

[Marina Poulet](#) (Marseille) : *Computing Galois groups of difference equations of order 3.*

Abstract: One important application of the difference Galois theory is the study of the (differential) transcendence of solutions of difference equations. Roughly speaking, if the difference Galois group G of a difference equation is sufficiently big then the nonzero solutions of this equation are (differentially) transcendental. More generally, the larger G is, the fewer algebraic relations there are. However, the computation of difference Galois groups is in general a difficult task, we do not have a way to do it for general difference equations. For difference equations of order 1 or 2, many things are known and we can compute Galois groups of q -difference equations, Mahler equations and other well-known types of equations. The aim of this talk is to present the main ideas used to compute difference Galois groups. In particular, we will give an extension of these results for difference equations of order 3 and, in some cases, of order greater than 3. It is a joint work with Thomas Dreyfus.