

How Fundamental Are YOUR Constants?

“Fundamental constants” are thought to be discoveries about Nature that are fixed and eternal, and not dependent on any theory. Actually constants have no definition outside the theory that uses them. The constants of physics changed radically with quantum mechanics and modern theory, yet their common interpretation assumes the opposite. *What do we really mean by the mass of an electron?* The Newtonian definition? The most advertised values of fundamental constants are currently determined in a framework assuming Newtonian MKS units are mandatory, and also that theory is “exact”. The general impression that all high quality data contributes to global fits to constants misses the fact that discrepancies from experiments in atomic, condensed matter, nuclear and particle physics are selectively removed from final results to make them be exact. Closely related, an international committee that doesn’t do physics, but names and standardizes units, now plans a new system where the fine structure constant will have a fixed reference value *forever*. Experimental information will be shuffled into the permittivity of free space ϵ_0 which the committee thinks is more fundamental. The talk will start at the high school level and the *kilogram* where the mixups begin. Someone should do the work of making global fits to high precision data including the discrepancies, and we will show it. Your personal favorite constant will probably get attention, and we will ask you to join a small social movement to *Save α , the fine structure constant from untimely death* by incompetence. Or, you may disagree.