

SESSION—Integrability criteria for single and multivariable difference equations and differential difference equations

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TITRE/TITLE : "INTEGRABILITY OF DIFFERENCE EQUATIONS THROUGH ALGEBRAIC ENTROPY AND GENERALIZED SYMMETRIES"

Given an equation arising from some application or theoretical consideration one of the first questions one might ask is: it is integrable? Which is its behavior? In this lectures we will introduce two different ways for establishing (and in some sense also defining) integrability for difference equations: Algebraic Entropy and Generalized symmetries. Algebraic Entropy deals with the degrees of growth of any kind of discrete equation (ordinary, partial or even differential-difference) and usually gives a quick test to establish if an equation is or not integrable. The approach based on Generalized Symmetries also provides tools for investigating integrable equations and also to find many particular solutions as symmetry reductions. The main focus of the lectures will be on the computational tools that allow us to calculate Symmetries and extract the value of the Algebraic Entropy from a finite number of iterations.