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Sexaquark Dark Matter

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A stable sexaquark (S) composed of $uuddss$ is a compelling Dark Matter candidate and would not have been discovered in accelerator experiments to date. I will briefly review its particle properties, why the S would have eluded searches for an H-dibaryon, and analyses of Upsilon decay and LHC data suitable to discovering it (as are now underway by BABAR, Belle, CMS and LHCb). The main focus of the talk will be direct detection constraints on S Dark Matter, and two major cosmological consequences: predicted $\Omega_{DM}/\Omega_b = 4.5 - 6$, in excellent agreement with the 5.3 ± 0.1 observed, and ^{7}Li abundance in agreement with observation (which is $\sim 10\sigma$ below the standard LCDM prediction). For the relevant parameter space of S interactions with nucleons via $\omega-\phi$ and f_0 meson exchange, the Born Approximation does not apply. This requires a complete re-evaluation of Direct Detection experiments, as will be reported. Time permitting, possible additional astrophysical consequences will be discussed.

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