

DEPARTMENT OF MATHEMATICS AND STATISTICS
MISSISSIPPI STATE UNIVERSITY

COLLOQUIUM

Darcy's Law of Compressible Porous Medium Flows

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Allen 18

Abstract. The motion of compressible flows through porous medium was governed by Euler equations with frictional damping, which states the basic balance laws of mass, momentum and energy. Due to its mathematical nature, it is very difficult to study in both analytical and numerical ways. Instead, the experimental law, called Darcy's law, plays an important role in applications. Therefore, a natural conjecture states that Darcy's law is valid time asymptotically. And as a consequence, the density satisfies the porous medium equation. In this talk, I will tell you the story on how the conjecture is formulated, the history of the problem, and how mathematics can justify the physical expectations. The main part of the talk is accessible by students of any level. You will just need common sense to understand the material.

There will be refreshments in Allen 467 at 3:00 pm.

Contact Xiangsheng Xu, xxu@math.msstate.edu or (662) 325-7144, for additional information.