

CACTUS VARIETIES OF CUBIC FORMS

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The rank of a symmetric form is the length of its shortest decomposition as a sum of pure powers of linear forms, i.e. the shortest smooth apolar scheme. The cactus rank of the form is the length of the shortest apolar scheme. The a -th cactus variety of cubic forms $C_{a,n}$ is the closure of the family of cubic forms of cactus rank a in the projective space of cubic forms in $n + 1$ variables. I shall report on recent work with Bernardi, Jelisiejew and Marques giving the dimension and a geometric characterization of the general member of $C_{a,n}$ when $1 \leq a \leq 2n + 2$.

Joint work with Alessandra Bernardi (Universita de Bologna, Italy), Joachim Jelisiejew (University of Warsaw, Poland) and Pedro Macias Marques (Universidade de Evora, Portugal).