Abstract:
At the most basic level, differential algebraic geometry studies solution spaces of systems of
differential polynomial equations. If a matrix group is defined by a set of such equations, one arrives
at the notion of a linear differential algebraic group, introduced by P. Cassidy. These groups naturally
appear as Galois groups of linear differential equations with parameters. Studying linear differential
algebraic groups and their representations is important for applications to finding dependencies
among solutions of differential and difference equations (e.g. transcendence properties of special
functions). This study makes extensive use of the representation theory of Lie algebras. Remarkably,
via their Lie algebras, differential algebraic groups are related to Lie conformal algebras, defined by V.
Kac. We will discuss these and other aspects of differential algebraic groups, as well as related open
problems.