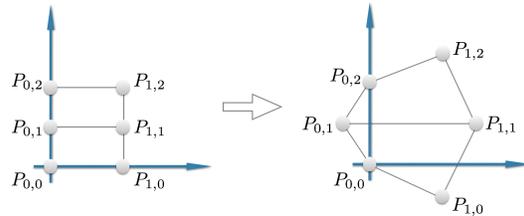


**MINI-WORKSHOP ON
“COMMUTATIVE ALGEBRA AND APPLICATIONS”**

Date: Thursday, September 22, 2016.

Location: Nice, ground floor room 1 of the Laboratoire J.-A. Dieudonné.

Organizers: Laurent Busé (Inria) and Alexandru Dimca (Université de Nice).



Program:

- 14:00-14:40 Ngo Viet Trung (Vietnam Academy of Science and Technology)

Castelnuovo-Mumford regularity and Ratliff-Rush closure

ABSTRACT: We establish relationships between the Castelnuovo-Mumford regularity of standard graded algebras and the Ratliff-Rush closure of ideals. These relationships can be used to compute the Ratliff-closure and the regularities of the Rees algebra and the fiber ring. As a consequence, these regularities are equal for large classes of monomial ideals in two variables, thereby confirming a conjecture of Eisenbud and Ulrich for these cases. This is a report on a joint paper with Maria-Evelina Rossi and Dinh Thanh Trung.

- 14:50-15:30 Alexandru Dimca (Université Côte d’Azur)

Castelnuovo-Mumford regularity and invariants of plane curves

ABSTRACT: We will recall first the definition of some naive numerical invariants associated to a complex projective plane curve. These invariants are then used to characterize the free and the nearly free plane curves. Finally we will relate them to the Castelnuovo-Mumford regularity of the Jacobian ring of any plane curve.

Coffee break

- 16:00-16:40 Aron Simis (Universidade Federal de Pernambuco)

Plane fat points of subhomaloidal type

ABSTRACT: This is joint work with Zaqueu Ramos. One aims at the ideal theoretic and homological properties of a class of plane fat ideals, based on general points, such that their second symbolic powers are fat ideals having virtual multiplicities of proper homaloidal

types. For this purpose one carries a detailed examination of their linear systems at the initial degree, a good deal of the results depending on the method of applying the classical arithmetic quadratic transformations of Hudson-Nagata (called Cremona equivalence by same authors). A subsidiary guide to understand these ideals through their initial linear systems has been supplied by questions of birationality with source 2 and target higher dimensional spaces. This leads, in particular, to the retrieval of birational maps studied by Geramita-Gimigliano-Pitteloud, including a few of the celebrated Bordiga-White parameterizations.

- 16:50-17:30 Laurent Busé (Inria Sophia Antipolis)

Effective criteria for bigraded birational maps

ABSTRACT: Motivated by applications in geometric modeling, I will report on some birationality criteria for rational maps from a product of two projective lines to a projective plane in very low bidegrees. These new matrix-based birationality criteria are obtained by analyzing the syzygies of the defining equations of the map, in particular by looking at the dimension of certain bigraded parts of the syzygy module. Then, I will also report on current works by the geometric modeling community on this topic and present some open problems in this direction. This is a joint work with N. Botbol, M. Chardin, H. Hassanzadeh and A. Simis.

This workshop will continue on Friday 23 September with free discussions among the participants. Please contact the organizers Laurent Busé (laurent.buse@inria.fr) and Alexandru Dimca (dimca@unice.fr) for more information.

Sponsors: this mini-workshop is supported by the Laboratoire J.-A. Dieudonné¹, the Institut Universitaire de France², the Inria project-team Aromath³ and the MathAmSud research program SYRAM⁴.



¹<http://math.unice.fr/>

²<http://www.iufrance.fr/>

³<http://team.inria.fr/aromath/>

⁴<http://www-sop.inria.fr/members/Laurent.Buse/syram/>