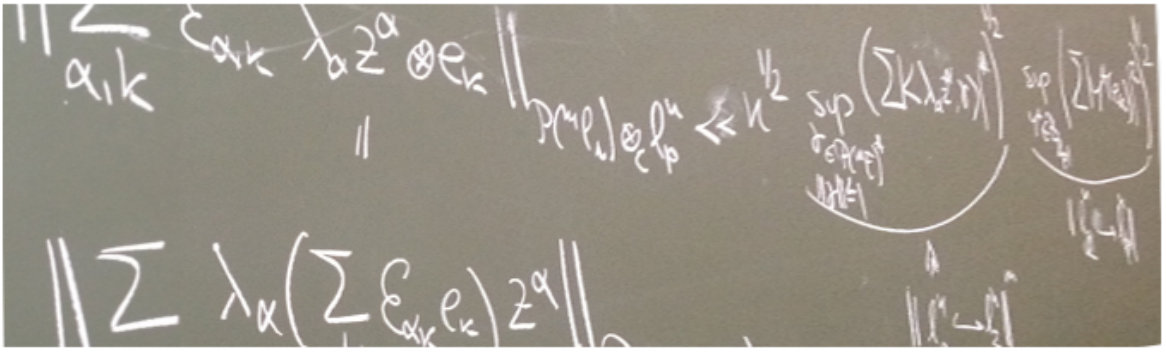
Conference on NonLinear Functional Analysis



Abstracts

Valencia, 17-20 October 2017

Including:
5th Workshop on Functional Analysis
Workshop on Infinite Dimensional Analysis Valencia 2017

Supported by MINECO/FEDER projects MTM2014-57838-C2-1-P and MTM2014-57838-C2-2-P

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Eve Oja
Lifting of nest approximation properties and related principles of local reflexivity

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On the coarse embeddability of Hilbert space

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Abstracts

20.10.2017
11:30-12:30

Richard M. Aron
Kent State University

Some problems related to algebras of holomorphic functions in finite and infinite dimensions

Let X be a complex Banach space with open unit ball B. As usual, let $\mathscr{H}_b(X)$ denote the Fréchet algebra of entire functions $f : X \to \mathbb{C}$ such that f is bounded on nB for all $n \in \mathbb{N}$. Also, let $\mathscr{H}^\infty(B) = \{f : B \to \mathbb{C} \mid f \text{ is bounded and holomorphic on } B\}$. and call $\mathscr{A}_u(B)$ the subalgebra of those functions in $\mathscr{H}^\infty(B)$ that are uniformly continuous. We will review some old, and perhaps a few new, open problems related to homomorphisms on these algebras.

19.10.2017
11:00-12:00

Frédéric Bayart
Université Blaise Pascal

Coordinatewise summability, inclusion theorems and p-Sidon sets

Let $m \geq 1$, $X_1, \ldots, X_m$, Y Banach spaces and $T : X_1 \times \cdots \times X_m \to Y$ m-linear. For $r \geq 1$ and $\mathbf{p} = (p_1, \ldots, p_m) \in [1, +\infty)^m$, we say that T is multiple $(r, \mathbf{p})$-summing if there exists a constant $C > 0$ such that for all sequences $x(j) \subset X_j^{\mathbb{N}}$, $1 \leq j \leq m$,

$$\left(\sum_{\mathbf{i} \in \mathbb{N}^m} \| T(x_{\mathbf{i}}) \|^r \right)^{\frac{1}{r}} \leq C w_{p_1}(x(1)) \cdots w_{p_m}(x(m))$$

In this talk, we discuss the multiple summability of T when we have information on the summability of the maps it induces on each coordinate, extending important results of Defant, Popa and Schwarting for $(r, 1)$-multiple summability. Our methods have applications to inclusion theorems for multiple summing multilinear mappings and to the product of p-Sidon sets.

17.10.2017
10:00-11:00

Andreas Defant
Universität Oldenburg

Bohr's phenomenon for functions on the Boolean cube

We study the asymptotic decay of the Fourier spectrum of real functions on the Boolean cube $\{-1, 1\}^N$ in the spirit of Bohr's phenomenon from complex analysis. Every such function admits a canonical representation through its Fourier-Walsh expansion $f(x) = \sum_{S \subset \{1, \ldots, N\}} \widehat{f}(S) x^S$, where $x^S = \prod_{k \in S} x_k$. Given a class $\mathscr{F}$ of functions on the Boolean cube $\{-1, 1\}^N$, the Boolean radius of $\mathscr{F}$ is defined to be the largest $\rho \geq 0$ such that $\sum_S |\widehat{f}(S)| \rho^{|S|} \leq \|f\|_\infty$ for every $f \in \mathscr{F}$. We indicate the precise asymptotic behaviour of the Boolean radius of several natural subclasses, as e.g. the class of all real functions on $\{-1, 1\}^N$, the subclass made of all homogeneous functions or certain threshold functions. Compared with the classical complex situation subtle differences as well as striking parallels occur. An interesting side aspect of our work is the following Bohnenblust-Hille type inequality for real functions on $\{-1, 1\}^N$: There

is an absolute constant $C > 0$ such that the $\ell_{2d/(d+1)}$-sum of the Fourier coefficients of every function $f : \{-1,1\}^N \to [-1,1]$ of degree d is bounded by $C^{\sqrt{d \log d}}$. It was recently proved that a similar result holds for complex-valued polynomials on the n-dimensional torus $\mathbb{T}^n$, but that in contrast to this a replacement of the n-dimensional torus $\mathbb{T}^n$ by the n-dimensional cube $[-1,1]^n$ leads to a substantially weaker estimate. Joint work with Mieczysław Mastyło and Antonio Pérez Hernández.

Gilles Godefroy
Université Paris 6

19.10.2017
09:30-10:30

Recent results of Lipschitz-free spaces

The purpose of this talk is to survey some recent results on the so-called Lispchitz-free spaces (that is, isometric preduals of spaces of Lipschitz functions on metric spaces) due to several authors, and to recall some open questions on these spaces.

Anna Kamińska
The University of Memphis

19.10.2017
12:00-13:00

Abstract Lorentz spaces and Köthe duality

Motivated by the theory and applications of Lorentz spaces we define abstract Lorentz spaces which comprise of classical, weighted and Orlicz-Lorentz spaces. By our procedure we also obtain a whole array of new examples of Lorentz type spaces. We study their properties and in particular their Köthe dual spaces. Given a symmetric space E and a decreasing positive weight w, the space E_w is an abstract weighted space and its symmetrization $\Lambda_{E,w}$ is a generalized Lorentz space. The class of functions $M_{E,w}$ equipped with the gauge $\|\cdot\|_{M_{E,w}}$ is defined in the spirit of Marcinkiewicz spaces. This class does not need to be even a linear space, however $\|f^0\|_{M_{E,w}}$ is a norm if it is finite, where f^0 is a level function. We further identify symmetric spaces $Q_{E,w}$ and $P_{E,w}$ and we show that they are Köthe dual spaces of Lorentz spaces. Consequently, we prove that the Köthe dual space of $\Lambda_{E,w}$ is equipped with three different formulas of the norm expressed in terms of Hardy-Littlewood inequalities and/or in terms of level functions. This not only allows us to recover the existing formulas of dual norms in classical and Orlicz-Lorentz spaces, but also to obtain a new one. Substituting for E various symmetric spaces we obtain a number of examples of generalized Lorentz spaces and their dual spaces. Joint work with Yves Raynaud.

Mieczysław Mastyło
Adam Mickiewicz University in Poznań

18.10.2017
09:30-10:30

Analytic families of multilinear operators

We will discuss interpolation of analytic families of multilinear operators defined on spaces generated by the Calderón method applied to couples of quasi-Banach spaces. We prove

a multilinear version of Stein's classical interpolation theorem and we show applications for analytic families of operators taking values in Lorentz and Hardy spaces. These results are applied to prove that the bilinear Bochner-Riesz transform is bounded from $L^p(\mathbb{R}^n) \times L^p(\mathbb{R}^n)$ to $L^{p/2}(\mathbb{R}^n)$ for all $1 < p < 2$. This is a joint work with Loukas Grafakos.

17.10.2017
11:30-12:30

Vassili Nestoridis
National and Kapodistrian University of Athens

A project on generic non-extendability of functions belonging to some new spaces and their properties, in one, several or infinitely many complex variables

First, we remind some generic non-extendability results valid for most of the function spaces in one or several complex variables, as well as, some generic results on totally unbounded functions. These results can be extended to be valid for some new function spaces that we introduce in one, several or infinetely denumerably many variables. These new spaces are defined by several properties of holomorphic functions that we require to hold when we approach several parts of the boundary of their common domain of definition. They are Frechet spaces when they are endowed with their natural topologies. An open issue is to investigate the properties of the functions belonging to these spaces.

18.10.2017
11:00-12:00

Eve Oja
University of Tartu

Lifting of nest approximation properties and related principles of local reflexivity

Recall that a Banach space X has the approximation property if there exists a net of bounded linear finite-rank operators on X converging uniformly on compact subsets of X to the identity operator. Nest approximation properties are defined by the requirement that the finite-rank approximating operators leave invariant all subspaces in a given nest of closed subspaces of X.
Nest approximation properties were launched by T. Figiel and W. B. Johnson in [1]. These properties refine the concept of approximation properties for pairs due to T. Figiel, W. B. Johnson, and A. Pełczyński [2]. The latter concept requires the finite-rank approximating operators to leave invariant a given closed subspace of X and it is, in turn, a refinement of the classical approximation properties.
In this lecture, we review some old and new results and open problems related to the lifting of various approximation properties between the dual space X^* and X. An emphasis is given to nest approximation properties, where lifting theorems rely on some new forms of the principle of local reflexivity which respect given nests of subspaces [3,4].

References

[1] T. Figiel, W. B. Johnson. *The Lidskii trace property and the nest approximation property in Banach spaces*, J. Funct. Anal., 271, 566-576 (2016).

[2] T. Figiel, W. B. Johnson, A. Pełczyński, *Some approximation properties of Banach spaces and Banach lattices*, Israel J. Math., 183, 199-231 (2011).

[3] E. Oja, *Principle of local reflexivity respecting subspaces*, Adv. Math., 258, 1-12 (2014).

[4] E. Oja, S. Veidenberg, *Principle of local reflexivity respecting nests of subspaces and the nest approximation properties*, J. Funct. Anal. 273, 2916-2938 (2017).

Kristian Seip
Norwegian University of Science and Technology

20.10.2017
10:00-11:00

Hardy spaces of Dirichlet series and the Riemann zeta function

We have in recent years seen a notable growth of interest in certain functional analytic aspects of the theory of ordinary Dirichlet series

$$\sum_{n=1}^{\infty} a_n n^{-s}.$$

Inspired by the classical theory of Hardy spaces and the operators acting on such spaces, this topic is also intertwined with analytic number theory and function theory on the infinite dimensional torus. Of particular interest are problems that involve an interplay between the additive and multiplicative structure of the integers, in this context embodied respectively by function theory in half-planes and the so-called Bohr lift that transforms Dirichlet series into functions of infinitely many complex variables.
In this survey talk, I will present some recent highlights from the function theory of Hardy spaces of Dirichlet series, outline some aspects of the operator theory that has been developed for these spaces, and present some applications to the Riemann zeta function $\zeta(s)$, including pseudomoments and lower bounds for the growth of $\zeta(1/2+it)$.

Thomas Schlumprecht
Texas A&M University

18.10.2017
12:00-13:00

On the coarse embeddability of Hilbert space

In this joint work with Florent Baudier and Gilles Lancien a new concentration inequality is proven for Lipschitz maps on the infinite Hamming graphs taking values into Tsirelson's original space. This concentration inequality is then used to disprove the conjecture, originating in the context of the Coarse Novikov Conjecture, that the separable infinite dimensional Hilbert space coarsely embeds into every infinite dimensional Banach space. Some positive embeddability results are proven for the infinite Hamming graphs and the countably branching trees using the theory of spreading models. A purely metric characterization of finite dimensionality is also obtained, as well as a rigidity result pertaining to the spreading model set for Banach spaces coarsely embeddable into Tsirelson's original space.

5th Workshop on Functional Analysis

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Porosity results for sets of strict contractions

Cleon Barroso
A new characterization of weak compactness

Óscar Blasco
Embeddings and Lebesgue-type inequalities for the greedy algorithm in Banach spaces

Jesús M. F. Castillo
Stability properties of the differential process generated by complex interpolation

Willian Corrêa
Type and Twisted Sums Induced by Complex Interpolation

Marek Cuth
Finitely additive measures and complementability of Lipschitz-free spaces

Elhadj Dahia
Factorization of (p,σ)*-continuous operators*

Loïc Demeulenaere
An open question about diametral dimensions

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Non-separable Banach spaces studied via projectional skeletons and "rich" families of their separable subspaces

Orlando Galdames-Bravo
On p*-summing operators that factor through* L^p*-spaces of a vector measure*

Fernando García-Castaño
Geometric Properties of Cones

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Karl Grosse-Erdmann
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$C^b(X)$ Lindelöf-Σ

Jorge Losada
Variable exponent sequence spaces revisited

Gonzalo Martínez Cervantes
Banach spaces with weak* -sequential dual ball

Julia Martsinkevitš
Uniqueness of norm-preserving extensions of functionals on strict ideals

Quentin Menet
Invariant subspaces in Fréchet spaces

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Weakly compactly generated Banach spaces and some of their relatives classified by using projectional skeletons

Fernando Muñoz Jiménez
The Bartle–Dunford–Schwartz and the Dinculeanu–Singer Theorems Revisited

David Nicolas Nenning
On groups of Hölder diffeomorphisms and their regularity

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Distortion of Lipschitz Functions on $c_0(\Gamma)$

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On the chances to extend a surjective isometry between the unit spheres of two operator algebras

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The linear structure of some dual Lipschitz free spaces

Oleg Reinov
On Z_d-symmetry of spectra of linear operators in Banach spaces

Abraham Rueda Zoca
A metric characterisation of Daugavet property in Lipschitz-free spaces

Gerhard Schindl
On the extension of Whitney ultrajets

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Abstracts

A characterization of the Bishop-Phelps-Bollobás property for operators for the pair (ℓ_∞^4, Y)

María D. Acosta
University of Granada (Spain)

19.10.2017
15:00–15:30

Bishop-Phelps Theorem states that the set of norm attaining functionals is dense in the (topological) dual of a Banach space. Bollobás showed a "quantitative" version of that result called nowadays the Bishop-Phelps-Bollobás Theorem. He proved that every pair of elements (x_0, x_0^*) in $S_X \times S_{X^*}$ such that $x_0^*(x_0) \sim 1$ can be approximated by another pair (x, x^*) in $S_X \times S_{X^*}$ such that $x^*(x) = 1$. In 2008 it was initiated the study of versions of such result for operators. A pair of Banach spaces (X, Y) has the Bishop-Phelps-Bollobás property for operators (BPBp for short) whenever every pair (x_0, S_0) in $S_X \times S_{L(X,Y)}$ such that $\|S_0(x_0)\| \sim 1$ can be approximated by another pair (x, T) in $S_X \times S_{L(X,Y)}$ such that $\|T(x)\| = 1$. Here we denote by $L(X, Y)$ the space of bounded and linear operators from X to Y. It is known that the previous property is non trivial. It is an open problem whether or not the pair (c_0, ℓ_1) has the BPBp in the real case. It is known that the pair (ℓ_∞^3, ℓ_1) has that property. Here we provide a characterization of the Banach spaces Y such that (ℓ_∞^4, Y) has the BPBp. As a consequence, we provide examples of spaces Y satisfying the previous condition.
The results are part of a joint work with J.L. Dávila and M. Soleimani–Mourchehk- horti.

Preserved extreme points in Lipschitz-free spaces

Ramon J. Aliaga
Universidad Politécnica de Valencia (Spain)

17.10.2017
17:30–18:00

In this talk, we will present a characterization of the preserved extreme points of the unit ball of a Lipschitz-free space $\mathscr{F}(X)$ in terms of the geometry of the underlying metric space X. We will describe how these and other types of extremal points are related to the existence of triples of points in X that are metrically aligned or tend to be aligned. In particular, we will use this characterization to prove a conjecture by N. Weaver regarding compact concave spaces, i.e. such that every elementary molecule in $\mathscr{F}(X)$ is preserved extreme.

Porosity results for sets of strict contractions

Christian Bargetz
University of Innsbruck (Austria)

20.10.2017
16:00–16:30

In the context of generic existence of fixed points of nonexpansive mappings, F. S. de Blasi and J. Myjak came upon the question of whether the generic nonexpansive mapping $f\colon C \to C$ on a convex, bounded and closed subset of a Banach space is a strict contraction, i.e., whether it satisfies $\|f(x) - f(y)\| \leq L\|x - y\|$ for all $x, y \in C$ with a constant $L < 1$.
In the case of Hilbert spaces they gave a negative answer by showing that the set of strict contractions is small in the sense that it is a σ-porous subset of the space of nonexpansive mappings. Recently, in [1], we were able to generalise this results to arbitrary Banach spaces.

In the case of separable Banach spaces we able to achieve a stronger version of this result including the local Lipschitz constant.
Even more general, we now introduce a class of geodesic metric spaces and show that certain sets, including the set of all strict contractions, are σ-porous in the space of nonexpansive mappings on star-shaped and closed subsets of these spaces. These results include the cases of nonexpansive self-mappings and the case of nonexpansive set-valued mappings.
This is joint work with Michael Dymond (University of Innsbruck) and Simeon Reich (The Technion—Israel Institute of Technology, Haifa).

References

[1] C. Bargetz and M. Dymond, *σ-Porosity of the set of strict contractions in a space of non-expansive mappings*, Israel J. Math., 214(1) (2016), 235–2449.

[2] C. Bargetz, M. Dymond, and S. Reich, *Porosity Results for Sets of Strict Contractions on Geodesic Metric Spaces*, Topological Methods in Nonlinear Analysis. Online First (2017), DOI: 10.12775/TMNA.2017.013

17.10.2017
16:00–16:30

A new characterization of weak compactness

Cleon Barroso
UFC (Brazil)

In this talk we will present a new characterization of weak compactness in terms of the metric fixed point property for the class of affine bi-Lipschitz maps. This is a joint work with V. Ferreira (UFC).

18.10.2017
15:30–16:00

Embeddings and Lebesgue-type inequalities for the greedy algorithm in Banach spaces

Oscar Blasco
Universidad de Valencia (Spain)

We obtain Lebesgue-type inequalities for the greedy algorithm for arbitrary biorthogonal systems in Banach spaces. The bounds are given only in terms of the upper democracy functions of the basis and its dual. We also show that these estimates are equivalent to embeddings between the given Banach space and certain discrete weighted Lorentz spaces. Finally, the asymptotic optimality of these inequalities is illustrated in various examples of non necessarily quasi-greedy bases. (Joint work with P. Berna, G. Garrigós, E. Hernández and T. Oikbergh)

Stability properties of the differential process generated by complex interpolation

19.10.2017
15:30–16:00

Jesús M. F. Castillo
Universidad de Extremadura (Spain)

The stability of the differential process associated to an interpolation scale has been a central topic in the theory since its inception. We will present here several advances obtained in collaboration with Willian Corrêa, Valentin Ferenczi and Manuel González. At the ground zero level the problem can be described as the study of properties P so that whenever the interpolation space X_θ has P (or an interpolated operator T has P on X_θ) there is an open neighborhood of θ so that all spaces X_t have P (or all interpolated operators T have P on X_t) for all t in that neighborhood. At level 1, which is the one we will consider in this talk, the problem is the study of properties P so that whenever the derived space dX_θ has P there is an open neighborhood of θ so that all derived spaces dX_t have P. We will focus on triviality and singularity properties.

In other words (or, better, in other drawings): Let $\mathbb{D}$ be the complex unit disk and let $(X_\xi)_{\xi\in\partial\mathbb{D}}$ be an interpolation family. Pick $\theta\in\mathbb{D}$ and assume that the induced exact sequence

$$0 \longrightarrow X_\theta \longrightarrow dX_\theta \longrightarrow X_\theta \longrightarrow 0$$

is trivial (resp. strictly singular). Does there exist $\varepsilon>0$ so that the induced exact sequences $0\to X_z\to dX_z\to X_z\to 0$ are trivial (resp. singular) for all $|z-\theta|<\varepsilon$?

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Type and Twisted Sums Induced by Complex Interpolation

19.10.2017
17:30–18:00

Willian Corrêa
Universidade de São Paulo (Brazil)

In this talk we will explore the relationship between the concepts of Rademacher type and twisted sums of Banach spaces induced by complex interpolation. We give criterions for

nontriviality and singularity of twisted sums through type, and apply them to the study of submodules of Schatten classes.

18.10.2017
16:00–16:30

Finitely additive measures and complementability of Lipschitz-free spaces

Marek Cuth
Charles University (Czech Republic)

Given a metric space M it is possible to construct a Banach space $F(M)$ in such a way that the metric structure of M corresponds to the linear structure of $F(M)$. This space $F(M)$ is sometimes called the Lipschitz-free space over M. The study of Lipschitz-free spaces is well-motivated: for example, if we knew that $F(\ell_1)$ is complemented in its bidual, it would solve famous open problem of whether every Banach space which is Lipschitz-isomorphic to ℓ_1 is actually linearly isomorphic to ℓ_1.
I will talk about our recent paper with O. Kalenda and P. Kaplický, where we prove that $F(\mathbb{R}^n)$ is complemented in its bidual.

18.10.2017
18:00–18:30

Factorization of (p,σ)-continuous operators

Elhadj Dahia
Med Boudiaf University-M'sila (Algeria)

We give the Pietsch factorization theorem for the (p,σ)-absolutely continuous linear operators. Although this result is essentially already known (it was proved by Matter in 1989), we write a new direct proof that highlights the role of the spaces $C(B_{X^*})$ and $L^p(\eta)$, where η is a regular Borel probability measure on B_{X^*}.
As an application, we show that (p,σ)-absolutely continuous linear operators are compact under some requirements and we prove a Dvoretzky–Rogers type theorem for this class of operators.

19.10.2017
17:00-17:30

An open question about diametral dimensions

Loïc Demeulenaere
Université de Liège (Belgium)

The diametral dimension is a topological invariant which characterizes Schwartz and nuclear spaces. However, there exists another diametral dimension which was conjectured by Bessaga, Mityagin, Pełczyński, and Rolewicz to be equal to the first one in Fréchet spaces.
In this talk, we describe some conditions which assure the equality of the two diametral dimensions in metrizable locally convex spaces. Besides, we explain why such an equality is generally impossible in non-metrizable spaces.

Non-separable Banach spaces studied via projectional skeletons and "rich" families of their separable subspaces

17.10.2017
15:00–15:30

Marian Fabian
Institute of Mathematics of the Academy of Sciences (Czech Republic)

We present a structural statement characterizing Asplund space X via a certain "rich" family of separable "rectangles" $V \times Y \subset X \times X^*$. This enables to construct easily a "projectional skeleton" (a modern substitute of PRI) in X^*. Further we find some rich "rectangle" families in $X \times X^*$ where X is a WCG, a WLD, or even a Pličko space. Thus we get a "commutative" projectional skeleton in X. The class of Pličko spaces is quite large. It contains $L_1(\mu)$, where μ is any σ-additive measure, duals of C^* algebras, order continuous lattices, $C(G)$, with G a compact abelian group, and preduals of semifinite von Neumann algebras. Finally, putting the results above together, we immediately get that X is simultaneously Asplund and WCG, if and only if it admits a commutative projectional skeleton such that the adjoint projections form a projectional skeleton in X^*. The lecture is based on three recent joint papers written together with Marek Cúth.

On p-summing operators that factor through L^p-spaces of a vector measure

18.10.2017
17:30–18:00

Orlando Galdames Bravo
Universitat Politècnica de València (Spain)

Let X and Y be Banach spaces and let $T \in \mathscr{L}(X,Y)$. On the one hand, it is well known that (p,q)-factorable operators (characterized by means of a factorization through the embedding $L^{q'}(\mu) \hookrightarrow L^p(\mu)$ where μ is a finite measure) are p-summing when $q = 1$. On the other hand, there are various situations in what a L^p-space of a finite scalar measure can be identified with a L^r-space of a vector measure, by this reason it is interesting the study of operators that factor through spaces of vector measures. In this talk we present a class of Banach operators that factor through a positive map $L^q(m_1)^* \to L^p(m_2)$, where m_1 and m_2 are vector measures and exhibit some examples of operators into this class. In order to find p-summing operators, we apply the properties of the L^p-spaces of vector measures and the operators involved in the factorization scheme.

Geometric Properties of Cones

20.10.2017
17:30–18:00

Fernando García–Castaño
University of Alicante (Spain)

It is well-known that an extreme point of a closed and convex subset of a Banach space is a denting point if and only if it is a point of continuity for such a set. As a consequence, given a closed, convex, and pointed cone C in a Banach space, the origin is a denting point of C if and only if it is a point of continuity for C. The former equivalence is not true for non complete normed spaces and non closed cones, and it is not clear if it remains true for closed cones in non complete normed spaces. In this talk we will state a result establishing that the origin is a denting point of a cone C if and only if it is a point of continuity for C and the dual cone,

C^*, is ""large enough"", i.e., the dual cone verifies $\overline{C^* - C^*} = X^*$. Other related results and consequences will also be stated.

These results are part of a joint work (under review) with M. A. Melguizo Padial. Department of Applied Mathematics. Polytechnic University College - EPSAlicante. University of Alicante.

18.10.2017
17:30–18:00

Extremal structure of Lipschitz free spaces

Luis C. García-Lirola
Universidad de Murcia (Spain)

Given a metric space M, we denote by $\mathrm{Lip}_0(M)$ the Banach space of all real-valued Lipschitz functions on M which vanish at a designated origin $0 \in M$. It is known that $\mathrm{Lip}_0(M)$ is a dual Banach space when it is endowed with the norm given by the best Lipschitz constant. Its canonical predual is called the Lipschitz free space over M and it is given by

$$\mathscr{F}(M) = \overline{\mathrm{span}}\{\delta(m) : m \in M\} \subseteq \mathrm{Lip}_0(M)^*,$$

where $\delta(m)(f) = f(m)(x)$ for every $m \in M$ and $f \in \mathrm{Lip}_0(M)$.

In this talk we focus on different extremal notions in the unit ball of Lipschitz free spaces. A result of Weaver states that every preserved extreme point of $B_{\mathscr{F}(M)}$ (i.e. a point of the space which is an extreme point of the bidual unit ball) is a *molecule*, that is, an element of the form $\frac{\delta(x)-\delta(y)}{d(x,y)}$ for some $x, y \in M$. Weaver also proved that the molecule $\frac{\delta(x)-\delta(y)}{d(x,y)}$ is a preserved extreme point whenever there is a Lipschitz function *peaking at* the pair x, y. Among other results, we show that indeed that condition characterises the strongly exposed points of $B_{\mathscr{F}(M)}$, and that every preserved extreme point of $B_{\mathscr{F}(M)}$ is also a denting point.
This is part of a joint work with C. Petitjean, A. Procházka and A. Rueda Zoca. This research is partially supported by the grants MINECO/FEDER MTM2014-57838-C2-1-P and Fundación Séneca CARM 19368/PI/14.

19.10.2017
16:00–16:30

Frequently hypercyclic bilateral shifts

Karl Grosse-Erdmann
University of Mons (Belgium)

It is an open problem in linear dynamics whether the inverse of any invertible upper frequently hypercyclic operator is again upper frequently hypercyclic. We show how not to solve the problem.

The Coburn-Simonenko theorem for Toeplitz operators acting between Hardy type subspaces of different Banach function spaces

Oleksiy Karlovych
Universidade NOVA de Lisboa (Portugal)

20.10.2017
15:00–15:30

Let Γ be a rectifiable Jordan curve, let X and Y be two reflexive Banach function spaces over Γ such that the Cauchy singular integral operator S is bounded on each of them, and let $M(X,Y)$ denote the space of pointwise multipliers from X to Y. Consider the Riesz projection $P=(I+S)/2$, the corresponding Hardy type subspaces PX and PY, and the Toeplitz operator $T(a):PX\to PY$ defined by $T(a)f=P(af)$ for a symbol $a\in M(X,Y)$. We show that if $X\subseteq Y$ and $a\in M(X,Y)\setminus\{0\}$, then $T(a)\in\mathscr{L}(PX,PY)$ has a trivial kernel in PX or a dense image in PY. In particular, if $1<q\le p<\infty$, $1/r=1/q-1/p$, and $a\in L^r\equiv M(L^p,L^q)$ is a nonzero function, then the Toeplitz operator $T(a)$, acting from the Hardy space H^p to the Hardy space H^q, has a trivial kernel in H^p or a dense image in H^q.

Systems of seminorms on spaces of operators and weak bounded approximation properties

Aleksei Lissitsin
University of Tartu (Estonia)

19.10.2017
17:30–18:00

A classical result, essentially due to Grothendieck, says that the approximation property (AP) of a dual Banach space X^* is metric whenever X^* or X^{**} have the Radon–Nikodým property (RNP). A version of its proof by Oja deals with the *weak metric* AP.
The weak metric AP and its generalization, a *bounded AP for a Banach operator ideal*, were introduced by Lima, Lima, and Oja in order to investigate the gap between the AP of a dual Banach space and its metric version.
We observe that in many cases the equivalence of such bounded APs boils down to a certain equivalence of systems of seminorms defined on all spaces of bounded linear operators. Such a language seems to help in highlighting the cornerstones of the theory. In particular, it enables one to simplify the aforementioned Oja's proof, eliminating the need to enter the original space X, and shows that the only essential part is Oja's "RNP impact lemma".

$C^b(X)$ **Lindelöf-**Σ

Manuel López–Pellicer
Universitat Politècnica de València (Spain)

20.10.2017
18:00–18:30

A topological space X is Lindel¨of-Σ if it exists an onto upper semicontinuous compact valued function $T:\Sigma\to\mathscr{K}(X)$, with $\Sigma\subset\mathbb{N}^{\mathbb{N}}$. If $\Sigma=\mathbb{N}^{\mathbb{N}}$ then X is K-analytic. Talagrand obtained in [4] that for a compact space K the space $C_p(K)$ is K-analytic if and only if $C(K)$ is weakly K-analytic; then K is called a Talagrand compact. In [1] it is proved that if Y is a G_δ-dense subset of a pseudocompact X and σ_Y is the topology of pointwise convergence on Y then $C_p(X)$ is K-analytic if and only if $(C(X),\sigma_Y)$ is K-analytic.

A subset Y of the dual closed unit ball B_{E^*} of a Banach space E is a *Rainwater set* for E if in each bounded sequence of E the pointwise convergence on Y implies weak convergence([2]). Each James boundary in B_{E^*} is a Rainwater set ([3]). For the Banach space $C^b(X)$ of real or complex continuous bounded functions defined on a completely regular topological space X endowed with the supremum norm we have that a subset Y of X is a Rainwater set for $C^b(X)$ if and only if Y is G_δ-dense in X and X is pseudocompact.
We present Rainwater subsets Y for the space $C^b(X)$ such that the topologies weak, σ_X and σ_Y have the same compacts and the same convergent sequences. We get that the three spaces $(C^b(X),\text{weak})$, $C^b_p(X)$ and $(C^b(X),\sigma_Y)$ are (or are not) Lindelöf-Σ spaces and, in the positive case, the three spaces have the same upper semicontinuous compact valued function T defining the Lindelöf-Σ character. The same property holds for the particular case of K-analyticity.
Finally we present some new properties of Rainwater sets as well as new characterizations of some classes of compact (Talagrand, Gul'ko, ... compacts).
This is a joint work with Salvador López-Alfonso.

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17.10.2017
18:00–18:30

Variable exponent sequence spaces revisited

Jorge Losada
Universidade de Santiago de Compostela (Spain)

This talk is about different definitions of variable exponent sequential spaces. Let us start by remembering classical definition and motivation of W. Orlicz sequence spaces to enter later in the ideas and spaces recently introduced by J. Talponen.
Te main goal of the talk is to show how we can introduce the spaces of J. Talponen in a slightly different way to obtain a bit more information about them.
We end with a discussion about some open questions and conjectures concerning the results and ideas previously treated.
This talk is based in a joint work with H. Rafeiro.

17.10.2017
17:00–17:30

Banach spaces with weak*-sequential dual ball

Gonzalo Martínez Cervantes
University of Murcia (Spain)

A topological space is said to be Fréchet-Urysohn (FU) if the closure of every subspace coincides with the set of limits of sequences in the subspace. A generalization of FU property

are sequentiality and countable tightness. A topological space is sequential if every non-closed subspace contains a sequence converging to a point which is not in the subspace. On the other hand, a topological space has countable tightness if the closure of every subspace coincides with the union of closures of countable subsets of the subspace. We study Banach spaces whose dual ball with the weak*-topology has some of these properties. Convex versions of the previous properties are also considered. We focus on Banach spaces with weak*-sequential dual ball. In particular, we show that if X is a Banach space with weak*-sequentially compact dual ball and $Y \subset X$ is a subspace such that Y and X/Y have weak*-sequential dual ball, then X has weak*-sequential dual ball. As an application we obtain that the Johnson-Lindenstrauss space JL_2 and $C(K)$ for K scattered compact space of countable height are examples of Banach spaces with weak*-sequential dual ball, answering in this way a question of A. Plichko.

Uniqueness of norm-preserving extensions of functionals on strict ideals

19.10.2017
17:00–17:30

Julia Martsinkevitš
University of Tartu (Estonia)

Godefroy, Kalton, and Saphar [1] called a closed subspace Y of a Banach space Z an ideal if its annihilator $Y^\perp$ is the kernel of a norm-one projection P on the dual space Z^*. If the range of P is norming for Z, then Y is said to be a strict ideal.
We consider functionals on strict ideals having unique norm-preserving extensions. The presentation is based on joint research with Märt Põldvere.

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Invariant subspaces in Fréchet spaces

20.10.2017
17:00–17:30

Quentin Menet
Université d'Artois (France)

A Fréchet space X has the invariant subspace property (resp. the invariant subset property) if every operator on X possesses a non-trivial invariant subspace (resp. subset). We will show that there exists a non-normable Fréchet space X with the invariant subspace property and even with the hereditary invariant subspace property, i.e. every closed infinite-dimensional subspace of X has the invariant subspace property. We will then state a sufficient condition for non-normable Fréchet spaces to not have the invariant subset property.

17.10.2017
15:30–16:00

Weakly compactly generated Banach spaces and some of their relatives classified by using projectional skeletons

Vicente Montesinos
Universitat Politècnica de Valéncia (Spain)

Projectional resolutions of the identity in Banach spaces have been a tool for the theory of nonseparable Banach spaces through decades. Recently, a new related and efficient instrument —*projectional skeletons*— made its successful way into the nonseparable theory. It was introduced by W. Kubiś in his paper [6]: He proved in particular that the fairly big class of 1-Pličko spaces is exactly that admitting a commutative 1-projectional skeleton. The paper [1] characterized Asplund spaces and Asplund WCG spaces with the help of suitable projectional skeletons. In this talk we shall characterize WCG spaces and their subspaces in a similar flavor. The more or less already known characterization of weakly Lindelöf determined spaces will be also recalled. The characterization of a still bigger class of Pličko spaces can be found in [6]. This contribution follows previous work by M. Cúth, M. Fabian, W. Kubiś and others.
This is a joint work with Marian Fabian, from the Institute of Mathematics of the Czech Academy of Sciences.

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18.10.2017
17:00–17:30

The Bartle–Dunford–Schwartz and the Dinculeanu–Singer Theorems Revisited

Fernando Muñoz Jiménez
Universidad de Huelva (Spain)

Let X and Y be Banach spaces and let Ω be a compact Hausdorff space. By the classical Bartle–Dunford–Schwartz theorem, any operator $S \in \mathscr{L}(\mathscr{C}(\Omega), Y)$ admits an integral representation with respect to a Y^{**}-valued measure. By the Dinculeanu–Singer theorem, each operator $U \in \mathscr{L}(\mathscr{C}(\Omega, X), Y)$ admits an integral representation with respect to an $\mathscr{L}(X, Y^{**})$-valued measure.
For operators $S \in \mathscr{L}(\mathscr{C}(\Omega), \mathscr{L}(X, Y))$, we establish an integral representation theorem with respect to an $\mathscr{L}(X, Y^{**})$-valued measure, extending the classical Bartle–Dunford–Schwartz representation theorem. This is a far-reaching extension which serves as a departure point

for a general integral representation theory, relying on a new concept of the q-semivariation, where $1 \le q \le \infty$, of an $\mathscr{L}(X, Y^{**})$-valued measure. In particular, it is an efficient tool that enables us to give an alternative simple proof to the Dinculeanu–Singer theorem. The latter theorem is proved in a more general context of operators $U \in \mathscr{L}(\mathscr{C}_p(\Omega, X), Y)$, where $\mathscr{C}_p(\Omega, X)$, $1 \le p \le \infty$, denotes the space of X-valued continuous functions with p-compact range. Among others, useful formulas which connect different vector measures are deduced. Joint work with Eve Oja (University of Tartu) and Cándido Piñeiro (Universidad de Huelva).

On groups of Hölder diffeomorphisms and their regularity

David Nicolas Nenning
University of Vienna (Austria)

17.10.2017
17:30–18:00

In this talk we study the set $\mathrm{Diff}C_0^{n,\beta}$, consisting of diffeomorphisms of $\mathbb{R}^d$ that differ from the identity by an (n,β)-Hölder function. This set forms a group, but left translation and inversion are not continuous. Nevertheless flows of time-dependent Hölder vector fields preserve regularity, i.e. $C_0^{n,\beta}$ is ODE-closed. We use this to show that the group of flows of time-dependent Hölder vector fields, the so-called Trouvé group, coincides with the connected component of the identity of $\mathrm{Diff}C_0^{n,\beta}$. This is joint work with Armin Rainer.

Distortion of Lipschitz Functions on $c_0(\Gamma)$

Matěj Novotný
Czech Technical University in Prague (Czech Republic)

17.10.2017
18:00–18:30

It is a famous result by Gowers that every real Lipschitz function on the sphere of c_0 stabilizes on some infinite-dimensional subspace. We prove for every uncountable Γ, there is a real symmetric 1-Lipschitz function defined on the sphere of $c_0(\Gamma)$ which doesn't stabilize on any of its subspaces with density $\mathrm{dens}c_0(\Gamma)$.

On the chances to extend a surjective isometry between the unit spheres of two operator algebras

Antonio M. Peralta
Universidad de Granada (Spain)

18.10.2017
15:00–15:30

We shall present some of the most recent progress on the study of the so-called Tingley's problem, as well as about the Mazur-Ulam property in the case of two operator algebras with special interest on C*- and von Neumann algebras.

18.10.2017
18:00–18:30

The linear structure of some dual Lipschitz free spaces

Colin Petitjean
Laboratoire de Mathématiques de Besançon (France)

"Consider a metric space M with a distinguished point 0_M. Let $Lip_0(M)$ be the Banach space of Lipschitz functions from M to $\mathbb{R}$ satisfying $f(0_M) = 0$ (the canonical norm being the best Lipschitz constant). The Lipschitz-free space over M is defined as follows:

$$\mathscr{F}(M) := \overline{\text{span}}^{\|\cdot\|}\{\delta(x) : x \in M\} \subset Lip_0(M)^*,$$

where $\delta(x)$ denotes the Dirac measure defined by $\langle \delta(x), f\rangle = f(x)$. The Lipschitz free space $\mathscr{F}(M)$ is a Banach space such that every Lipschitz function on M admits a canonical linear extension defined on $\mathscr{F}(M)$. It follows easily from this fundamental linearisation property that the dual of $\mathscr{F}(M)$ is in fact $Lip_0(M)$. A considerable effort to study the linear structure and geometry of these spaces has been undergone by many researchers in the last two or three decades.
In this talk, we first focus on some classes of metric spaces M for which $\mathscr{F}(M)$ is isometrically isomorphic to a dual Banach space. After a quick overview of the already known results in this line, we define and study the notion of ""natural predual"". A natural predual is a Banach space X such that $X^* = \mathscr{F}(M)$ isometrically and $\delta(M)$ is $\sigma(\mathscr{F}(M), X)$-closed. As we shall see, $\delta(M)$ is always $\sigma(\mathscr{F}(M), Lip_0(M))$-closed but it may happened that it is not $\sigma(\mathscr{F}(M), X)$-closed for some predual X. We characterise the existence of a natural predual in some particular classes of metric spaces. Notably, we concentrate on the class of uniformly discrete and bounded (shortened u.d.b.) metric spaces, for which it is well known that $\mathscr{F}(M)$ is isomorphic to ℓ_1. In particular, we exhibit an example of a u.d.b. metric space M for which $\mathscr{F}(M)$ is a dual isometrically but which does not have any natural predual. We also provide a u.d.b. metric space M such that $\mathscr{F}(M)$ is not a dual isometrically. We finish with the study of the extremal structure of Lipschitz free spaces admitting a natural predual.
This is part of a joint work with L. García-Lirola, A. Procházka and A. Rueda Zoca.

20.10.2017
15:30–16:00

On Z_d-symmetry of spectra of linear operators in Banach spaces

Oleg Reinov
Saint–Petersburg State University (Russia)

It was shown by M. I. Zelikin (2007) that the spectrum of a nuclear operator in a separable Hilbert space is central-symmetric iff the traces of all odd powers of the operator equal zero. The criterium can not be extended to the case of general Banach spaces: It follows from Grothendieck-Enflo results that *there exists a nuclear operator U in the space l_1 with the property that $trace\, U = 1$ and $U^2 = 0$.*
B. Mityagin (2016) generalized Zelikin's criterium to the case of compact operators in Banach spaces some of which powers are nuclear (he considered even the so-called Z_d-symmetry of spectra).
We give sharp generalizations of Zelikin's theorem (to the cases of subspaces of quotients of L_p-spaces) and of Mityagin's result (for the case where the operators are not necessarily compact). Our results are optimal: We present the following (sharp) generalization of Grothendieck-Enflo theorem.

Theorem. *Let $p \in [1,\infty]$, $p \neq 2$, $1/r = 1 + |1/2 - 1/p|$. There exists a nuclear operator V in l_p such that V is s-nuclear for each $s \in (r,1]$; 2) V is not r-nuclear;* 3) trace $V = 1$ *and* $V^2 = 0$.

A metric characterisation of Daugavet property in Lipschitz-free spaces

18.10.2017
17:00–17:30

Abraham Rueda Zoca
Universidad de Granada (Spain)

In this talk we give a metric characterisation of the Daugavet property in the space of Lipschitz function. More precisely, given a metric space M, we will prove that the space of all Lipschitz function $Lip(M)$ has the Daugavet property if, and only if, M is a length space, that is, for every pair of points $x, y \in M$, the distance $d(x,y)$ is equal to the infimum of the length of rectifiable curves joining them. As a consequence, we prove that a space of Lipschitz functions $Lip(M)$ has the Daugavet property if, and only if, its canonical predual Lipschitz-free space $\mathscr{F}(M)$ has the Daugavet property.

On the extension of Whitney ultrajets

17.10.2017
17:00–17:30

Gerhard Schindl
University of Vienna / Universidad de Valladolid (Austria / Spain)

In this joint work with Armin Rainer we prove necessary and sufficient conditions for the validity of Whitney's extension theorem in the ultradifferentiable Roumieu setting with controlled loss of regularity. The growth rate of the jets, respectively of the derivatives of a smooth function, is measured by weight functions.
The weight functions which allow for an extension theorem preserving the ultradifferentiable class (for arbitrary compact sets) have already been fully characterized by Bonet, Braun, Meise, and Taylor. We are considering the situation where a loss of regularity arises, i.e. we are considering a mixed setting of two weight functions as it has been considered for the one-point set by Bonet, Meise, and Taylor.
Finally we apply our main theorem to the mixed weight sequence case as well and compare our statement with the result of Chaumat and Chollet.

NoLiFA
València 17-20 Oct 2017

Workshop on Infinite Dimensional Analysis Valencia 2017

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Sunke Schlüeters
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Andriy Zagorodnyuk
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Abstracts

On the dynamics associated to the hyperbolic heat transfer equation

Salud Bartoll
Universitat Politècnica de València (Spain)

18.10.2017
18:00–18:30

C_0-semigroups describe the solutions of so-called abstract Cauchy problems. This makes the semigroup formulation of chaos applicable to linear differential equations. We study the solution semigroup associated to the hyperbolic heat equation concerning one of the strongest versions of chaos for continuous dynamical systems, namely the specification property. In this case, the phase space plays a key role for this kind of dynamics. The specification property for C_0-semigroups (SgSp) implies other well-known dynamical properties: mixing, Devaney's chaos, distributional chaos and frequent hypercyclicity. The techniques presented here can be applied to other linear PDEs and infinite systems of ODEs.

Orbits of homogeneous polynomials on Banach spaces

Rodrigo Cardeccia
Universidad de Buenos Aires & CONICET (Argentina)

19.10.2017
17:00–17:30

Let X be a Banach space. A function $F : X \to X$ is said to be hypercyclic if there exists $x \in X$ whose orbit $Orb_F(x) = \{F^n(x) : n \in \mathbb{N}\}$ is dense in X. It is a known fact that there are linear hypercyclic operators in arbitrary separable infinite dimensional Banach spaces. The dynamical system induced by a homogeneous polynomial is quite different. Associated to each (non linear) homogeneous polynomial there is a ball, centered at zero, that is invariant under the action of the polynomial. Moreover, the behavior of the orbits that meet this limit ball is clear: they simply tend to zero. Therefore homogeneous polynomials on Banach spaces are far from being hypercyclic.
However, the behavior of the orbits that never meet the limit ball can be highly non trivial. Indeed, in [1] Bernardes showed the existence of orbits oscillating between infinity and the limit ball. He also proved that there are supercyclic homogeneous polynomials in arbitrary separable infinite dimensional Banach spaces.
In this talk we will show a simple and natural 2-homogeneous polynomial that is at the same time d-hypercyclic (the orbit meets every ball of radius d), weakly hypercyclic (the orbit is dense with to respect the weak topology) and Γ-supercyclic ($\overline{\Gamma Orb_P(x)} = X$) for each subset $\Gamma \subseteq \mathbb{C}$ unbounded or not bounded away from zero. We will also generalize the construction to arbitrary infinite dimensional Fréchet spaces.

The talk is based on joint work with Santiago Muro.

References

[1] N.C. Bernardes. *On orbits of polynomial maps in Banach spaces*, Quaest. Math., 21 (3-4) 311–318 (1998).

17.10.2017
18:00–18:30

Multiple Dirichlet Series

Jaime Castillo-Medina
University of Valencia (Spain)

In last years there has been a lot of research on the study of Dirichlet series $\sum a_n n^{-s}$ and the connection with many aspects of functional analysis. With the aim of extending this research to several complex variables we study spaces of multiple Dirichlet series. We present the extension of a classical result that establishes an isometric isomorphism between spaces of Dirichlet series and holomorphic functions in infinitely many variables as a fundamental step towards proving that the spaces studied are isometrically isomorphic independently form the dimension.

17.10.2017
15:00–15:30

The Bishop-Phelps-Bollobás property on bounded closed convex sets

Yun Sung Choi
POSTECH (Korea)

The Bishop-Phelps theorem [2], that is,"the set of norm attaining linear functionals on a Banach space X is dense in its dual space X^*" appeared in 1961. Bollobás [3] sharpened in 1970 the Bishop-Phelps theorem by dealing simultaneously with norm attaining linear functionals and their norming points, which is called the Bishop-Phelps- Bollobás theorem.
Recently, the Bishop-Phelps-Bollobás property [1] for operators between Banach spaces was introduced. The set of their interest is the closed unit ball of a domain Banach space. in this talk we extend it for arbitrary bounded closed convex subsets of a real Banach space and show some positive and negative results [4].

References

[1] M.D. Acosta, R.M. Aron, D. García and M. Maestre, *The Bishop-Phelps-Bollobás Theorem for operators*, J. Funct. Anal. 254 (2008) 2780–2799.

[2] E. Bishop and R.R. Phelps, *A proof that every Banach space is subreflexive*, Bull. Amer. Math. Soc. 67 (1961) 97-98.

[3] B. Bollobás, *An extension to the theorem of Bishop and Phelps*, Bull. London. Math. Soc. 2 (1970) 181-182.

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18.10.2017
18:00–18:30

Recent results of the Bishop-Phelps-Bollobás point property

Sheldon Dantas
Universidad de Valencia (Spain)

In 1970, Bollobás proved that if x^* almost attains its norm at x, then there are a new point y and a new functional y^* such that y^* attains its norm at y, y is close to x and y^* is close to x^*. Nowadays, this theorem is known as the Bishop-Phelps-Bollobás theorem. On the

other hand, Lindenstrauss showed that this result is no longer true for bounded linear operators and for that reason M. Acosta, R. Aron, D. García and M. Maestre introduced the Bishop-Phelps-Bollobás property (the BPBp, for short) in order to get a Bollobás type theorem for operators. Very recently it was introduced a stronger property called the Bishop-Phelps-Bollobás *point* property (the BPBpp, for short). This property says that there exists a function $\varepsilon \mapsto \eta(\varepsilon)$ such whenever $\|T(x_0)\| > 1-\eta(\varepsilon)$, there is a new operator $S \in \mathscr{L}(X,Y)$ with $\|S\| = 1$ such that $\|S(x_0)\| = 1$ and $\|S-T\| < \varepsilon$. In this talk, we will present some recent results about the BPBpp. This a joint work with V. Kadets, S. K. Kim, H. J. Lee and M. Martín.

Polynomial Daugavet property for representable spaces

Elisa Regina dos Santos
Universidade Federal de Uberlândia (Brasil)

19.10.2017
17:00–17:30

A Banach space X is said to have the *Daugavet property* if every rank-one operator $T : X \to X$ satisfies

$$\|\mathrm{Id} + T\| = 1 + \|T\|,$$

which is known as the *Daugavet equation*. This equation was first studied by I. K. Daugavet [3] in the space $C[0,1]$. Since then several authors have shown that different Banach spaces has the Daugavet property. Classical examples of Banach spaces fulfilling this property are $C(K)$ and $L_1(\mu)$, for every perfect compact Hausdorff space K and every atomless σ-finite measure μ.
In 2007 the study of the Daugavet equation was extended to bounded functions from the unit ball of a Banach space into the space [2] and, in particular, to polynomials. Let X denote a Banach space. A function $\Phi \in \ell_\infty(B_X, X)$ satisfies the *Daugavet equation* if

$$\|\mathrm{Id} + \Phi\| = 1 + \|\Phi\|. \tag{DE}$$

We say that a Banach space X has the *polynomial Daugavet property* (PDP) if every weakly compact polynomial on X satisfies (DE).
Now let K be a compact Hausdorff space. A Banach space X is said *K-representable* if there exists a family $(X_k)_{k\in K}$ of Banach spaces such that X is (linearly isometric to) a closed $C(K)$-submodule of the $C(K)$-module $\prod_{k\in K}^{\infty} X_k$ in such a way that, for every $x \in S_X$ and every $\varepsilon > 0$, the set $\{k \in K : \|x(k)\| > 1-\varepsilon\}$ is infinite. When the compact set K is not relevant, we simply say that X is representable. J. B. Guerrero and A. Rodrígues-Palacios [4] showed that every representable space has the Daugavet property.
The purpose of this work is to extend this result of Becerra Guerrero and Rodríguez-Palacios by proving that every representable Banach space has the polynomial Daugavet property as well. This will allow us to present new examples of Banach spaces with the polynomial Daugavet property. These results are presented in detail in [1].

References

[1] Botelho, G. and Santos, E. R., *Representable spaces have the polynomial Daugavet property*, Arch. Math., **107**, 37–42, 2016.

[2] Choi, Y. S., García, D., Maestre, M., Martín, M., *The Daugavet equation for polynomials*, Studia Math., **178**, 63–82, 2007.

[3] Daugavet, I. K., *On a property of completely continuous operators in the space C.* Uspekhi Mat. Nauk, **18**, 157–158, 1963 (in Russian).

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19.10.2017
15:00–15:30

Hypercyclic sets

Romuald Ernst
Université du Littoral Côte d'Opale (France)

A bounded linear operator on a Banach space X is said to be *hypercyclic* if there exists a vector $x \in X$ such that the orbit $\mathrm{Orb}(x, T)$ is dense in X. In 2000-2001, Costakis and Peris proved that if the union of finitely many orbits is dense then T is hypercyclic. In the same spirit, León and Müller proved that the density of the orbit of one vector x is equivalent to the density of the orbit of the set $\mathbb{T}x$. In this talk, we will discuss the properties of the sets $A \subset X$ having the property that $\mathrm{Orb}(A, T)$ is dense if and only if T is hypercyclic.

19.10.2017
18:00–18:30

Algebras of hypercyclic vectors

Javier Falcó
Universidad de Valencia (Spain)

An operator T on a Fréchet space X is called hypercyclic if there is a vector $x \in X$ (also called hypercyclic) whose orbit visits each non-empty open subset of X. The set of vectors with a dense orbit under a given operator is fundamentally non-linear. However it is natural to ask if this set contains large subsets with good structure. During the last quarter of a century the existence of linear structures in the set of hypercyclic vectors has been a fascinating research topic in the area of linear dynamical systems. Recently authors have studied the existence of richer structures in the set of hypercyclic vectors. In particular, if X is a Fréchet algebra, some authors have tried to extend this algebraic structure to a subset of hypercyclic vectors. We will discuss some recent advances in this direction.
This is joint work with Karl Grosse-Erdmann.

18.10.2017
15:30–16:00

The Segre cone of Banach spaces and Σ-operators

Maite Fernández-Unzueta
CIMAT (Mexico)

We introduce Σ-operators to study multilinear mappings on Banach spaces. For the domain of these operators (the Segre cone Σ of Banach spaces) to be well defined, we shall first see that any two reasonable cross norms defined on the tensor product of n Banach spaces induce $(2k)^{n-1}$-Lipschitz equivalent metrics and, therefore, a unique topology on the set of vectors of rank $\leq k$. We will discuss some applications of this approach.

The class of p-compact mappings in the operator space setting

20.10.2017
17:30–18:00

Daniel Galicer
Universidad de Buenos Aires & CONICET (Argentina)

The class of p-compact mappings has lately been studied as a natural generalization of the ideal of compact operators in the Banach space framework. In this talk we will review several structural properties of this class from the perspective of the theories of tensor norms and operator ideals. We will explain how this notion can be translated to the category of operator spaces and, if time allows, what are the obstacles that we deal with.

Joint work with Alejandro Chávez-Domínguez (University of Oklahoma, U.S.A.) and Verónica Dimant (Universidad de San Andrés, Argentina).

Factorizations of Multilinear Operators via Σ-Operators

18.10.2017
17:00–17:30

Samuel García
CIMAT (Mexico)

According to resent research of Maite F., every multilinear operator $T : X_1 \times \cdots \times X_n \to Y$ has an associated Σ-operator $f : \Sigma_{X_1 \ldots X_n} \to Y$. New approximations of a wide range of ideal properties of multilinear operators can be stated in terms of Σ-operators. As a result, factorizations of multilinear operators can be obtained. These factorizations are diverse in nature, for instance, multilinear operators that factor through Hilbert or L_p spaces. This new approach of ideal properties leads us to a natural theory of ideals of Σ-operators; moreover, particular tensor norms, named Σ-tensor norms, are naturally involved. In this talk, we will see a few examples of factorizations of multilinear operators and the Σ-tensor norms involved.

Growth rates of frequently hypercyclic harmonic functions

19.10.2017
17:30–18:00

Clifford Gilmore
University of Helsinki (Finland)

The notion of frequent hypercyclicity stems from ergodic theory and it was introduced by Bayart and Grivaux (2004). Many natural continuous linear operators are frequently hypercyclic, for instance the differentiation operator on the space of entire holomorphic functions. We consider the partial differentiation operator acting on the space of harmonic functions on R^n and we identify minimal growth rates, in terms of the L^2 norm on spheres, of its frequently hypercyclic vectors. This answers a question posed by Blasco, Bonilla and Grosse-Erdmann (2010).
This is joint work with Eero Saksman and Hans-Olav Tylli.

20.10.2017
17:00–17:30

Some progress on the polynomial Dunford–Pettis property

Joaquín M. Gutiérrez
Universidad Politécnica de Madrid (Spain)

A Banach space E has the Dunford-Pettis property (DPP, for short) if every weakly compact (linear) operator on E is completely continuous. The $\mathfrak{L}_1$ and the $\mathfrak{L}_\infty$-spaces have the DPP. In 1979 R. A. Ryan proved that E has the DPP if and only if every weakly compact polynomial on E is completely continuous.
Every k-homogeneous (continuous) polynomial $P \in \mathscr{P}(^kE, F)$ between Banach spaces E and F admits an extension $\widetilde{P} \in \mathscr{P}(^kE^{**}, F^{**})$ called the Aron-Berner extension. The Aron-Berner extension of every weakly compact polynomial $P \in \mathscr{P}(^kE, F)$ is F-valued, that is, $\widetilde{P}(E^{**}) \subseteq F$, but there are nonweakly compact polynomials with F-valued Aron-Berner extension.
We strengthen Ryan's result by showing that E has the DPP if and only if every polynomial $P \in \mathscr{P}(^kE, F)$ with F-valued Aron-Berner extension is completely continuous whenever the closed unit ball B_{F^*} is weak-star sequentially compact. This gives a partial answer to a question raised in 2003 by I. Villanueva and J. M. Gutiérrez. They proved the result for spaces E such that every operator from E into the dual E^* is weakly compact, but the question remained open for other spaces such as the $\mathfrak{L}_1$-spaces.
Joint work with Raffaella Cilia.

17.10.2017
17:00–17:30

Spectra of some algebras of entire functions of bounded type, generated by the sequence of polynomials on a Banach space

Svitlana Halushchak
Vasyl Stefanyk Precarpathian National University (Ukraine)

Let X be a complex Banach space. Let $\mathbb{P} = \{P_1, \ldots, P_n, \ldots\}$ be the sequence of polynomials such that P_n is an n-homogeneous continuous complex-valued polynomial on X for every positive integer n and the elements of $\mathbb{P}$ are algebraically independent. Let us denote $H_{\mathbb{P}}(X)$ the closed subalgebra, generated by the elements of $\mathbb{P}$, of the the Fréchet algebra $H_b(X)$ of all entire functions of bounded type on X. Note that every $f \in H_{\mathbb{P}}(X)$ can be uniquely represented in the form

$$f(x) = f(0) + \sum_{n=1}^{\infty} \sum_{k_1+2k_2+\ldots+nk_n=n} a_{k_1\ldots k_n} P_1^{k_1}(x) \cdots P_n^{k_n}(x).$$

Consequently, every continuous homomorphism $\varphi : H_{\mathbb{P}}(X) \to \mathbb{C}$ is uniquely determined by its values on the elements of $\mathbb{P}$. Therefore, the spectrum of $H_{\mathbb{P}}(X)$ can be identified with some set of sequences of complex numbers.
In this work we describe spectra of some algebras $H_{\mathbb{P}}(X)$.

A remark on smooth images of Banach spaces

Michal Johanis
Charles University (Czech Republic)

20.10.2017
15:30–16:00

Let X be a non-separable super-reflexive Banach space with density a regular cardinal. Then for any separable Banach space Y of dimension at least two there exists a C^∞-smooth surjective mapping $f\colon X \to Y$ such that the restriction of f onto any separable subspace of X fails to be surjective. This solves a problem posed by Aron, Jaramillo, and Ransford.
This is a joint work with Petr Hájek.

Inversion of nonsmooth maps between Banach spaces

Sebastián Lajara
Universidad de Castilla-La Mancha (Spain)

18.10.2017
15:00–15:30

We study the invertibility nonsmooth maps between infinite-dimensional Banach spaces. To this end, we introduce an analogue of the notion of pseudo-Jacobian matrix of Jeyakumar and Luc in this infinite-dimensional setting. Using this, we obtain several inversion results. In particular, we give a version of the classical Hadamard integral condition for global invertibility in this context.
This talk is based on a joint work with Jesús A. Jaramillo and Óscar Madiedo.

Biholomorphic functions on dual Banach spaces

Mary Lilian Lourenço
Universidade de São Paulo (Brazil)

19.10.2017
16:00–16:30

Let E be a dual Banach space and let $U \subset E$ be a bounded domain with the separation property such that its weak* closure coincides with its norm closure. Let $f : U \to U$ be a holomorphic function such that $f(p) = p$. We study some conditions of df_p such that f is biholomorphic function.
This is joint work with H. Carrión and P. Galindo.

The sup-norm vs. the norm of the coefficients

Martín Ignacio Mansilla
Universidad de Buenos Aires & CONICET (Argentina)

18.10.2017
17:30–18:00

Let $A^m_{p,r}(n)$ be the best constant such that the following inequality holds: for every m-homogeneous polynomial $P(z) = \sum_{|\alpha|=m} a_\alpha z^\alpha$ in n complex variables,

$$\Big(\sum_{|\alpha|=m} |a_\alpha|^r\Big)^{1/r} \leq A^m_{p,r}(n) \sup_{z \in B_{\ell_p^n}} |P(z)|.$$

In this talk we show the ideas behind the study of the asymptotic behavior of these constants when n goes to infinity. We also relate these estimates with the asymptotic behavior of the mixed unconditional constant $\chi_{p,q}(m,n)$ i.e., the least $\lambda > 0$ such that for every m- homogeneous polynomial P in n complex variables written as above it holds

$$\sup_{z\in B_{\ell_q^n}} \sum_{|\alpha|=m} |a_\alpha z^\alpha| \leq \lambda \left| \sup_{z\in B_{\ell_p^n}} \sum_{|\alpha|=m} a_\alpha z^\alpha \right|.$$

If time allows, we will treat the relation between $\chi_{p,q}(m,n)$ and the so-called mixed Bohr radii for holomorphic functions and exhibit some partial results on its asymptotic growth.
Joint work with Daniel Galicer and Santiago Muro.

18.10.2017
17:00–17:30

Some remarks on non-symmetric polarization

Felipe Marceca
Universidad de Buenos Aires & CONICET (Argentina)

Let $P : \mathbb{C}^n \to \mathbb{C}$ be an m-homogeneous polynomial given by

$$P(x) = \sum_{1\leq j_1\leq\ldots\leq j_m\leq n} c_{j_1\ldots j_m} x_{j_1}\ldots x_{j_m}.$$

Defant and Schlüters defined a non-symmetric associated m-form $L_P : (\mathbb{C}^n)^m \to \mathbb{C}$ by

$$L_P\left(x^{(1)},\ldots,x^{(m)}\right) = \sum_{1\leq j_1\leq\ldots\leq j_m\leq n} c_{j_1\ldots j_m} x^{(1)}_{j_1}\ldots x^{(m)}_{j_m},$$

and estimated the norm of L_P on $(\mathbb{C}^n, \|\cdot\|)^m$ by the norm of P on $(\mathbb{C}^n, \|\cdot\|)$ times a $(c\log n)^{m^2}$ factor for every 1-unconditional norm $\|\cdot\|$ on $\mathbb{C}^n$. We will discuss a symmetrization procedure based on a card-shuffling algorithm which (together with Defant and Schlüters' argument) brings the constant term down to $(cm\log n)^{m-1}$. Regarding the lower bound, we will show that the optimal constant is bigger than $(c\log n)^{m/2}$ when $n \gg m$. Finally, the case of ℓ_p-norms $\|\cdot\|_p$ with $1 \leq p < 2$ will be addressed.
Joint work with Daniel Carando.

17.10.2017
15:30–16:00

Multilinear Marcinkiewicz-Zygmund inequalities

Martín Diego Mazzitelli
Universidad Nacional del Comahue & CONICET (Argentina)

Given $1 \leq p,q,r \leq \infty$, the triple (p,q,r) is said to satisfy a Marcinkiewicz-Zygmund inequality if there is a constant $C \geq 1$ such that for each continuous linear operator $T\colon L^q(\mu) \to L^p(\nu)$, each $n \in \mathbb{N}$ and functions $f_1,\ldots,f_n \in L^q(\mu)$,

$$\left\| \left(\sum_{k=1}^n |T(f_k)|^r \right)^{1/r} \right\|_{L^p(\nu)} \leq C\|T\| \left\| \left(\sum_{k=1}^n |f_k|^r \right)^{1/r} \right\|_{L^q(\mu)}. \tag{1}$$

Particular cases of (1) include well-known inequalities of Marcinkiewicz, Zygmund, Paley, Grothendieck and Herz among others. A systematic study of these vector-valued inequalities was addressed by Defant-Junge and Gasch-Maligranda, who determined the set of triples (p,q,r) and, in almost all the cases, the best constants $C \geq 1$ satisfying (1). The aim of this talk is to discuss the extension of these classical inequalities to the multilinear setting. As an application, we will obtain vector-valued estimates for multilinear singular integrals. We will also study the connection between Marcinkiewicz-Zygmund inequalities and weighted inequalities.

The minimal volume of simplices containing a convex body

Mariano Merzbacher
Universidad de Buenos Aires & CONICET (Argentina)

19.10.2017
17:30–18:00

Given a convex body $K \subset \mathbb{R}^n$, we define its simplex volume ratio, $S(K) := \min\left(\frac{\mathrm{vol}(S)}{\mathrm{vol}(K)}\right)$, where the minimum is taken over all simplices $S \subset \mathbb{R}^n$ containing K. Bounding $S(K)$ is an old problem in convex geometry.
We show that, given convex body K, there is a simplex S contained in it with the same barycenter and "large volume". This is achieved using stochastic geometric techniques. More precisely, if K is in isotropic position, we present a method to find centered simplices with that property that works with extremely high probability. As a consequence, we provide correct asymptotic bounds (when the dimension goes to infinity) for $S(K)$. We also give an alternative non-probabilistic approach to this problem. Up to an absolute constant our bound cannot be lessened.

Joint work with Daniel Galicer and Damian Pinasco.

Interpolating sequences for weighted spaces of analytic functions on the unit ball of a Hilbert space

Alejandro Miralles
Universitat Jaume I (Spain)

20.10.2017
16:00–16:30

We show that an interpolating sequence for the weighted Banach space of analytic functions on the unit ball of a Hilbert space is hyperbolically separated. In the case of the so-called standard weights, a sufficient condition for a sequence to be linear interpolating is given in terms of Carleson type measures. Other conditions to be linearly interpolating are provided as well. Our results apply to the space of Bloch functions of such unit ball.
Joint work with O. Blasco, P. Galindo y M. Lindström

20.10.2017
15:00–15:30

Algebras of Lorch analytic mappings defined in uniform algebras

Luiza A. Moraes
Universidade Federal do Rio de Janeiro (Brazil)

If E is a commutative complex Banach algebra with unit and U is an open (non empty) connected subset of E, a mapping $f : U \to E$ is analytic in U in the sense of Lorch if given any $a \in U$ there exists $\rho > 0$ and there exist unique elements $a_n \in E$, such that $B_\rho(a) \subset U$ and $f(z) = \sum_{n=0}^{\infty} a_n (z-a)^n$, for all z in $\|z-a\| < \rho$.
The space $\mathscr{H}_L(U)$ of the mappings from U into E that are analytic in the sense of Lorch is usually endowed with a convenient topology τ_d which coincides with the topology τ_b when $U = E$ or $U = B_r(z_0) = \{z \in E; \|z - z_0\| < r\}$ $(z_0 \in E, r > 0)$. In this talk we will consider the case $U = E_\Omega = \{z \in E; \sigma(z) \subset \Omega\}$ where $\Omega \subsetneq \mathbb{C}$ is a simply connected domain. We will present a description of the spectrum of $(\mathscr{H}_L(E_\Omega), \tau_d)$ in case E is a uniform algebra and, as a consequence, we will get that in this case the algebra $(\mathscr{H}_L(E_\Omega), \tau_d)$ is semi-simple. Moreover we will consider $\mathscr{H}_L(E_\Omega)$ endowed with the compact open topology τ_0 and present a description of the spectrum of $(\mathscr{H}_L(E_\Omega), \tau_0)$ in case E is a separable C^*-algebra.

The results presented in this talk are part of a joint work with Guilherme V. S. Mauro, from the Universidade Federal da Integração Latino-Americana (UNILA), Brasil.

References

[1] G. V. S. Mauro and L. A. Moraes, *Algebras of Lorch analytic mappings on uniform algebras.*, Preprint

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18.10.2017
17:30–18:00

Hypercyclic algebras

Dimitris Papathanasiou
UMONS (Greece)

Aron et al have shown that no translation operator acting on the space of entire functions supports a hypercyclic algebra, that is a subalgebra consisting entirely (but the origin), of hypercyclic vectors. Later, Shkarin, and, with a different approach, Bayart and Matheron, proved that the differentiation operator on the same space supports a hypercyclic algebra, leading to the following question raised by Aron: "For which functions Φ of exponential type, does $\Phi(D)$ 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 transcedental functions. Furthermore, we anwer 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 the space of complex valued, smooth functions defined on the real line.

References

[1] J. Bes, J.A. Conejero and D. Papathanasiou, *Convlolution operators supporting hypercyclic algebras.*, J. Math. Anal. Appl., 445, 1232-1238, 2017..

[2] J. Bes, J.A. Conejero and D. Papathanasiou, *Hypercyclic algebras for convolution and composition operators.*, arXiv: 1706.08022, 2017.

[3] J. Bes and D. Papathanasiou, *Algebrable sets of hypercyclic vectors for convolution operators.*, arXiv: 1706.08651, 2017

The Radius of Analyticity for Real Analytic Functions

20.10.2017
18:00–18:30

Raymond A. Ryan
National University of Ireland Galway (Ireland)

Let U be an open subset of a real Banach space E and let $f\colon E \to \mathbb{R}$ be a real analytic function. Then f is said to be *fully analytic* in U if for every point a in U, the Taylor series of f at a converges uniformly to f in every closed ball centered at a and contained in U.
Now consider a function f defined by a power series $\sum_n P_n$ with radius of uniform convergence $R > 0$. The *radius of analyticity* of f at a is defined to be the largest $r > 0$ such that f is fully analytic in the open ball at a with radius r. T. Nguyen (2009) showed that the radius of analyticity is at least $R/\sqrt{e}$. Recently, Papadiamantis and Sarantopoulos (2016) improved this lower bound to $R/\sqrt{2}$.
Motivated by these results, we define a *constant of analyticity* for real Banach spaces and we study the behaviour of this constant for some classical spaces and for Banach lattices.
Joint work with Christopher Boyd and Nina Snigireva.

Non-symmetric polarization

18.10.2017
16:00–16:30

Sunke Schlüeters
Carl von Ossietzky University Oldenburg (Germany)

Let P be an m-homogeneous polynomial in n-complex variables $x_1, \dots, x_n$. Clearly, P has a unique representation in the form

$$P(x) = \sum_{1 \le j_1 \le \dots \le j_m \le n} c_{(j_1,\dots,j_m)}\, x_{j_1} \cdots x_{j_m},$$

and the m-form

$$L_P(x^{(1)}, \dots, x^{(m)}) = \sum_{1 \le j_1 \le \dots \le j_m \le n} c_{(j_1,\dots,j_m)}\, x^{(1)}_{j_1} \cdots x^{(m)}_{j_m}$$

satisfies $L_P(x, \dots, x) = P(x)$ for every $x \in \mathbb{C}^n$. We show that, although L_P in general is non-symmetric, for a large class of reasonable norms $\|\cdot\|$ on $\mathbb{C}^n$ the norm of L_P on $(\mathbb{C}^n, \|\cdot\|)^m$ up to a logarithmic term $(c \log n)^{m^2}$ can be estimated by the norm of P on $(\mathbb{C}^n, \|\cdot\|)$; here $c \ge 1$ denotes a universal constant. Moreover, for the ℓ_p-norms $\|\cdot\|_p$, $1 \le p < 2$ the logarithmic term in the number n of variables is even superfluous.

17.10.2017
17:00–17:30

Hardy type spaces of general Dirichlet series

Ingo Schoolmann
Carl von Ossietzky University (Germany)

A general Dirichlet series is a formal series $\sum a_n e^{-\lambda_n s}$, where s is a complex variable, (a_n) is a complex sequence of coefficients, and (λ_n) a frequency, i.e. a strictly increasing non-negative real sequence which tends to $+\infty$. Choosing $\lambda_n = \log n$ leads to ordinary Dirichlet series $\sum a_n n^{-s}$. Due to an ingenious idea of H. Bohr the recent $\mathscr{H}_p$-theory of ordinary Dirichlet series is intimately linked with Fourier analysis on the infinite dimensional polytorus $\mathbb{T}^\infty$. For a fixed frequency (λ_n) and $1 \le p \le \infty$ we define Hardy spaces $\mathscr{H}_p(\lambda)$ of λ-Dirichlet series. Inspired by ideas of Bohr and Helson we indicate that in this more general situation a natural substitute of the polytorus $\mathbb{T}^\infty$ is given by the Bohr-compactification of $\mathbb{R}$, and sketch how Fourier analysis on this group rules the $\mathscr{H}_p$-theory of general Dirichlet series.

17.10.2017
17:30–18:00

Random unconditional convergence of vector-valued Dirichlet series

Melisa Scotti
Universidad de Buenos Aires & CONICET (Argentina)

A basic sequence $(x_n)_n$ of a Banach space X is said to be random unconditionally convergent (RUC), if there is a constant C such that for every $N \in \mathbb{N}$ and every sequence of scalars $(a_n)_{n=1}^N$ one has that

$$\mathbb{E}\left\| \sum_{n=1}^N \varepsilon_n a_n x_n \right\| \le C \left\| \sum_{n=1}^N a_n x_n \right\|,$$

where ε_n are Rademacher random variables. Likewise, the sequence is said to be random unconditionally divergent (RUD) if the reverse inequality is satisfied.
We will focus our attention on the case where X is the Hardy space $\mathscr{H}_p(E)$ $(1 \le p \le \infty)$ of vector-valued Dirichlet series $\sum_n a_n n^{-s}$ with coefficients in E. We will discuss conditions on the Banach space E to ensure that $(x_n n^{-s})_n$ is RUC (or RUD) in $\mathscr{H}_p(E)$ for every sequence $(x_n)_n \subset E$. Furthermore, we will explore the relation between this question and the concepts of type and cotype.
This talk is based on joint work with Daniel Carando, Felipe Marceca and Pedro Tradacete.

Homomorphisms between uniform algebras of holomorphic functions, a look through the spectrum

17.10.2017
18:00–18:30

Joaquín Camilo Singer
Universidad de Buenos Aires & CONICET (Argentina)

Let X and Y be Banach spaces with respective unit balls B_X and B_Y. With the aim of studying the homomorphisms between the uniform algebras $\mathscr{H}^\infty(B_X)$ and $\mathscr{H}^\infty(B_Y)$ not as individuals but as a whole we consider the generalized spectrum $\mathscr{M}_\infty(B_X, B_Y)$ as the set of all algebra homomorphisms between $\mathscr{H}^\infty(B_X)$ and $\mathscr{H}^\infty(B_Y)$ and study the correlations and differences with the usual spectrum in the scalar case.

This talk is based on joint work with Verónica Dimant.

On mappings between Banach spaces preserving $\mathscr{A}$-compact sets

19.10.2017
15:30–16:00

Pablo Turco
Universidad de Buenos Aires & CONICET (Argentina)

In the recent years, the behavior of polynomials and analytic functions on certain classes of compact sets received the attention of several authors. Namely, Aron and Rueda [2] showed that homogeneous polynomials map p-compact sets into p-compact sets. Later, Aron, Çalişkan, García and Maestre [1] addressed a similar question for holomorphic mappings.
Inspired in these results we are interested in the following questions. Fixed a class of $\mathscr{A}$-compact sets (of Carl and Stephani [3]) where $\mathscr{A}$ is a λ-Banach operator ideal: Does every homogeneous polynomial between Banach spaces preserve $\mathscr{A}$-compact sets? When this not the case, is there any subclass of homogeneous polynomials for which the answer is positive? In this talk, making use of the theory of *tensorstability* for operator ideals, we give some conditions under which homogeneous polynomials preserve $\mathscr{A}$-compact sets. We also show several examples. Our approach allows us to extend the obtained results to holomorphic functions between Banach spaces.

Joint work with Silvia Lassalle (Universidad de San Andrés and CONICET).

References

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17.10.2017
17:30–18:00

The spectrum of the algebra of symmetric analytic functions on L_∞

Taras Vasylyshyn
Vasyl Stefanyk Precarpathian National University (Ukraine)

Let L_∞ be the complex Banach space of all Lebesgue measurable essentially bounded complex-valued functions x on $[0,1]$ with norm

$$\|x\|_\infty = \operatorname{ess\,sup}_{t\in[0,1]}|x(t)|.$$

Let Ξ be the set of all measurable bijections of $[0,1]$ that preserve the measure. A function $f : L_\infty \to \mathbb{C}$ is called symmetric if for every $x \in L_\infty$ and for every $\sigma \in \Xi$

$$f(x\circ\sigma) = f(x).$$

Let $H_{bs}(L_\infty)$ be the Fréchet algebra of all entire symmetric functions $f : L_\infty \to \mathbb{C}$ which are bounded on bounded sets endowed with the topology of uniform convergence on bounded sets. We describe the spectrum of the algebra $H_{bs}(L_\infty)$.

17.10.2017
16:00–16:30

Some problems related to algebras of symmetric analytic functions on Banach spaces

Andriy Zagorodnyuk
Vasyl Stefanyk Precarpathian National University (Ukraine)

Let G be a group of isometric operators on a Banach space X. A function f on X is *G-symmetric* if it is invariant with respect to actions of operators in G. In the talk we will discuss some questions related to algebras of G-symmetric analytic functions on X and their spectra for various groups G.
