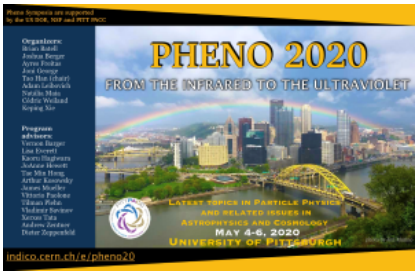

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Phenomenology of Singlet-doublet Fermionic Dark Matter

Monday 4 May 2020 15:45 (15 minutes)

At present the Standard Model (SM) of particle physics is the best theory to describe the fundamental particles and their interactions in nature. After the Higgs discovery, the particle spectrum of the SM is almost complete. However, the SM does not possess a candidate that can mimic the nature of dark matter (DM) inferred from astrophysical observations. Moreover, the SM does not explain the sub-eV masses of the active left-handed neutrinos which is required to explain observed solar and atmospheric oscillation phenomena. Amongst many possibilities to accommodate DM in an extension of SM, a simple possibility is to extend the SM with two vector-like fermions: a SM gauge singlet and a doublet.

In this talk I shall elaborate how such singlet-doublet mixing can save a WIMP-like DM from stringent direct detection exclusion limit. At the same time, I shall elucidate, depending on the scalar sector, such DM models can also address *light neutrino mass*, paves path to a *stable electroweak vacuum* and give rise to strong first order phase transition producing *detectable gravitational wave*.

Summary

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Primary authors: SAHA, Abhijit; DUTTA BANIK, Amit (Saha Institute of Nuclear Physics); Mr PAUL, Avik (SINP, Kolkata); BARMAN, Basabendu; BORAH, Debasish (Indian Institute of Technology Guwahati); SAHU, Narendra (IIT Hyderabad); Mr KADAM, Saurabh (IISER, Pune); BHATTACHARYA, Subhaditya; Mr GHOSH, purusottam

Presenter: BARMAN, Basabendu

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