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Research Background...

Early Universe phase transitions and formation of topological defects.

Generating matter antimatter asymmetry through leptogenesis route.

Theoretical models of neutrino masses and matter antimatter asymmetry via leptogenesis route.

- **Non-thermal Leptogenesis from cosmic string decay products.**
- **Left-Right symetric model, neutrino masses and leptogenesis.**

- **Leptogenesis without B-L violation and Majorana neutrino masses.**
- **Low scale leptogenesis and Neutrino Masses**
- **Spontaneous CP violation and leptogenesis**

Current work and future directions...

Cold and Warm dark matter.

- Z_2-singlino Dark matter in extended MSSM.
- Direct and Indirect test of Z_2 singlino dark matter.
- μ-problem, dark matter and Inflation in supersymmetric Portal Models

Leptogenesis without B-L violation and Neutrino Masses and Mixings.

Publications...

(1) J. McDonald, N. Sahu and U. Sarkar, "Type-II seesaw at collider, Lepton asymmetry and singlet scalar dark matter", arXiv:0711.4820[hep-ph], JCAP 0804:037 (2008).

(2) J. McDonald and N. Sahu,"Z_2 siglino dark matter in Portal-like extensions of Minimal Supersymmetric Stan dard Model,arXiv:0802.3847[hep-ph], JCAP, 0806, 026 (2008).

(3) N. Sahu and U. Sarkar, "Extended Zee Model for neutrino masses,leptogenesis and sterile neutrino like dark matter", arXiv:0804.2072[hep-ph]

(4) J. McDonald and N. Sahu, "keV Warm Dark Matter via the supersymmetric Higgs Portal", arXiv:0809.0247[hep-ph]

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THANK YOU