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In the beginning . . .[1]

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. . . freely propagating quarks and gluons existed in the Universe in a deconfined phase of matter, the quark-gluon plasma (QGP). Relativistic heavy ion (RHI) experiments have established that the structure of matter changed when the Universe cooled to a temperature of about $T \simeq 150\,\mathrm{MeV}$. At that time, about $20\,\mu\mathrm{s}$ after the Big Bang, mass-carrying hadrons and anti-hadrons formed. To explain the change in the form of matter that fills the Universe, confinement of the QCD charge, the color, in the 'frozen' vacuum is required. This is confirmed by the decade-long dedicated RHI experimental effort in which hot drops of QGP were created and studied. Such a drastic temperature-dependent change in the transport properties of the vacuum is a paradigm change: the laws of physics are not only encoded in the vacuum, but are subject to modification as a function of temperature. QGP hadronization, the conversion of QGP into hadrons, produced matter and antimatter in laboratory. By applying hadronization to the early Universe we obtain the properties of the hot emergent nearly symmetric matter-antimatter Universe. After three seconds, all antimatter mixed into matter in the Universe is annihilated. Many questions remain open about the details of Universe hadronization and annihilation process, and its relation to the observed matter-antimatter asymmetry.

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