CERN physicists break record for hottest manmade material

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(Phys.org) -- Apparently discovering a Higgs-like particle isn't enough for the physicists working at the CERN facility, now another team working with the LHC has broken the record for the hottest manmade material ever. The old record was about four trillion degrees Celsius, the new one appears to be in the range of five and a half, a bump up of some thirty eight percent.

The three teams working at CERN, ATLAS, CMS and ALICE are all working on the same basic problem, figuring out what existed just after the Big Bang so as to better understand how matter works at the subatomic level. ATLAS and CMS were recently in the news of course for finding evidence of particles that strongly resemble the notorious Higgs boson. Meanwhile the ALICE team has been hard at work

smashing lead ions into one another creating quark-gluon plasma, material that is being described as a primordial soup, because it is believed to be similar to the stuff that came about right after the Big Bang, and because unlike protons and neutrons, they are believed to move around freely, rather than existing as a bound material.

The prior temperature record was held by researchers at Brookhaven National Laboratory who got a nod from the Guinness Book of Records for their feat. The new team won't be getting their listing just yet, because their findings have yet to be finalized. In announcing their results at this year's Quark Matter conference, they said they won't have any official numbers for several weeks, though they do expect it to be approximately thirty eight percent hotter than what BNL recorded, which would take it from just over seven trillion degrees Fahrenheit, to almost ten.

The team at BNL isn't sitting on their hands of course, though they can't compete with the CERN facility in reaching ever hotter temperatures, they have found evidence to suggest that under certain conditions, quark-gluon plasma, which has been observed to behave as a frictionless gas, may morph into a hadron gas, which is considered to be normal matter, similar to the way water morphs into ice or steam, depending on conditions.

The ALICE team, who don't see breaking temperature records as one of their goals, will continue to study the conditions under which quark-gluon plasma comes to exist in hopes of better understanding its properties. The overall plan is that all of the work being done at CERN by the three teams will eventually come together to clear the picture of not just what went on shortly after the Big Bang, but of the very nature of matter.