



The University of Chicago
Department of Statistics
Seminar Series

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From Statistics to Topology and Back Again

MONDAY, February 4, 2008 at 4:00 PM
133 Eckhart Hall, 5734 S. University Avenue

Refreshments following the seminar in Eckhart 110.

This is a joint talk with the Department of Mathematics.

ABSTRACT

We shall start by briefly discussing some statistical problems related to the structure of the primordial universe, as seen through the Nobel Prize winning cosmic microwave background (COBE) data.

The next step will be to turn this into an abstract problem related to the (integral and differential) geometry generated by Gaussian random processes on manifolds.

Out of this will come extensions to Riemannian manifolds of the famous Kinematic Fundamental Formula of classical, Euclidean, integral geometry, as well as the related Crofton Formula.

In the end we shall see how these results shed new light on excursion probabilities for smooth Gaussian processes, and even how they are relevant to analysing the COBE data.