Meson to muons- ultra-rare decay

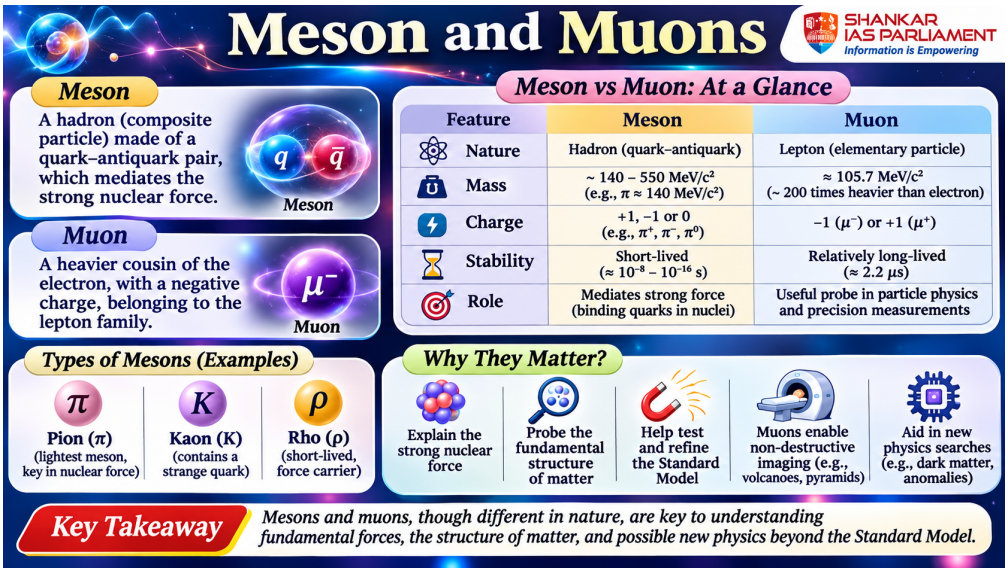
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Why in News?

Physicists at CERN have found evidence of the ultra-rare decay of a neutral B_0 meson into a pair of muons (one positively charged and one negatively charged) with a statistical significance of 3.2 sigma.

Details of the Discovery

- **The Process-** A B_0 meson (composed of a beauty antiquark and a down quark) transforms into a muon and an antimuon.
- **Rarity -** The Standard Model of particle physics predicts that only about **1 in 10 billion** B_0 mesons will undergo this specific decay.
- **Significance-** The signal was detected at **3.2 sigma**, meaning it is highly unlikely to be a random statistical fluctuation.
- **Why It Matters-** The measured properties of this decay align with the predictions of the Standard Model. This tightens constraints on theoretical extensions (such as supersymmetry) that attempt to solve missing pieces of physics like dark matter.



Reference

[The Hindu| Meson to muons– ultra-rare decay]



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