

# SEMPARIS – Séminaires en région parisienne

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## Séminaire informel

**Mercredi 24 Mai 2017, 14 :00**

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Domaines : hep-th—math—math-ph—math.AG—math.CO—math.KT—math.MP—math.QA

Titre : *Schubert calculus and quantum integrability (3/3)*

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Résumé : *Schubert calculus is a branch of enumerative geometry, which deals with configurations of linear subspaces of a vector space. Translated into the modern language, it amounts to certain calculations in the cohomology ring of Grassmannians and flag varieties. A practical problem is to give a combinatorial rule for the structure constants of that ring. A few years ago, I observed that there was a hidden quantum integrability in the case of Grassmannians (for which the combinatorial rule is the so-called Littlewood–Richardson rule). In a somewhat unrelated development, there has been a growing body of work (including my own) showing the deep connection between cohomology theories (ordinary cohomology,  $K$ -theory, elliptic cohomology) and quantum integrable systems. In particular Maulik and Okounkov introduced a nice framework for this connection. It is natural to try to reinterpret my observation above in this language. After introducing these various concepts, I shall present recent work with A. Knutson in this direction. In particular, this provides completely new rules for the calculation of structure constants of the equivariant cohomology or  $K$ -theory of  $d$ -step flag varieties for  $d$  smaller or equal to 4, thus moving several "steps" closer to the completion of the program of Schubert calculus.*

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