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Πρόγραμμα Ομιλιών

Δευτέρα, 4 Ιουλίου 2022

15:00-15:30 – **Μυρτώ Μανωλάκη**, *A strong form of Plessner's theorem*

15:30-16:00 – **Ιάσων Εφραυμίδης**, *Harmonic mappings and the Schwarzian derivative*

16:00-16:30 – *Καφές*

16:30-17:00 – **Κωνσταντίνος Ζάρβαλης**, *Προς τα πίσω τροχιές σε ημιομάδες ολόμορφων συναρτίσεων*

17:00-17:30 – **Μαρία Κούρου**, *Spherically Convex Functions and Schwarz Lemma*

17:30-18:00 – **Κωνσταντίνος Παντελής**, *Closed range integral operators on Hardy spaces*

18:00-18:30 – **Βασίλειος Δασκαλογιάννης**, *Semigroups of analytic functions and an extension to Sarason's characterization of vanishing mean oscillation*

18:30-19:00 – **Νικόλαος Χαλμούκης**, *Invariant capacities in the unit ball of \mathbb{C}^n and exceptional sets for Hardy Sobolev spaces*

Τρίτη, 5 Ιουλίου 2022

09:30-10:10 – **Μιχάλης Μούργουγλου**, *The Dirichlet problem with Sobolev boundary data for the Laplace equation in rough domains*

10:10-10:50 – **Ιωάννης Παρίσης**, *Directional square functions*

16:00-16:30 – *Καφές*

16:30-17:00 – **Αλέξανδρος Εσκενάζης**, *Dimension reduction for incompressible subsets of ℓ_p*

17:00-17:30 – **Χριστίνα Γιαννίτση**, *Improving and maximal inequalities for primes in progressions*

17:30-18:00 – **Έφη Παπαγεωργίου**, *The size of a common tile of several lattices*

18:00-18:30 – **Μαρία Συσκάκη**, *The distribution of reduced quadratic irrationals arising from continued fraction expansions*

18:30-19:00 – **Οδυσσέας Μπάκας**, *Codimension one multiplier operators*

Τετάρτη, 6 Ιουλίου 2022

09:30-10:10 – Ευγένιος Κακαριάδης, *Morita equivalence for operator systems*

10:10-10:50 – Πέτρος Βαλέττας, *Lower deviation estimates for norms*

16:00-16:30 – Καφές

16:30-17:00 – Παύλος Μοτάκης, *Separable spaces of continuous functions as Calkin algebras*

17:00-17:30 – Κωνσταντίνος Τσίνας, *Multiple ergodic averages along sequences of polynomial growth*

17:30-18:00 – Γιώργος Χασάπης, *A negative moments approach to the study of sections of convex bodies*

18:00-18:30 – Χριστόφορος Παναγιώτης, *The percolation density $\theta(p)$ is analytic*

18:30-19:00 – Δημήτριος Παπαθανασίου, *Dynamics of weighted shifts on directed trees*

Πέμπτη, 7 Ιουλίου 2022

09:30-10:10 – Βασιλική Ευδωρίδου, *The Denjoy-Wolff set and wandering domains*

10:10-10:50 – Βύρων Βέλλης, *Analysis on thin Cantor sets*

16:00-16:30 – Καφές

16:30-17:00 – Νικόλαος Αθανασίου, *A scale-critical trapped surface formation criterion for the Einstein-Maxwell system*

17:00-17:30 – Αθανάσιος Χατζηκαλέας, *Περιοδικές λύσεις και νήσοι ευστάθειας στον Anti-de Sitter χωροχρόνο*

17:30-18:00 – Αλεξάνδρα Σταυριανίδη, *The anomalous spreading property for a system of Fisher-KPP type equations*

18:00-18:30 – Μαρία Ντεκουμέ, *On the well-posedness of the derivative nonlinear Schrödinger equation*

18:30-19:00 – Κωνσταντίνος Ζέμας, *Geometric rigidity in variable domains and applications to SDRI models*

Περιλήψεις

Νικόλαος Αθανασίου (American College of Thessaloniki)

A scale-critical trapped surface formation criterion for the Einstein-Maxwell system

Few notions within the realm of mathematical physics succeed in capturing the imagination and inspiring awe as well as that of a black hole. First encountered in the Schwarzschild solution, discovered a few months after the presentation of the Field Equations of General Relativity at the Prussian Academy of Sciences, the black hole as a mathematical phenomenon accompanies and prominently features within the history of General Relativity since its inception. In this talk we will lay out a brief history of the question of dynamical black hole formation in General Relativity and discuss a recent result, in collaboration with Xinliang An, on a scale-critical trapped surface formation criterion for the Einstein-Maxwell system.

Πέτρος Βαλέττας (University of Missouri, Columbia)

Lower deviation estimates for norms

Small ball estimates occupy a central role in the probabilistic study of high-dimensional structures. Examples of applications are the random matrix theory for quantifying the non-singularity of large random matrices and the asymptotic theory of normed spaces for locating almost Euclidean subspaces, to name a few. This talk will discuss a novel approach for establishing optimal lower deviation estimates for norms. The techniques draw on superconcentration theory, semigroup tools, and geometric methods. In this study, the ℓ_∞ plays the role of the (approximate) extremal structure.

Based on joint work with G. Paouris (Texas A&M) and K. Tikhomirov (Georgia Tech).

Βύρων Βέλλης (University of Tennessee, Knoxville)

Analysis on thin Cantor sets

A set X is called uniformly disconnected (thin) if for any x in X and any $r > 0$ there exists an isolated island E in X that contains x , has diameter at most r and distance from $X \setminus E$ at least a fixed multiple of r . First, we give a geometrical uniformization result for all thin Cantor sets that generalizes a result of MacManus from 2 to all dimensions. Then we give three applications of this theorem; the first in complex dynamics (Julia sets of UQR maps), the second in hyperbolic geometry (pants decompositions of Riemann surfaces of infinite type), and the third in geometric function theory (Decomposition Problem for

planar bi-Lipschitz mappings). The talk is based on works partially joint with Alastair Fletcher and Dan Stoertz.

Χριστίνα Γιαννίτση (Georgia Institute of Technology)

Improving and maximal inequalities for primes in progressions

Assume that $y < N$ are integers, and that $(b, y) = 1$. Define an average along the primes in a progression of spacing y , given by integer b .

$$A_{N,y,b} := \frac{\phi(y)}{N} \sum_{\substack{n < N \\ n \equiv b \pmod{y}}} \Lambda(n) f(x - n),$$

where Λ is the von Mangoldt function and ϕ is the Euler totient function. We establish improving and maximal inequalities for these averages, with bounds that are uniform in the choice of progression. For instance, for $1 < r < \infty$ there is an integer $N_{y,r}$ so that

$$\left\| \sup_{N > N_{y,r}} |A_{N,y,b} f| \right\|_r \ll \|f\|_r.$$

The implied constant is only a function of r .

This is joint work with Michael Lacey, Hamed Mousavi and Yaghoub Rahimi.

Βασίλειος Δασκαλογιάννης (Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης & American College of Thessaloniki)

Semigroups of analytic functions and an extension to Sarason's characterization of vanishing mean oscillation

It is a classical theorem of Sarason that an analytic function of bounded mean oscillation (*BMOA*), is of vanishing mean oscillation (*VMOA*) if and only if its rotations converge in norm to the original function as the angle of the rotation tends to zero, i.e. for a function $f \in BMOA$,

$$\lim_{t \rightarrow 0^+} \|f \circ e^{it} z - f\|_{BMOA} = 0$$

if and only if $f \in VMOA$.

In a series of two papers Blasco, Contreras, Díaz-Madriral, Martínez, Papadimitrakis and Siskakis have raised the problem of characterizing all semigroups of holomorphic functions (φ_t) that can replace the semigroup of rotations in Sarason's Theorem. We give a complete answer to this question, in terms of a "logarithmic vanishing oscillation" condition on the infinitesimal generator of the semigroup (φ_t) . In addition we confirm the conjecture of Blasco et al. that all such semigroups are elliptic. We also investigate the analogous question for the Bloch and the little Bloch space and, surprisingly enough,

we find that the semigroups for which the Bloch version of Sarason's Theorem holds are exactly the same as in the *BMOA* case. This is a joint work with N. Chalmoukis.

Αλέξανδρος Εσκενάζης (Sorbonne Université & University of Cambridge)

Dimension reduction for incompressible subsets of ℓ_p

We present a Johnson-Lindenstrauss-type dimension reduction algorithm with additive error for incompressible subsets of ℓ_p . The proof relies on a derandomized version of Maurey's empirical method and a combinatorial idea of Ball.

Βασιλική Ευδωρίδου (University of Liverpool)

The Denjoy-Wolff set and wandering domains

In the iteration of inner functions, the dynamical behaviour of points in the unit disc is determined by the Denjoy-Wolff theorem. In the case where the Denjoy-Wolff point lies on the unit circle there is a remarkable dichotomy on the behaviour of boundary points. Motivated by these classical results we study the internal and boundary behaviour of simply connected wandering domains of entire functions. Wandering domains, i.e. Fatou components that are not eventually periodic, have gained much attention in Complex Dynamics in recent years mostly due to the fact that they are the least understood of all Fatou components. We discuss analogues of the Denjoy-Wolff behaviour in simply connected wandering domains and define the Denjoy-Wolff set. We also study analogues of the aforementioned dichotomy and relate internal to boundary behaviour.

This is joint work with A.M. Benini, N. Fagella, P. Rippon and G. Stallard.

Ιάσων Εφραιμίδης (Universidad Autónoma de Madrid)

Harmonic mappings and the Schwarzian derivative

According to a classical theorem of Nehari an analytic function in the unit disk is univalent if its Schwarzian derivative

$$Sf = \left(\frac{f''}{f'}\right)' - \frac{1}{2}\left(\frac{f''}{f'}\right)^2$$

is small, in certain sense. This theorem has been generalized to functions defined on quasidisks by Ahlfors, on finitely connected domains (all of whose boundary components are either points or quasicircles) by Osgood and, finally, on uniform domains by Martio-Sarvas. Moreover, criteria for the existence of a quasiconformal extension have been

proved on these types of domains, respectively, by Ahlfors-Weill, Ahlfors, Osgood and Astala-Heinonen.

In this talk we will generalize these theorems to harmonic mappings using the definition of the Schwarzian derivative given by Hernández and Martín. Moreover, we will give two explicit quasiconformal extensions for harmonic mappings on the unit disk that generalize the classical extension of Ahlfors and Weill for analytic functions.

Κωνσταντίνος Ζάρβαλης (Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης)

Προς τα πίσω τροχιές σε ημιομάδες ολόμορφων συναρτήσεων

Μία συνεχής μονοπαραμετρική ημιομάδα ολόμορφων συναρτήσεων στον μοναδιαίο δίσκο, ή συντομότερα μία ημιομάδα στο \mathbb{D} , είναι μία οικογένεια ολόμορφων συναρτήσεων από το \mathbb{D} στο \mathbb{D} που λειτουργεί ως «συνεχής επέκταση» της ακολουθίας επαναλήψεων μίας συνάρτησης. Αν (ϕ_t) , $t \geq 0$, είναι μία ημιομάδα στο \mathbb{D} και αν $z \in \mathbb{D}$, παίρνοντας την ένωση όλων των εικόνων $\phi_t(z)$, για $t \geq 0$, κατασκευάζουμε την τροχιά του z μέσω της ημιομάδας. Υπό ορισμένες προϋποθέσεις μπορούμε να θεωρήσουμε και την προς τα πίσω τροχιά του z , χρησιμοποιώντας τις εικόνες του z , αλλά αυτή τη φορά για «αρνητικούς χρόνους». Στην ομιλία μας, θα ορίσουμε αυστηρά τις προς τα πίσω τροχιές και θα μελετήσουμε τις βασικές τους ιδιότητες. Στη συνέχεια θα μιλήσουμε για ορισμένα νέα αποτελέσματα που δείχνουν ότι μία υποοικογένεια των προς τα πίσω τροχιών έχει συμπεριφορά συγκρίσιμη με αυτήν των υπερβολικών γεωδαισιακών, γεγονός που αποδεικνύεται ότι είναι ισοδύναμο με την ικανοποίηση μίας εύχρηστης Ευκλείδειας συνθήκης.

Κωνσταντίνος Ζέμας (University of Münster)

Geometric rigidity in variable domains and applications to SDRI models

Quantitative rigidity results, besides from their inherent geometric interest, have played a prominent role in the mathematical study of models related to elasticity-plasticity. For instance, the celebrated rigidity estimate of Friesecke, James, and Müller has been widely used in problems related to linearization, discrete-to-continuum or dimension-reduction issues for functionals within the framework of nonlinear elasticity.

In this talk I will present a generalization of this result to the setting of variable domains, where the geometry of the domain comes into play in terms of a suitable surface energy of its boundary. The estimate can be used to establish compactness in $GSBD^2$ for sequences of rescaled displacements, related to deformations with uniformly bounded elastic energy.

As an application, we rigorously derive linearized models for nonlinearly elastic materials with free surfaces by means of Γ -convergence.

This is joint work with Manuel Friedrich and Leonard Kreutz.

Ευγένιος Κακαριάδης (University of Newcastle)

Morita equivalence for operator systems

In ring theory, Morita equivalence preserves many properties of the objects, and generalizes the isomorphism equivalence between commutative rings. A strong Morita equivalence for selfadjoint operator algebras was introduced by Rieffel in the 60s, and works as a correspondence between their representations. In the past 30 years there has been an interest to develop a similar theory for nonselfadjoint operator algebras and operator spaces with much success and in this talk we will review the main points of these works. Then we will present a Morita theory for operator systems thus answering a recent question of Connes and van Suijlekom. We will give equivalent characterizations of Morita equivalence via Morita contexts, bihomomorphisms and stable isomorphism, while we will highlight properties that are preserved in this context. Finally we will provide applications to rigid systems, function systems and non-commutative graphs. This is joint work with George Eleftherakis and Ivan Todorov.

Μαρία Κούρου (Julius-Maximilians University of Wuerzburg)

Spherically Convex Functions and Schwarz Lemma

A function $f : \mathbb{D} \rightarrow \widehat{\mathbb{C}}$ is called spherically convex if the spherical geodesic that joins two points in $f(\mathbb{D})$ also lies in $f(\mathbb{D})$. We will discuss several sharp distortion and monotonicity theorems for spherically convex functions involving geometric quantities such as spherical length, spherical area and total spherical curvature. These results can be viewed as geometric variants of the classical Schwarz lemma for spherically convex functions. This is a joint work with Prof. Oliver Roth.

Μυρτώ Μανωλάκη (University College Dublin)

A strong form of Plessner's theorem

Let f be a holomorphic function on the unit disc. According to Plessner's theorem, for almost every point ζ on the unit circle, either (i) f has a finite nontangential limit at ζ , or (ii) the image $f(S)$ of any Stolz angle S at ζ is dense in the complex plane. Using tools from Potential Theory, we show that condition (ii) can be replaced by a much stronger condition. Our new theorem and its harmonic analogue on halfspaces improve classical results of Spencer, Stein and Carleson. (Joint work with Stephen Gardiner)

Παύλος Μοτάκης (York University)

Separable spaces of continuous functions as Calkin algebras

For a Banach space X denote $\mathcal{L}(X) = \{T : X \rightarrow X \text{ linear and bounded}\}$ and $\mathcal{K}(X) = \{T \in \mathcal{L}(X) : T \text{ compact}\}$. The Calkin algebra of X is the Banach algebra $\text{Cal}(X) = \mathcal{L}(X)/\mathcal{K}(X)$. A question that has gathered attention in recent years is what unital Banach algebras admit representations as Calkin algebras. We discuss developments in this topic as well as a recent contribution, namely that for every compact metric space K there exists a Banach space X so that $\text{Cal}(X)$ coincides isometrically with $C(K)$ as a Banach algebra.

Μιχάλης Μούργουλου (University of the Basque Country)

The Dirichlet problem with Sobolev boundary data for the Laplace equation in rough domains

In this talk I will present some recent advances on Boundary Value Problems for the Laplace operator with rough boundary data in a bounded corkscrew domain in \mathbb{R}^{n+1} whose boundary is uniformly n -rectifiable. In particular, I will discuss the equivalence between solvability of the Dirichlet problem for the Laplacian with boundary data in $L^{p'}$ and solvability of the regularity problem for the Laplacian with boundary data in an appropriate Sobolev space $W^{1,p}$, where $p \in (1, 2 + \varepsilon)$ and $1/p + 1/p' = 1$. As chord-arc domains satisfy the aforementioned geometric assumptions, our result answers a question posed by Carlos Kenig in 1991. This is joint work with Xavier Tolsa.

Οδυσσέας Μπάκας (Basque Center for Applied Mathematics)

Codimension one multiplier operators

For a vector field $v : \mathbb{R}^2 \rightarrow \mathbb{R}^2$, consider the truncated directional maximal operator along v

$$M_{v,\varepsilon}(f)(x) := \sup_{0 < r \leq \varepsilon} \frac{1}{2r} \int_{|t| \leq r} |f(x - tv(x))| dt.$$

A conjecture attributed to Zygmund states that if v is Lipschitz then, for suitable $\varepsilon > 0$, $M_{v,\varepsilon}$ is of weak-type $(2, 2)$. Stein's conjecture is a singular integral variant of that problem stating that if v is Lipschitz then the truncated directional Hilbert transform along v is of weak-type $(2, 2)$.

In 2006, Lacey and Li proved that the directional Hilbert transform along general measurable vector fields satisfies a weak-type $(2, 2)$ bound when acting on functions that are frequency supported in an annulus in \mathbb{R}^2 , a result that implies Carleson's celebrated theorem on the convergence of Fourier series.

In this talk, a new formulation of the aforementioned result of Lacey and Li is introduced. More specifically, we present weak-type $(2, 2)$ bounds in the single annulus case for singular integral operators along variable $(n - 1)$ -dimensional subspaces of \mathbb{R}^n given by the orthogonal complement of a measurable vector field. Applications of our results, including connections with appropriate Carleson-type theorems in higher dimensions, will also be discussed.

This is joint work with Francesco Di Plinio, Ioannis Parisis, and Luz Roncal.

Μαρία Ντεκουμέ (Rice University)

On the well-posedness of the derivative nonlinear Schrödinger equation

We consider the derivative nonlinear Schrödinger equation (DNLS) on the line. This model is known to be completely integrable and L^2 -critical with respect to scaling. However, until recently not much was known regarding the well-posedness of the equation below $H^{\frac{1}{2}}$. In this talk we prove that the problem is well-posed in the critical space L^2 , highlighting several recent results that led to this resolution. This is joint work with Benjamin Harrop-Griffiths, Rowan Killip, and Monica Visan.

Χριστόφορος Παναγιώτης (University of Geneva)

The percolation density $\theta(p)$ is analytic

We prove that for Bernoulli bond percolation on \mathbb{Z}^d , $d \geq 2$, the percolation density $\theta(p)$ (defined as the probability of the origin lying in an infinite cluster) is an analytic function of the parameter in the whole supercritical interval $(p_c, 1]$. This answers a question of Kesten from 1981.

The proof involves a little bit of elementary complex analysis, a few well-known results from percolation theory (sharpness of phase transition), but above all combinatorial ideas. We used a new notion of contours, bounds on the number of partitions of an integer, and the inclusion-exclusion principle, to obtain a refinement of a classical argument of Peierls that settled the 2-dimensional case in 2018. More recently, we coupled these techniques with a renormalisation argument to handle all dimensions. Joint work with Agelos Georgakopoulos.

Κωνσταντίνος Παντερός (Πανεπιστήμιο Κρήτης)

Closed range integral operators on Hardy spaces

Let \mathbb{D} be the open unit disk in the complex plane, \mathbb{T} be the unit circle and m the normalized length Lebesgue measure in \mathbb{T} . For $0 < p < \infty$ the Hardy space H^p is defined

as the set of all analytic functions f in \mathbb{D} for which

$$\sup_{0 \leq r < 1} \int_{\mathbb{T}} |f(r\zeta)|^p dm(\zeta) < +\infty.$$

If $g \in H^\infty$, the integral operator S_g on the Hardy space H^p , is defined as $S_g f(z) = \int_0^z f'(w)g(w)dw$. We derive a necessary and sufficient condition for the operator S_g to have closed range on H^p ($1 \leq p < \infty$). This condition depends only on the function g .

Έφθ Παπαγεωργίου (Πανεπιστήμιο Κρήτης)

The size of a common tile of several lattices

The original Steinhaus Tiling Problem asks for a subset of the plane that tiles with all rotations of the integer lattice, and is still open when one demands measurability of the tile. Variations of this problem include to ask for a set that tiles with finitely many rotations, or for a function (not necessarily an indicator function) that can tile with many (or all) rotations of the integer lattice.

Motivated by the above, we study the problem of finding a function with “small support” that simultaneously tiles with finitely many lattices in Euclidean spaces. This will be discussed under various assumptions and several notions of size. The setting of finite abelian groups is also discussed.

Joint work with M. Kolountzakis (Univ. of Crete).

Δημήτριος Παπαθανασίου (Université de Mons)

Dynamics of weighted shifts on directed trees

Weighted backward shifts (unilateral or bilateral) on sequence spaces have been extensively studied and their dynamical properties are well known. We will extend this class of operators by substituting the set of natural numbers or integers by a directed tree and letting the underlying space to be a sequence space on that tree. Motivated by the work of Jablonski, Jung and Stochel, we will define weighted shifts on such spaces and we will characterize when they are hypercyclic, weakly mixing, mixing or chaotic. As expected, those characterizations depend on the family of weights of the shift, and the geometry of the tree.

Ιωάννης Παρίσης (University of the Basque Country and Ikerbasque)

Directional square functions

A well known result of Rubio de Francia states that the square function of frequency projections onto disjoint intervals of the real line is bounded on $L^p(\mathbb{R})$ for $2 < p < \infty$. Higher dimensional versions of this result have different possible realizations, depending on the choice of frequency projections. If the projection sets have a directional element then these operators will have Keakeya counterexamples. This is the case for frequency projections onto cones or rectangles in \mathbb{R}^2 pointing at a finite set of directions. We prove directional Rubio de Francia estimates in the critical range of L^p -spaces with sharp dependence on the number of directions. The proof uses a directional Carleson embedding theorem coupled with time-frequency analysis techniques. Underlying these results is a theorem for Keakeya-type maximal averages in codimension 1.

Αλεξάνδρα Σταυριανίδη (Stanford University)

The anomalous spreading property for a system of Fisher-KPP type equations

In this talk, I will establish the beautiful connection between Branching Brownian Motion and the Fisher-KPP equation, focusing on how this connection relates to the convergence in shape of the solution of Fisher-KPP to a travelling wave. Multitype Branching Brownian Motion can exhibit anomalous spreading behavior, as was shown by Mallein and Belloum, and as was first observed by Biggins for branching random walks. Multitype Branching Brownian Motion leads us to the study of coupled systems of Fisher-KPP type equations and the anomalous spreading property translates to interesting long-time behavior for the solutions of the system, which can be interpreted from a PDE point of view.

Μαρία Συσκάκη (University of Illinois at Urbana-Champaign)

The distribution of reduced quadratic irrationals arising from continued fraction expansions

It is known that the reduced quadratic irrationals arising from regular continued fraction expansions are uniformly distributed when ordered by their length with respect to the Gauss measure. In this talk, I will describe a number theoretical approach developed by Kallies, Ozluk, Peter and Snyder, and then by Boca, that gives the error in the asymptotic behavior of this distribution. Moreover, I will present the respective result for the distribution of reduced quadratic irrationals that arise from even and odd continued fractions (joint work with F. Boca).

Κωνσταντίνος Τσίνας (Πανεπιστήμιο Κρήτης)

Multiple ergodic averages along sequences of polynomial growth

We study mean convergence of multiple ergodic averages along sequences of polynomial growth, where the iterates are sequences arising from functions that have at most polynomial growth and satisfy some nice smoothness properties. We will discuss the problem and the ideas of the proof, which is based on the Host-Kra theory of characteristic factors. As a combinatorial application, we will also see some generalizations of Szemerédi's theorem along sequences more general than arithmetic progressions.

Νικόλαος Χαλμούκης (Saarland University)

Invariant capacities in the unit ball of \mathbb{C}^n and exceptional sets for Hardy-Sobolev spaces

The class of holomorphic Hardy-Sobolev spaces in the unit ball of \mathbb{C}^n is a family of spaces including the Hardy, Drury-Arveson, Bergman and Dirichlet space. In this talk we will focus on questions regarding exceptional sets both from function theoretic and a functional analytic perspective. These two approaches have led in the past in two different notions of exceptional sets. From the point of view of function theory, exceptional sets are sets where a function in the corresponding Hardy-Sobolev space fails to have admissible limits and can be characterized as a null sets for some appropriately defined capacity. While from the functional analysis perspective null sets, called totally null sets, play the role of Lebesgue measure zero sets in the Sz.-Nagy-Foias $H^\infty(\mathbb{D})$ functional calculus. Our main theorem proves the equivalence of the two notions. We will discuss also some interesting corollaries.

Γιώργος Χασάπης (Carnegie Mellon University)

A negative moments approach to the study of sections of convex bodies

We derive a probabilistic formula for the volume of sections of an arbitrary origin symmetric convex body in \mathbb{R}^n . This lets us recover several well-known results on the extremal volume sections of ℓ_p^n balls as a consequence of sharp Khinchin-type inequalities for negative moments of sums of independent random variables. Moving on, we show how our approach can lead to further sharpening of such geometric inequalities proving stability-type estimates for the extremal-volume hyperplane sections of ℓ_p^n balls in all cases in which the extremisers are known. Joint work with P. Nayar and T. Tkocz.

Αθανάσιος Χατζηκαλέας (University of Münster)

Περιοδικές λύσεις και νήσοι ευστάθειας στον Anti-de Sitter χωροχρόνο

Στην ομιλία αυτή, θα επικεντρωθούμε στην εικασία των Δαφέρμος-Holzegel, ως προς την οποία, η Anti-de Sitter λύση των εξισώσεων Einstein είναι ασταθής για αυθαίρετα αρχικά δεδομένα, καθώς και την, επίσης εικαζόμενη, ύπαρξη ευσταθών περιοδικών λύσεων, κοντά στην Anti-de Sitter μετρική, από τους Rostworowski-Maliborski. Συγκεκριμένα, σε συνεργασία με τον Jacques Smulevici (Sorbonne Université), αναπτύσσουμε μια μέθοδο που αποδεικνύει την ύπαρξη περιοδικών ως προς τον χρόνο λύσεων σε διάφορα κυματοειδή μοντέλα, δίνοντας έτσι αυστηρή απόδειξη για την εικασία των Rostworowski-Maliborski, σε ένα πιο απλό πλαίσιο.