

# Derived from first principles fine-structure constant constants

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**Abstract:** If you don't feel the subtlety of it, you don't really like physics.

**Key words:** universal Gravitational constant formula, Coulomb's law, Basic atomic mass.

$$\left\{ \begin{array}{l} \frac{(m_e)(R_\infty)(G_N)}{(a_0)} = 2\pi(m_e)[\alpha_0](c) , \\ \frac{(e_0)(R_\infty)}{4\pi(\epsilon_0)(a_0)} = (c) , \\ \frac{1}{2}(m_e)[\alpha_0]^2(c)^2 = \frac{(m_{atom})(c)^2}{2\pi(R_\infty)} , \end{array} \right.$$

Where  $(\epsilon_0)$  is the Vacuum dielectric constant,  $(\mu_0)$  is the Permeability of vacuum,  $(c)$  is the Speed of light,  $(e_0)$  is the Elementary charge,  $[\alpha_0]$  is the Fine structure constant,  $(R_\infty)$  is the Rydberg constant,  $(a_0)$  is the Bohr radius,  $(m_{atom})$  is the Basic atomic mass,  $(m_e)$  is the Electron rest mass,  $(G_N)$  is the Gravitational constant.

Reference: [https://en.wikipedia.org/wiki/Physical\\_constant](https://en.wikipedia.org/wiki/Physical_constant).