

# Your Muonium is $\mu$ -drogen

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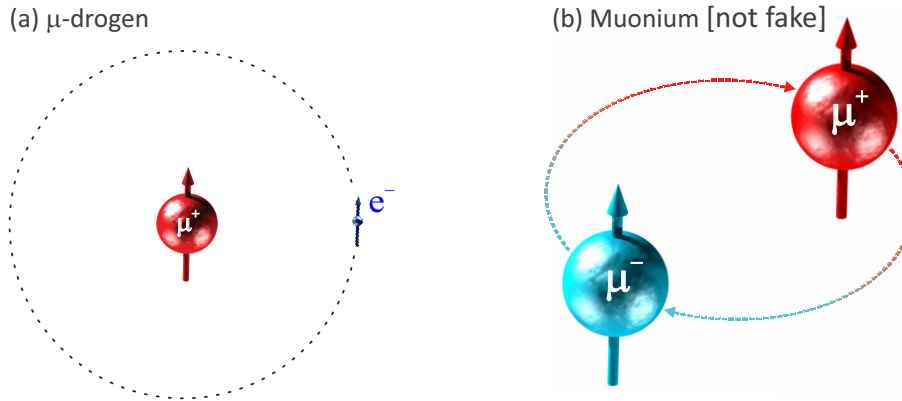
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Science has come a long way since the first idea of the atom, *atomos*, hypothesized by Demokritos during the ancient Greek times. He believed all matter was built of small indivisible and indestructible objects, hence *atomos*, the Greek word for invisible. Since then, new concepts and ideas have merged into science resulting into more new words in our dictionary. Most new words in science have a meaning and or an idea behind them, *e.g.* the term phonon was chosen to draw parallel with the light quanta photon. Historically, there have also been many new words based on the discoverer or the inventor to honor the discovery with its name, even though it is not as common today.

Every word in physics has meaning and an interesting history behind it. This is of course not always considered during the everyday work of a scientist. However, these words act and are the first encounters to a new concept for a learning scientist. If the terminology is inappropriate, it could influence the young mind in the wrong way and misinterpret the real meaning behind the word. One simple example is the term force friction. The correct terminology would be normal force, frictional force or referring to it to as force due to friction.



**Fig. 1.** (a) The  $\mu$ -drogen atom (b) Ortho-muonium

Having a background in particle physics, a particular word commonly used in the  $\mu$ SR community was confusing for me personally. As a newcomer to this community, I recently experienced the word *muonium* during my very first beam time at ISIS. From a particle physicist's point of view, an *onium* is the bound system of a particle and the corresponding anti-particle, *e.g.* the positronium, pionium, quarkonium (charmonium and bottomonium), kaonium or the protonium. In the  $\mu$ SR community however, muonium is known as the bound state of an anti-muon ( $\mu^+$ ) and an electron ( $e^-$ ), which in reality should be describing bound system of the anti-muon ( $\mu^+$ ) and the muon ( $\mu^-$ ). The conventional and correct way of formulating a particle-electron system is adding -ium to its name,