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Titles and Abstracts

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Marco Abate *University of Pisa, Pisa, Italy*

Index theorems and geodesic flow for meromorphic connections

Abstract: The study of meromorphic connections on Riemann surfaces is a classical topic, related for instance to the 21st Hilbert problem.
In this talk I shall introduce a novel point of view, with unexpected analytic, geometric and dynamical applications. More precisely, I shall show how to associate to holomorphic maps having a positive-dimensional fixed point set a meromorphic connection along a foliation in Riemann surfaces, that can be used to prove several index theorems generalizing and extending both the classical holomorphic Lefschetz index theorem and the Camacho-Sad index theorems for foliations. Furthermore, I shall describe how to study with analytical and geometrical techniques the geodesic flow associated to a meromorphic connection, with the aim of describing the asymptotic behavior of the real geodesic defined by the connection. Finally, I shall describe a few applications of these results to the study of the dynamics of germs tangent to the identity, to the study of the flow of homogeneous vector fields, and to the study of meromorphic self-maps of the complex projective space.

Tae-Yong Ahn *POSTECH(GAIA), Pohang, Korea*

The Bergman metric of Kohn-Nirenberg domains

Abstract. In this talk, we discuss the existence and the completeness of the Bergman metric of Kohn-Nirenberg domains. For the existence, we apply the Hanh-Lu comparison theorem of the Caratheodory metric and the Bergman metric. For the completeness, we construct peak functions at each boundary point by solving d-bar equations with Fornaess-McNeal type data and again use Hahn-Lu comparison theorem.

This is based upon joint work with H. Gaussier and K.T. Kim [1].

[1] T. Ahn, H. Gaussier, K.-T. Kim: *Bergman and Caratheodory metrics of the Kohn-Nirenberg domains*, arXiv:1406.3406

Leandro Arosio *Istituto Nazionale della Alta Matematica, Roma, Italy*
Canonical models for holomorphic iteration

Abstract: We say that a holomorphic self-map f of the unit disc $\Delta \subset \mathbf{C}$ has a model if it is conjugated to an automorphism of Δ or of $\mathbf{C}$ (the base space of the model). The problem of finding a model for a holomorphic mapping is old as complex dynamics itself: for a self-map f with a fixed point at the origin and with $0 < |f'(0)| < 1$, the model is given by the Schroeder equation, solved in 1884 by Koenigs. If f has no fixed points in the interior of the disc the model is given by the Valiron equation (in the hyperbolic case) and by the Abel equation (in the parabolic case). For a univalent self-map f of the unit ball $\mathbf{B}^q \subset \mathbf{C}^q$ it is not even clear *a priori* what the base space should be. In this talk we show, using the abstract basin of attraction and generalizing the abstract approach introduced by Cowen in one variable [Cowen], that there always exists a model whose base space Ω is determined up to biholomorphism by the dynamics of f. We cannot determine the complex structure of Ω, but, using a result of Fornaess-Sibony on the union problem [FS], we can single out a canonical semi-model whose base space is a possibly lower-dimensional ball $\mathbf{B}^k$, which still contains all the Kobayashi pseudometric informations of the model. If f is a hyperbolic self-map, we obtain in this way a solution of the Valiron equation in several complex variables. This is a joint work with Filippo Bracci [AB].

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Eric Bedford *Indiana University, Bloomington, Indiana, U.S.A.*
Automorphisms of blowups of projective space

Abstract: We will discuss the existence of automorphisms and pseudo-automorphisms of complex manifolds which have positive entropy.

Zbigniew Błocki *Jagiellonian University, Krakow, Poland*
Estimates for the Bergman Kernel and the Suita Conjecture

Abstract: We will present some estimates for the Bergman kernel on the diagonal in terms of pluripotential theory. They lead in particular to a multidimensional version of the Suita conjecture. Especially accurate bounds are obtained for convex domains, then the Bergman kernel is very close to the reciprocal of the volume of the Kobayashi indicatrix. We will also present formulas for some complex ellipsoids where both the Bergman kernel and especially the Kobayashi pseudometric are hard to compute.

This is a joint work with Wlodzimierz Zwonek.

Bo-Yong Chen *Tongji University, Shanghai, China*
Supplement to L^2 theory for $\bar{\partial}$ on complete Kähler domains

Abstract: We introduce an approach to study L^2 estimates of $\bar{\partial}$ operator with respect to singular weights on complete Kähler domains. As an application, we obtain a Thullen type extension theorem for psh functions on complete pluripolar complements, generalizing a theorem of Siu. This work is based on a joint paper with J.J. Wu and X. Wang. If time permits, I shall discuss boundary behavior of Bergman or Szegö kernels that provides vanishing of L^2 $\bar{\partial}$ or $\bar{\partial}_b$ cohomology groups (without weights).

Boo-Rim Choe *Korea University, Seoul, Korea*

Commuting Toeplitz operators and fixed points of the Berezin transform on the Fock space

Abstract: In the setting of the Bergman space over the disk or the ball, it has been known that two Toeplitz operators with bounded pluriharmonic symbols can (semi-)commute only in the trivial cases. In this talk we present the analogues on the Fock space over the multi-dimensional complex space. As is the case on various other settings, we are naturally led to the problem of characterizing certain type of fixed points of the Berezin transform. For such fixed points, we obtain a complete characterization by means of eigenfunctions of the Laplacian. We also obtain other characterizations. In particular, it turns out that there are many nontrivial cases on the Fock space for (semi-)commuting Toeplitz operators with pluriharmonic symbols.

All in all our results reveal that the situation on the Fock space appears to be much more complicated than that on the classical Bergman space setting, which partly is caused by the unboundedness of the operator symbols. Some of our results are restricted to the one-variable case and the corresponding several-variable case is left open.

This is a joint work, still in progress, with W. Bauer and H. Koo.

Jean-Pierre Demailly *Universite Joseph Fourier-Grenoble 1, Grenoble, France*

Structure theorems for compact Kähler manifolds

Abstract. In this lecture, we investigate structure theorems for compact Kähler manifolds under certain assumptions for the sign of the Ricci curvature form. Especially, we describe the structure of compact Kähler manifolds with semipositive Ricci curvature, and properties of the Albanese morphism in the more general situation where the Ricci class is numerically effective.

This is based on joint work with Frédéric Campana and Thomas Peternell.

John Erik Fornaess *NTNU, Trondheim, Norway*
Example of Oka manifold

Abstract: This is joint work with Erlend Wold We give a new example of an Oka manifold.

Tobias Harz *University of Wuppertal, Wuppertal, Germany*
The core of a complex manifold

Abstract: The core $\mathbf{c}(\mathcal{M})$ of a complex manifold $\mathcal{M}$ is introduced as the set of all points where every smooth and bounded from above plurisubharmonic function on $\mathcal{M}$ fails to be strictly plurisubharmonic.
I will explain that every strictly pseudoconvex domain $\Omega \subset \mathcal{M}$ with smooth boundary admits a global defining function that is strictly plurisubharmonic precisely in the complement of $\mathbf{c}(\Omega)$. Moreover, I will discuss properties of the core, in particular

(1) 1-pseudoconcavity of the core, and
(2) Liouville type properties of the core.

This talk is based on joint work with N. Shcherbina and G. Tomassini.

Atsushi Hayashimoto *Nagano National College of Technology, Nagano, Japan*
Classification of proper holomorphic mappings between generalized pseudoellipsoids of different dimensions

Abstract: Let $E(m; m_1, \ldots, m_N; \alpha_1, \ldots, \alpha_N)$ be a bounded domain in $\mathbf{C}^{m+1}$ with a real analytic boundary defined by

$$E(m; m_1, \ldots, m_N; \alpha_1, \ldots, \alpha_N) = \{(z, w_1, \ldots, w_N) \in \mathbf{C} \times \mathbf{C}^{m_1} \times \mathbf{C}^{m_N} : |z|^2 + ||w_1||^{2\alpha_1} + \ldots + ||w_N||^{2\alpha_N} - 1 < 0\},$$

where $\alpha_1, \ldots, \alpha_N \in \mathbf{N}$, $m_1 + \ldots + m_N = m$ and $||w_j||^2 = |w_j^1|^2 + \ldots + |w_j^{m_j}|^2$ for $w_j = (w_j^1, \ldots, w_j^{m_j}) \in \mathbf{C}^{m_j}$. This is called a generalized pseudoellipsoid with N blocks. We denote by this domain $E(m; (m_j); (\alpha_j))$.
We say that the mapping $F : D_1 \to D_2$ is equivalent to the mapping $G : D_1 \to D_2$ if there exist automorphisms ϕ_1 of D_1 and ϕ_2 of D_2 such that $F = \phi_2 \circ G \circ \phi_1$.
In this talk, we shall explain the following theorem, which can be considered as a pseudoellipsoid version of a gap theorem for balls.

Theorem 0.1. *Let $E(m; (m_j); (\alpha_j))$ and $E(n; (n_j); (\beta_j))$ be generalized pseudoellipsoids with N blocks and suppose that $2 < m_j$ and $3 < n_j$. Assume that there exists a proper holomorphic mapping $(\mathcal{F}, \mathcal{G}_1, \ldots, \mathcal{G}_N) : E(m; (m_j); (\alpha_j)) \to E(n; (n_j); (\beta_j))$ which is holomorphic up to the boundary and fixes the origin. If there exists a permutation of indices σ of order N such that $n_j < 2m_{\sigma(j)} - 1$, then $\alpha_{\sigma(j)} = \beta_j$ and $(\mathcal{F}, \mathcal{G}_1, \ldots, \mathcal{G}_N)$ is equivalent to $(z, \widetilde{\mathcal{G}_1}, \ldots, \widetilde{\mathcal{G}_N})$. Here, $\widetilde{\mathcal{G}_j} = (w_{\sigma(j)}, 0, \ldots, 0)$ with the first $m_{\sigma(j)}$ components being $w_{\sigma(j)}$ and the rest being zero.*

We shall refer to the case of $m_j = 2, n_j = 3$ and the case of $2 < m_j, 4 \leq n_j \leq 3m_j - 4$.

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Dano Kim *Seoul National University, Seoul, Korea*

Section rings, Singular hermitian metrics and the Skoda division theorem

Abstract: Given a line bundle L on a compact complex manifold, its section ring is defined to be the graded ring of holomorphic sections of all the tensor powers of L. It is a fundamental object in algebraic geometry and also gives a natural context to consider singularity of various singular hermitian metrics of L (equivalently, singularity of plurisubharmonic functions).

In the first part of this talk, we will discuss recent results on the singularity of psh functions: on monotone subsequences of Demailly approximation and on Siu-type singular metrics. In particular, we will show in a strong sense that Lelong numbers cannot determine the singularity of a psh function even up to equivalence of singularities.

In the second part, we will turn to the Skoda division theorem which is closely related to section rings. We pursue the most general statement of Skoda-type division and will explain that, beyond the currently best possible statement, it can be further generalized using the notion of pseudo- division. This will make it possible to generalize Geometric Effective Nullstellensatz of Ein-Lazarsfeld.

This talk is based on preprints "Equivalence of plurisubharmonic singularities and Siu-type metrics" and "Skoda division of line bundle sections and pseudo-division" to be posted on arXiv.

Hyeseon Kim *POSTECH(GAIA), Pohang, Korea*

A generalized Newlander-Nirenberg theorem on almost complex manifolds

Abstract: For an almost complex manifold (M^{2m}, J), $m \geq 1$, there can be at most m independent J- holomorphic functions, which is the case of the integrability condition due to Newlander and Nirenberg as a complex version of Frobenius theorem in differential geometry. In this talk, we determine the partial integrability on almost complex manifolds as an extension of the celebrated Newlander-Nirenberg theorem. As a complex version of Cartan-Gardner theory, we follow the method in analyzing a certain torsion tensor. Then we investigate several examples, including the natural almost complex structure on S^6. This talk is based on a collaboration with Chong-Kyu Han.

Sung-Yeon Kim *Kangwon National University, Chun-cheon, Korea*

RIGIDITY OF PROPER HOLOMORPHIC MAPS BETWEEN BOUNDED SYMMETRIC DOMAINS

Abstract. In this talk, we investigate the conditions for proper holomorphic maps between Cartan type I bounded symmetric domains to be simple block matrix shape, answering positively a question of Mok. The proof is based on the similar phenomenon for local CR maps between arbitrary boundary components of two bounded symmetric domains. In this talk, we follow an approach going back to the general Cartan's moving frame method. To compensate for the lack of the power of Tanaka-Chern-Moser normalization, we introduce a sequence of several subsequent adjustments of moving frames reaching further and further normalization conditions. When boundary components are other than Shilov boundary component, which are Levi-degenerate, our analysis is based on their 2-nondegeneracy combining Levi form with higher order tensors.

Frank Kutzschebauch *University of Bern, Bern, Switzerland*

The density and volume density properties for complex manifolds - two strong forms of holomorphic flexibility

Abstract: Compared to the real differentiable case complex manifolds in general are more rigid, their groups ofholomorphic diffeomorphisms are rather small (in general trivial). A long known exception to this behavior is affine n-space $\mathbf{C}^n$ for $n \geq 2$, its group of holomorphic diffeomorphisms is infinite dimensional. In the late 1980's Andersen - Lempert proved a remarkable theorem which stated in its generalized version due to Forstneric and Rosay that any local holomorphic phase flow given on a Runge subset of $\mathbf{C}^n$ can be locally uniformly approximated by a global holomorphic diffeomorphism. The main ingredient in the proof was formalized by Varolin to be called the density property: The Lie algebra generated by complete holomorphic vector fields is dense in the Lie algebra of all holomorphic vector fields. In these manifolds, assumed they are Stein, a similar local to global approximation of Andersen-Lempert type holds, It is a precise way of saying that the group of holomorphic diffeomorphisms is large.
If the Stein manifold in question is equipped with a holomorphic volume form ω, a similar density property for the Lie algebra of vector fields annihilating ω, the so called volume density property, can be considered. We would like to remark that the relation between density property and volume density property is totally unexplored yet. Moreover there is no obvious relation between the two properties. A Stein manifold could have density property, but does not admit a holomorphic volume form. The volume density property depends on the choice of volume form, a manifold could have volume density property with respect to one form but not with respect to another form, also suppose volume density property hold with respect to one form, all holomorphic diffeomorphisms may leave invariant that form (up to a multiple).
In the talk we will explain how these two notions are related to other more recent flexibility notions in Complex Geometry, in particular to the notion of Oka-Forstnerič manifold. We will give examples of manifolds with these two properties and sketch applications of the density property (resp. volume density property). If time permits we will explain criteria for the density property (resp.volume density property) developed by Kaliman and the speaker or sketch some future plans.

References

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Kang-Hyurk Lee *Gyeongsang National University, Jinju, Korea*
Characterization of the Heisenberg models in almost CR manifolds

Abstract: As observed by Gaussier-Sukhov and the author, the classical Wong-Rosay theorem (the characterization of the unit ball by its automorphism group) fails in almost complex manifolds. There are many strongly pseudoconvex domains, called model domains, in almost complex manifolds which is homogeneous but not biholomorphic to the unit ball. Simultaneously the boundary of the model domain also has the same Heisenberg group structure but is not CR equivalent to the standard Heisenberg model. In this talk, we discuss the characterization of these models in terms of pseudo-conformal and pseudo-Hermitian autormophism groups.
This presentation is based on the joint papers with Jae-Cheon Joo.

References

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Shin-ichi Matsumura *Kagoshima University, Kagoshima, Japan*
Injectivity theorems with multiplier ideal sheaves and their applications

Abstract: In this talk, I give an injectivity theorem with multiplier ideal sheaves of singular metrics with transcendental singularities. This result can be seen as a generalization of various injectivity and vanishing theorems. The proof is based on a combination of the theory of harmonic integrals and the L^2-method for the $\bar{\partial}$-equation. To treat transcendental singularities, after regularizing a given singular metric, we study the asymptotic behavior of the harmonic forms with respect to a family of the regularized metrics. Moreover we obtain L^2-estimates of solutions of the $\bar{\partial}$-equation by using the Cech complex.

As applications of this injectivity theorem, I give some extension theorems of holomorphic sections of pluri-log-canonical bundle from subvarieties to the ambient space. Moreover, by combining techniques of the minimal model program, we obtain some results for semi-ampleness related to the abundance conjecture in birational geometry.

This talk is based on the preprint in arXiv:1308.2033v2 and a joint work with Y. Gongyo in arXiv:1406.6132v1

Takeo Ohsawa *Nagoya University, Nagoya, Japan*

A remark on Hörmander's isomorphism–*To the memory of Lars Hörmander*

Abstract: Let M be a complex manifold of dimension n, let $E \to M$ be a holomorphic vector bundle, let $\phi : M \to [0, \infty)$ be a C^∞ exhaustion function, and let $M_c = \{x \in M; \phi(x) < c\}$. As for the $\bar\partial$-cohomology $H^{p,q}$ and the L^2 $\bar\partial$-cohomology $H^{p,q}_{(2)}$ of M and M_c with values in E, a quantitative refinement of Andreotti-Grauert's finiteness theorem (cf.[A-G]) was established in [H]. It implies in particular the following.

Theorem 0.1. *If $\partial\bar\partial\phi$ has at least $n - q + 1$ positive eigenvalues everywhere on $M \setminus M_c$,*

$$H^{0,q}(M, E) \cong H^{0,q}(M_c, E) \cong H^{0,q}_{(2)}(M_c, E)$$

(with respect to any metrics on M and E) and, for any fiber metric h on E one can find a Hermitian metric ω on M, a convex increasing function $\lambda : \mathbf{R} \to \mathbf{R}$ and $\mu_0 > 0$ such that, for every $\mu \geq \mu_0$

$$H^{0,q}(M, E) \cong H^{0,q}_{(2)}(M, E)$$

holds with respect to (the squared) L^2 norm $\int_M e^{-\mu\lambda(\phi)}|u|^2_{h,\omega}\omega^n$.

A variant of this was given in [Oh] when ϕ is plurisubharmonic and (E, h) is a Hermitian line bundle whose curvature form is positive on $M \setminus M_c$. We shall refine it further to derive an extension theorem which is somewhat of non-effective nature but still implies the following.

Theorem 0.2. *Let X be a compact complex surface containing a smooth complex curve C of genus ≥ 2. X is algebraic if $[C]$ is semipositive.*

References

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Jasmin Raissy *Universit Paul Sabatier, Toulouse, France*

A Julia-Wolff-Caratheodory theorem for infinitesimal generators of one-parameter semigroups

Abstract: In this talk I shall present some recent results (see [1]) on the boundary behavior of infinitesimal generators of one-parameter semigroups of holomorphic self-maps of the unit ball $B^n \subset \mathbf{C}^n$. In particular I shall discuss a Julia-Wolff-Caratheodory theorem which completes the interesting results already obtained on this topic by F. Bracci and D. Shoikhet in [2]. (Joint work with M. Abate).

References

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Feng Rong *Jiao Tong University, Shanghai, China*
New invariants and attracting domains in local holomorphic dynamics

Abstract: From the work of Écalle and Hakim, we learned the importance of characteristic directions in the study of local holomorphic dynamics for maps tangent to the identity. Associated to non-degenerate characteristic directions, Hakim defined the so-called directors and showed that if the real part of the directors are all positive then there exist attracting domains tangent to that direction. We will treat the case when some of the real part of the directors are zero. By introducing a new invariant, called the non-dicritical order, we give sufficient conditions for the existence of attracting domains in this case. For degenerate characteristic directions, we will introduce a new invariant, called the essential order, and give sufficient conditions for the existence of attracting domains. A similar study can be carried out for quasi-parabolic maps which are non-dynamically-separating.

Jean Ruppenthal *University of Wuppertal, Wuppertal, Germany*
L^2-Serre duality on singular complex spaces

Abstract: In this talk, we will discuss a version of topological L^2-Serre duality for singular complex spaces with arbitrary singularities. This duality can be used to deduce various L^2-vanishing theorems on singular spaces. It will be shown that complex spaces with rational singularities behave quite tame with respect to the dbar-equation in the L^2-sense. More precisely: a singular point is rational if and only if the L^2-$\bar{\partial}$-complex is exact in this point. So, we obtain an L^2-$\bar{\partial}$- resolution of the structure sheaf in rational points.

Yuji Sano *Kumamoto University, Kumamoto, Japan*
On the extremal vector fields on smooth toric Fano manifolds

Abstract: On a compact Kahler manifold, Futaki and Mabuchi showed that the complex gradient vector field of the projection of the scalar curvature to the space of the normalized Hamiltonian functions of holomorphic vector fields is independent of the choice of Kahler metrics. Such vector field is called the extremal vector field. In this talk, I will explain about a computation on the extremal vector fields on smooth toric Fano manifolds.

Aeryeong Seo *Korea Institute for Advanced Study, Seoul, Korea*
Construction of proper holomorphic maps

Abstract: Let $D_{r,s}$ be the generalized ball defined by

$$D_{r,s} = \{[z_1, \ldots, z_{r+s}] \in \mathbf{P}^{r+s-1} : |z_1|^2 + \ldots |z_r|^2 > |z_{r+1}|^2 + \ldots + |z_{r+s}|^2\}$$

and $\Omega_{r,s}$ be the bounded symmetric domain of type I defined by

$$\Omega_{r,s} = \{Z \in M(r,s,\mathbf{C}) : I_{r,r} - Z\overline{Z}^t > 0\},$$

where "> 0" denotes the positive definiteness of square matrices, $M(r,s,\mathbf{C})$ the set of $r \times s$ complex matrices and $I_{r,r}$ the $r \times r$ identity matrix.
In this talk, I will introduce the method of constructing proper holomorphic maps between bounded symmetric domains of type I and the proper monomial rational maps between generalized balls. As an application, we characterize the proper holomorphic maps from $\Omega_{r,r}$ to $\Omega_{r+1,r+1}$ and suggest new examples.

Yum-Tong Siu *Harvard University, Cambridge, Massachusetts, U.S.A*
Pluricanonical Hodge Decomposition

Abstract: The m-genus of a compact complex manifold is the complex dimension of the vector space of all holomorphic sections of the m-th tensor power of its canonical line bundle. The deformational invariance of the m-genus for any positive m is known to hold for compact complex algebraic manifolds. When m is 1, such a deformational invariance for all compact Kähler manifolds is a just direct consequence of the Hodge decomposition. The question naturally arises whether the deformational invariance of m-genus for m greater than 1 can also be understood in the context of some form of Hodge decomposition with the vector space of all holomorphic m-canonical sections as a summand. We discuss the results and the developments in the study of this problem by starting with the simplest case of compact Riemann surfaces.

Berit Stensønes *NTNU, Trondheim, Norway*

Ninh Van Thu *POSTECH(GAIA), Pohang, Korea*

On the CR automorphism group of a certain hypersurface of infinite type in $\mathbf{C}^2$

Abstract: We consider $\mathcal{C}^\infty$-smooth real hypersurfaces of infinite type in $\mathbf{C}^2$. The purpose of this talk is to give explicit descriptions for stability groups of the hypersurface $M(a, \alpha, p, q)$ and a radially symmetric hypersurface in $\mathbf{C}^2$.

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August Tsikh *Siberian Federal University, Krasnoyarsk, Russia*
Singular cuspidal type strata of the classical discriminant

Abstract: We consider an algebraic equation with variable complex coefficients. For the reduced discriminant set of this equation we get a parametrization of singular strata responsible for existence of roots with prescribed multiplicity. In fact this parametrization is the restriction to a flag of linear subspaces of the HornKapranov uniformization for the whole reduced discriminant set. We prove that strata mentioned above are birationally isomorphic to some A-discriminant sets, and therefore they are of maximum likelihood degree one. We suppose also to discuss the relation of the topic with the Hilberts Thirteenth problem in the algebraic setting.

Hajime Tsuji *Sophia University, Tokyo, Japan*
Some dynamical systems of measures on a compat Kähler manifolds

Abstract: In this talk I would like to present a dynamical system of measures on a compact Kähler manifold with pseudoeffective canonical class. The dynamical system presumably converges to the Kähler- Einstein like volume form on the manifold.

Masaki Tsukamoto *Kyoto University, Kyoto Japan*
Dynamics of holomorphic curves

Abstract: The study of holomorphic curves in algebraic varieties is an old but still mysterious subject. I will explain a dynamical approach to this problem. Our approach is based on the idea of "mean dimension" introduced by Gromov. This reveals a new structure of holomorphic curves.

Erlend Fornæss Wold *University of Oslo, Oslo, Norway*
Exposing points of Stein Compacta in Stein Spaces

Abstract. In this talk I will discuss recent work with F. Deng and J. E. Fornæss.

Let X be a complex space, let $\Omega \subset X$ be domain with $\overline{\Omega}$ a Stein compactum, and let $p \in b\Omega$ be a strongly ψ-convex boundary point. Furthermore, let $M \subset X \setminus \overline{\Omega}$ be a real hypersurface, let $q \in M$ be a smooth point, and assume that there exists a curve $\gamma \subset \mathrm{Reg}(X)$ connecting p and q. Then there exists an injective holomorphic map $\phi : \overline{\Omega} \to X$ such that $\phi^{-1}(\{q\}) = \{p\}$, and the map ϕ may be chosen to be arbitrarily close to the identity away from $\{p\}$. There are also parametrised versions where p varies continuously on (parts of) the boundary of Ω.

In $\mathbf{C}^n$ a similar result was proved by Diederich-Fornæss-Wold, and this was used by F. Deng et al, to prove that if $\Omega \subset \mathbf{C}^n$ is a bounded strictly ψ-convex domain, then the squeezing function $S_\Omega(z)$ tends to 1 as $z \to b\Omega$.

Elizabeth Wulcan *Chalmers University of Technology, Göteborg, Sweden*
Residue currents and fundamental cycles

Abstract: I will discuss a joint work (in progress) with Richard Lärkäng. Given holomorphic functions $f_1, \dots, f_m$ whose common zero set $\{f = 0\}$ has codimension m, there is a factorization of the current of integration $[f = 0]$ along $\{f = 0\}$, counted with multiplicities, as

$$[f = 0] = \frac{1}{(2\pi i)^m} \bar{\partial}\Big[\frac{1}{f_1}\Big] \wedge \cdots \wedge \bar{\partial}\Big[\frac{1}{f_m}\Big] \wedge df_m \wedge \cdots \wedge df_1.$$

Here $\bar{\partial}[1/f_1] \wedge \cdots \wedge \bar{\partial}[1/f_m]$ is the Coleff-Herrera residue current of $f_1, \dots, f_m$.
I will present a generalization of this factorization to a more general setting, which is closely related to a result by Monique Lejeune-Jalabert from the 80's.

Atushi Yamamori *POSTECH(GAIA), Pohang, Korea*

On Bergman's representative domains and origin-preserving automorphisms of quasi-circular domains

Abstract: A classical theorem due to Cartan asserts that every origin-preserving automorphism of bounded circular domains is linear. It is also known by Kaup [1] that every origin-preserving automorphism of bounded quasi-circular domains is a polynomial mapping. In this talk, by employing the theory of Bergman's representative domain, we prove that Cartan's theorem remains true for quasi- circular domains under certain circumstances. This talk is based on the paper [2].

References

[1] W. Kaup, Über das Randverhalten von holomorphen Automorphismen beschränkter Gebiete, Manuscr. Math., 3 (1970), 257–270.
[2] A. Yamamori, Automorphisms of normal quasi-circular domains, Bull. Sci. Math., 138 (2014), 406–415.

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On intrinsic derivatives of holomorphic mappings and curvature estimates of bounded domains

Abstract: We will talk about the so called intrinsic derivatives of holomorphic mappings introduced by Qi-Keng Lu in 1979. Using this kind of derivatives, we get estimates of the holomorphic sectional curvature and the Ricci curvature with respect to the Bergman metric on a bounded domain D. When D has the uniform squeezing property, in particular, D is strongly pseudoconvex, we can recover some well known facts given by P. Klembeck, K.-T. Kim and J. Yu, et al.

References

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3. F. Deng, Q. Guan and L. Zhang, Properties of squeezing functions and geometry of bounded domains, arXiv:1202.4896v1, to appear in Trans. of AMS.
4. F. Deng, Q. Guan and L. Zhang, Some properties of squeezing functions on bounded domains, Pacific J. Math., 257 (2), pp 319-341, 2012.