

DEPARTMENT OF MATHEMATICS AND STATISTICS
MISSISSIPPI STATE UNIVERSITY

FIRST ANNUAL

SPENCER B. MURRAY AND ARTHUR OLLIVIER LECTURE

Multiscale Modeling of Preferential Flow

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4th Floor Swalm

Abstract. For all the advances in computer power of recent years, many real-world processes are still so complex that they defy the capability of even the most advanced computers to describe them. The flow of fluid through a porous medium, such as water through soil, is such an example. This can be extraordinarily complex, due to the range of scales in time and space.

We first describe a remarkable experiment that provides a testbed for all attempts to model saturated flow coupled to transport through a highly heterogeneous medium. After a review of principle ideas and issues in the development of multiscale models of porous media, we describe a new approach which includes not only the usual diffusion effects from various spatial scales but also the effects of local advective transport in the upscaled global transport and flow equations.

A reception will follow Dr. Showalter's talk.

This lecture is sponsored by a generous gift from Drs. Grace and Dean Boswell.