NORDAN 13

Reykholt, Borgarfjörður, Iceland
April 17-19, 2009

Schedule

Friday, April 17

18:00	*Bus leaves for Reykholt from the Tæknigarður building, University of Iceland*
20:00	*Dinner at Reykholt*

Saturday, April 18

9:00-9:45	Thomas
10:00-10:45	Löw
	Coffee
11:15-12:00	Ounaïes
	Lunch
14:00-14:45	Hénaut
15:00-15:45	Rigat
	Coffee
16:15-17:00	Ivarsson
18:00	*Visit to Snorrastofa, Culture- and medieval centre, founded in memory of Snorri Sturluson.*
20:00	*Dinner*

Sunday, April 19

9:00-9:45	Meylan
10:00-10:45	Tsikh
	Coffee
11:15-12:00	Passare
	Lunch
14:00	*Sightseeing tour*
18:00-19:00	*Arrival to Reykjavik*

Abstracts

Alain Hénaut (Bordeaux)

Geometric normal forms for planar webs of maximum rank

Abstract: Web geometry deals with families of foliations in general position. We shall restrict our attention to the planar case with complex analytic foliations of curves. For a planar d-web $\mathcal{W}(d)$ of maximum rank $\pi_d = \frac{1}{2}(d-1)(d-2)$, we shall present the following geometric dichotomy result: *either* $\mathcal{W}(d)$ is linearizable and equivalent to an algebraic web associated, by duality, with a curve of degree d in $\mathbb{P}^2$ *or* $\mathcal{W}(d)$ with $d \geq 5$ is not linearizable and equivalent to a web associated with a parametrized B-projective surface in $\check{\mathbb{P}}^{\pi_d - 1}$. The methods used combine algebraic geometry and projective differential geometry.

Björn Ivarsson (Bern)

Holomorphic factorization of mappings into the special linear group

Abstract: In linear algebra we learn that an invertible matrix can be row-reduced to the identity matrix. For a matrix with determinant equal to one this means that it can be written as a product of unipotent matrices. What happens if you have elements of a ring R as entries in the matrix instead of complex numbers? Can you write matrices in $\mathrm{SL}_m(R)$ as a product of unipotent matrices? This question was asked by Gromov for the ring of holomorphic functions defined on $\mathbb{C}^n$. We show that the same type of factorization is in fact possible for this ring.

Erik Löw (Oslo)

Polynomial convexity and totally real manifolds

Abstract: (Joint work with E.F. Wold.) We study generic properties of totally real submanifolds M of $\mathbb{C}^n$. If M is polynomially convex and has bounded exhaustion hull, we show that the same holds for sufficently small C^1 perturbations. If M is only totally real and $\dim M < n$, there are arbitrarily small C^1 perturbations of M that are polynomially convex and has bounded exhaustion hulls.

Francine Meylan (Fribourg)

Intrinsic deformation Theory of CR structures

Abstract: This is a joint work with Paolo de Bartolomeis. Let (V, ξ) be a contact manifold and let J be a strictly pseudoconvex CR structure of hypersurface type on (V, ξ) ; starting only from these data, we define and we investigate a differential graded Lie algebra which governs the deformation theory of J.

Myriam Ounaïes (Strasbourg)

Traces of Hörmander algebras on discrete sequences

Abstract: We call Hörmander algebras the spaces $A_p(\mathbb{C})$ of entire functions f such that, for all z,

$$|f(z)| \leq A\, e^{Bp(z)},$$

where A and B are some positive constants (depending on f) and p is a subharmonic weight. We consider the following interpolation problem: Given a discrete sequence $\{a_j\}$ of complex numbers and a sequence of complex values $\{b_j\}$, under what conditions does there exist a function $f \in A_p(\mathbb{C})$ such that $f(a_j) = b_j$ for all j ? In other words, what is the trace of $A_p(\mathbb{C})$ on $\{a_j\}$? We say that $\{a_j\}$ is an interpolating sequence if the trace is defined by the space of all $\{b_j\}$ satisfying $|b_j| \leq A' e^{B' p(a_j)}$, for some constants $A', B' > 0$. We use Hörmander's L^2-estimates for the $\bar{\partial}$-equation to describe the trace when the weight p is radial and doubling and to characterize the interpolating sequences for more general weights.

Mikael Passare (Stockholm)
Mellin transforms of rational functions

Abstract: We shall discuss the connection between Newton polytopes, coamoebas, and the multidimensional Mellin transforms of rational functions. The coamoeba of a complex polynomial f is defined to be the image of the hypersurface defined by f under the mapping Arg that sends each coordinate z_k to its argument $\arg z_k$. The Newton polytope of f is the convex hull in $\mathbf{R}^n$ of the set of exponent vectors of the monomials occurring in f. Our main result is a description, for a general polynomial f, of the polar locus of (the meromorphic continuation of) the Mellin transform of the rational function $1/f$.

Stéphane Rigat (Marseille)
Hardy Spaces for the Beltrami equation

Abstract: In this talk we consider solutions to the Beltrami equation $\bar{\partial} f = \nu \overline{\partial f}$ in the unit disk, where ν is a mapping from the unit disk $\mathbb{D}$ into $(-1, 1)$ which belongs to $W^{1,+\infty}(\mathbb{D})$. Moreover, we assume that f satisfies growth conditions analogous to the ones for functions in the usual Hardy spaces. We prove density results as well as existence results for such functions and give some applications to problems in physics. This is a joint work with Laurent Baratchart, Juliette Leblond and Emmanuel Russ.

Pascal Thomas (Toulouse)
Limits of multipole pluricomplex Green functions

Abstract: Let Ω be a bounded hyperconvex domain in $\mathbb{C}^n$, $0 \in \Omega$, and S_ε a family of N poles in Ω, all tending to 0 as ε tends to 0. To each S_ε we associate the vanishing ideal I_ε and a pluricomplex Green function $G_\varepsilon = G_{I_\varepsilon}$, the pluricomplex Green function of the ideal I_ε. Suppose that, as ε tends to 0, $(I_\varepsilon)_\varepsilon$ converges to I, (local uniform convergence), and that $(G_\varepsilon)_\varepsilon$ converges to G, in L^1_{loc}; then $G \geq G_I$. If S_ε is a complete intersection (uniformly in ε), then convergence occurs and furthermore $G = G_I$. Contrarily, if the Hilbert-Samuel multiplicity of I is strictly larger than its length (codimension, equal to N here), then $G > G_I$. We work out the case of three poles in the bidisk.

August Tsikh (Krasnoyarsk)
The discriminantal variety of a general polynomial transformation of $\mathbb{C}^n$

Abstract: (Joint work with I. Antipova). We consider a polynomial mapping $P\colon \mathbb{C}^n \to \mathbb{C}^n$ given by (fixed) monomials and varying coefficients; we then say that P is a general polynomial transformation of $\mathbb{C}^n$. In the space of coefficients we study the discriminantal variety ∇ for P, characterized by the condition that P has multiple roots. The main result consists in a parametrization of the inhomogeneous irreducible discriminantal variety ∇. The formula for the parametrization contains only exponents of monomials that appear in P. In the case $n = 1$ (that is, for the classical discriminant) we recover a previous result of M. Passare and myself (2004). For irreducible ∇ of codimension one the parametrization is inverse to the logarithmic Gauss mapping, that is, we obtain in this case an analogue of the Horn-Kapranov parametrization for A-discriminants.

Participants

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Organizers

Benedikt Steinar Magnússon, Jón Ingólfur Magnússon, and Ragnar Sigurðsson

FYRSTA Norðan-ráðstefnan utan Skandinavíu fór fram undir rísandi síðvetrarsól á gamla Fróni. Norðanvindur skók ráðstefnugesti er þeir stigu úr loftförum sínum, en frost og kuldi gleymdust fljótt í yl Bláa lónsins. Fyrirlestrar voru haldnir í Háskóla Íslands, nánar tiltekið í Odda, en þátttakendur dvöldu í góðu yfirlæti á Hótel Sögu. Þó svo stærðfræðin skipaði öndvegi þessa daga, þá fundu menn sér stund til að heimsækja Stofnun Árna Magnússonar og berja þar augum forn skinnhandrit sem ein geyma veigamikla þætti úr sögu Norðurlanda.