

# Report on a Scientific Event

## Winter School in Abstract Analysis, Set Theory January 29th-February 5th 2011 Hejnice, Czech Republic

### Summary

The meeting jointly organized by the Czech Mathematical Society and the Mathematical Institute of the Czech Academy of Sciences took place at Hejnice, Czech Republic between January 29th and February 5th 2011. Out of the 59 registered registered participants 4 had to cancel their registration leading to a total of **55 participants** from diverse countries.

The conference consisted of four series of **tutorial lectures** delivered by the invited speakers, **research presentations** of the participants and **discussion & networking time**. One afternoon was devoted to a trip to the mountains.

The conference took place at the International Center for Spiritual Rehabilitation, an old monastery which was recently renovated and now serves as a conference center with accommodation facilities. The location was ideal since it allowed the participants to stay in a single place and had excellent supporting facilities. We were also able to arrange favourable prices.

Based on the feedback of participants the conference was an **overall success** and the participants have been very enthusiastic about attending the school next year.

### Scientific Content

This year of the tutorial lectures (each tutorial comprising of several 50 minute lectures) were devoted to advanced topics of Combinatorial and Descriptive Set Theory. They were delivered by leading experts in the respective fields.

Professor **Andreas Blass** (University of Michigan, Ann Arbor) gave a series of talks introducing recent developements in **ultrafilter theory**. He had especially emphasized the connections with algebra.

Professor **Péter Komjáth** (Eötvös Loránd University, Budapest) prepared an introductory course in infinite combinatorics especially concentrating on the results of **P. Erdős**. He had also mentioned intriguing open questions.

Professor **Lionel Nguyen van Thé** (Université Paul Cézanne, Marseille)

gave an overview of the exciting new connections which were recently discovered between descriptive set theory, **topological dynamics** and combinatorial set theory. The main topic of his lectures was the relationship of extreme amenability of topological groups and the Ramsey properties of certain Fraïssé classes.

Professor **Petr Simon** (Charles University, Prague) talked about almost disjoint refinement theorems (a topic one of whose initiators P. Simon is) and the recent results of S. Shelah on **completely separable MAD families**.

The research presentations were given mainly by younger participants who presented their newest results. The topics included General Topology, Set Theory, Boolean Algebras and Forcing, Descriptive Set Theory, Large Cardinals and the Theory of Ultrafilters.

Each day participants had time to discuss their work with colleagues. The topics of the discussions were diverse and included recent developments in set theory (The exciting new result on the consistency of the Borel and dual Borel conjecture, ultrafilter limits, recent trends in set theoretic topology, automorphisms of  $\omega^*$  etc.)

The final program of the conference, presentation slides from the talks and the list of participants can be found at the following address:

[winterschoo.eu/2011](http://winterschoo.eu/2011)

## Results assessment

There are two main purposes scientific meetings serve. First they are a means of disseminating knowledge and presenting current research. Secondly they have a networking effect in bringing together people and facilitating cooperation. In both of these aspects the present meeting had fulfilled its goals.

The tutorials were an invaluable opportunity for younger researchers to acquaint themselves with topics currently only accessible in research articles or not accessible at all. Time was reserved for questions and the speakers made special effort to present the topics in very clear and intuitive terms.

The research presentations gave a nice overview of current set theoretic research trends ranging from combinatorial problems on the natural numbers, descriptive set theory of the reals to large cardinals. It helped prevent the isolation which sometimes threatens people working on a very specialized topic.

During discussions people got together to work on problems and progress has been made on some important open challenges / recent developments (**The Borel and Dual Borel conjecture** and others).

Each of the participants was invited to submit the slides of their talk to the organizers so that they could be made available on the conference website. We were happy that, except for three talks where the person did not have them in electronic form, we were able to make them available to a broader audience on our website.

The conference itself is part of a recently emerging trend of strong set theoretic research in Europe as witnessed by the **INFTY** network or, e.g., the **Young Set Theory Workshops**.

## Financial report summary

ESF Funding	
Board	€ 1920
Accommodation	€ 2565
Administrative costs	€ 515
<b>Total</b>	<b>€ 5000</b>
Co-Sponsors	
CTS <sup>1</sup>	€ 300
MŠMT ČR <sup>2</sup>	€ 2100
MU AV ČR <sup>3</sup>	€ 500
<b>Total</b>	<b>€ 2900</b>

<sup>1</sup>Center for Theoretical Study, Charles University and Academy of Sciences of the Czech Republic

<sup>2</sup>The Ministry of Education of the Czech Republic

<sup>3</sup>The Mathematical Institute of the Academy of Sciences of the Czech Republic

## Final programme

### Sunday

- 8:00-9:00, **Breakfast**
- 9:00-10:00, **Holy Mass**

#### Morning Session

Jindrich Zapletal

- 10:30--11:20, **A. Blass** Ultrafilters on Countable Sets I.
- 11:40--12:10, **J. Flašková** Uniformity of the van der Waerden ideal
- 12:30--13:30, **Lunch**

## Afternoon Session

Jana Flašková

- 15:30--16:00, **B. Farkas** Ideals and almost disjoint sets
- 16:30--17:20, **L. Nguyen Van The** Structural Ramsey theory and topological dynamics I.
- 17:35--18:05, **J. Verner** Ultrafilters generic over  $P(N)/I$
- 18:10--18:30, **A. Primavesi** Embedding structure for LOTs
- 18:30--19:30, **Dinner**

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## Monday

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- 8:00-9:00, **Breakfast**

### Morning Session

Lajos Soukup

- 9:00--9:50, **A. Blass** Ultrafilters on Countable Sets II.
- 10:20--10:50, **A. Starosolski** Existence of ordinal ultrafilters and of  $P$ -hierarchy
- 11:05--11:35, **H. Minami** Mathias-Prikry forcing and dominating real
- 11:50--12:10, **T. Weinert** Partition relations and coloured finite digraphs
- 12:30--13:30, **Lunch**

### Afternoon Session

Taras Banach

- 15:30--16:00, **W. Wohofsky** Borel Conjecture and Dual Borel Conjecture
- 16:15--17:05, **L. Nguyen Van The** Structural Ramsey theory and topological dynamics II.
- 17:35--18:00, **J. Šupina** Sequence selection principles for special convergences
- 18:10--18:30, **P. Borodulin-Nadzieja** Sequential properties of space of measures
- 18:30--19:30, **Dinner**

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## Tuesday

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- 8:00-9:00, **Breakfast**

### Morning Session

Marcin Kysiak

- 9:00--9:50, **A. Blass** Ultrafilters on Countable Sets III.
- 10:20--11:10, **P. Simon** Almost Disjoint Refinement by Countable Sets I
- 11:30--12:00, **D. Soukup** Guessing clubs for  $aD$ , non  $D$ -spaces

- 12:10--12:30, **J. Spěvák** Mappings between posets of continuous functions
- 12:30--13:30, **Lunch**

### Afternoon Session

Piotr Borodulin-Nadzieja

- 15:30--15:45, **S. Glab** Ideals with bases of unbounded Borel hierarchy
- 15:55--16:25, **M. Balcerzak** Monotone Borel hulls
- 16:40--17:30, **L. Nguyen Van The** Structural Ramsey theory and topological dynamics III.
- 18:00--18:30, **A. Bartoszewicz** Remarks on ideal convergence
- 18:30--19:30, **Dinner**

## THE PARTY

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### Wednesday

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- 8:00-9:00, **Breakfast**

### Morning Session

Aleksandar Pavlović

- 10:00--10:30, **A. Kucharski** Very I-favorable spaces
- 11:00--11:15, **A. Kipiani** On Representations of Abstract Groups as Automorphism Groups of Graphs
- 11:30--12:20, **P. Komjáth** Delta systems, set mappings
- 12:30--13:30, **Lunch**

## Wednesday Winter School Walk

Start in front of the building

- 13:30, **Long Trip**
- 14:00, **Short Trip**
- 18:30--19:30, **Dinner**

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### Thursday

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- 8:00-9:00, **Breakfast**

### Morning Session

Magdalena Grzech

- 9:00--9:50, **P. Simon** Almost Disjoint Refinement by Countable Sets II
- 10:20--11:10, **P. Komjáth** Set mappings, con't, polarized partition

calculus

- 11:30--12:00, **M. Staš** Perfect set property
- 12:10--12:30, **A. Brooke-Taylor** Subcompact Cardinals, Squares
- 12:30--13:30, **Lunch**

### Afternoon Session

Andrew Brooke-Taylor

- 15:30--15:50, **P. Schlicht** Automatic ordinals and linear orders
- 16:05--16:35, **K. Raesch** A minimal Prikry-type forcing for singularizing a measurable cardinal
- 17:05--17:35, **R. Honzik** Distributivity of the Cohen forcing in larger universes
- 17:50--18:20, **T. Bice** Projections in the Calkin Algebra: Order Structure and Cardinal Invariants
- 18:30--19:30, **Dinner**

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## Friday

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- 8:00-9:00, **Breakfast**

### Morning Session

Martin Weese

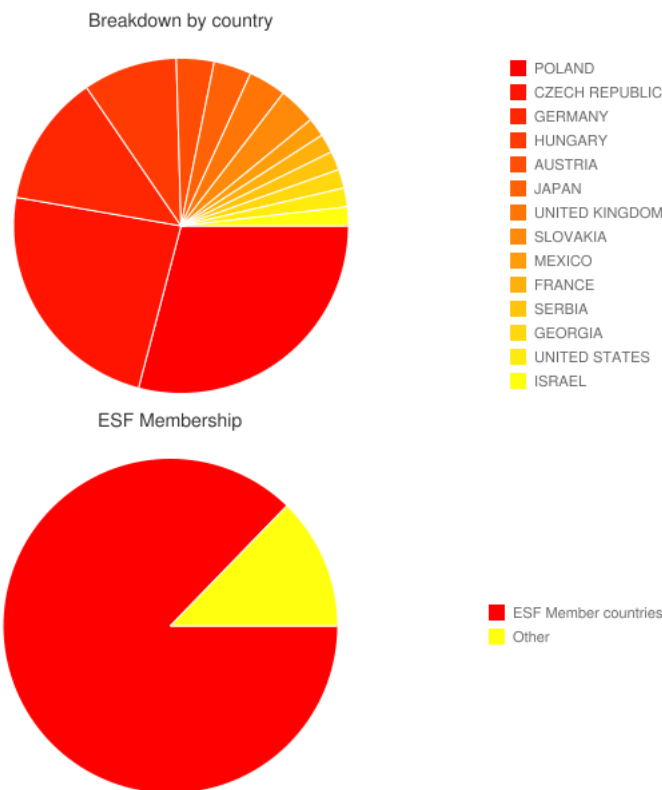
- 9:00--9:50, **P. Simon** Almost Disjoint Refinement by Countable Sets III
- 10:20--11:10, **P. Komjáth** Partititon calculus
- 11:30--11:55, **S. Spadaro** Selection Principles and Dense Sets
- 12:10--12:30, **R. Hernandez-Gutierrez** Remote Points and Extremal Disconnectedness
- 12:30--13:30, **Lunch**

### Afternoon Session

Tomáš Pazák

- 15:30--15:50, **S. Zeberski** Nonmeasurability v.s. complete nonmeasurability
- 16:00--16:30, **R. Ralowski** Nonmeasurable partitions on the real line
- 17:00--17:30, **T. Banach** Network character and meager convergence in topological spaces
- 17:50--18:20, **L. Soukup** Pcf theory and cardinal invariants of the reals
- 18:30--19:30, **Dinner**

List of participants




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<b>Name &amp; Surname</b>	<b>Institution</b>	<b>Country</b>
<i>Paweł Łabędzki</i>	The Jan Kochanowski University of Humanities and Sciences	POLAND
<i>Jaroslav Šupina</i>	Pavol Jozef Šafárik University	SLOVAKIA
<i>Bohuslav Balcar</i>	Mathematical Institute, AVČR, Prague	CZECH REPUBLIC
<i>Marek Balcerzak</i>	Technical University of Lodz	POLAND
<i>Taras Banakh</i>	Jan Kochanowski University	POLAND
<i>Artur Bartoszewicz</i>	Łódź Technical University	POLAND
<i>Tristan Bice</i>	Kobe University	JAPAN
<i>Marek Bienias</i>	Technical University of Łódź, Poland	POLAND
<i>Andreas Blass</i>	University of Michigan	UNITED STATES
<i>Piotr Borodulin-Nadzieja</i>	Wroclaw University	POLAND
<i>Andrew Brooke-Taylor</i>	University of Bristol	UNITED KINGDOM
<i>David Chodounsky</i>		CZECH REPUBLIC
<i>Michal Doucha</i>	Charles University in Prague	CZECH REPUBLIC

<b>Name &amp; Surname</b>	<b>Institution</b>	<b>Country</b>
<i>Barnabás Farkas</i>	Budapest University of Technology	HUNGARY
<i>Jana Flašková</i>	University of West Bohemia in Pilsen	CZECH REPUBLIC
<i>Joanna Garbulińska</i>	The Jan Kochanowski University in Kielce / The Jagiellonian University in Krakow	POLAND
<i>Szymon Glab</i>	Technical University of Lodz	POLAND
<i>Magdalena Grzech</i>	Cracow University of Technology	POLAND
<i>Rodrigo Hernandez-Gutierrez</i>	Universidad Nacional Autonoma de Mexico (UNAM, Mexico)	MEXICO
<i>Radek Honzik</i>	Charles University in Prague	CZECH REPUBLIC
<i>Magdalena Kiełek</i>	The Jan Kochanowski University in Kielce / The Jagiellonian University in Krakow	POLAND
<i>Archil Kipiani</i>	Iv.Javakhishvili Tbilisi State University	GEORGIA
<i>Péter Komjáth</i>	Eötvös Loránd University, Budapest	HUNGARY
<i>Marios Koulakis</i>	University of Münster	GERMANY
<i>Andrzej Kucharski</i>	University of Silesia, Katowice	POLAND
<i>Marcin Kysiak</i>	University of Warsaw	POLAND
<i>Anna Lauschmannová</i>	ÚFAL MFF, Charles University	CZECH REPUBLIC
<i>Hiroaki Minami</i>	Kurt Gödel Research Center	JAPAN
<i>Lionel Nguyen Van The</i>	Université Paul Cézanne	FRANCE
<i>Aleksandar Pavlović</i>	University of Novi Sad	SERBIA
<i>Tomáš Pazák</i>	Center for Theoretical Study	CZECH REPUBLIC
<i>Alex Primavesi</i>	University of East Anglia	UNITED KINGDOM
<i>Karen Raesch</i>	University of Muenster	GERMANY
<i>Robert Ralowski</i>	Wroclaw University of Technology	POLAND
<i>Růžena Roháčková</i>	Mathematical Institute, AVČR, Prague	CZECH REPUBLIC
<i>Philipp Schlicht</i>	University of Bonn	GERMANY
<i>Robin Scholz</i>	Universität Potsdam	GERMANY



<b>Name &amp; Surname</b>	<b>Institution</b>	<b>Country</b>
<i>Petr Simon</i>	Charles University, Prague	CZECH REPUBLIC
<i>Daniel Soukup</i>	Eötvös Loránd University	HUNGARY
<i>Lajos Soukup</i>	Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences	HUNGARY
<i>Santi Spadaro</i>	Ben Gurion University of the Negev	ISRAEL
<i>Jan Spěvák</i>	KMA, PŘF UJEP	CZECH REPUBLIC
<i>Michal Staš</i>	Technical University of Kosice	SLOVAKIA
<i>Andrzej Starosolski</i>	Silesian University of Technology	POLAND
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<i>Sławomir Szczepaniak</i>	Institute of Mathematics of the Polish Academy of Sciences (branch in Wrocław)	POLAND
<i>Katie Thompson</i>	DMG, TU Wien	AUSTRIA
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