

## **From Statistics to Topology and Back Again**

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<b>Date</b>	Wednesday, 9 July 2008
<b>Venue</b>	Colloquium Room A S14, #03-10 Department of Mathematics Faculty of Science National University of Singapore
<b>Time</b>	3:00 – 4:00pm
<b>About the Speaker</b>	<p>Robert Adler holds the Louis and Samuel Seiden Academic Chair at the Technion-Israel Institute of Technology in Haifa and has a joint appointment between the Faculty of Industrial Engineering and Management and the Faculty of Electrical Engineering. He holds degrees from Sydney University (BSc), the Australian National University (MSc) and University of New South Wales (PhD) and has held visiting positions at a number of universities, including Cambridge, Stanford, and Harvard.</p> <p>He has published extensively in a wide variety of topics in pure and applied probability, including three major books on random fields and Gaussian processes, with another one underway with Jonathan Taylor and Keith Worsley. He was the editor of Stochastic Processes and Their Applications from 1993-1995 and the Annals of Applied Probability from 2003-2005.</p>
<b>Abstract</b>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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 and other astrophysical data and models.</p>