1042-28-164   **Jasun Gong*** (`jasun@pitt.edu`), Department of Mathematics, 301 Thackeray Hall, University of Pittsburgh, Pittsburgh, PA 15260. *Derivations on Metric Measure Spaces.* Preliminary report.

In this talk we will discuss derivations on metric spaces with a prescribed measure, which are generalizations of differential operators in the case of smooth spaces. This notion is closely related to the (metric) derivations of N. Weaver.

It is not fully understood what choices of metric and measure on a space will guarantee a nontrivial supply of derivations on that space. In this direction we consider the cases of the real line and the Euclidean plane. In each case, we characterize measures on the space which induce a "maximum supply" of derivations. To formulate this result precisely, we will state it in terms of linearly independent sets of derivations.

If time permits, we also consider metric spaces which admit a doubling measure and a weak (1,p)-Poincare inequality. J. Cheeger and N. Weaver have shown that such spaces admit a nontrivial supply of derivations. Using similar techniques, we will show a special case of a conjecture of Cheeger, which concerns the non-degeneracy of certain Lipschitz images of such spaces. (Received August 18, 2008)