Colloquium

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Friday, September, 22, 2017
1:00p.m., HH-3017

Equivalence groups and equivalence
groupoids of classes of differential equations

Abstract:

Point (resp. contact) transformations on several underlying spaces, which are related to a class of differential equations, constitute various algebraic objects. This includes the equivalence groupoid of the class, its usual (resp. generalized, resp. effective generalized, resp. extended generalized) equivalence group, point symmetry groups of single equations from the class and infinitesimal counterparts of these objects. We characterize transformational properties of classes of differential equations in terms of the notion of normalization and its modifications. Thus, a class of differential equations is called normalized in the usual sense if its usual equivalence group generates its equivalence groupoid. We present a procedure for finding equivalence groupoids. The description of an equivalence groupoid may involve generalizations of equivalence group, partition into normalized subclasses, mappings between classes, etc. The framework developed allows us to revise and to essentially enhance the algebraic method of group classification of differential equations. The theoretical results are illustrated with nontrivial examples.