CASTELNUOVO VARIETIES AND WEBS OF MAXIMAL RANK

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After having presented some basic notions of web geometry and some links with projective geometry, I will explain that Castelnuovo-Harris bound on the genus of projective varieties still holds for the *rank* of webs in general. This leads to the

> **Algebraization problem:** *Has a web of maximal rank an algebraic origine, i.e is such a web equivalent (up to a change of coordinates) to an algebraic web associated to a Castelnuovo variety?*

I will explain that one can mimic for webs the construction of the canonical map of an algebraic variety. With this, the web-theoretic "Algebraization problem" formulated above leads to the following

> **Geometrical problem:** *Describe the projective varieties X that are "n-covered by rational normal curves of degree δ", ie. such that through n general points of X passes a rational normal curve of degree δ included in X.*

I will present some results on this question of projective geometry:

(1) in most of the cases, a X n-covered by rational normal curves is of "*Castelnuovo type*";
(2) in some particular cases (related to cubic Jordan algebras), there are examples of varieties 3-covered by twisted cubics that are of a distinct type ("*Jordan type*").

Finally, considering (some of the) varieties 3-covered by twisted cubics of Jordan type, I will construct some "*algebraic exceptional webs*", that is webs of maximal rank that are algebraic in a natural sense but not in the classical one.

(Most of the talk is based on a joint work with J.-M. Trépreau)