DEPARTMENT OF
MATHEMATICS & STATISTICS
COLLOQUIUM

Speaker: **Dr. Manil Mohan, Air Force Institute of Technology**

Title: **Some Recent Progress in Quasilinear Hyperbolic Systems: New Local Solvability Methods and Stochastic Analysis**

Date: **Friday, February 10, 2017**

Room/Time: **Meet–n–Greet:** **10:00 a.m.** **Room 222 MM**
Talk: **11:30 a.m.** **Room 224 MM**

Host: **Dr. Thomas Svobodny**

ABSTRACT:

Quasilinear symmetric and symmetrizable hyperbolic system has a wide range of applications in engineering and physics including unsteady Euler and potential equations of gas dynamics, inviscid magnetohydrodynamic (MHD) equations, shallow water equations, non-Newtonian fluid dynamics, and Einstein field equations of general relativity. In the past, the Cauchy problem of smooth solutions for these systems has been studied by several mathematicians using semi group approach and fixed point arguments. In a recent work of M. T. Mohan and S. S. Sritharan, the local solvability of symmetric hyperbolic system is established using two different methods, viz. local monotonicity method and a frequency truncation method. The local existence and uniqueness of solutions of symmetrizable hyperbolic system is also proved by them using a frequency truncation method. Later they established the local solvability of the stochastic quasilinear symmetric hyperbolic system perturbed by Levy noise using a stochastic generalization of the localized Minty-Browder technique. Under a smallness assumption on the initial data, a global solvability for the multiplicative noise case is also proved. The essence of this talk is to give an overview of these new local solvability methods and their applications.

SPEAKER BIO:

Dr. Manil T. Mohan received his Doctor of Philosophy (Ph.D.) in Mathematics in 2014 from the Indian Institute of Science Education and Research, Thiruvananthapuram (IISER-TVM), India. After completing his Ph.D., he joined the National Board of Higher Mathematics (NBHM) as a Post Doctoral Fellow in IISER-TVM in January 2015. Since June 2015 he has worked as a National Research Council (NRC) Post Doctoral Fellow at the Air Force Institute of Technology (AFIT). He has authored/co-authored 8 research papers in the areas such as Partial Differential Equations, Mathematical Fluid Dynamics, Control Theory and Stochastic Analysis.