Matter Molecules Atoms Dalton ~1817 53 to 156 pm **Electrons Atoms** J. J. Thomson 1897 <1 am **Nucleus Molecules Rutherford 1911 Boyle 1661 Neutrons** 1.76 to 11.71 fm >0.07 nm Chadwick 1932 ~0.8 fm **Protons Forces** Rutherford 1917 ~0.8 fm **Electromagnetism** Maxwell 1873 **Weak force** Becquerel, Curie 1896 Strings (?) **Proton** Green, Schwarz 1984 **Down quark** ~10⁻³⁵ m Strong force Greenberg 1964, Nambu 1965 **Up quarks** Gravity Newton 1687, Einstein 1915 Quarks Gell-Mann, Zweig 1964 <0.1 am