

Mathematics Distinguished Lecture Series
Department of Mathematics
University of Kansas

**Oscillations, Weak Convergence and
Nonlinear Differential Equations**

Lawrence Craig Evans
Member of the National Academy of Sciences
University of California, Berkeley

Thursday, March 28, 2019

4:00 pm

120 Snow Hall

(Refreshments at 3:30 pm, 406 Snow)

In this expository talk I will discuss the general issues of high frequency oscillations for solutions of nonlinear differential equations and how these cause (interesting) difficulties when we try to pass to various limits. I will explain how to resolve these problems for several examples, illustrating (i) stabilization of the inverted pendulum, (ii) adiabatic invariants for Hamiltonian systems, and (iii) homogenization for nonlinear first-order PDE.

Lawrence Craig Evans is Professor of Mathematics at the University of California, Berkeley. He received his Ph.D. with thesis advisor Michael G. Crandall at the University of California, Los Angeles in 1975.

His research is in the field of nonlinear partial differential equations, primarily elliptic equations. In 2004, he shared the Leroy P. Steele Prize for Seminal Contribution to Research with Nicolai V. Krylov for their proofs, found independently, that solutions of concave, fully nonlinear, uniformly elliptic equations are $C^{2,\alpha}$. Evans also made significant contributions to the development of the theory of viscosity solutions of nonlinear equations, to the understanding of the Hamilton–Jacobi–Bellman equation arising in stochastic optimal control theory, and to the theory of harmonic maps. He is also well known as the author of the textbook *Partial Differential Equations*, which is currently the standard introduction to the theory at the graduate level.



In 2012, he became a fellow of the American Mathematical Society. In 2014, he was elected to the National Academy of Sciences. Evans is listed as an ISI highly cited researcher.