

Σεμινάριο Μαθηματικής Ανάλυσης

ΣΥΝΑΝΤΗΣΗ ΜΑΘΗΜΑΤΙΚΗΣ ΑΝΑΛΥΣΗΣ

Θεσσαλονίκη, 21-22 Δεκεμβρίου 2017, αίθουσα M2

Πρόγραμμα Ομιλιών

Πέμπτη 21 Δεκεμβρίου 2017

10.15: Έναρξη,

10.20-10.50: Ανδρέας Σάββας - Χαλιλάι, Πανεπιστήμιο Ιωαννίνων
Ελαχιστικά υποπολυπύγματα με βαθμίδα 2 στον υπερβολικό χώρο

Περίληψη: I will discuss several aspects of the geometric structure of complete minimal Riemannian submanifolds of rank two in the hyperbolic space H^n (any codimension). If the dimension of the submanifold is 3 and the scalar curvature is bounded, we prove that the submanifold is either totally geodesic or a generalized cylinder over a complete minimal surface lying in an equidistant submanifold of H^n . The proof makes use of the theory of real analytic sets, of the Omori-Yau maximum principle and of the gradient estimate of Yau for harmonic functions on complete Riemannian manifolds. This work is joint with M. Dajczer (IMPA), Th. Kasioumis (Ioannina) and Th. Vlachos (Ioannina).

11.00-11.30: Δημήτριος Παπαθανασίου, University of Mons
Υπερκυκλικές Άλγεβρες

Περίληψη: Aron et al have shown that no translation operator acting on $H(C)$ supports a hypercyclic algebra. Later, Shkarin, and, with a different approach, Bayart and Matheron, proved that the differentiation operator on the same space supports one, leading to the following question raised by Aron: “For which functions F of exponential type, does $F(D)$ support a hypercyclic algebra?” We provide a partial answer to the above mentioned question by showing the existence of hypercyclic algebras for several convolution operators induced either by polynomials or by transcendental functions. Furthermore, we answer the following question posed also by Aron: “Does the differentiation operator on the space of entire functions support a dense, infinitely generated hypercyclic algebra?” Finally, we discuss the same phenomena for the translation operator on $C^\infty(R, C)$.

11.40-12.10: Δημήτριος Ασκητής, University of Copenhagen
Λογαριθμική κοιλότητα τής αντιστρόφου μη πλήρους συνάρτησης Βήτα ως προς την πρώτη παράμετρο

Περίληψη: The regularised incomplete beta function is defined by

$$I_{a,b}(x) := \frac{\Gamma(a)\Gamma(b)}{\Gamma(a+b)} \int_0^x t^{a-1}(1-t)^{b-1} dt.$$

We are interested in studying its inverse as a function of its parameter a , i.e. the function q defined implicitly by $I_{a,b}(q(a)) = p$. This includes the median and the p -quantiles of the beta distribution as special cases. We show that the logarithm of q , for fixed $b > 0$ and $p \in (0, 1)$, is concave.

17.15-18.00: Λουκάς Γραφάκος, University of Missouri

Αθροισσιμότητα των σειρών Fourier: παλαιά προβλήματα, καινούριες ιδέες

Περίληψη: Θα γίνει παρουσίαση σημαντικών αποτελεσμάτων σχετικά με τη σύγκλιση σειρών Fourier. Θα συζητηθούν καινούριες μέθοδοι χωροσυχνότητας και πρόσφατα αποτελέσματα που αφορούν συγκλίσεις γραμμικών και διγραμμικών σειρών Fourier.

18.20-18.50: Δημήτριος Νταλαμπέκος, UCLA

Αφαιρεσιμότητα συνόλων για συναρτήσεις Sobolev

Περίληψη: Removability of sets for Sobolev functions has applications in Complex Dynamics, in Conformal Welding, and in other problems that require “gluing” of Sobolev functions to obtain a new Sobolev function. We seek geometric conditions on sets which guarantee their removability. In particular, we prove that the Sierpinski gasket is removable for continuous functions of the class $W^{1,p}$ for $p > 2$. The method applies to more general fractals that resemble the Sierpinski gasket, such as Apollonian gaskets and generalized Sierpinski gasket Julia sets.

19.00-19.30: Παναγιώτης Μπατακίδης, Πανεπιστήμιο Κύπρου

Γεωμετρία Poisson σε near-symplectic πολλαπλότητες

Περίληψη: We first introduce some background of near-symplectic (and some on Poisson) geometry along with the most important developments in the last 20 years. We then describe the construction of different Poisson structures from these data and relate them with other results from 4-manifold theory. The last part of the talk will contain a discussion on classification results and computations of Poisson cohomology. Based on joint work with Ramon Vera.

19.40-20.10: Μιχάλης Μούργουλου, Universidad del Pais Vasco & Ikerbasque

Ένας χαρακτηρισμός της ομοιόμορφης ευθυγραμμισιμότητας μέσω μερικών διαφορικών εξισώσεων

Περίληψη: In this talk we will discuss some recent results that provide the first characterization of uniform rectifiability in terms of certain PDE estimates that play a fundamental role in the solvability of the Dirichlet problem with L^p data for different types of PDEs, and different geometric restrictions, such as chord-arc domains. For the Laplace operator, the goal is the L^2 -boundedness of the Riesz transform combining elements of corona techniques, of delicate properties of harmonic measure in subtle geometric settings, and of in-depth theory of Calderon-Zygmund operators (joint work with Garnett and Tolsa, accepted in Duke Math. J.). For more general elliptic operators, we combine a corona decomposition for elliptic measure with techniques from free boundary problems proving an elliptic version of the Alt-Caffarelli and Friedman monotonicity formula (joint work with Azzam, Garnett, and Tolsa).

Παρασκευή 22 Δεκεμβρίου 2017

11.15-11.45: Αχιλλέας Πορφυριάδης, UC Santa Barbara
Βαρυτικά κύματα μέσω σύμμορφων απεικονίσεων

Περίληψη: Astronomical observation suggests the existence of rapidly rotating black holes in the sky. Properties of diffeomorphisms imply that gravitational dynamics of the near-horizon region of such near-extreme black holes are governed by an infinite-dimensional conformal symmetry. This symmetry may be exploited to analytically compute a variety of potentially observable processes. In this talk I will show how we compute the gravitational radiation emitted by a small compact object that orbits in the near-horizon region and plunges into the horizon of such a near-extreme black hole.

11.55-12.25: Βύρων Βέλλης, University of Connecticut
Μη-ακέραια ευθυγραμμισιμότητα

Περίληψη: Let A be a bounded set in the Euclidean n -space. Given a positive integer $m < n$, when is it possible to construct a nice map (Hölder, Lipschitz, quasisymmetric, bi-Lipschitz etc.) from the m -cube into the n -space so that A is contained in its image? In this talk we present sharp sufficient conditions in terms of the geometry of A and its metric (Assouad) dimension which ensure that A admits such a parametrization. We, then, apply these parametrizations to investigate the influence that s -dimensional lower and upper Hausdorff s -densities have on the geometry of a Radon measure in the n -space when s is a real number between 0 and n . This topic in geometric measure theory has been extensively studied when s is an integer and, in this talk, we focus on the non-integer case.

12.35-13.05: Μυρτώ Μανωλάκη, University of South Florida
Ψάχνοντας για καθολικές σειρές Taylor χρησιμοποιώντας Θεωρία Δυναμικού

Περίληψη: Given a domain Ω in the complex plane and a point ζ in Ω , is it possible to find a holomorphic function on Ω with the property that the partial sums of its Taylor expansion about ζ can approximate every “plausible” function outside Ω ? In this talk, using tools from potential theory, we will investigate the above question for a certain category of multiply connected domains.