# A common-sense interpretation of quantum physics

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The following principles (we could have grouped or ungrouped some) are a summary of the 40 papers I wrote over the past two years.

1. A force acts on a charge. The electromagnetic force acts on an electric charge (there is no separate magnetic charge) and the strong force acts on a strong charge. A charge is a charge: a pointlike 'thing' with zero rest mass. The idea of an electron combines the idea of a charge and its motion (Schrödinger's *Zitterbewegung*). The electron's rest mass is the equivalent mass of the energy in its motion (mass without mass). The elementary wavefunction represents this motion.

2. There is no weak force: a force theory explaining why charges stay together must also explain when and how they separate. A force works through a force field: the idea that forces are *mediated* by virtual messenger particles resembles 19$^{th}$ century aether theory. The fermion-boson dichotomy does not reflect anything real: we have charged and non-charged wavicles (electrons versus photons, for example).

3. The Planck-Einstein law embodies a (stable) wavicle. A stable wavicle respects the Planck-Einstein relation (E = h·*f*) *and* Einstein's mass-energy equivalence relation ($E = m \cdot c^2$). A wavicle will, therefore, carry energy but it will also pack one or more units of Planck's quantum of action. Planck's quantum of action represents an elementary *cycle* in Nature. An elementary particle embodies the idea of an elementary cycle.

4. The 'particle zoo' is a collection of unstable wavicles: they disintegrate because their cycle is slightly off (the integral of the force over the distance of the loop and over the cycle time is not *exactly* equal to *h*).

5. An electron is a wavicle that carries charge. A photon does *not* carry charge: it carries energy between wavicle *systems* (atoms, basically). It can do so because it is an oscillating *field*.

6. An atom is a wavicle system. A wavicle system has an *equilibrium* energy state. This equilibrium state packs one unit of *h*. Higher energy states pack two, three,…, *n* units of h. When an atom transitions from one energy state to another, it will emit or absorb a photon that (i) carries the energy difference between the two energy states and (ii) packs one unit of *h*.

7. Nucleons (protons and neutrons) are held together because of a strong force. The strong force acts on a strong charge, for which we need to define a new unit: we choose the *dirac* but – out of respect for Yukawa, we abbreviate one *dirac* as 1 Y. If Yukawa's function models the strong force correctly, then the strong force – which we denote as $F_N$ - can be calculated from the Yukawa potential:

$$F_N = -\frac{g_N^2}{4\pi\upsilon_0} \cdot \frac{(\frac{r}{a} + 1) \cdot e^{-\frac{r}{a}}}{r^2}$$

This function includes a scale parameter *a* and a *nuclear proportionality constant* $\upsilon_0$. Besides its function as an (inverse) mathematical proportionality constant, it also ensures the *physical* dimensions on the left- and the right-hand side of the force equation are the same. We can choose to equate the *numerical* value of $\upsilon_0$ to one.

8. The nuclear force attracts two positive electric charges. The electrostatic force repels them. These two forces are equal at a distance *r* = *a*. The strong charge unit ($g_N$) can, therefore, be calculated. It is equal to:

$$g_N = \sqrt{e \cdot \alpha \cdot h \cdot c \cdot \upsilon_0} \approx 6.27723 \ldots \times 10^{-14} \text{ Y } (dirac)$$

9. Nucleons (protons or neutrons) carry both electric as well as strong charge ($q_e$ and $g_N$). A kinematic model disentangling both has not yet been found. Such model should explain the magnetic moment of protons and neutrons.

10. We think of a nucleus as wavicle system. When going from one energy state to another, the nucleus emits or absorbs neutrinos. Hence, we think of the neutrino as the photon of the strong force. Such changes in energy states may also involve the emission and/or absorption of an electric charge (an electron or a positron).

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