

## Strangeness in Quark Matter 2019



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# Hawking- Unruh Radiation from the relics of the cosmic quark hadron phase transition

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It is entirely plausible that during the primordial quark –hadron transition, microseconds after the Big Bang, supercooling takes place accompanied by mini inflation leading to a first –order phase transition from quarks to hadrons. The relics, in the form of quark nuggets consisting of Strange Quark Matter under certain circumstances survive.

It is conjectured that color confinement turns the physical vacuum to an event horizon for quarks and gluons. The horizon can be crossed only by quantum tunnelling. The process just mentioned is the QCD counterpart of Hawking radiation from gravitational black holes. Thus, when the Hawking temperature of the quark nuggets gets turned off, tunnelling will stop and the nuggets will survive forever. The baryon number and the mass of these nuggets are derived using this theoretical format. The results agree well with the prediction using other phenomenological models. Further, the variation of Hawking temperature as a function of baryon number and mass of the nugget mimicks chiral phase transition, from zero mass to the full baryonic mass. Finally the strange quark nuggets may well be the candidates of baryonic dark matter.

## Collaboration name

## Track

Strangeness in astrophysics

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