Statement of Research Interest

My research interest broadly lies in the field of experimental high energy physics in CMS. With the start-up of LHC, a new domain of energy will be explored and an extrapolation of our current knowledge in the form of the Standard Model may not be sufficient to describe the new measurements. Even in the first data-taking phase with a rather low luminosity, studies of jet physics in the framework of Quantum Chromodynamics (QCD) will allow to check our current theory against the new data.

Specifically, my research interest falls under the following areas:

(A) Physics analysis with Jet and $\not{E}_T$

During my Ph.D. I have been working on the multijet topologies and global event shape variables in hadronic events which test the validity of the perturbative QCD at the energies that will be probed by LHC pp collisions and allow for measurement of the strong coupling constant, α_s. I would like to carry this study forward with the first CMS data ($\sim 10\text{pb}^{-1}$) in order to complete the analysis performed during my Ph.D. and this will also be important towards understanding QCD multijet backgrounds for new physics signals.

I would like to get involved with either searches for the Higgs particle or searches for new phenomena beyond the Standard Model (SUSY). In both cases the `Jets+MET` final state is a prominent channel of discovery. However, QCD is a dominant and particularly compelling background which needs to be understood and I expect that my previous expertise in multijets will help me in carrying on such an analysis.

(B) Calorimeter performance and Understanding of $\not{E}_T$

Event signatures for SUSY and Higgs boson production require proper understanding of jets and missing E_T. The jets are primarily reconstructed using the information of the calorimeteric energy measurement. During my Ph.D. I worked extensively in the understanding of the Hadron Calorimeter and have been a part of the calorimetry task force which tries to tune the Monte Carlo program with test beam data. I am interested in understanding the particle response of the CMS calorimeter. I would like to take advantage of my advanced calorimeter knowledge in performing the low level detector calibration. Also I would like to be involved in commissioning of `MET` object which will be critical for the physics analysis for signals beyond the Standard Model.

In a nutshell I already have experience in analyzing calorimetry data from test beam and handling jets in the Monte Carlo and I would like to use this experience for exploring new physics signals from the challenging data of LHC.