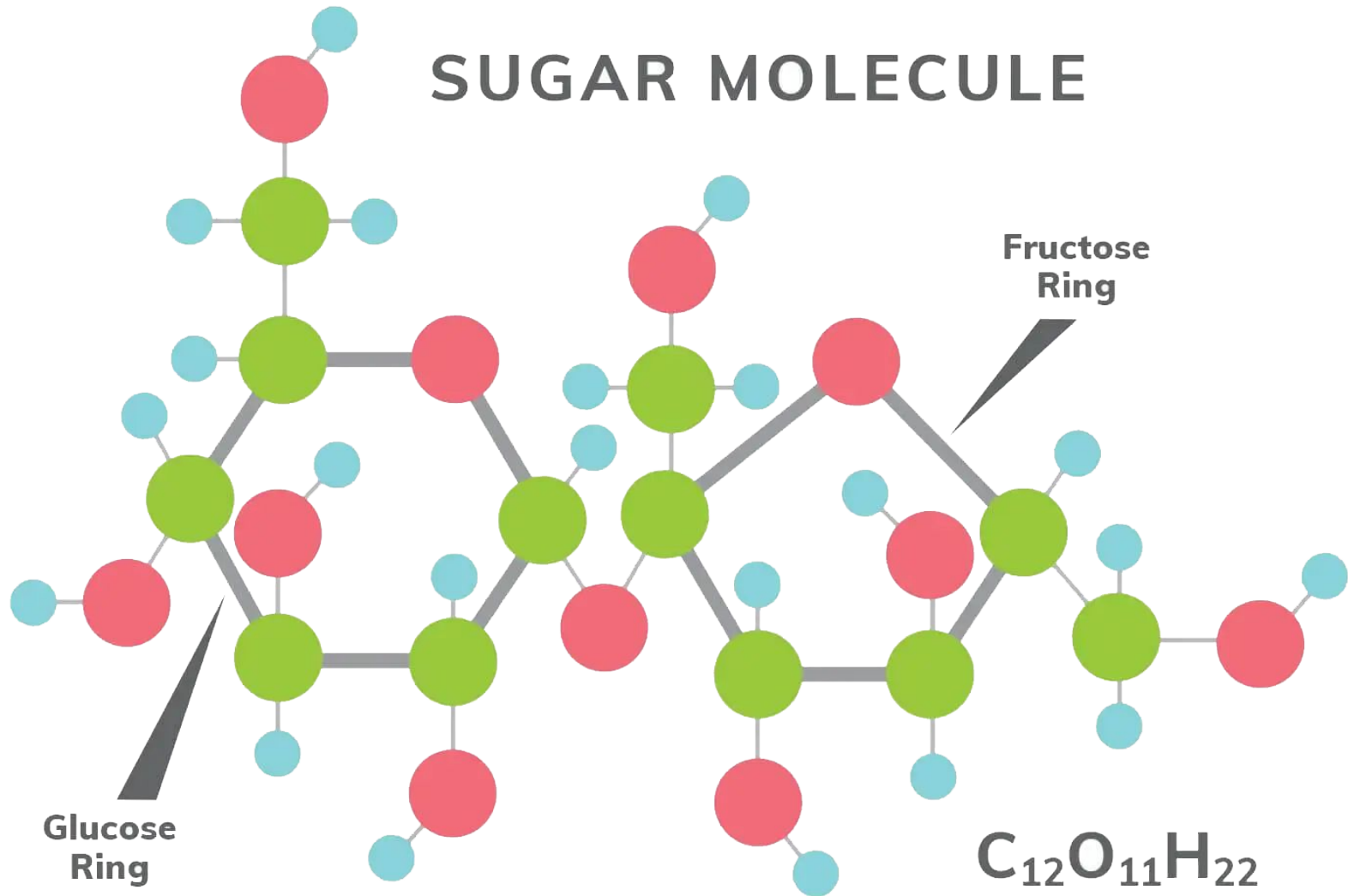
Dennis Chavez Elementary School

Dr. Mora Durocher

Particle Hierarchy



SUGAR MOLECULE



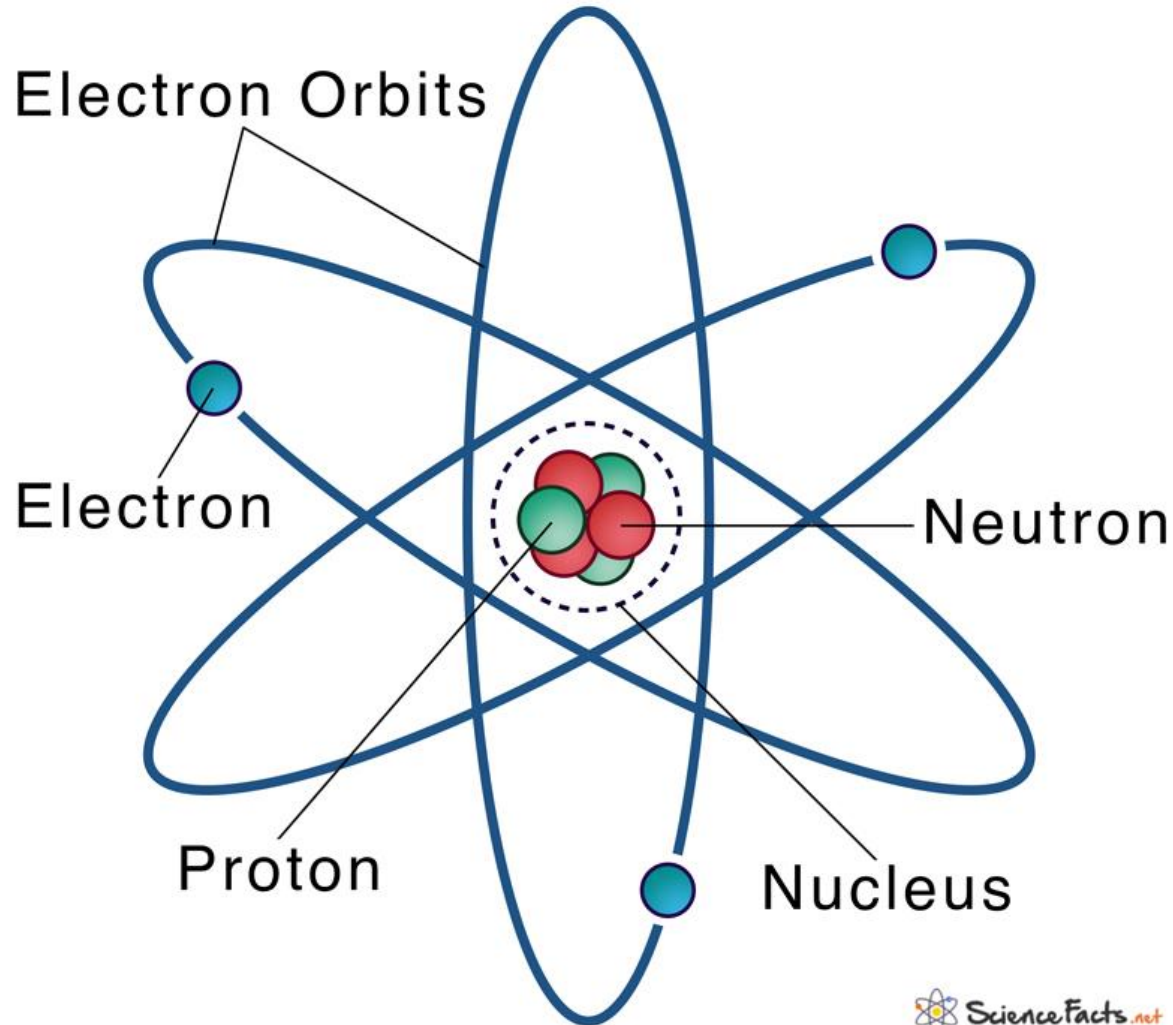
PERIODIC TABLE OF ELEMENTS

Year Discovered

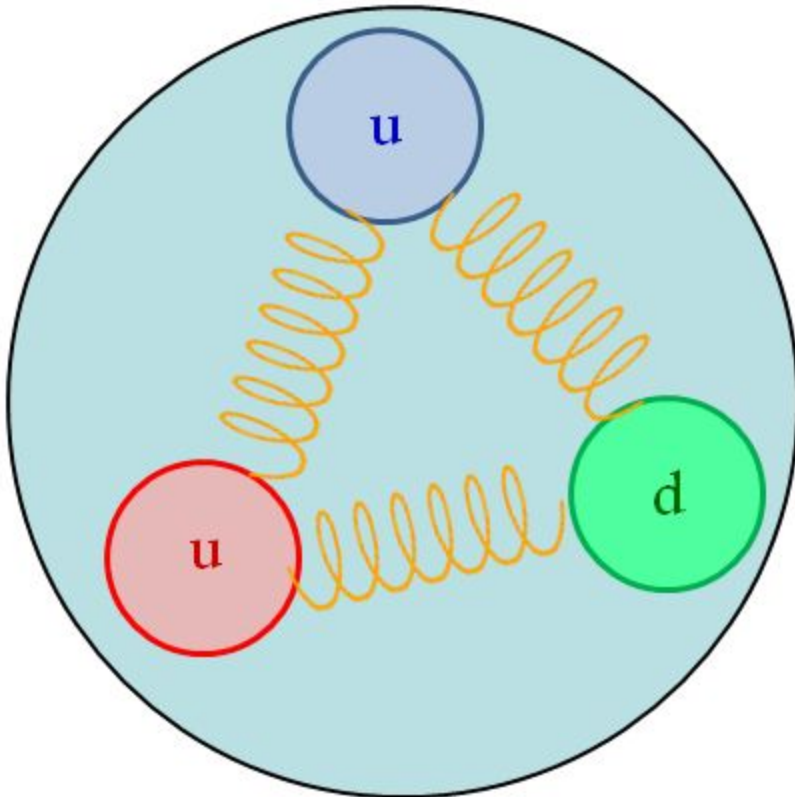
PubChem

1																	18										
1	1.0080																	2	4.00260								
1	H Hydrogen 1766																		He Helium 1868								
2	3	4											5	6	7	8	9	10									
	7.0	9.012183											10.81	12.011	14.007	15.999	18.9984...	20.180									
2	Li Lithium 1817	Be Beryllium 1798											B Boron 1808	C Carbon Ancient	N Nitrogen 1772	O Oxygen 1774	F Fluorine 1670	Ne Neon 1898									
	Atomic Number		17	35.45												Atomic Mass, u											
	Name		Cl	Chlorine												Symbol											
				1774												Year Discovered											
3	11	12											13	14	15	16	17	18									
	22.989...	24.305											26.981...	28.085	30.973...	32.07	35.45	39.9									
3	Na Sodium 1807	Mg Magnesium 1808											Al Aluminum Ancient	Si Silicon 1854	P Phosphorus 1669	S Sulfur Ancient	Cl Chlorine 1774	Ar Argon 1894									
4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36									
	39.0983	40.08	44.95591	47.867	50.9415	51.996	54.93804	55.84	58.93319	58.693	63.55	65.4	69.723	72.63	74.92159	78.97	79.90	83.80									
4	K Potassium 1807	Ca Calcium Ancient	Sc Scandium 1879	Ti Titanium 1791	V Vanadium 1801	Cr Chromium 1797	Mn Manganese 1774	Fe Iron Ancient	Co Cobalt 1735	Ni Nickel 1751	Cu Copper Ancient	Zn Zinc 1746	Ga Gallium 1875	Ge Germanium 1886	As Arsenic Ancient	Se Selenium 1817	Br Bromine 1826	Kr Krypton 1898									
5	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54									
	85.468	87.62	88.90584	91.22	92.90637	95.95	96.90636	101.1	102.9055	106.42	107.868	112.41	114.818	118.71	121.760	127.6	126.9045	131.29									
5	Rb Rubidium 1861	Sr Strontium 1790	Y Yttrium 1794	Zr Zirconium 1789	Nb Niobium 1801	Mo Molybdenum 1778	Tc Technetium 1937	Ru Ruthenium 1827	Rh Rhodium 1803	Pd Palladium 1803	Ag Silver Ancient	Cd Cadmium 1817	In Indium 1863	Sn Tin Ancient	Sb Antimony Ancient	Te Tellurium 1782	I Iodine 1811	Xe Xenon 1898									
6	55	56											72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
	132.90...	137.33											178.49	180.9479	183.84	186.207	190.2	192.22	195.08	196.96...	200.59	204.383	207	208.98...	208.98...	209.98...	222.01...
6	Cs Cesium 1860	Ba Barium 1808											Hf Hafnium 1923	Ta Tantalum 1802	W Tungsten 1783	Re Rhenium 1925	Os Osmium 1803	Ir Iridium 1803	Pt Platinum 1735	Au Gold Ancient	Hg Mercury Ancient	Tl Thallium 1861	Pb Lead Ancient	Bi Bismuth 1753	Po Polonium 1898	At Astatine 1940	Rn Radon 1900
7	87	88											104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
	223.01...	226.02...											267.1...	268.1...	269.1...	270.1...	269.1...	277.1...	282.1...	282.1...	286.1...	286.1...	290.1...	290.1...	293.2...	294.2...	295.2...
7	Fr Francium 1939	Ra Radium 1898											Rf Rutherfordium 1964	Db Dubnium 1967	Sg Seaborgium 1974	Bh Bohrium 1976	Hs Hassium 1984	Mt Meitnerium 1982	Ds Darmstadtium 1994	Rg Roentgenium 1994	Cn Copernicium 1996	Nh Nihonium 2004	Fl Flerovium 1998	Mc Moscovium 2003	Lv Livermorium 2000	Ts Tennessine 2010	Og Oganesson 2006
	57		58	59	60	61	62	63	64	65	66	67	68	69	70	71											
	138.9055		140.116	140.90...	144.24	144.91...	150.4	151.964	157.2	158.92...	162.500	164.93...	167.26	168.93...	173.05	174.9668											
	La Lanthanum 1839		Ce Cerium 1803	Pr Praseodymium 1885	Nd Neodymium 1885	Pm Promethium 1945	Sm Samarium 1879	Eu Europium 1901	Gd Gadolinium 1880	Tb Terbium 1843	Dy Dysprosium 1886	Ho Holmium 1878	Er Erbium 1843	Tm Thulium 1879	Yb Ytterbium 1878	Lu Lutetium 1907											
	89		90	91	92	93	94	95	96	97	98	99	100	101	102	103											
	227.02...		232.038	231.03...	238.0289	237.04...	244.06...	243.06...	247.07...	247.07...	251.07...	252.0830	257.0...	258.0...	259.1...	266.1...											
	Ac Actinium 1899		Th Thorium 1828	Pa Protactinium 1913	U Uranium 1789	Np Neptunium 1940	Pu Plutonium 1940	Am Americium 1944	Cm Curium 1944	Bk Berkelium 1949	Cf Californium 1950	Es Einsteinium 1952	Fm Fermium 1952	Md Mendelevium 1955	No Nobelium 1957	Lr Lawrencium 1961											

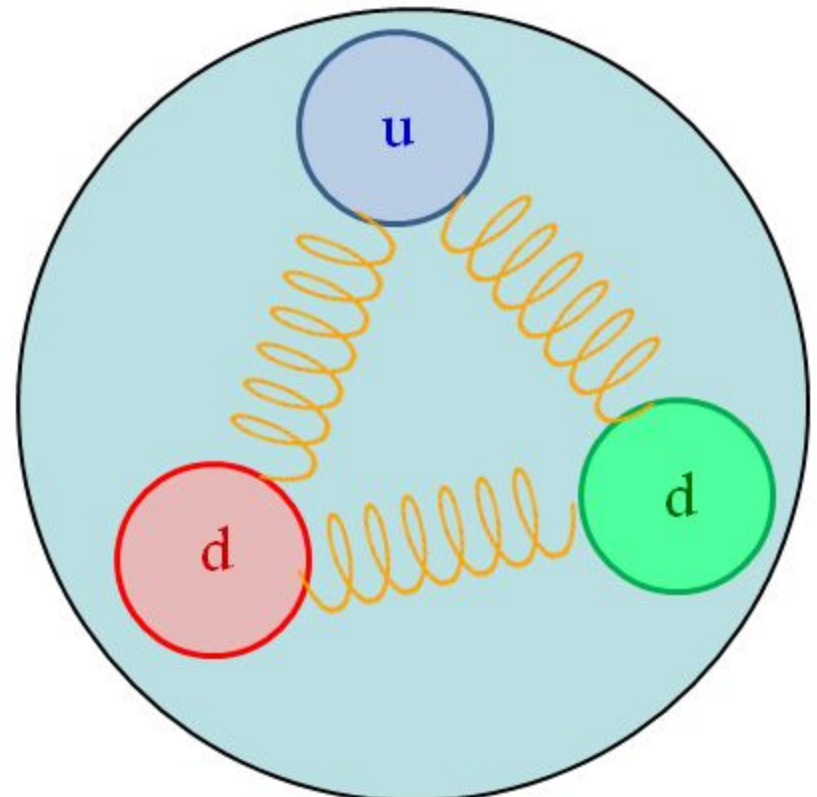
Atom



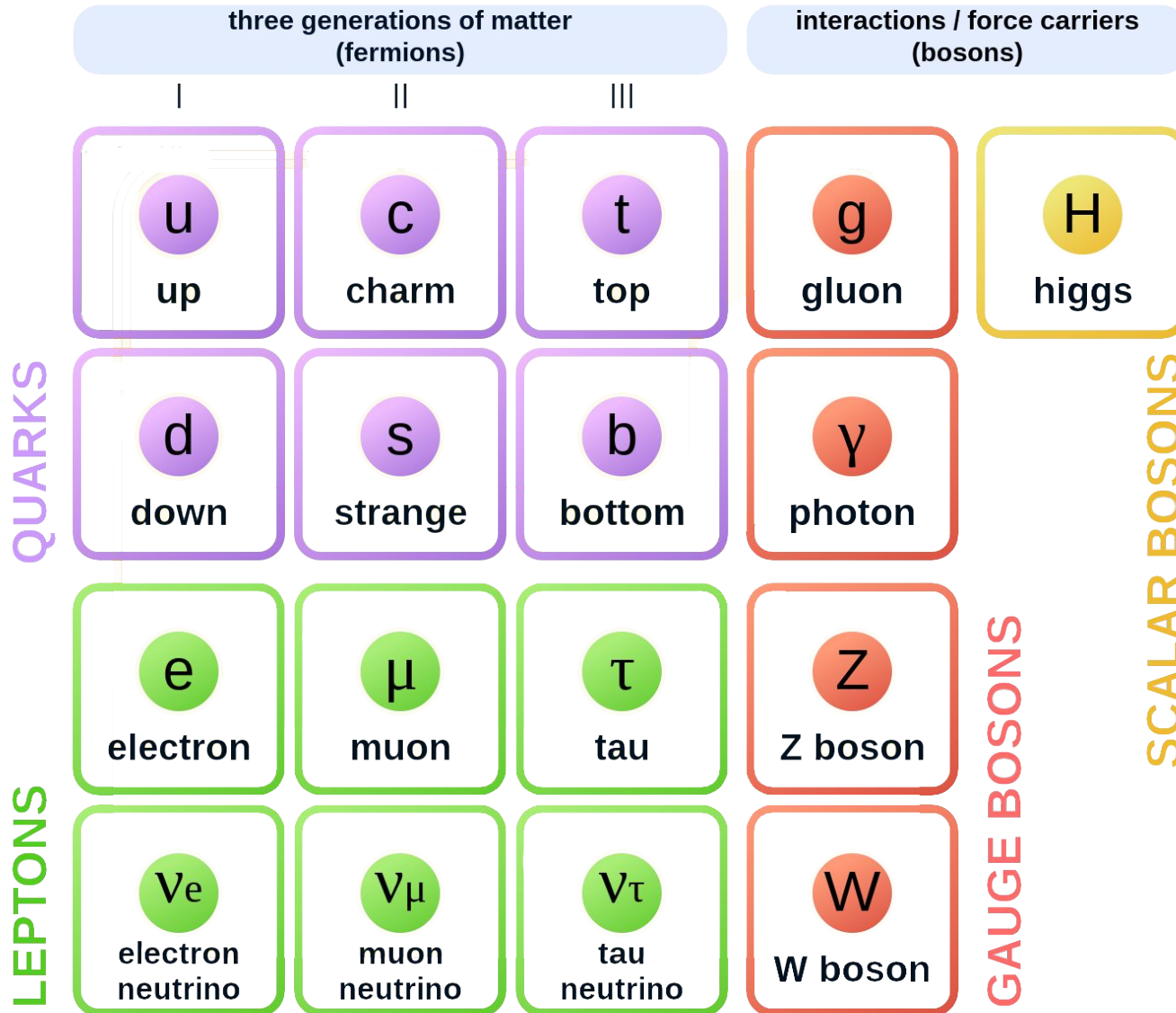
proton

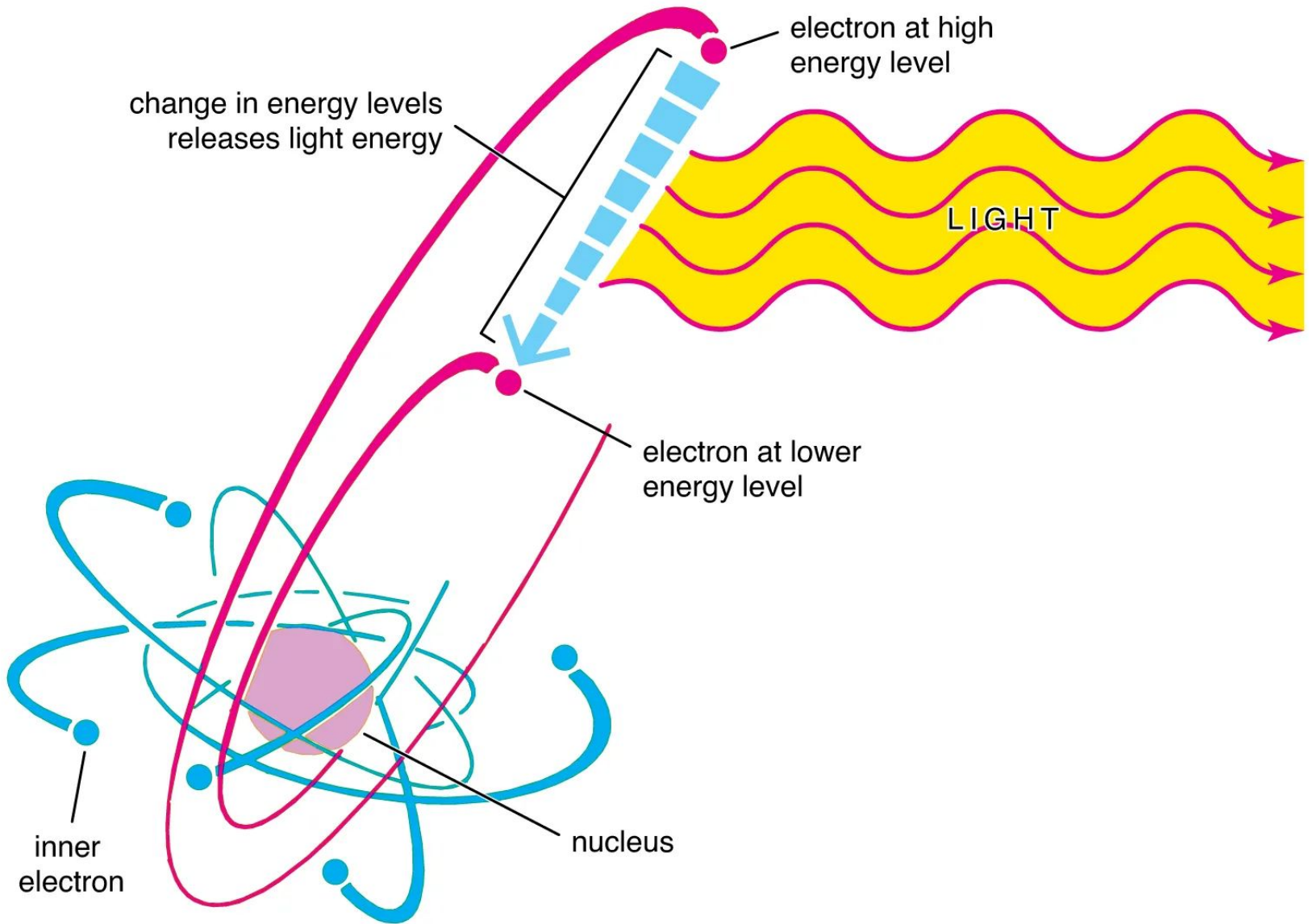


neutron



Standard Model of Elementary Particles





© Encyclopædia Britannica, Inc.