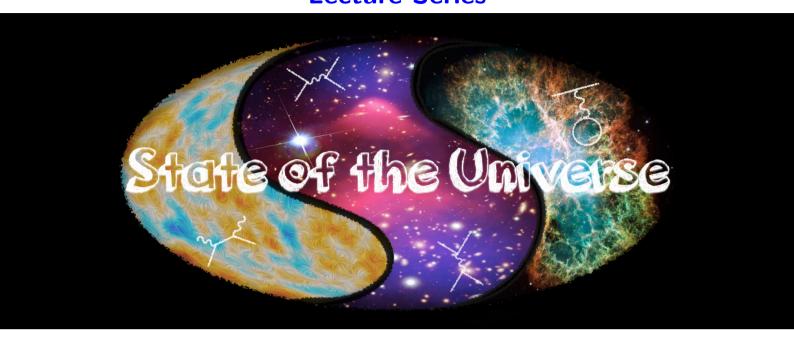
Department of Theoretical Physics Lecture Series



Sphalerons and matter-antimatter asymmetry of the Universe

Urjit Yajnik Indian Institute of Technology Bombay

Lecture 1 (Monday, 24 February 2020, 17:30, Room AG80)

Topology of Yang-Mills theory. Large gauge transformations. Instantons. Sphalerons in the presence of Higgs. Jackiw-Rebbi vacua and axial current anomaly.

Lecture 2 (Tuesday, 25 February 2020, 13:00, Room A304)

Connection of the sphaleron to B+L number anomaly. The temperature dependent effective potential. Sphalerons at $T\approx v_{\rm EW}$ and fermion number violation rate. Anomaly at $T>v_{\rm EW}/\alpha_W$.

Lecture 3 (Wednesday, 26 February 2020, 17:30, Room A304)

Weinberg-Sakharov criteria for dynamical origin of baryon number. The options tree for matter-antimatter asymmetry. "Electroweak baryogenesis" a review and posssible variants. Problem of inadequate CP violation. Leptogenesis - high scale in SO(10). Connection to low energy neutrino data. Leptogenesis - low scale within Left-Right symmetric models.

