Research Workshop of the Israel Science Foundation

Interactions between Logic, Topological structures and Banach spaces theory

EILAT, May 19–24, 2013

Eilat Campus of Ben-Gurion University of the Negev, ISRAEL

Center for Advanced Studies in Mathematics,
Department of Mathematics

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Contents

Registration

Saturday, May 18
19:00 - 21:00 Hotel Adi

Sunday, May 19
09:00 - 09:30 University Campus, building N 5, room N 122

Program

Day One — Sunday, May 19

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09:30 - 09:40	opening ceremony
	Morning session (Chair: Matatyahu Rubin)
09:40 - 10:30	**Plenary lecture :** Przemyslaw Wojtaszczyk, *Performance of greedy algorithm in estimating Kolmogorov diameters*
10:35 - 11:05	Yosef Yomdin, *Jet Spaces: from Groups Action to Smooth Extensions and Numerical Solving of PDE's*
11:10 - 11:40	Joseph E. Borzellino, *Orbifolds, Spaces of Smooth Mappings between them, and Embeddings*
11:40 - 11:55	coffee break
11:55 - 12:25	Andreas Blass, *Fragile ultrafilters and the Tukey ordering*
12:30 - 13:00	Norbert Sauer, *Homogeneous metric spaces*
13:00 - 15:00	lunch break
	Afternoon session (Chair: Andreas Blass)
15:00 - 15:50	**Plenary lecture:** Istvan Juhasz, *Good, splendid, and Jakovlev*
15:55 - 16:25	Stefan Geschke, *How continuous colorings turned into clopen graphs*
16:30 - 17:00	Sabine Koppelberg, *Remarks on multiple recurrent points*
17:00 - 17:20	coffee break
17:20 - 17:50	Tomasz Rybicki, *On the reconstruction of a smooth geometric structure from its automorphism groups*
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The opening session and all talks take place in the building N 5, room N 122.

Day Two — Monday, May 20

Morning session (Chair: Martin Weese)

09:00 - 09:50	**Plenary lecture:** Saharon Shelah, *Ultra-products of finite cardinals: spectrum of an ultrafilter*
09:55 - 10:25	Menachem Kojman, *Disjoint Refinements*
10:30 - 11:00	Assaf Hasson, *Looking for geometrically minimal strongly minimal sets*
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11:20 - 11:50	Boaz Tsaban, *Coherent Omission of Intervals*
11:55 - 12:25	Juris Steprans, *Universal Functions*
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13:00 - 15:00	lunch break

Afternoon session (Chair: Juris Steprans)

15:00 - 15:50	**Plenary lecture :** Martin Weese, *On the structure of superatomic Boolean algebras*
15:55 - 16:25	Don Monk, *Results and problems on minimum cardinals on Boolean algebras*
16:30 - 17:00	Robert Bonnet, *About subalgebras of the Boolean algebra of the real line*
17:00 - 17:20	coffee break
17:20 - 17:50	María Jesús Chasco, *On the splitting problem for twisted sums of topological groups and its relationship with three-space problems*
17:55 - 18:25	Saak S. Gabriyelyan, *On characterized subgroups of Abelian topological groups X and the group of all X-valued null sequences*
18:30 - 19:00	Alexander V. Osipov, *On Homeomorphism Groups and the C-Compact-Open Topology*

All talks take place in the building N 5, room N 122.

Day Three – Tuesday, May 21

Morning session (Chair: Vladimir Pestov)

09:00 - 09:50 **Plenary lecture:**
Slawomir Solecki, *Point realizations of Boolean actions*

09:55 - 10:25 Benjamin Weiss, *The ergodic theory of hypercyclic operators*

10:30 - 11:00 Eli Glasner, *On affine embeddings of dynamical systems*

11:00 - 11:20 coffee break

11:20 - 11:50 Piotr Koszmider, *Radon-Nikodym compacta, zero-dimensionality and the isomorphic classification of $C(K)$ Banach spaces*

11:55 - 12:25 Witold Marciszewski, *On Borel structures in function spaces*

12:30 - 13:00 Michael Megrelishvili, *Representations of topological groups on Asplund and Rosenthal Banach spaces*

13:00 - 15:00 lunch break

Afternoon session (Chair: Slawomir Solecki)

15:00 - 15:50 **Plenary lecture:**
Wieslaw Kubiś, *Approximative Fraïssé limits*

15:55 - 16:25 Sergei Gul'ko, *On complemented subspaces of $C_p(X)$*

16:30 - 17:00 Taras Banakh, *Characterizing topological spaces and topological groups that are (locally) homeomorphic to LF-spaces*

17:00 - 17:20 coffee break

17:20 - 17:50 Tadeusz Dobrowolski, *Characterizing locally contractible coset spaces*

17:55 - 18:25 Vesko Valov, *Alexandroff type manifolds and homogeneous compacta*

18:30 - 19:00 Alex Usvyatsov, *On the existence of l_p types*

All talks take place in the building N 5, room N 122.

Day Four – Wednesday, May 22

Swimming at the Dolphin Reef Eilat and Conference Dinner

Day Five – Thursday, May 23

Morning session (Chair: Vladimir Fonf)

09:00 - 09:50	**Plenary lecture:** Matatyahu Rubin, *Open questions about reconstruction problems and locally moving groups*
09:55 - 10:25	Mirna Džamonja, *Universality of Banach spaces*
10:30 - 11:00	Bill Johnson, *Subspaces of L_p that embed into $L_p(\mu)$ with μ finite*
11:00 - 11:20	coffee break
11:20 - 11:50	Stanimir Troyanski, *Renormings of Banach spaces with uncountable unconditional basis*
11:55 - 12:25	Antonio Pallares, *Polyhedrality in pieces*
12:30 - 13:00	Richard Smith, *Topology, polyhedrality and smoothness in Banach spaces*
13:00 - 15:00	lunch break

All talks take place in the building N 5, room N 122

Day Five – Thursday, May 23

Morning parallel session, talks take place in the building N 5, room N 123 (Chair: Norbert Sauer)

09:00 - 09:20 Luie Polev, *Minimality of some topological groups*

09:25 - 09:45 Doron Shafrir, *Universal locally p-finite groups do not exist in some cardinals*

09:50 - 10:10 Omer Mermelstein, *On a reduct of Hrushovski's uncollapsed construction*

10:15 - 10:35 Haim Horowitz, *Saccharinity with c.c.c.*

10:40 - 11:00 Nadav Meir, *Symmetric and elementary indivisibilty of structures and their compositions*

11:00 - 11:20 coffee break

11:20 - 11:50 Artem Chernikov, *Model theoretic approach to de Finetti theory*

11:55 - 12:25 Menachem Shlossberg, *Free non-archimedean topological groups*

12:30 - 13:00 Denis I. Saveliev, *On ultrafilter extensions of first-order models*

Afternoon session (Chair: Arkady Leiderman)

15:00 - 15:50 **Plenary lecture:**
Vladimir Fonf, *Isometric characterization of the Gurariy space*

15:55 - 16:25 Clemente Zanco, *Point-finite coverings of Banach spaces*

16:30 - 17:00 Antonio Avilés, *A Banach space in which every injective operator is surjective*

17:00 - 17:20 coffee break

17:20 - 17:50 Libor Veselý, *Extension of continuous convex functions I*

17:55 - 18:25 Carlo Alberto De Bernardi, *Extension of continuous convex functions II*

18:30 - 19:00 Michael Levin, *A property of* $C_p[0,1]$

19:00 closing

All talks of the afternoon session take place in the building N 5, room N 122.

Abstracts of Plenary Lectures

Isometric characterization of the Gurariy space.

Vladimir Fonf
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Coauthors: Przemyslav Wojtaszczyk

The Gurariy space was constructed (by Gurariy) more than 50 years ago, and since then it attracted many mathematicians. A separable Banach space G is called a Gurariy space if for any isometric embedding T of finite-dimensional normed space E into G and for any finite-dimensional normed space M containing E, for any $\epsilon > 0$, there is a linear extension $S : M \to G$ with $||S||||S^{-1}|| < 1 + \epsilon$. Recall that a pair of normed spaces $E \subset M$ has the unique Hahn-Banach extension property (UHB) if any linear bounded functional on E has the unique Hahn-Banach extension on M. The main result of our work is

Theorem. Let X be a separable Banach space. Then TFAE
1) $X = G$
2) For any pair of finite-dimensional normed spaces $E \subset M$ with UHB and such that $\mathrm{codim}_M E = 1$, and for any isometric embedding $T : E \to X$, there is isometric extension $S : M \to X$.

Good, splendid, and Jakovlev

Istvan Juhasz
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A topological space is called *good* if it is T_3, countably compact, and locally countable. It is *splendid* if, in addition, every countable subset of it has countable closure. In the first part of the talk I intend to review what we know about the, apparently very hard, problem if good or splendid spaces of size continuum (or even of arbitrarily large size) exist.
In the second part I define and treat the analogous problems for *Jakovlev* spaces. These are variants of good spaces where local countability is somewhat strengthened while countable compactness is somewhat weakened. They are of interest mainly because they provide counterexamples to a very old problem of Arhangel'skij concerning weakly first countable compacta. It is still unknown if uncountable Jakovlev spaces exist in ZFC but many recent consistency results were obtained jointly with W. Weiss about constructing large Jakovlev spaces that are in close analogy with similar results on the size of good spaces.

Approximative Fraïssé limits

Wieslaw Kubiś
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We shall present a theory of *approximative* Fraïssé limits, based on categories enriched over metric spaces. Our motivation was the *Gurarii space* and partially the *Urysohn space*, which are two canonical examples of approximative Fraïssé limits. The former one was not recognized as such, until the recent work of Kubiś & Solecki [*A proof of uniqueness of the Gurarii space*, to appear in Israel J. Math.].

Roughly speaking, the *Fraïssé limit* of a class of structures S is a structure U which is the limit of a chain of S-structures, containing isomorphic copies of all S-structures and having the following homogeneity property: Given an isomorphism $f\colon A \to B$, where $A, B \in S$ are substructures of U, there exists an automorphism $h\colon U \to U$ such that $h|A = f$. In the countable case, the Fraïssé limit is unique up to isomorphism and universal for the class of all structures that are representable as limits of countable chains of S-structures.

Approximative version of the Fraïssé limit usually shows up when dealing with structures involving some metric spaces. Homogeneity is then understood as follows: Every isomorphism $f\colon A \to B$ between small substructures of U can be approximated by automorphisms of U. The Gurarii space is a canonical example of an approximative Fraïssé limit. Another example is the *pseudo-arc*, an interesting compact connected metric space, representable as the inverse limit of unit intervals, recognized previously in [T. Irwin, S. Solecki, *Projective Fraïssé limits and the pseudo-arc*, Trans. Amer. Math. Soc. **358**, no. 7 (2006) 3077–3096] as a canonical quotient of the *projective Fraïssé limit* of a certain class of graphs. As an application of our theory, we obtain a new and simple characterization of the pseudo-arc.

Another application comes by considering the category of non-expansive linear operators between finite-dimensional Banach spaces, aiming at universal projections. As a byproduct, we obtain a simple proof of the result of Wojtaszczyk [*Some remarks on the Gurarij space*, Studia Math. **41** (1972) 207–210] on complemented embeddings of isometric L_1 preduals into the Gurarii space.

The lecture is based mostly on [1], [2]

1. W. Kubiś, *Metric-enriched categories and approximate Fraïssé limits*, preprint, arXiv: http://arxiv.org/abs/1210.6506
2. W. Kubiś, *Fraïssé sequences: category-theoretic approach to universal homogeneous structures*, preprint, arXiv :http://arxiv.org/abs/0711.1683

Open questions about reconstruction problems and locally moving groups

Matatyahu Rubin
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The term a "reconstruction problem" refers in this abstract to questions of the type: Given two mathematical structures whose automorphism groups are isomorphic in the algebraic sense, does it imply that the two structures are isomorphic?

Example - Theorem Take two open subsets of two normed spaces. Suppose that their groups of auto-homeomorphisms are isomorphic. Then the two open sets are homeomorphic.

There are various variants of this type of questions. We call them *reconstruction problems in the wide sense.*

I shall tell about a variety of open reconstruction problems in the wide sense. The types of structures to be considered are: topological spaces with and without extra structure, measure spaces, trees as posets and trees as graphs.

The central notion which is employed in dealing with reconstruction of such types of structures is a "locally moving group". It has the following simple definition: A group G is *locally moving*, if it is a group of automorphisms of a complete atomless Boolean algebra B such that for every $a \in B \setminus \{0^B\}$ there is $g \in G \setminus \{Id\}$ such that g is the identity outside a, namely, for every $b \in B$ which is disjoint from a, $g(b) = b$.

Note that in the above definition G is a subgroup of $Aut(B)$ and not necessarily all of $Aut(B)$.

A certain reconstruction theorem about locally moving groups is a first step in all the reconstruction theorems that will be considered in my lecture.

I shall also present questions concerning locally moving groups, and questions concerning the Urysohn Space.

Ultra-products of finite cardinals: spectrum of an ultrafilter

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For a regular ultrafilter D of a cardinal λ we may consider the following spectrum $spec(D)$: the set of ultra-products of finite cardinals. An old question of Keisler is what can this set be, and works of Keisler, myself and Koppelberg give much information. We give a final answer and may deal with related problems.

Point realizations of Boolean actions

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Coauthors: Justin Moore

We will look at measure preserving Boolean actions of Polish groups and consider the problem, going back to Mackey, of determining when such actions have point realizations. We will explore the boundary line between the groups whose all Boolean actions have point realizability and those that do not have this property. One older result, joint with Ola Kwiatkowska, states that Boolean actions of Polish groups of isometries of locally compact separable metric spaces can always be point realized. On the other hand, a recent result with Justin Moore, states that the group of all continuous functions from an uncountable compact space to the circle does not have the point realizability property. In several respects, this last group is quite different from other groups that were shown earlier, by Vershik, Becker and Glasner-Weiss, not to have the point realizability property. Connections with the solution to Hilbert's 5-th problem, with the concentration of measure phenomena, and with the Cameron-Martin theorem will be mentioned.

On the structure of superatomic Boolean algebras

Martin Weese
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We survey results concerning the structure of superatomic Boolean algebras.

Performance of greedy algorithm in estimating Kolmogorov diameters

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The problem we discuss originates from the reduced basis method introduced for the accurate online evaluation of solutions to a parameter dependent family of elliptic partial differential equations. Abstractly, it can be viewed as determining a "good" n dimensional space $\mathcal{H}_n$ to be used in approximating the elements of a compact set $\mathcal{F}$ in a Hilbert or Banach space $\mathcal{H}$ where solutions live. One, by now popular, computational approach is to find $\mathcal{H}_n$ through a greedy strategy. It is natural to compare the approximation performance of the $\mathcal{H}_n$ generated by this strategy with that of the Kolmogorov widths $d_n(\mathcal{F})$ since the latter gives the smallest error that can be achieved by subspaces of fixed dimension n. The first such comparisons, given in A. Buffa, Y. Maday, A.T. Patera, C. Prud'homme, and G. Turinici, *A Priori convergence of the greedy algorithm for the parameterized reduced basis* M2AN Math. Model. Numer. Anal., **46**(2012), 595–603, show that the approximation error in a Hilbert space, $\sigma_n(\mathcal{F}) := \text{dist}(\mathcal{F}, \mathcal{H}_n)$, obtained by the greedy strategy satisfies $\sigma_n(\mathcal{F}) \leq Cn2^n d_n(\mathcal{F})$. In this talk, various improvements

of this result will be given both in Hilbert and in Banach space case. We discuss both individual comparison between $\sigma_n(\mathcal{F})$ and $d_s(\mathcal{F})$ and the estimates for classes when we assume certain decay of $d_n(\mathcal{F})$ and obtain related decay of $\sigma_n(\mathcal{F})$.

This talk reports the joint work with Peter Binev, Albert Cohen, Wolfgang Dahmen, Ronald DeVore and Guergana Petro.

Abstracts of Regular Talks

A Banach space in which every injective operator is surjective

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We construct a Banach space of the form $C(K)$ such that all injective operators are surjective.

The logic of the topological structure of the ordinal numbers

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We consider a transfinite sequence of topologies on the class of ordinal numbers, which are obtained by adding at each step new open sets that are sets of accumulation points in the previous topologies. We characterize the non-isolated points in these topologies in terms of a generalized form of stationary reflection, and we present a result (joint with M. Magidor and H. Sakai) showing that in the constructible universe, the regular non-isolated points for the $(n+1)$-th topology are precise the Pi^1_n-indescribable cardinals. Finally, we discuss the outstanding question of topological completeness for Generalized Provability Logics with respect to these topologies.

Recognizing topological groups, which are locally homeomorphic to LF-spaces

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An LF-space is the direct limit of an increasing sequence of Frechet spaces in the category of locally convex topological vector spaces. By an old result of Mankiewicz (1974), each infinite-dimensional separable LF-space is homeomorphic to one of thee model spaces: the Hilbert space ℓ_2, the direct limit $\mathbb{R}^\infty = \lim \mathbb{R}^n$ of finite-dimensional Euclidean spaces, or the product $\ell_2 \times \mathbb{R}^\infty$. Topological characterizations of the spaces ℓ_2 and $\mathbb{R}^\infty$ were given by H.Torunczyk (1980) and K.Sakai (1984), respectively. We shall present a topological characterization of the space $\ell_2 \times \mathbb{R}^\infty$ and shall apply this characterization to detecting topological groups which are (locally) homeomorphic to LF-spaces. In particular, we prove that for each non-compact connected surface M the group $H_c(M)$ of compactly supported homeomorphisms of M, endowed with the Whitney topology, is homeomorphic to $\ell_2 \times \mathbb{R}^\infty$ or to $\mathbb{Z} \times \ell_2 \times \mathbb{R}^\infty$.

Extension of continuous convex functions II

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Coauthors: Libor Vesely

Let Y be a subspace of a real topological vector space X. We say that the couple (X, Y) has the CE-*property* ("convex extension property") if each continuous convex function on Y admits a continuous convex extension defined on X.

By our results on the CE-property and by using a characterization of the CE-property in terms of extension of certain operators, we obtain generalizations and alternative proofs of extension theorems of Rosenthal and Sobczyk.

Moreover, using a decomposition lemma due to Johnson and Zippin, we obtain that, if X is the $c_0(\Gamma)$-sum or the $\ell_p(\Gamma)$-sum $(1 < p < \infty)$ of separable Banach spaces, then the couple (X, Y) has the CE-property, for each subspace Y of X.

Fragile ultrafilters and the Tukey ordering

Andreas Blass
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I plan to describe two properties of ultrafilters, which remain somewhat mysterious despite recent progress. One is fragility, the property of being destroyed whenever a new real is adjoined to the universe. The other is being at the top of the Tukey ordering. The known information about these suggests a strong correlation between these different-looking properties.

About subalgebras of the Boolean algebra of the real line

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Coauthors: U. Abraham and M. Rubin

We consider the Boolean algebra $B(R)$ over the real line R: its space of ultrafilters is (called) the Alexandroff "double arrow space". We prove the following two results:

Theorem 1. Every subalgebra of $B(R)$ is generated by countably many chains.

Theorem 2. There is a subalgebra of $B(R)$ which is not generated by finitely many chains.

We recall also that every chain in $B(R)$ is order-embeddable in R.

Orbifolds, Spaces of Smooth Mappings Between Them, and Embeddings

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This talk will discuss orbifolds and the topological structure of spaces of smooth maps between them. Orbifolds are a mild generalization of the notion of a manifold where the property of being locally Euclidean is relaxed to being locally a Euclidean quotient by finite group. After reviewing known results about the structure of spaces of smooth mappings between manifolds, I will discuss some corresponding results for orbifolds as well as some of the challenges encountered in providing adequate generalizations. Lastly, I will discuss spaces of embeddings. Much of the talk will focus on relevant background, definitions and examples.

On the splitting problem for twisted sums of topological groups and its relationship with three-space problems

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We study twisted sums for pairs of topological groups $(\mathbb{T}, G)$ where $\mathbb{T}$ is the unit circle of the complex plane and G is an arbitrary topological Abelian group. A twisted sum of $\mathbb{T}$ and G is a topological group X with a subgroup X_0 topologically isomorphic to $\mathbb{T}$ and such that the quotient X/X_0 topologically isomorphic to G. The twisted sum splits if X is topologically isomorphic to $X_0 \times G$.

We will find classes of topological groups for which every twisted sum $(\mathbb{T}, G)$ splits, and find some important subclasses of it. We also study the relation of splitting twisted sums $(\mathbb{T}, G)$ with the existence of quasi-characters on G and with three-space problems for topological groups. The subject is inspired on concepts known in the framework of topological vector spaces such as the notion of $\mathcal{K}$-space introduced by Kalton and Peck [in 1979].

Model theoretic approach to de Finetti theory

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Coauthors: Itai Ben Yaacov

A classical theorem of de Finetti from probability theory says that a sequence of random variables is exchangeable if and only if it is independent and identically distributed over its tail sigma-algebra. Various multi-dimensional generalizations of this characterization form the so-called exchangeability theory. I will discuss an abstract model theoretic

approach to these phenomena in terms of forking calculus, canonical bases and Morley sequences in the context of an arbitrary stable first-order theory, in the sense of continuous logic (which specializes to the classical case considering the theory of $[0,1]$-valued random variables equipped with the L^1 metric). Joint work with Itai Ben Yaacov.

Characterizing locally contractible coset spaces

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Coauthors: Sergey Antonyan

Let H be a closed subgroup of a locally compact group G. For the coset space G/H, the following conditions are equivalent: (1) G/H is locally contractible; (2) G/H is finite-dimensional and locally connected; (3) G/H is a manifold. A consequence (claimed by J. Szenthe in his 1974 paper):

If a locally compact almost connected group G acts effectively and transitively on a locally contractible locally compact space X, then G is a Lie group and X is a manifold.

Universality of Banach spaces

Mirna Džamonjaa
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We explore various negative universality results in the class of Banach spaces of a given density, with various kinds of embeddings.

On characterized subgroups of Abelian topological groups X and the group of all X-valued null sequences

Saak S. Gabriyelyan
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Let X be an Abelian topological group. A subgroup H of X is characterized if there is a sequence $\mathbf{u} = \{u_n\}$ in the dual group of X such that $H = \{x \in X : (u_n, x) \to 1\}$. We reduce the study of characterized subgroups of X to the study of characterized subgroups of compact metrizable Abelian groups. Let $c_0(X)$ be the group of all X-valued null sequences and $\mathfrak{u}_0$ be the uniform topology on $c_0(X)$. If X is compact we prove that $c_0(X)$ is a characterized subgroup of $X^{\mathbb{N}}$ if and only if $X \cong \mathbb{T}^n \times F$, where $n \geq 0$ and F is a finite Abelian group. For every compact Abelian group X, the group $c_0(X)$ is a $\mathfrak{g}$-closed subgroup of $X^{\mathbb{N}}$. Some general properties of $(c_0(X), \mathfrak{u}_0)$ and its dual group are given. In particular, we describe compact subsets of $(c_0(X), \mathfrak{u}_0)$.

How continuous colorings turned into clopen graphs

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I will survey some old and new results on clopen graphs on separable metric spaces, starting with the Open Coloring Axiom of Abraham, Rubin and Shelah and finishing with some recent results on the embedding structure of such graphs.

On affine embeddings of dynamical systems

Eli Glasner
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For an embedding $X \to Q$, of a dynamical system (X, G) into an affine dynamical system (Q, G) with $Q = cls(co(X))$, we ask which properties of X are inherited by Q. I will report on some old works by Gl, and Gl-Weiss, and on a new work by Gl-Megrelishvili.

On complemented subspaces of $C_p(X)$

Sergei Gul'ko
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Coauthors: Tatiyana Khmyleva, Vadim Lazarev

We will consider some questions concerning complemented subspaces of $C_p(X)$ of all continuous functions endowed with the pointwise topology.

Looking for geometrically minimal strongly minimal sets

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Coauthors: Omer Mermelstein

Since Hrushvoski's refutation of Zilber's trichotomy conjecture in the late 1980s, and despite the strong evidence of the importance of a classification of the geometries of strongly minimal sets, no reformulation of Zilber's conjecture has been obtained. In this talk we describe the first step in an attempt to formulate a structure theory for the geometries of strongly minimal sets: we will try to investigate the possibility of there being "geometrically minimal" strongly minimal sets.

Saccharinity with c.c.c.

Haim Horowitz
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Coauthors: Saharon Shelah

We consider the problem of forcing measurability with respect to ideals that come from definable forcing. By working with suitable c.c.c. creature forcing and iterating along a homogeneous non-wellfounded linear order, we obtain a c.c.c. forcing which leads to a model of ZF where countable choice fails and all sets of reals are measurable with respect to the ideal given by the forcing. This is joint work with Saharon Shelah.

Polish G-spaces similar to logic G-spaces of continuous structures

Aleksander Ivanov
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Coauthors: Barbara Majcher-Iwanow (University of Wroclaw)

We extend the concept of nice topologies of H.Becker to the general case of Polish G-spaces (Becker assumed that G is a subgroup of $Sym(\mathbb{N})$).

Let (Y, d) be a Polish space and $Iso(Y, d)$ be the corresponding isometry group endowed with the pointwise convergence topology. Then $Iso(Y, d)$ is a Polish group.

For any countable continuous signature L the set Y_L of all continuous metric L-structures on (Y, d) can be considered as a Polish $Iso(Y, d)$-space. We call this action logic. Note that for any tuple y from Y the map taking elements g from G to $d(y, g(y))$ can be considered as a graded subgroup of G. For any continuous sentence ϕ we have a graded subset of Y_L taking structures M from Y_L to ϕ^M.

Typical notions naturally arising for logic actions can be applied in the general case of a Polish G-space X with G as above. If we consider G together with a family of graded subgroups as above, then distinguishing an appropriate family $\mathcal{B}$ of graded subsets of X we arrive at the situation very similar to the logic space Y_L. Under some natural assumptions we can treat elements of $\mathcal{B}$ as continuous formulas. Many theorems of traditional model theory can be generalised to topological statements concerning spaces with topologies generated by such $\mathcal{B}$.

The case when our generalised model theory is considered over the bounded Urysohn space $\mathbb{U}$ is central in our work. This material is based on some new amalgamation properties of $\mathbb{U}$.

Subspaces of L_p that embed into $L_p(\mu)$ with μ finite

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40 years ago, Enflo and Rosenthal proved that $\ell_p(\aleph_1)$, $1 < p < 2$, does not (isomorphically) embed into $L_p(\mu)$ with μ a finite measure. Schechtman and I complement that theorem by proving that if X is a subspace of an L_p space, $1 < p < 2$, and $\ell_p(\aleph_1)$ does not embed into X, then X embeds into $L_p(\mu)$ for some finite measure μ.

This work is an outgrowth of an unsuccessful attempt to solve a problem left open by Enflo and Rosenthal; namely, whether $L_p(\mu)$ can have an unconditional basis when $1 < p \neq 2 < \infty$, the measure μ is finite, and the density character of $L_p(\mu)$ is $\aleph_1$. If the answer is yes, then the results of Enflo and Rosenthal would show that "$L_p(\{-1,1\})^{2^{\aleph_0}}$) has an unconditional basis" is undecidable.

On Arens-Kaplansky type theorem for real locally C*-algebras.

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For a real unital locally C*-algebra A, the spectrum-space X of its complexification B with its natural topology is known to be a compactly generated Tychonoff space. This space X with certain homeomorphism onto itself is shown to be sufficient to determine A at an algebraic level. A structure of a filtered space on X is then used to determine A as well topologically, thus obtaining Arens-Kaplansky type theorem for real locally C*-algebras.

Disjoint Refinements

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Erdős, Hajnal, Komjath, Juhasz and Shelah proved with additional cardinal arithmetic assumptions, mostly with the GCH, generalizations of Miller's theorem on the existence of disjoint refinements for certain families of sets. With the Shelah's Revised GCH theorem, asymptotic versions of these theorems are now proved in ZFC.

Remarks on multiple recurrent points

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We recall the notion of a multiple recurrent point in a dynamical system and state results and examples on existence / non-existence of such points.

Radon-Nikodym compacta, zero-dimensionality and the isomorphic classification of C(K) Banach spaces

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We discuss our recent solution with Antonio Avileś of Namioka's problem that unlike Eberlein compacta or Corson compacta, the Radon-Nikodym compacta are not closed under continuous images. It is, among others, related to the question when a C(K) Banach space is isomorphic to a C(L) for L zero-dimensional and in general to the isomorphic classification of C(K) spaces.

A property of $C_p[0,1]$

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We show that for a finite dimensional compact metric space X, the space $C_p(X)$ can be obtained as an open continuous linear image of $C_p[0,1]$.

On Borel structures in function spaces

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Coauthors: Grzegorz Plebanek and Roman Pol

Given a space $C(K)$ of continuous real-valued functions on a compact space K, we shall consider the following three σ-algebras in $C(K)$: the σ-algebras $Borel(C(K), norm)$, $Borel(C(K), weak)$, $Borel(C(K), pointwise)$ of Borel sets in $C(K)$ with respect to the uniform topology, the weak topology, or the pointwise topology in $C(K)$, respectively. We will discuss some problems concerning these σ-algebras in $C(K)$. In particular, we show (in ZFC) that, for the remainder ω^* of the Čech-Stone compactifcation $\beta\omega$ of the space of natural numbers ω, the weak and the pointwise topology generate different Borel structures in the space $C(\omega^*)$.

Representations of topological groups on Asplund and Rosenthal Banach spaces

Michael Megrelishvili
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By a (*topologically faithful*) representation of a topological group G on a Banach space V we mean a continuous homomorphism (resp., *topological group embedding*) $h : G \to Is(V)$ of a topological group G into the group $Is(V)$ of all linear onto isometries of V endowed with the strong operator topology. We survey some recent results around representability of topological groups in nice classes of Banach spaces. Like: Hilbert, reflexive, Asplund and *Rosenthal* (i.e., not containing an isomorphic copy of l_1). We sketch in particular the following new result.

Theorem. (Glasner and Megrelishvili) *The Polish topological group $H_+[0,1]$ of all orientation preserving self-homeomorphisms of the closed interval is representable on a separable Rosenthal Banach space and not representable on any Asplund space.*

Some open problems will be also presented.

Symmetric and elementary indivisibilty of structures and their compositions

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An $\mathcal{L}$ structure $\mathcal{M}$ is *indivisible* if for every colouring of M in two colours, there is a monochromatic substructure $\mathcal{M}' \subseteq \mathcal{M}$ such that $\mathcal{M}'$ is isomorphic to $\mathcal{M}$.

An $\mathcal{L}$ structure $\mathcal{M}$ is *symmetrically indivisible* if for every colouring of M in two colours, there is a monochromatic substructure $\mathcal{M}' \subseteq \mathcal{M}$ such that $\mathcal{M}'$ is isomorphic to $\mathcal{M}$ and $\mathcal{M}'$ is symmetrically embedded in $\mathcal{M}$ (That is, any automorphism of $\mathcal{M}'$ can be extended to an automorphism of $\mathcal{M}$)

An $\mathcal{L}$ structure $\mathcal{M}$ is *elementary indivisible* if for every colouring of M in two colours, there is a monochromatic substructure $\mathcal{M}' \subseteq \mathcal{M}$ such that $\mathcal{M}'$ is isomorphic to $\mathcal{M}$ and $\mathcal{M}'$ is elementarily embedded in $\mathcal{M}$ (That is, every first order formula with parameters from $\mathcal{M}'$ is true in $\mathcal{M}'$ if and only if it is true in $\mathcal{M}$)

In this talk we will give an introduction to symmetric indivisibility, introduce the notion of "composition of structures", or (a generalization of) "lexicographic product" and show it's application to symmetric indivisibility and elementary indivisibility.

On a reduct of Hrushovski's uncollapsed construction

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At the end of the 1980's Hrushovski refuted Zilber's structural conjecture which was a suggested classification of the geometries of strongly minimal sets into trivial, locally modular and "rich" (algebraically closed field) geometries. Hrushovski constructed a strongly minimal structure with a non-locally modular geometry that does not interpret an infinite group.

We work in Hrushovski's uncollapsed construction for a symmetric ternary relation. In the talk we will zip through the description of the construction and describe a specific reduct of it. This type of reduct appears to be a generalization of the original construction. We present our findings regarding the specific reduct and ask some questions which we hope to answer in the future.

Results and problems on minimum cardinals on Boolean algebras

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We sketch the proof that there is a superatomic BA such that $t(A) < s_{mm}(A)$. ($t(A)$ is the least size of a tower; $s_{mm}(A)$ is the least size of a maximal ideal independent set) Problems will be mentioned concerning small independence, minimum free sequences, and small irredundance.

On Homeomorphism Groups and the C-Compact-Open Topology

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Let Hom(X) be a group of all homeomorphisms of a topological space X onto itself. It is well known that if X is a compact Hausdorff space, then Hom(X) with the compact-open topology is a topological group. For non-compact case, we have a classic theorem of Arens [1].

Theorem (Arens). Let X be a noncompact Hausdorff space. If every point in X has a neighbourhood that is a continuum, then Hom(X) with the compact-open topology is a topological group.

Like compact-open topology on Hom(X), we define a C-compact-open topology.

Theorem 1. If X is a pseudocompact space, then Hom(X) with the C-compact-open topology is a topological group.

Important natural examples of homogeneous spaces are provided by quotients of topological groups with respect to closed subgroups. Though these quotients need not be topological groups themselves, they are always homogeneous topological spaces. A natural question for consideration is the following one: which homogeneous spaces can be represented as quotients of topological group with respect to closed subgroup?

A partial answer to this question was obtained in the following

Theorem (N. Bourbaki). Every homogeneous zero-dimensional compact space X can be represented as the quotient space of a topological group with respect to a closed subgroup.

The following theorem extends a class of spaces to pseudocompact spaces.

Theorem 2. Every homogeneous zero-dimensional pseudocompact space X can be represented as the quotient space of a topological group with respect to a closed subgroup.

References

[1] R. Arens, Topologies for homeomorphism groups, Amer. J. Math.68,(1946), 593-610.

Polyhedrality in pieces

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Coauthors: V. Fonf, R. Smith and S. Troyanski

The aim of this talk is to present a tool that make the task of finding equivalent norms on certain Banach spaces easer and more transparent. The hypothesis of the tool is based on countable decompositions on the unit sphere S_X and corresponding sequences of subsets of the dual ball B_{X^*} of a given Banach space X. The sufficient conditions for this tool in the separable case are also necessary. We provide some examples.

Minimality of some topological groups

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A topological group G is *minimal* if it does not admit a strictly coarser Hausdorff group topology. First I will discuss semidirect products. From a result by M. Megrelishvili it follows that for a compact abelian group G, the semidirect product of G and $Aut(G)$ is minimal. I will show that the same result holds for non-abelian compact groups. I will also discuss the minimality of $H_+([0,1])$, the subgroup of $Homeo([0,1])$ that consists of orientation preserving homeomorphisms of $[0,1]$, and the minimality of the group $Homeo(S^1)$.

On the reconstruction of a smooth geometric structure from its automorphism groups

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In view of a fundamental result due to Matatyahu Rubin, a regular topological space is determined by any factorizable non-fixing homeomorphism group of it. There exist several generalizations of this theorem. In this talk I shall deal with the reconstruction problem of a smooth geometric structure from its automorphism groups by using Rubin's results and a notion of a weak Lie subgroup of a regular Lie group (due to myself). In particular I shall formulate new sufficient conditions for such a reconstruction. Several examples will be presented.

Homogeneous metric spaces

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A metric space $\mathrm{M} = (M; d)$ is *homogeneous* if for every isometry f of a finite subspace of M to a subspace of M there exists an isometry of M onto M extending f.

The space M is *universal* if it isometrically embeds every finite metric space F with $\mathrm{dist(F)} \subseteq \mathrm{dist(M)}$.

A labelling l of the edges of a graph G with labels in the set $\mathcal{R}$ of the positive reals is $\mathcal{R}$-*metric* if there exists a metric space $\mathrm{M} = (V(\mathrm{G}; d)$ with $\mathrm{dist(M)} \subseteq R$ for which the distance function d agrees with l on the edges of G.

A metric space $\mathrm{M} = (M; d)$ has *property* OS if for every $\epsilon > 0$ and every uniformly continuous and bounded function f to the reals there exists an isometric copy $\mathrm{M}^* = (M^*; d)$ of M in M for which: $\sup\{|f(x) - f(y)| : x, y \in M^*\} < \epsilon$.

The metric space M is *approximately indivisible* if for every epsilon > 0 and $n \in \omega$ and function $f : M \to n$ there exist $i \in n$ and an isometric copy $\mathrm{M}^* = (M^*; d)$ of M in M which is in the epsilon neighbourhood of $f^{-1}(i)$.

Let $\mathcal{R}$ be a set of reals then the operation $\oplus$, or $\oplus_{\mathcal{R}}$ if the distinction is needed, is given by: $a \oplus b := \sup\{x \in \mathcal{R} \mid x \leq a + b\}$ and $\boldsymbol{Aso}$ denotes the set of closed subsets $\mathcal{R}$ of the non negative reals for which the operation $\oplus_{\mathcal{R}}$ is associative.

Theorem 1 Let $0 \in \mathcal{R}$ be a set of non negative reals with 0 as a limit. Then there exists a separable, complete, homogeneous, universal metric space if and only if $\mathcal{R} \in \boldsymbol{Aso}$.

Theorem 2 A metric space $\mathrm{M} = (M; d)$ has property OS if and only if it is approximately indivisible.

Theorem 3 Every bounded, uncountable, separable, complete, homogeneous, universal metric space $\mathrm{M} = (M; d)$ has property OS.

Theorem 4 All labeled graphs G with labels in $\mathcal{R}$ are $\mathcal{R}$-*metric* iff $\mathcal{R} \in \boldsymbol{Aso}$ and "two obvious metric conditions" hold.

On ultrafilter extensions of first-order models

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We show that any first-order model $\mathfrak{A}$ extends, in a canonical way, to a model $\beta\mathfrak{A}$ (of the same language) which consists of all ultrafilters over it and carries the standard compact Hausdorff topology on the set of ultrafilters. The extension procedure preserves relationships between models: any homomorphism of $\mathfrak{A}$ into $\mathfrak{B}$ extends to a continuous homomorphism of $\beta\mathfrak{A}$ into $\beta\mathfrak{B}$. Moreover, if a model $\mathfrak{C}$ carries a compact Hausdorff topology which is compatible, in a sense, with its structure, then any homomorphism of $\mathfrak{A}$ into $\mathfrak{C}$ extends to a continuous homomorphism of $\beta\mathfrak{A}$ into $\mathfrak{C}$; analogous statements are true also for embeddings and some other types of relationships between models. Thus the construction provides a natural generalization of the Stone – Cech compactification of a discrete space to the case when the space is endowed with a first-order structure.

Universal locally p-finite groups do not exist in some cardinals

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For a class of models $\mathcal{C}$, a model M in $\mathcal{C}$ is called universal if every N in $\mathcal{C}$ with the same cardinality can be embedded in M. Grossberg and Shelah showed for the class of locally finite groups, that for many cardinals there is no universal group. Using their methods I will prove a parallel result for locally p-finite groups.

Free non-archimedean topological groups

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We study free topological groups defined over uniform spaces in some subclasses of the class **NA** of non-archimedean groups. Our descriptions of the corresponding topologies show that for metrizable uniformities the corresponding free balanced, free abelian and free Boolean **NA** groups are also metrizable. Graev type ultra-metrics determine the corresponding free topologies. Such results are in a striking contrast with free balanced and free abelian topological groups cases (in standard varieties). If time allows we will provide a couple of applications: one concerning the epimorphism problem in **NA** and the other regarding surjectively universal groups. The talk is based on a paper which will appear in a special issue of Comment. Math. Univ. Carolinae, dedicated to the 120th birthday anniversary of E. Cech (joint work with Michael Megrelishvili). An arXiv version is also available.

Topology, polyhedrality and smoothness in Banach spaces

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Coauthors: V. Bible, V. Fonf, A. Pallares, S. Troyanski

We present a property of subsets of a dual Banach space X^*, expressed in terms of the w^* and norm topologies, which gives a sufficient condition for the existence of equivalent polyhedral norms and C^∞ smooth norms on X. These results generalise some well known theorems of Fonf, Hájek and Haydon.

Universal Functions

Juris Steprans
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Coauthors: P. Larson, A. Miller and W. Weiss

A function of two variables $F(x, y)$ is universal iff for every other function $G(x, y)$ there exists functions $h(x)$ and $k(y)$ with

$$G(x, y) = F(h(x), k(y)).$$

This talks will report some results obtained with P. Larson, A. Miller and W. Weiss. For example, it is consistent with ZFC that there is no universal function on the reals,

Renormings of Banach spaces with uncountable unconditional basis.

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We present some renormings results of differents geometrical properties of the unit ball in Banach spaces with uncountable unconditional basis. The most of the result are from joint works with V. Fonf, A. Pallares and R. Smith.

Coherent Omission of Intervals

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I will describe a combinatorial method for constructing subsets of the real line with strong (selective) topological properties. This method synthesizes and extends ideas from the Galvin–Miller classical construction of a γ-set and the Bartoszyński–Shelah construction of a Hurewicz non-σ-compact set of reals.

This method lead to solutions of some notorious problems concerning the topology of the real line. Some of its major results are:

1. A construction of a nontrivial γ-set of reals from a weaker hypothesis than all those hitherto used (some axiom is necessary).

2. There is a non-σ-compact, *productively* Hurewicz set of reals.

3. There is (in ZFC) a set of reals, of the uncountable cardinality $\mathfrak{b}$, such that for each sequence of open covers, one can choose for each n two elements U_n and V_n from the n-th cover, such that the sequence $U_1 \cup V_1, U_2 \cup V_2, \ldots$ is a point-cofinite cover of our set.
   (*Two* cannot be provably reduced to *one* here.)

This method shows that very natural constructions produce such sets.

Credits: Item (1) is joint work with Tal Orenshtein. Item (2) is joint work with Lyubomyr Zdomskyy. The nice name *coherent omission of intervals* for the method I propose was coined by Zdomskyy.

The main reference for this method is: B. Tsaban, *Menger's and Hurewicz's Problems: Solutions from "The Book" and refinements*, Contemporary Mathematics 533 (2011), 211-226.
http://arxiv.org/abs/0909.5645

On the existence of l_p types

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I will discuss some recent developments concerning existence and characterization of l_p types over Banach spaces. By a famous result of Krivine and Maurey, the existence of such a type implies that the space embeds an l_p space almost isometrically.

Alexandroff type manifolds and homogeneous compacta

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Finite-dimensional homogeneous metric compacta have some properties which are possessed by Euclidean manifolds. It is still unknown if every n-dimensional homoheneous ANR is a V^n-continuum in the sense of Alexandroff, as well as if every Alexandroff $D^{n-2}(G)$-manifold is a Mazurkiewicz $D^{n-2}(G)$-manifold (here $D^{n-2}(G)$ is the class of all spaces with cohomological dimension $dim_G \leq n-2$). Searching for the answers of the above questions we introduce and investigate $K^n(G)$-manifolds.

Extension of continuous convex functions I

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Coauthors: Carlo A. De Bernardi (Università degli studi di Milano, Italy)

This is a joint work with C.A. De Bernardi, in which we continue the research by Borwein–Montesinos–Vanderverff (2006) and Veselý–Zajíček (2010) on extendability of continuous convex functions.

Let X be a topological vector space, $Y \subset X$ a subspace, $0 \in A \subset X$ an open convex set, and f a continuous convex function on $A \cap Y$. Then, let us say that $E(X, Y, A, f)$ holds if f admits a continuous convex extension defined on A. It is known that $E(X, Y, A, f)$ can fail: e.g., there exists a continuous convex function on c_0 that has no continuous convex extension to ℓ_∞.

We provide characterizations of $E(X, Y, A, f)$ for any fixed f, as well as characterizations of validity of $E(X, Y, A, f)$ for each f. These characterizations enable us to prove, for instance, the following two results, based on a notion of "conditional separability", weaker than separability (equivalent to separability for metrizable topologies). Assume that X is a locally convex space.

(a) If X/Y is conditionally separable then every continuous convex function on Y admits a continuous convex extension defined on X.

(b) If X is conditionally separable then, for each open convex set $0 \in A \subset X$, every continuous convex function on $A \cap Y$ admits a continuous convex extension defined on X.

The ergodic theory of hypercyclic operators

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A hypercyclic operator is a bounded linear operator S on a Banach space B that has vectors with dense orbits. There has been some recent work on such operators that preserve Borel probability measures ν with full support such that (B, ν, S) is an ergodic system. I will explain these notions and describe a construction of such an operator S on Hilbert space H with the following universal property: For any abstract aperiodic probability preserving transformation (X, μ, T) there is an S-invariant measure ν such that (H, ν, S) is isomorphic to (X, μ, T). I will also explain how this generalizes to actions of locally compact groups.

Jet Spaces: from Groups Action to Smooth Extensions and Numerical Solving of PDE's

Yosef Yomdin
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For X a subset in R^n jet space $J^d(X)$ is formed by polynomials of a fixed degree d, taken at each point x in X. Each C^k-smooth mapping f of X defines its "jet-extension", obtained by Taylor polynomial of f of degree d at each point x in X. A group of diffeomeorphisms of X acts also on the corresponding jet-spaces, and this action has been used in our joint work with M. Rubin. On the other hand, jet spaces play a central role in Whitney problem on extension of smooth functions, where recently a serious progress has been achieved. Yet another important application of jets appears in efficient numerical solving of ODE's and PDE's. I plan to present some of these topics.

Point-finite coverings of Banach spaces

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It is known that any Banach space admits a point-finite covering by closed, bounded convex sets with nonempty interior. The following question seems very far from being answered: which Banach spaces admit point-finite coverings by balls? Some starting results are presented in this framework.

Additional information

Accommodation

The rooms for all conference participants are reserved at the Hotel Adi (3*). All rooms are air-conditioned. If you want to make a tea or coffee in the room then bringing your own small electric kettle could be a good idea.

Transportation

In the morning a bus will leave the hotels to the university campus at 08:30, and back from the campus to the hotels at 19:05. The cost of short or medium size journey in Eilat by taxi range from 25-30 shekels.

Meals

Breakfasts will be served in the hotel. During the working days of the conference (May 19, 20, 21, 23) free lunches will be organized for all participants in the restaurant at the university campus. The restaurant is located in the main building N 5, where all lectures will take place. The name of the restaurant literally means "Pots and Books".
There are a lot of restaurants in Eilat which could be found via Internet.
We have a Conference dinner on Wednesday, May 22.

Banking

The New Israeli Shekel - abbreviated as NIS, is Israel's currency. There are coins of 10, 50 agorot and 1, 2, 5, 10 shekels, as well as 20, 50, 100 and 200 shekels notes. Money can be exchanged at any of the street exchange bureau, ATMs or any of Israel's major banks (i.e.- Hapoalim, Leumi, Discount bank, and Hamizrahi).

Banks - When exchanging money at a bank, you will be charged a fixed exchange fee, and if you choose to use an exchange place on the street, you will not be charged for the transaction, but will receive a lower rate than the banks supply.

If you do choose to use the bank, try not to exchange money on Sundays. The reason is that while the Israeli banks are open on Sundays, there is no world currency trade on Sunday, and the banks charge a commission that is higher than on any other day of the week. Exchange rates: 1 US$ $\sim$ 3.56, 1 Euro $\sim$ 4.64 (May 10, 2013)

All major credit cards (Visa and Master Card/Eurocard, American Express and Diners Club) are widely accepted throughout Israel.

Electricity

The electrical current in Israel is 220 volt AC, single phase, 50 Hertz. 110V appliances can be used only with a step-up transformer or appropriate adapter.

Internet access

Computer and internet access facilities are available in the building N 5, where all lectures will take place. Computers room is N 121. For the duration of the conference, a wireless access to the Internet will be arranged.

Swimming at the Dolphin Reef Eilat and Conference Dinner on Day Four

Wednesday, May 22:
Swimming at the Dolphin Reef Eilat

All participants and accompanying persons are invited to take part in the swimming at the Dolphin Reef Eilat.
Swimming at the Dolphin Reef Eilat, Time 10:00-14:00
`http://www.dolphinreef.co.il/`
Leaving the hotel Adi by bus at 9:30.
The participants are advised to have the following items with them:
– Hat, sun-glasses, towel
– Sun blocking lotion (blocking factor > 30 is recommended),
– Swimming clothes, snorkel
Water and a light lunch (including salads and sandwiches) will be provided.
Weather in May: Sunny, no rains at all. Air Temperature: around +35 Celsius daily. Water temperature is stable: 22 - 24 Celsius.
We shall have a reserved area on the private beach.
The standard activities will be swimming and snorkeling.
Entrance, lunch and the standard activities will be paid by the conference.
Extra activities (to be paid by the participants) are
(1) Swimming with Dolphins. Price: 305 NIS for 30 minutes. (2) Diving with Dolphins. Price: 252 NIS for 30 minutes.
(Prices include advanced booking discount for snorkeling and diving with dolphins).

Wednesday, May 22: Conference Dinner in the Restaurant Chateau Eilat
`http://www.eilat-city.net/Article-ltr.aspx?ArticleId=332`
The restaurant is located in King City Eilat.
Address: Shvil haYam No. 6, Phone: 08-6332666
Restaurant Chateau Eilat is kosher.
Menu includes asian chicken salad, vegetable salads, chicken wings, vegetable sushi, steak, chicken, noodles, fillet Dennis fish, dessert, and more.
Light beverages, wine and beer are unlimited.
Time : 20:00 – 23:00. Leaving the hotel Adi by bus at 19:45.

Participants:
Antonio Avilés (University of Murcia, Spain)
Andreas Blass (University of Michigan, USA)
Robert Bonnet (University of Savoie, France)
Joseph Borzellino (California Polytechnic State University, USA)
Montserrat Bruguera (Universitat Politechnica de Catalunya, Spain)
María Jesús Chasco (University of Navarra, Spain)
Artem Chernikov (Hebrew University, Israel)
Tadeusz Dobrowolski (Pittsburg State University, USA)
Mirna Džamonja (University of East Anglia, Norwich, UK)
Stefan Geschke (Hausdorff Center for Mathematics, Bonn, Germany)
Eli Glasner (Tel Aviv University, Israel)
Sergei Gul'ko (Tomsk University, Russia)
Alexander Ivanov (Wroclaw University, Poland)
William Johnson (Texas A&M University, USA)
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Haim Horowitz (Hebrew University, Israel)
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Piotr Koszmider (Institute of Mathematics, Warsaw, Poland)
Wieslaw Kubiś (University in Kielce, Poland and Institute of Mathematics, Prague, Czech Republic)
Noa Lavi (Hebrew University, Israel)
Elisabetta Maluta (Politecnico of Milano, Italy)
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Menachem Shlossberg (Bar-Ilan University, Israel)
Richard Smith (University College Dublin, Ireland)
Juris Steprans (York University, Canada)
Vera Tonic (Ben-Gurion University, Israel)
Stanimir Troyanski (University of Murcia, Spain)
Boaz Tsaban (Bar-Ilan University, Israel)
Alex Usvyatsov (Open University, Israel)

Vesko Valov (Nipissing University, North Bay, Canada)
Libor Veselý (University of Milano, Italy)
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Benjamin Weiss (Hebrew University, Israel)
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