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Discovery of anti-hypertriton and future exotic particle searches at RHIC[1]

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While nuclei are abundant in the universe, antimatter nuclei that are heavier than the antiproton have been observed only as products of interactions at particle accelerators. Nuclear collisions recreate conditions similar to that of the universe microseconds after the Big Bang. The subsequent rapid expansion of Quark-Gluon Plasma in nuclear collisions is significantly different from the case of the Big Bang. This decouples matter and antimatter before annihilation, and provides an ideal laboratory for producing and studying heavy antimatter. We present the discovery of the heaviest known antimatter and the first antihypernucleus - the antihypertriton, which is comprised of an antiproton, an antineutron and their heavier strange partner (antilambda). The production and discovery of even heavier antimatter with the existing facilities and their implications will also be discussed.

[1]for the STAR Collaboration