

UIC Model Theory Seminar, October 31, 2006
The theory of exponential differential equations

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I will give a complete axiomatization of the theory of exponential differential equations in the context of differential fields.

The axiomatization consists of a description of which systems of equations can and cannot have solutions. It builds on James Ax's differential field version of Schanuel's conjecture of transcendental number theory. The method works for the equations satisfied by the exponential maps of any semiabelian variety, but in this talk I will concentrate mainly on the usual exponentiation.

The first-order nature of the axiomatization is closely related to an application in diophantine geometry, which will be discussed more carefully in a future number theory seminar. An application of this work to complex exponentiation was discussed at a previous seminar.