

# After the Big Bang: Project explores seconds that shaped the universe

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Kent State faculty and graduate students are among a team of physicists who recreated the material essence of the universe as it would have been mere microseconds after the Big Bang -- a quark-gluon plasma.

This huge insight allows scientists to study matter in its earliest form and comes from an experiment carried out over the past five years at the Relativistic Heavy Ion Collider (RHIC), the giant crusher of nuclei located at Brookhaven National Lab, where scientists created a toy version of the cosmos amid high-energy collisions.

Kent State is playing a vital role in this ongoing research partnership, which includes the University of California-Berkley, Massachusetts Institute of Technology, and the Academy of Sciences Nuclear Physics Institute.

At the fundamental level, this research advances our understanding of what the universe is really made of and how the early universe evolved into the universe as we now know it.

In addition, the development of the equipment and techniques necessary to conduct the research at RHIC will ultimately improve nuclear equipment training for young researchers.

Presently, nuclear techniques are used extensively in cancer radiotherapy and non-destructive analysis of steel, oil samples, ceramics and many other materials. As our understanding, equipment and techniques

improve, we are able to better treat cancerous tumors and conduct material analysis.

The researchers' work has appeared in the journals *Nuclear Physics A* and *Physical Review Letters*, as well as the *Journal of Physics G: Nuclear and Particle Physics*, and was presented at the annual meeting of the American Physical Society. Links to the most recent articles are available at:

[http://arxiv.org/find/nucl-ex/1/au:+Collaboration\\_STAR/0/1/0/all/0/1](http://arxiv.org/find/nucl-ex/1/au:+Collaboration_STAR/0/1/0/all/0/1)

Source: Kent State University

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