



Joint Mathematics Meetings

January 15–18, 2014

Baltimore Convention Center, Baltimore, Maryland, USA

The Society for Industrial and Applied Mathematics is a participant in the Joint Mathematics Meetings. SIAM sponsors an invited speaker and several minisymposia. The SIAM Coordinating Committee for the JMM (with members William Cook, Edriss Titi, and Luminita Vese) invites you to attend these exciting activities.

SIAM Invited Address



On Variational Formulation of Entropy Solutions to Nonlinear Conservation Laws

Eitan Tadmor, University of Maryland

Time: Thursday January 16, 2014, 11:10 a.m.-12:00 p.m.

Location: Ballrooms I & II, 4th Floor, BCC

Eitan Tadmor is a Distinguished University Professor in the Department of Mathematics, Institute of Physical Science and Technology and the Director of the Center for Scientific Computation and Mathematical Modeling at the University of Maryland.

Abstract: A proper notion of weak solutions for nonlinear conservation laws requires such solutions to be Entropic. Classical and more recent results show the important role entropy plays in the analysis and computation of stable solutions. Entropy solutions are found to be at the crossroads when reached from a microscopic kinetic formulation or from a macroscopic realization as vanishing viscosity limit. In both cases, entropy solutions were also interpreted within a proper variational framework.

The notion of entropy, which is intimately connected with symmetry, is an extension imposed on nonlinear systems conservation laws. In this context, K. O. Friedrichs in his 1979 John von Neumann Lecture, asked

“Now, in many branches of physics...symmetries play a fundamental role, but all these symmetries (as it seems to me) are assumed and not derived. I now wonder whether or not...symmetries can also be derived.”

In this lecture I will give a concise overview on the theory and computation of entropy solutions for nonlinear conservation laws, and I will present a new variational formulation which addresses the question raised by Friedrichs.

More on reverse

