

**Title:** Design and Construction of Time Projection Chamber for sPHENIX.

**Abstract:**

For those of who do theory, have you ever wondered how we produce any physics results and confirm your work? For those in experiments, would you like to know how the collision of the 2 particles becomes a stream of data that you analyse? This talk is to fill that bridge, focusing specifically on the physics motivation, design and construction of the Time Projection Chamber which is going to be installed as part of sPHENIX detector system at Brookhaven National Lab.

The physics of Quantum Chromodynamics is very different compared to Quantum electrodynamics which leads to interesting effects like anti-screening, asymptotic freedom and the formation of Quark Gluon Plasma(QGP). In this talk, I will focus on one such experimental probe which is used in understanding QGP and its evolution into Hadronic states.

**Time Projection Chamber (TPC)**

The sequential melting of Upsilon states gives information about the Debye length of the QGP and in an effort to understand this better, the sPHENIX is building a TPC so that we can resolve the three Upsilon states -  $\Upsilon(1S, 2S, 3S)$ .

This section of the talk will be about the design and construction of the detector that is needed to satisfy our physics requirement. This section will also include details of the prototype TPC that we recently built and took it for test beam at Fermilab.