

On non-Archimedean Valued Fields and Ultrametric Spaces: the Hahn Fields and Levi-Civita Fields

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In this talk, we will briefly review basic properties of ultrametric spaces, valued fields and ordered fields as well as the connection between these different mathematical objects. In particular, we will present a survey of their algebraic, topological and metric structures. As examples, we will introduce the so-called general Hahn fields and Levi-Civita fields, and we will present a summary of their key properties. Finally, we will give a summary of our work on two special Levi-Civita fields: \mathcal{R} and its complex counterpart \mathcal{C} . Among all the non-Archimedean fields surveyed in the talk, \mathcal{R} and \mathcal{C} are unique from a pure Mathematical point of view as well as from a computational point of view.