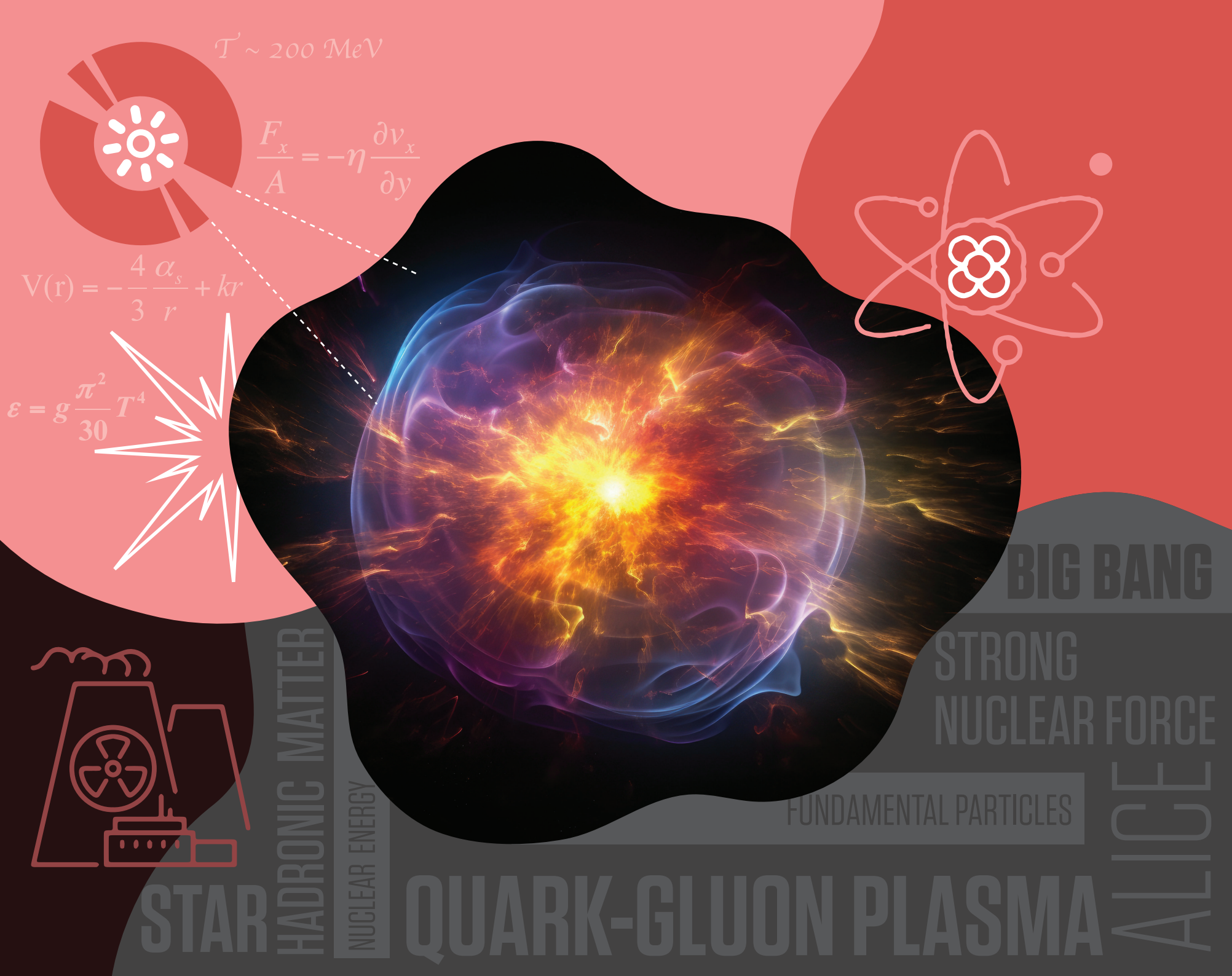
$T \sim 200\ MeV$
$\frac{F_x}{A} = -\eta \frac{\partial v_x}{\partial y}$
$V(r) = -\frac{4}{3}\frac{\alpha_s}{r} + kr$
$\varepsilon = g\frac{\pi^2}{30}T^4$
BIG BANG
STRONG NUCLEAR FORCE
FUNDAMENTAL PARTICLES
ALICE
QUARK-GLUON PLASMA
NUCLEAR ENERGY
HADRONIC MATTER
STAR

The forces that hold us

There are certain fundamental forces of nature that hold together the world we see around us. Gravity is the most obvious one. And then there is electromagnetism, weak nuclear force and strong nuclear force. Strong nuclear force is the glue that holds together the most fundamental particles that make up matter such as quarks, protons, neutrons. It is the strongest force in nature, about 1040 times stronger than gravity.

It is the strong nuclear force that powers the sun. It is also the strong nuclear force that is responsible generation of power in nuclear reactors. In the sun the strong force is released in the process of nuclear fusion and in a nuclear reactor or an atomic bomb the power of the strong force is released in nuclear fission. As ubiquitous and important as the strong nuclear force is, scientific research concentrates on finding ways to harness its power usefully and discovering the emerging properties of matter we all are made.

Prof. Bedangadas Mohanty's work has furthered our understanding of the strong force and brought knowledge about the various phases of strongly interacting matter. He has done this by studying the quark-gluon plasma (QGP) and hadronic matter by recreating in the laboratory the circumstances in the first microsecond after the universe was born. Quark-Gluon plasma is the primordial soup of matter that was brought forth by the big bang. It contains quarks and gluons which are the repository of the strong force that holds the quarks together. Hadronic matter is a subatomic particle made of two or more quarks held together by strong force.

Prof. Mohanty studied QGP and hadronic matter as a leader of the STAR experiment at Brookhaven Laboratory and ALICE at CERN. He calculated the temperature at which phase transition occurs from QGP to hadronic matter and measured the properties of the QGP. STAR stands for Solenoidal Tracker At RHIC (the Relativistic Heavy Ion Collider at Brookhaven National Lab) and ALICE stands for A Large Ion Collider Experiment at the Large Hardon Collider Facility in CERN.

Prof. Mohanty's contribution to understanding the strong nuclear force, helps us understand how to harness nuclear energy, what are the phases of strongly interacting matter and the properties of nuclear matter under extreme conditions of temperature and pressure. Additionally, his research contributes to understanding the powerful, mysterious activity in celestial bodies such as the interior of stars, neutron stars and others. Here on earth, Prof. Mohanty's work helps the research of scientists such as astronomers, nuclear chemists, physicists, and others who work with nuclear sciences.