1. Editor’s note

Dear Friends,

1. Marion Scheepers, of the Department of Mathematics, Boise State University, was awarded the honor and title of Distinguished Professor. This award is, among other things, in recognition of Prof. Scheepers’ founding the field of Selection Principles and of his seminal contributions to this field. I use this opportunity to greet Prof. Scheepers for this well-deserved recognition, and wish him many more happy years of fruitful research.

2. Bemaer presentations for most of the lectures delivered at that Fourth Workshop on Coverings, Selections and Games in Topology (aka SPMC2012), are available at the Workshop’s webpage: http://u.cs.biu.ac.il/~tsaban/spmc12/ under Lectures.

3. A special Issue of Topology and its Applications will be dedicated to SPM and related topics, following the SPMC2012 conference. Submissions of high quality research papers is welcome. Submit your paper to TopApplIssue@gmail.com

Submissions will be refereed according to the usual high standards of the journal, and the final acceptance or rejection decision will be made by the journal’s chief editors.

Submission deadline: October 31, 2012. Later submissions may be considered in exceptional cases. Email the mentioned address in case of a need for deadline extension.

4. Last, but not least: Our long announcements section is concluded by one where Malliaris and Shelah announce a solution to the minimal tower problem. Surprisingly, their solution is that \( p = t \), in ZFC! This solution is expected to have deep implications within SPM and related areas. Details about the minimal tower problem are available at Issue 5 of this bulletin: http://arxiv.org/pdf/math/0305367.pdf Greetings to Malliaris and Shelah for their breakthrough.

With best regards,

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2. Long announcements

2.1. Universally Kuratowski–Ulam space and open-open games. We examine the class of spaces in which the second player has winning strategy in the open-open game. We shown that this space is not an universally Kuratowski-Ulam. We also show that the games G and G7 introduced by Daniels, Kunen, Zhou are not equivalent.
2.2. Maximal functions and the additivity of various families of null sets. It is shown to be consistent with set theory that every set of reals of size \( \mathbb{N}_1 \) is null yet there are planes in Euclidean 3-space whose union is not null. Similar results are obtained for circles in the plane as well as other geometric objects. The proof relies on results from harmonic analysis about the boundedness of certain maximal operators and a measure-theoretic pigeonhole principle.

Juris Steprans

2.3. Additivity of the Gerlits–Nagy property and concentrated sets. We settle all problems posed by Scheepers, in his tribute paper to Gerlits, concerning the additivity of the Gerlits–Nagy property and related additivity numbers. We apply these results to compute the minimal number of concentrated sets of reals (in the sense of Besicovitch) whose union, when multiplied with a Gerlits–Nagy space, need not have Rothberger’s property. We apply these methods to construct a large family of spaces, whose product with every Hurewicz space has Menger’s property.

Boaz Tsaban and Lyubomyr Zdomskyy

2.4. On \( \infty \)-convex sets in spaces of scatteredly continuous functions. Given a topological space \( X \), we study the structure of \( \infty \)-convex subsets in the space \( SC_p(X) \) of scatteredly continuous functions on \( X \). Our main result says that for a topological space \( X \) with countable strong fan tightness, each potentially bounded \( \infty \)-convex subset \( F \subset SC_p(X) \) is weakly discontinuous in the sense that each non-empty subset \( A \subset X \) contains an open dense subset \( U \subset A \) such that each function \( f|U, f \in F \), is continuous. This implies that \( F \) has network weight \( nw(F) \leq nw(X) \).

Taras Banakh, Bogdan Bokalo, and Nadiya Kolos

2.5. Diagonalizations of dense families. We develop a unified framework for the study of properties involving diagonalizations of dense families in topological spaces. We provide complete classification of these properties. Our classification draws upon a large number of methods and constructions scattered in the literature, and on some novel results concerning the classical properties.

Comment. The field is very active these days, and consequently we may have missed some references. We would appreciate any feedback, in particular concerning relevant references.

Maddalena Bonanzinga, Filippo Cammaroto, Bruno Antonio Pansera, Boaz Tsaban

2.6. On open-open games of uncountable length. The aim of this note is to investigate the open-open game of uncountable length. We introduce a cardinal number \( \mu(X) \), which says how long the Player I has to play to ensure a victory. It is proved that \( su(X) \leq \mu(X) \leq su(X)^+ \). We also introduce the class \( C_{\kappa} \) of topological
spaces that can be represented as the inverse limit of \( \kappa \)-complete system \( \{ X_\sigma, \pi_\rho, \Sigma \} \)
with \( \omega(X_\sigma) \leq \kappa \) and skeletal bonding maps. It is shown that product of spaces which
belong to \( C_\kappa \) also belongs to this class and \( \mu(X) \leq \kappa \) whenever \( X \in C_\kappa \).

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2.7. Topologically invariant \( \sigma \)-ideals on Euclidean spaces. We study and clas-
sify topologically invariant \( \sigma \)-ideals with an analytic base on Euclidean spaces and
evaluate the cardinal characteristics of such ideals.

2.8. Cofinality spectrum theorems in model theory, set theory and general
topology. We connect and solve two longstanding open problems in quite differen-
t areas: the model-theoretic question of whether \( SOP_2 \) is maximal in Keisler’s order,
and the question from set theory/general topology of whether \( p = t \), the oldest
problem on cardinal invariants of the continuum. We do so by showing these problems
can be translated into instances of a more fundamental problem which we state and
solve completely, using model-theoretic methods.

3. Short announcements

3.1. Subspaces of monotonically normal compacta.

3.2. The topological Baumgartner-Hajnal theorem.

3.3. Forcing, games and families of closed sets.

3.4. Reflexivity in precompact groups and extensions.

3.5. On \( \sigma \)-convex subsets in spaces of scatteredly continuous functions.

3.6. Filter convergence in \( \beta \omega \).
3.7. Covering an uncountable square by countably many continuous functions.

http://www.ams.org/journal-getitem?pii=S0002-9939-2012-11292-4
Wieslaw Kubis; Benjamin Vejnar

3.8. Kuratowski operations revisited.

http://arxiv.org/abs/1205.3391
Szymon Plewik and Marta Walczyńska

3.9. A new class of Ramsey-classification theorems and their applications in the Tukey theory of ultrafilters.

http://arxiv.org/abs/1205.5909
Natasha Dobrinen and Stevo Todorcevic

3.10. On the structure of finite level and $\omega$-decomposable Borel functions.

http://arxiv.org/abs/1206.0795
Luca Motto Ros

3.11. Notes on the od-Lindelöf property.

http://arxiv.org/abs/1206.0722
Mathieu Baillif

3.12. Infinite dimensional perfect set theorems.

http://www.ams.org/journal-getitem?pii=S0002-9947-2012-05468-7
Tamas Matrai

3.13. Large sets in the sense of the Ellentuck topology does not admit the Kuratowski’s partition.

http://arxiv.org/abs/1206.5581
Ryszard Frankiewicz Sławomir Szczepaniak

3.14. On Borel sets belonging to every invariant ccc $\sigma$-ideal on $2^\mathbb{N}$.

http://www.ams.org/journal-getitem?pii=S0002-9939-2012-11384-X
Piotr Zakrzewski
4. Unsolved problems from earlier issues

Issue 1. Is \( \binom{\Omega}{\Gamma} = \binom{\Gamma}{\Gamma} \)?

Issue 2. Is \( U_{\text{fin}}(\mathcal{O}, \Omega) = S_{\text{fin}}(\Gamma, \Omega) \)? And if not, does \( U_{\text{fin}}(\mathcal{O}, \Gamma) \) imply \( S_{\text{fin}}(\Gamma, \Omega) \)?

Issue 4. Does \( S_1(\Omega, T) \) imply \( U_{\text{fin}}(\Gamma, \Gamma) \)?

Issue 5. Is \( p = p^* \)? (See the definition of \( p^* \) in that issue.)

Issue 6. Does there exist (in ZFC) an uncountable set satisfying \( S_{\text{fin}}(\mathcal{B}, \mathcal{B}) \)?

Issue 8. Does \( X \not\in \text{NON}(\mathcal{M}) \) and \( Y \not\in \text{D} \) imply that \( X \cup Y \not\in \text{COF}(\mathcal{M}) \)?

Issue 9 (CH). Is \( \text{Split}(\Lambda, \Lambda) \) preserved under finite unions?

Issue 10. Is \( \text{cov}(\mathcal{M}) = \text{od} \)? (See the definition of \( \text{od} \) in that issue.)

Issue 12. Could there be a Baire metric space \( M \) of weight \( \aleph_1 \) and a partition \( \mathcal{U} \) of \( M \) into \( \aleph_1 \) meager sets where for each \( \mathcal{U}' \subset \mathcal{U} \), \( \bigcup \mathcal{U}' \) has the Baire property in \( M \)?

Issue 14. Does there exist (in ZFC) a set of reals \( X \) of cardinality \( \mathfrak{d} \) such that all finite powers of \( X \) have Menger’s property \( S_{\text{fin}}(\mathcal{O}, \mathcal{O}) \)?

Issue 15. Can a Borel non-\( \sigma \)-compact group be generated by a Hurewicz subspace?

Issue 16 (MA). Is there \( X \subseteq \mathbb{R} \) of cardinality continuum, satisfying \( S_1(\mathcal{B}_\Omega, \mathcal{B}_\Gamma) \)?

Issue 17 (CH). Is there a totally imperfect \( X \) satisfying \( U_{\text{fin}}(\mathcal{O}, \Gamma) \) that can be mapped continuously onto \( \{0, 1\}^\mathbb{N} \)?

Issue 18 (CH). Is there a Hurewicz \( X \) such that \( X^2 \) is Menger but not Hurewicz?

Issue 19. Does the Pytkeev property of \( C_p(X) \) imply that \( X \) has Menger’s property?

Issue 20. Does every hereditarily Hurewicz space satisfy \( S_1(\mathcal{B}_\Gamma, \mathcal{B}_\Gamma) \)?

Issue 21 (CH). Is there a Rothberger-bounded \( G \leq \mathbb{Z}^\mathbb{N} \) such that \( G^2 \) is not Menger-bounded?

Issue 22. Let \( \mathcal{W} \) be the van der Waerden ideal. Are \( \mathcal{W} \)-ultrafilters closed under products?

Issue 23. Is the \( \delta \)-property equivalent to the \( \gamma \)-property \( \binom{\Omega}{1} \)?