

As 'Run 3' begins, CERN touts discovery of exotic particles

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A technician works in the LHC (Large Hadron Collider) tunnel of the European Organization for Nuclear Research, CERN, during a press visit in Meyrin, near Geneva, Switzerland, Feb. 16, 2016. The physics lab that's home to the world's largest atom smasher announced on Tuesday, July 5, 2022 the observation of three new "exotic particles" that could provide clues about the force that binds subatomic particles together. The observation of a new type of pentaquark and the first duo of tetraquarks at CERN, the Geneva-area home to the LHC, offers a new angle to assess the so-called "strong force" that holds together the nuclei of

atoms. Credit: Laurent Gillieron/Keystone via AP, file

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Most exotic hadrons, which are [subatomic particles](#), are made up of two or three elemental particles known as quarks. The [strong force](#) is one of four forces known in the universe, along with the "weak force"—which applies to the decay of particles—as well as the [electromagnetic force](#) and gravity.

The announcement comes amid a flurry of activity this week at CERN: Also Tuesday, the LHC's underground ring of superconducting magnets that propel infinitesimal particles along a 27-kilometer (about 17-mile) circuit and at near light speed, began smashing them together again. Data from the collisions is snapped up by high-tech detectors along the circular path.

The so-called "Run 3" of collisions, ending a three-year pause for maintenance and other checks, is operating at an unprecedented energy of 13.6 trillion electronvolts, which will offer the prospect of new discoveries in particle physics.

CERN scientists hailed a smooth start to what is expected to be nearly

four years of operation in "Run 3"—the third time the LHC has carried out collisions since its debut in 2008.

A day earlier, CERN celebrated the 10-year anniversary of the confirmation of the Higgs boson, the subatomic particle that has a central place in the so-called Standard Model that explains the basics of particle physics.

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