Ines Adouani  
(Université de Sousse)  

"Lower bound of admissible functions on the Grassmannian $G_{m,nm}(\mathbb{C})"$

Abstract: We prove the existence of an "extremal" function lower bounding all admissible functions (i.e., plurisubharmonic functions modulo a metric) with sup equal to zero on the complex Grassmann manifold $G_{m,nm}(\mathbb{C})$. The functions considered are invariant under a suitable automorphisms group. This gives a conceptually simple method to compute Tian's invariant in the case of a non toric manifold.

Gautam Bharali  
(Indian Institute of Science, Bangalore)  

"The dynamics of holomorphic correspondences on compact Riemann surface"$

Abstract: Owing to the theorem of M. de Franchis, a compact hyperbolic Riemann surface does not admit any interesting iterative holomorphic dynamics. However, these surfaces are rich in holomorphic correspondences. The iteration of such a correspondence gives rise to many questions – which have begun to be investigated fairly recently – that are analogous to those in the theory of iterations of rational maps on the 2-sphere. A part of this talk will be devoted to defining the analogue of the Fatou set for correspondences.

Let $F$ be a holomorphic correspondence on a compact Riemann surface $X$. Under certain conditions, $F$ admits a canonical measure, $\mu_F$, that is invariant under $F$ in a specific sense and has good ergodic properties. The work of Dinh and Sibony gives several ways of describing $\mu_F$, in view of which the support of $\mu_F$ seems to be a good analogue of the Julia set in the case of correspondences. To this end, we show that the support of $\mu_F$ is disjoint from the (analogue of) the Fatou set of $F$. The proof of this also reveals a dynamically meaningful condition under which the analogues of the Fatou and the Julia set partition the underlying Riemann surface (which is simply definitional in the case of rational maps on the 2-sphere).

A part of this talk is joint work with Shrihari Sridharan.
Thibaut Delcroix  
(Institut Fourier, Grenoble)  

Kähler-Einstein metrics on group compactifications  

Abstract: Wang and Zhu characterized the existence of Kähler-Einstein metrics on Fano toric manifolds in terms of the barycenter of the associated polytope. The aim of this talk is to present a generalization of this result for Fano GxG-equivariant compactifications of a complex reductive groupe G. I will explain how the barycenter of the moment polytope of such a manifold with respect to the Duistermaat-Heckman measure is linked with the existence of Kähler-Einstein metrics. Our result provides in particular new examples of Kähler-Einstein metrics, and an example with vanishing Futaki invariant but no Kähler-Einstein metrics.

Sławomir Dinew, slawomir.dinew@im.uj.edu.pl  
(Jagiellonian University)  

Minimum sets of strictly plurisubharmonic functions  

Abstract: A classical theorem by Harvey and Wells states that the minimum set of a bounded smooth plurisubharmonic function is contained in a totally real submanifold. In particular this yields that such a set has small Hausdorff dimension and has no analytic structure. In the talk I will discuss what happens if instead of strict plurisubharmonicity one assumes strict positivity of the Monge-Ampere measure. The results will be compared with their real analogues due to Caffarelli.

Xin Dong  
(Nagoya University, Japan)  

Boundary asymptotics of the relative Bergman kernel metric for hyper-elliptic curves  

Abstract: The Bergman kernel on each complex manifold is a canonical volume form determined by the complex structure and we study the variation of Bergman kernels at degeneration. For a holomorphic family of hyper-elliptic curves, we obtain asymptotic formulas at the limiting case of the relative Bergman kernel metric with precise coefficients involving the complex structure information. The results are different from the elliptic curve case where hyperbolic growth exists, although topologically both degenerations are of nodal types. Lower bounds of Bergman kernels are also discussed by relating to a method of Berndtsson and Lempert.
Lucas Kaufmann  
(IMJ-PRG, Paris 6)  

Commuting pairs of endomorphisms of $\mathbb{P}^2$

Abstract: We consider the problem of describing the commuting pairs of endomorphisms of the complex projective space under the condition that they do not share an iterate.

The one-dimensional case is classical and it was completely classified by Fatou, Julia and Ritt in the 1920s.

In higher dimensions, Dinh and Sibony gave a structural theorem for such pairs under the extra condition that their degrees are distinct after iteration. They also showed that their conclusion is false in dimension 3 and higher if this condition is dropped.

The aim of this talk is to come back to the original problem and to give a complete description of commuting pairs in dimension 2. The remaining case to be studied is when their degrees are equal after a number of iterations.

Takayuki Koike  
(University of Tokyo)  

On some analogues of Ueda theory and their applications

Let $C$ be a compact complex curve included in a non-singular complex surface such that the normal bundle is topologically trivial. Ueda studied complex analytic properties of a neighborhood of $C$ when $C$ is non-singular or is a rational curve with a node. We propose analogues of Ueda’s theory in two manners: Ueda’s theory for the case where $C$ admits nodes and a codimension two analogue of Ueda’s theory. As an application, we study singular Hermitian metrics with semi-positive curvature on some kinds of nef line bundles defined on complex manifolds.

Szymon Pliś  
(Cracow University of Technology )  

Pluripolar sets on almost complex surfaces

Abstract: I will present some recent results on pluripolar sets on almost complex surfaces. In particular I will prove that (singular) pseudoholomorphic curves are (locally) pluripolar.
Dan Popovici  
(Université Paul Sabatier, Toulouse)  

*Positivity and Duality on Compact Complex Manifolds*

Abstract: We shall explain how the duality between Demailly’s pseudo-effective cone of Bott-Chern cohomology classes of closed positive $(1,1)$-currents and the closure of the Gauduchon cone of Aeppli cohomology classes of $(n-1)$-st powers of Gauduchon metrics that we introduced in 2013 can be combined with pointwise inequalities between products of traces of smooth positive definite forms and estimates in certain Monge-Ampère equations to prove the qualitative part and give a partial positive answer to the quantitative part of Demailly’s Transcendental Morse Inequalities Conjecture for differences of two nef cohomology classes on compact Kähler manifolds. If time permits, we shall also explain the relevance of an extension of this conjecture beyond the Kähler world to solving another conjecture that we proposed predicting that every $\partial\bar{\partial}$-manifold will carry a balanced metric.

Alexandre Ramos-Peon  
(Universität Bern)  

*Non-algebraic examples of manifolds with a volume density property*

Abstract: Some Stein manifolds (with a volume form), such as $\mathbb{C}^n$ or some homogeneous spaces of linear algebraic groups, have a “very large” group of (volume-preserving) automorphisms, a notion which was formalized by D. Varolin with the concept of (volume) density property, which I will explain, and which has several interesting consequences. The volume case has been less studied and so far all known examples are algebraic, and satisfy a related algebraic density property. In this talk I will present a criterion for the volume density property, and as an application we will show that there are some non-algebraic examples, namely subvarieties defined by an equation of the type $uv = f(z_0, \ldots z_n)$, where $f$ is a holomorphic function vanishing on a non-straightenable embedding of $\mathbb{C}^n$ of codimension one. Such a variety is a potential counterexample to the holomorphic version of the Zariski cancelation problem.

Iris Smit  
(NTNU)  

*Fatou components of attracting skew products*

Abstract: Sullivan’s famous non-wandering domains theorem states that the Fatou components of a rational function on the Riemann sphere are all periodic or pre-periodic. It was shown in 2014 by M. Astorg, X. Buff, R. Dujardin, H. Peters and J. Raissy that wandering domain can exist for polynomial maps in $\mathbb{C}^2$. Their examples are parabolic skew products. In this talk, I will discuss joint work with Han Peters, where we investigate the existence of wandering domains for attracting skew products.
Songyan Xie  
(Paris-Sud)  

Title: On the ampleness of the cotangents bundles of complete intersections

Abstract: Taking inspiration from a recent breakthrough of Damian Brotbek, for the intersection family $\mathcal{X}$ of certain Fermat-type hypersurfaces in $\mathbb{P}_K^N$ defined over any field $K$, we construct explicit symmetric differential forms by applying Cramer’s rule, skipping cohomology arguments, and we further exhibit unveiled families of lower degree symmetric differential forms on all possible intersections of $\mathcal{X}$ with coordinate hyperplanes.

Thereafter, we develop what we call the “moving coefficients method” to prove a conjecture made by Olivier Debarre: for a generic choice of $c \geq N/2$ hypersurfaces $H_1, \ldots, H_c \subset \mathbb{P}^N_K$ of degrees $d_1, \ldots, d_c$ sufficiently large, the intersection $X := H_1 \cap \cdots \cap H_c$ has ample cotangent bundle $\Omega_X$, and concerning effectiveness, the lower bound:

$$d_1, \ldots, d_c \geq N^{N^2}$$

works. In particular, when $K = \mathbb{C}$, it is known that such $X$ are Kobayashi-hyperbolic.

Lastly, assuming that the ambient field $K$ has characteristic zero, thanks to known results about the Fujita Conjecture, we establish the very-ampleness of $\text{Sym}^\kappa \Omega_X$ for all $\kappa \geq \kappa_0$, with a uniform lower bound:

$$\kappa_0 = 16 (N - c + 1)^2 \left( \sum_{i=1}^c d_i \right)^2$$

independent of $X$. 