1078-37-51 **Mariusz Urbanski*** (urbanski@unt.edu), Mariusz Urbanski, Department of Mathematics, University of North Texas, Denton, TX 76203, and **Volker Mayer** and **Bartlomiej Skorulski**.

Distance expanding random mappings, thermodynamic formalism, Gibbs measures, and fractal geometry.

In this talk we introduce measurable expanding random systems, present the appropriate form of thermodynamical formalism and establish, in particular, exponential decay of correlations and real analyticity of the expected pressure even though the spectral gap property does not hold. This theory is then used to investigate fractal properties of conformal random systems. We discuss a Bowen's formula and the multifractal formalism of the Gibbs states. Depending on the behavior of the Birkhoff sums of the pressure function we get a natural classifications of the systems into two classes: quasi-deterministic systems which share many properties of deterministic ones and essential random systems which are rather generic and never bi-Lipschitz equivalent to deterministic systems. We show in the essential case that the Hausdorff measure vanishes which refutes a conjecture of Bogenschütz and Ochs. We finally give applications of our results to various specific conformal random systems and positively answer a question of Brück and Bürger concerning the Hausdorff dimension of random Julia sets. (Received November 12, 2011)