

Read this 1st: J-language uses: $_$ for negative numbers, % for divide, $\%$ for square-root, 4p1 for 4π , 4r3p1 for $(4/3)\pi$, 2p2 for $2\pi^2$

Now using CODATA 2018		Matching digits highlighted in yellow						
Quantity	Value	relUnc	L	T	M	C	sum	SIunits
h hBar = h%2p1	6.62607015000000e-34 1.05457181764616e-34	9.9e-15 9.9e-15	2	-1	1	0	2	J/Hz J S
l_P l_P = hBar%mu_P*c l_P = %:hBar*G%c^3	1.61625300000000e-35 1.61625502432592e-35 1.61625502432592e-35	1.1e-5 1.1e-5 1.1e-5	1	0	0	0	1	m m m
t_P2018 t_P = l_P%c	5.39124700000000e-44 5.39123969556299e-44	1.1e-5 1.1e-5	0	1	0	0	1	s s
c c = l_P%t_P c = Zo%mu_0 c = G*(m_P^2)%hBar c = 1%eps_0*Zo c = hBar%l_P*m_P c = 2*alpha*h%mu_0*e^2 c = %:K_e%k_m c = %:1%eps_0*mu_0	299792458.000000 299792051.856568 299792458.108825 299792458.145099 299792458.359751 299792833.520586 299792458.000000 299792458.063968 299792458.062020	0 1.6e-5 2.7e-5 3.1e-5 4.9e-5 1.6e-5 1.8e-12 2.1e-5 2.1e-5	1	-1	0	0	0	m/s m/s m/s m/s m/s m/s m/s m/s m/s
Zo = mu_0*c Zo = 4p1*m_P*(l_P^2)%t_P*q_P^2	3.76730313461771e2 3.76729331331779e2	0 2.7e-5	2	-1	1	-2	0	Zo Ohms
G_2018 G = (l_P^3)%m_P*t_P^2 G = hBar*c%mu_P^2	6.67430000000000e-11 6.67427355903721e-11 6.67430000000000e-11	2.2e-5 4.1e-5 2.2e-5	3	-2	-1	0	0	m3/kg s2 m3/kg s2 m3/kg s2
m_P2018 m_P = %:(hBar*c%G)	2.17643400000000e-8 2.17643434311292e-8	1.1e-5 1.1e-5	0	0	1	0	1	kg kg
T_P2018 T_P = m_P*(c^2)%k_B T_P = %:(hBar*(c^5)%G*k_B^2)	1.41678400000000e32 1.41678416241449e32 1.41678416241449e32	1.1e-5 1.1e-5 1.1e-5	2	-2	1	2	3	K K K
rho_P = 6%l_P1*G*t_P^2 rho_P = m_P%4r3p1*(l_P^2)^3	9.84503343562903e96 9.84507244509799e96	3.1e-5 3.5e-5	-3	0	1	0	-2	kg/m3 kg/m3
alpha_2018 alpha = (e%q_P)^2 alpha = (Zo*e^2)%2*h alpha = (e^2)%2*h*c*eps_0 alpha = %:(2*Ro0*h*c*m_e) alpha = %:r_e%a_0	7.29735256930000e-3 7.29735256530521e-3 7.29735256795415e-3 7.29735257139120e-3 7.29735256530521e-3 7.29735256577224e-3	1.5e-10 1.3e-12 2.7e-5 4.1e-5 1.3e-12 1.1e-5	0	0	0	0	0	
r_e = alpha*l_P*(hBar*t_P*c^2)%m_e r_e = alpha*l_P*(m_P%mu_e)	2.81793650397917e-15 2.81793679250917e-15	1.6e-5 1.6e-5	1	0	0	0	1	m m
a_0_2018 a_0 = hBar%alpha*m_e*c a_0 = 4p1*eps_0*(hBar^2)%m_e*e^2 a_0 = l_P*m_P%alpha*m_e	5.29177210903000e-11 5.29177210613775e-11 5.29177211061989e-11 5.29176547894316e-11	1.5e-10 2.3e-12 4.1e-5 1.6e-5	1	0	0	0	1	m m m m

relUnc is standard relative uncertainty.
sum: of Length Time Mass Charge dimensional units: when=0 the value is truly constant when=1 they are covariant, 2 variant to 2nd power...
Much to my surprise CODATA2018 appears to have gotten h and hBar right on! Why so puzzled? Here a 9-digit number yields 15 digits of precision. I've pondered this for weeks now. See next page for more thoughts.

Planck's constant: 14-decimal places is close to 64-bit floating point limit thus the 9.9e-15 is about 1.0e-14

Us Earthlings have defined the length of a meter to exactly match the reciprocal of the speed of light.

Zo=Impedance of Space (Normally Ohms, but here I want to emphasize Zobels being 100% reactive impedance, 0 resistance.)
mu_0, mu_0, is Magnetic Permeability.

Read this 2nd: J-language uses: _ for negative numbers, % for divide, %: for square-root, 4p1 for 4π, 4r3p1 for (4/3)π, 2p2 for 2π

Now using **JohnWsol2020** corrected Planck_units Matching digits highlighted in **Yell-Oh!** |

Quantity	Value	relUnc	L__T__M__C	sum	SIunits
h hBar	6.626070150000000e_34 1.05457181764616e_34	9.9e_15 9.9e_15	2 _1 1 0 2 _1 1 0	2 2	J/Hz J s
l_P l_P = hBar%mu_P*c l_P = %:hBar*G%c^3	1.61625409490756e_35 1.61625409490756e_35 1.61625409490756e_35	9.9e_15 1.7e_14 1.6e_14	1 0 0 0 1 0 0 0 1 0 0 0	1 1 1	m m m
t_P2018 t_P = l_P%c	5.391247000000000e_44 5.39124334778149e_44	1.1e_5 1e_14	0 1 0 0 0 1 0 0	1 1	s s
c c = l_P*t_P c = Zo%mu_0 c = G*(m_PA2)%hBar c = 1%eps_0*Zo c = hBar%l_P*m_P c = 2*alpha*h%mu_0*e^2 c = %:K_e%K_m c = %:1%eps_0*mu_0	299792458.000000 299792458.000000 299792458.000000 299792458.000000 299792458.000000 299792458.000000 299792458.000000 299792458.000000	1.4e_14 1.4e_14 4.2e_14 0 2e_14 1.8e_12 0 0	1 _1 0 0 1 _1 0 0 1 _1 0 0 1 _1 0 0 1 _1 0 0 1 _1 0 0 1 _1 0 0 1 _1 0 0	0 0 0 0 0 0 0 0	m/s m/s m/s m/s m/s m/s m/s m/s
Zo = mu_0*c Zo = 4p1*m_P*(l_PA2)%t_P*q_PA2	3.76730313461771e2 3.76730313461771e2	2.8e_14	2 _1 1 _2 2 _1 1 _2	0 0	Zo Ohms
q_P = %:(2*h%Zo) q_P = e%:%:alpha	1.8755460382902e_18 1.8755460382902e_18	0 0	0 0 0 1 0 0 0 1	1 1	C A s
G_2018 G = (l_PA3)%m_P*t_PA2 G = hBar*c%l_PA2	6.674300000000000e_11 6.67429232315729e_11 6.67429232315729e_11	2.2e_5 3.8e_14 3e_14	3 _2 _1 0 3 _2 _1 0 3 _2 _1 0	0 0 0	m3/kg s2 m3/kg s2 m3/kg s2
m_P m_P = %:(hBar*c%G)	2.17643559439662e_8 2.17643559439662e_8	1.4e_14 1.6e_14	0 0 1 0 0 0 1 0	1 1	kg kg
T_P2018 T_P = m_P*(c^2)%k_B T_P = %:(hBar*(c^5)%G*k_B^2)	1.416784000000000e32 1.41678497695729e32 1.41678497695729e32	1.1e_5 1.4e_14 1.6e_14	2 _2 1 2 2 _2 1 2 2 _2 1 2	3 3 3	K K K
rho_P = 6%p1*G*t_PA2 rho_P = m_P%4r3p1*(l_P%2)^3	9.84505808991950e96 9.84505808991950e96	3.6e_14 3.3e_14	-3 0 1 0 -3 0 1 0	-2 -2	kg/m3 kg/m3
alpha_2018 alpha = (e%q_P)^2 alpha = (Zo*e^2)%2*h alpha = (e^2)%2*h*c*eps_0 alpha = %:(2*Rooh*c*m_e) alpha = %:r_e%a_0	7.29735256930000e_3 7.29735256530521e_3 7.29735256530521e_3 7.29735256530521e_3 7.29735256530521e_3 7.29735256530521e_3	1.5e_10 1.3e_12 1.3e_12 1.3e_12 1.3e_12 1.6e_12	0 0	0 0 0 0 0 0	
r_e = alpha*l_P*(hBar%t_P*c^2)%m_e r_e = alpha*l_P*(m_P%me)	2.81794032158006e_15 2.81794032158006e_15	2.3e_12 2.3e_12	1 0 0 0 1 0 0 0	1 1	m m
a_0_2018 a_0 = hBar%alpha*m_e*c a_0 = 4p1*eps_0*(hBar^2)%m_e*e^2 a_0 = l_P*m_P%alpha*m_e	5.29177210903000e_11 5.29177210613775e_11 5.29177210613775e_11 5.29177210613775e_11	1.5e_10 2.3e_12 2.3e_12 2.3e_12	1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0	1 1 1 1	m m m m
r_p2018 r_p = 4*a_0*alpha%MpMe MpMe	8.414000000000000e_16 8.41235640424147e_16 1836.15267343000	0.0022 6e_11 6e_11	1 0 0 0 1 0 0 0 1 0 0 0	1 1 0	m m m

Corrected values are now much more precise.

c = Zo/mu says "the speed of light is the ratio of two properties of **4D Space-Time medium**: (1) impedance of 376.73 Zobel's, (2) 4πK_m kg m/C².

Thus, Michelson-Morley, et.al., were all wrong about the so called, "aether". Thinking it was a 3D medium with properties of "drag". Superfluids have zero viscosity.

← Using corrected **l_P & t_P** now yields the **exact speed of light**.

← **Zo, Impedance of Free Space, divided by, mu_0, Magnetic Permeability**, confirms this perfect agreement.

← **Newton's Gravitational constant**

Planck Charge in SI units is "Amp seconds" which is equivalent to "(Coulombs/second) × seconds." Defined this "SI" way the seconds cancel leaving Planck charge representing true quantum unity, 1.

Newton's definition of a kilogram, when examined at the quantum-scale, we realize that Planck mass (2.127e_8 kg) takes one second's worth of time to manifest that number. At the quantum-scale we see that one Planck time's worth of mass has the units of kg seconds.

One **quantum** increment of mass = 1 Planck times worth of Planck Mass: Every massive object, the sun, Earth, you & me whatever number of kilograms we are – that amount manifests every second.

$$m_t t_t = \frac{h}{c^2} \approx 1.73369 \times 10^{-51} [kg s] \quad (1)$$

Proton radius values are probably accurate to same precision as proton-to-electron mass ratio, MpMe – about 10+ digits.

* Planck's Constant's dimensional units exponents add to 2. This means, if Planck Time, Length, Mass & Charge are covariant, then Planck's Constant MUST vary with time. The math cannot tell a lie. Scientifically speaking, this assertion is "falsifiable". I don't know yet how many years it will take to monitor (hBar%Rooh)^8 but -- over time -- this will vary. This would be a way to measure the age of the universe - proton's surface/mass is another.

Quantity	Value	relUnc	L__T__M__C	sum	SIunits
hBar	1.0545718176462e_34	1e_15	2 _1 1 0	2	J/Hz
h	6.6260701500000e_34	1e_15	2 _1 1 0	2	J/Hz
rho_P = 6%1p1*G*t_PA2	9.8450580899195e96	2.8e_14	_3 0 1 0	_2	kg/m3
rho_P = m_P%4r3p1*(1_P%2)^3	9.8450580899195e96	3.1e_14	_3 0 1 0	_2	kg/m3
T_P2018	1.416784e32	1.1e_5	2 _2 1 2	3	K
T_P = %:(hBar*(c^5)%G*k_B^2)	1.4167849769573e32	1e_14	2 _2 1 2	3	K
T_P = m_P*(c^2)%k_B	1.4167849769573e32	1e_14	2 _2 1 2	3	K

Second and third order variant physical quantities.

14 calc 'G2018 G (1_PA2)*(c^3)%hBar hBar*c%m_PA2 (t_PA2)*q_P%:(K_m*(c^11)%hBar^3)'

Quantity	Value	relUnc	L__T__M__C	sum	SIunits
G2018	6.67430000000000e_11	2.2e_5	3 _2 _1 0	0	m3/kg s2
G	6.67430000000000e_11	2.2e_5	3 _2 _1 0	0	m3/kg s2
(1_PA2)*(c^3)%hBar	6.67428328116561e_11	2.2e_5	3 _2 _1 0	0	m3/kg s2
hBar*c%m_PA2	6.67430210439531e_11	2.2e_5	3 _2 _1 0	0	m3/kg s2
(t_PA2)*q_P%:(K_m*(c^11)%hBar^3)	6.67430136677026e_11	2.2e_5	3 _2 _1 0	0	m3/kg s2

Using these CODATA 2018 values gives us inconsistent Values for these formulae which should yield G.
 <<-Old calc G =
 These are the values BEFORE applying any corrections note they are all different.

14 calc 'G2018 G (1_PA2)*(c^3)%hBar hBar*c%m_PA2 (t_PA2)*q_P%:(K_m*(c^11)%hBar^3)'

Quantity	Value	relUnc	L__T__M__C	sum	SIunits
G2018	6.67430000000000e_11	2.2e_5	3 _2 _1 0	0	m3/kg s2
G	6.67429232315729e_11	3e_14	3 _2 _1 0	0	m3/kg s2
K_Theta*c^2	6.67429232315729e_11	3e_14	3 _2 _1 0	0	m3/kg s2
(1_PA2)*(c^3)%hBar	6.67429232315729e_11	2.2e_14	3 _2 _1 0	0	m3/kg s2
hBar*c%m_PA2	6.67429232315729e_11	3e_14	3 _2 _1 0	0	m3/kg s2
(t_PA2)*q_P%:(K_m*(c^11)%hBar^3)	6.67429232315729e_11	2.5e_14	3 _2 _1 0	0	m3/kg s2

These are the same formulae as before correcting base values, but now ALL
 Last formula with (c^11) is an original discovery of mine from 2-weeks ago.
 This ought to help 11-Dimensional M-theory.

Quantity	Value	relUnc	L__T__M__C	sum	SIunits	AkaUnits
c	2.99792458000000e8	0	1 _1 0 0	0	m/s	
Z_P%K_m	2.99792458000000e8	0	1 _1 0 0	0	m/s	
Z_P	2.99792458000000e1	0	2 _1 1 _2	0	Zo	
hBar*q_PA2	2.99792458000000e1	1.4e_14	2 _1 1 _2	0	Zo	
Zo(4*pi)	2.99792458000000e1	0	2 _1 1 _2	0	Zo	
q_P	1.87554603829021e_18	4.9e_15	0 0 0 1	1	A s	C
%:hBar%Z_P	1.87554603829021e_18	5e_15	0 0 0 1	1	A s	C

These next calculations cross check the precision of related calculations.
 c is the universal standard we gauge all our measurements by.
 Planck Impedance divided by Magnetic force constant
 Planck Impedance is...
 = to hBar divided by PlanckCharge^2 and also...
 = Space Impedance divided by 4pi
 Planck Charge is equal to...
 = hBar divided by Planck Impedance

CONCLUSION: Except for electron, Bohr, & proton radius' All calculations with the corrected values yield full 15-digit accuracy (14-decimal places) with 100% agreement between all related calculations. I respectfully submit these calculations and specific

values for consideration by the CODATA committee for inclusion in the next official release of these foundational values and constants.