

# Matrix Painlevé hierarchies

**Pilar Ruiz Gordoa**

(Universidad Rey Juan Carlos, Madrid, Spain)

## Abstract

In this talk we consider the construction of hierarchies of matrix ordinary differential equations, analogous to scalar Painlevé hierarchies. By considering generalized matrix KdV and mKdV hierarchies we derive a matrix first Painlevé hierarchy and a matrix second Painlevé hierarchy. The relationship between the matrix mKdV equation and the matrix second Painlevé equation is thus clarified. We also investigate properties of the matrix second Painlevé hierarchy, e.g., auto-Bäcklund transformations. We consider further examples of matrix Painlevé equations. Our work shows how properties of matrix ODEs can be derived using structures of related matrix PDEs.