

**DAAD**

Deutscher Akademischer Austausch Dienst  
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Forschungsgemeinschaft



*Draft of the Programme,  
all speakers to be confirmed*

# The 5<sup>th</sup> German-Russian Week of the Young Researcher

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## “Discrete Geometry”

National Research University  
Moscow Institute of Physics and Technology

September 7-11, 2015

Deutsches Wissenschafts- und  
Innovationshaus – Moskau



Deutschland  
Land der Ideen



## **Conference Hotel**

### **SK Royal Moscow**

Dmitrovskoye shosse 163a, Moscow

Telefon: +7 (495) 988 54 85

## **Conference Location**

### **National Research University**

**“Moscow Institute of Physics and Technology” (MIPT)**

Institutskiy per. 9, 141700 Dolgoprudny, Moscow Region

With financial support of



## **Welcome to the „5<sup>th</sup> German-Russian Week of the Young Researcher“!**

Dear colleagues,

We would like to offer you a warm welcome to this, our “5<sup>th</sup> German-Russian Week of the Young Researcher“! When we convened the “German-Russian Year of Science“ four years ago, the idea was born to invite young researchers from our countries to come together to discuss current topics of mutual interest. Since then it has grown from strength to strength. The success of the first week in Kazan in 2011 encouraged us to turn it into an annual event.

The main goal of these meetings is to foster collaboration among young scientists and researchers who will be setting the agenda of scientific cooperation in the near future. Research organizations and institutions of higher education will be presenting their funding programmes and describing the platforms that they can offer to PhD students or Post Doctoral researchers. The overarching principle behind these presentations is to facilitate collaboration and to broaden international research networks.

After focusing on “Man and Energy“ in Kazan (2011), “Health and Society“ in Yekaterinburg (2012), “Aviation and Space“ in Novosibirsk (2013) and “Global History“ in St. Petersburg (2014), in 2015 we discuss mathematical matters at the Moscow Institute for Physics and Technology. The MIPT was set up in 1946 with the efforts of prominent scholars of the Soviet Academy of Sciences, including the Nobel Prize winners Pyotr Kapitsa, Nikolay Semyonov and Lev Landau. MIPT was to become an elite school for natural sciences and has used a unique system for training young specialists from the very beginning, known as the Phystech System. Amongst MIPT graduates are the Nobel Prize winners of 2010 in Physics, Andrey Geim and Konstantin Novoselov. Today MIPT with its 6.000 students ranks among the top universities in the areas of physics, mathematics, and informatics. In 2009 MIPT was granted the status of a National Research University by the Russian government and therefore belongs to the prestigious group of “Russia’s Leading Universities“.

We would like to express our deepest gratitude to MIPT and its academic hospitality, to the German Embassy for its kind support, as well as to the Russian Foundation for Basic Research (RFBR) for their cooperation. And, of course, we thank all of you, the participants, for your involvement and cooperation in this conference.

Dr. Gregor Berghorn

German Academic Exchange Service  
Head of DAAD Office Moscow

Dr. Jörn Achterberg

German Research Foundation  
Head of DFG Office Moscow

<b>September 6, Sunday</b>		
	Arrival of Participants Transfer from Sheremetyevo Airport (SVO) to Hotel	
19:00	<b>Buffet Dinner and Words of Welcome</b> to the participants of the week by <ul style="list-style-type: none"> <li>• Dr. Gregor Berghorn, DAAD Moscow</li> <li>• Dr. Jörn Achterberg, DFG Moscow</li> <li>• Dr. Roman Karasev, MIPT</li> </ul>	<i>Hotel SK Royal Dmitrovskoye shosse 163a, Moscow</i>
<b>September 7, Monday</b>		
09:00	Transfer from Hotel	
09:30	Registration of Participants at MIPT	<i>MIPT, Main building, Dolgoprudny</i>
10:00	<b>Official Opening of the Week at MIPT Moscow Institute of Physics and Technology</b> with welcome addresses by <ul style="list-style-type: none"> <li>• Prof. Dr. Nikolai Kudryavtsev, Rector of MIPT</li> <li>• Mr. Mikhail Rusakov, Embassy of the Federal Republic of Germany in the Russian Federation</li> <li>• Prof. Dr. Peter Funke, Vice-President of the DFG</li> <li>• Prof. Dr. Peter Scharff, Member of DAAD Executive Committee, Rector of Ilmenau University of Technology</li> <li>• Mr. Oleg Sharipov, Head of International Department, Russian Foundation for Basic Research (RFBR)</li> </ul>	<i>MIPT, Concert Hall, Main building, Dolgoprudny</i>
10:45	<b>Presentation of National Research University Moscow Institute of Physics and Technology</b>	

11:00	<p><b>Opening Lecture</b>  “Equivariant Methods in Discrete Geometry: Problems and Progress”</p> <p><b>Professor Dr. Günter Ziegler</b>,  Mathematical Institute, Discrete Geometry Group,  Freie Universität Berlin</p> <p><i>- Discussion -</i></p>	
12:15-12:45	<p>Official Opening of travelling exhibition  <b>“IMAGINARY - through the eyes of mathematics”</b></p> <ul style="list-style-type: none"> <li>• Prof. Dr. Günter Ziegler,  Chair of Scientific Committee of MFO  (Mathematisches Forschungsinstitut Oberwolfach -  Oberwolfach Research Institute for Mathematics)</li> <li>• Dr. Andreas Matt,  Curator of “Imaginary”, MFO Oberwolfach</li> <li>• Mr. Mikhail Rusakov, Embassy of the Federal  Republic of Germany in the Russian Federation</li> </ul> <p>The opening will be followed by a standing reception  (including <b>light lunch</b>).</p>	<p><i>MIPT,  Laboratory  building,  Entrance Hall</i></p>
14:00	<p><b>Introductory Remarks to the 5<sup>th</sup> German-Russian Week of the Young Researcher</b></p> <ul style="list-style-type: none"> <li>• Prof. Dr. Peter Funke,  Vice-President of the DFG</li> <li>• Prof. Dr. Peter Scharff,  Member of DAAD Executive Committee</li> </ul>	
14:30-17:15	<p><b>Scientific Lectures</b>  Chair:</p> <ul style="list-style-type: none"> <li>• Prof. Dr. Günter Ziegler, Freie Universität Berlin</li> <li>• Prof. Dr. Roman Karasev, MIPT</li> </ul>	
14:30-15:10	<p><b>Professor Dr. Pavle Blagojević</b>,  Mathematical Institute, Discrete Geometry Group,  Freie Universität Berlin</p> <p>“Cutting, Embedding, Bouncing Characteristic Classes”</p> <p><i>- Discussion -</i></p>	
15:15-15:35	<p><b>Moritz Firsching</b> (FU Berlin):  “Enumerating Simplicial Polytopes”</p>	
15:40-16:00	<p><b>Albert Haase</b> (FU Berlin): “The Grünbaum-Hadwiger-Ramos Hyperplane Mass Partition Problem”</p>	

16:00	Coffee Break	
16:30-16:50	<b>Arkadiy Skopenkov</b> (MIPT and Independent University of Moscow): "A Classification of Link Maps of Graphs to $R^3$ and Polyhedra to $R^m$ "	
16:55-17:15	<b>Alexey Volovikov</b> (Moscow State Institute of Radio-Engineering, Electronics and Automation): "Borsuk-Ulam Type G-Spaces"	
17:30	<p><b>DWIH Science Lecture</b> on the occasion of the opening of IMAGINARY</p> <p><b>"Geometry in Interactive Mathematics Communication - Examples and Adventures"</b></p> <p><b>Dr. Andreas Matt,</b> Mathematisches Forschungsinstitut Oberwolfach (Oberwolfach Research Institute for Mathematics)</p>	
18:30	Transfer to Hotel and Dinner	
20:00	Transfer to Moscow, Red Square	
	<b>Free time for sightseeing</b>	
22:30	Transfer to Hotel	
<b>September 8, Tuesday</b>		
08:30	Transfer from Hotel	
09:00	<p><b>DWIH Moskau</b> <b>Deutsches Haus für Wissenschaft und Innovation</b> German House for Research and Innovation</p> <p>Dr. Gregor Berghorn, DAAD Moscow Dr. Jörn Achterberg, DFG Moscow</p>	<i>MIPT, Dolgoprudny</i>
09:30	<p><b>DFG - Deutsche Forschungsgemeinschaft</b> German Research Foundation</p> <p><b>Dr. Frank Kiefer,</b> Programme Director, Group of Physics, Mathematics, Geosciences, DFG Bonn</p>	

10:00-12:40	<b>Scientific Lectures</b> Chair: <ul style="list-style-type: none"> <li>• Prof. Dr. Carsten Schütt, University of Kiel</li> <li>• Prof. Dr. János Pach, École Polytechnique Fédérale de Lausanne and Alfred Renyi Institute of Mathematics, Budapest</li> </ul>	
10:00-10:40	<b>Professor Dr. János Pach</b> , Chair of Combinatorial Geometry, École Polytechnique Fédérale de Lausanne and Alfred Renyi Institute of Mathematics, Budapest  "Accidental Meetings"  – <i>Discussion</i> –	
10:40	Coffee Break	
11:10-11:50	<b>Professor Dr. Carsten Schütt</b> , Department of Mathematics, University of Kiel  "Functional Affine-Isoperimetry and an Inverse Logarithmic Sobolev Inequality"  – <i>Discussion</i> –	
11:55-12:15	<b>Konrad Swanepoel</b> (London School of Economics and Political Science): "Arrangements of Homothets of a Convex Body"	
12:20-12:40	<b>Hauke Dirksen</b> (University of Kiel): "Sections of the Regular Simplex - Volume Formulas and Estimates"	
12:40	Lunch	
14:00-16:25	<b>Scientific Lectures</b> Chair: <ul style="list-style-type: none"> <li>• Prof. Dr. Pavle Blagojević, Freie Universität Berlin</li> <li>• Dr. Alexander Gaifullin, Steklov Mathematical Institute</li> </ul>	
14:00-14:20	<b>Andreas Holmsen</b> (KAIST, Daejeon and EPFL, Lausanne): "Orthogonal Colorings of the Sphere"	
14:25-14:45	<b>Thomas Jahn</b> (TU Chemnitz): "The Center Problem in Strictly Convex Planes"	
14:50-15:10	<b>Undine Leopold</b> (TU Chemnitz): "Vertex-Transitive Polyhedra"	
15:15-15:35	<b>Martina Juhnke-Kubitzke</b> (University of Osnabrück): "Balanced Generalized Lower Bound Inequality for Simplicial Polytopes"	

15:40-16:00	<b>Lukas Katthän</b> (University of Osnabrück): "Recent Results on Local h-Vectors"	
16:05-16:25	<b>Gergely Ambrus</b> (Alfred Renyi Institute of Mathematics, Budapest): "Small Subset Sums"	
16:30	Transfer to Hotel	
17:30	Transfer to the Evening Reception	
19:00	<b>Evening Reception at MIPT Moscow</b>  With welcome addresses by <ul style="list-style-type: none"> <li>• Representative of MIPT</li> <li>• Mr. Andreas Meitzner, Minister, Deputy Head of Mission, Embassy of the Federal Republic of Germany in Russian Federation</li> </ul>	<i>Klimentovsky per. 1, bld. 1 Moscow</i>
<b>September 9, Wednesday</b>		
08:30	Transfer from Hotel	
09:00-12:30	<b>Scientific Lectures</b> Chair: <ul style="list-style-type: none"> <li>• Prof. Dr. Horst Martini, TU Chemnitz</li> <li>• Dr. Imre Bárány, Alfred Renyi Institute of Mathematics</li> </ul>	<i>MIPT, Dolgoprudny</i>
09:00-09:40	<b>Professor Dr. Luis Montejano,</b> Institute for Mathematics, National University of Mexico  "Variations of the Nerve Theorem and Meshulam-Sperner type results"  – Discussion –	
09:45-10:25	<b>Professor Dr. Horst Martini,</b> Faculty of Mathematics, Technical University Chemnitz  "Discrete Geometry in Minkowski Spaces"  – Discussion –	



10:30-10:50	<b>Márton Naszódi</b> (Loránd Eötvös University, Budapest): "Proof of a conjecture of Bárány, Katchalski, and Pach"	
10:50	Coffee Break	
11:20-12:00	<b>Professor Dr. Vladimir Protasov</b> , Faculty of Mechanics and Mathematics, Moscow State University  "Invariant Zonoids and $L_1$ Spectral Radius of Matrices"  – <i>Discussion</i> –	
12:05-12:25	<b>Erik Friese</b> (University of Rostock): "Affine Symmetries of Orbit Polytopes"	
12:30	<b>DFG - Deutsche Forschungsgemeinschaft</b> <b>RFBR - Russian Foundation for Basic Research</b>  Funding Opportunities for Young Scientists: "Promoting Early Research Careers"  Dr. Jürgen Breitkopf, Programme Director, Group of Research Careers, DFG Bonn  Dr. Irina Zhurbina, RFBR Moscow Head of Department of Youths Programmes	
13:30	Lunch	
14:30-16:30	<b>Scientific Lectures</b> Chair: <ul style="list-style-type: none"> <li>• Dr. Benjamin Matschke, Max Planck Institute for Mathematics, Bonn</li> <li>• Prof. Dr. Vladimir Protasov, Moscow State University</li> </ul>	
14:30-14:50	<b>Georgy Sharygin</b> (Moscow State University): "Local Formulas for the Chern Classes of Triangulated $S^1$ -Bundles"	
14:55-15:15	<b>Mikhail Tikhomirov</b> (MIPT): "On Computational Complexity of Length Embeddability of Graphs"	
15:20-15:40	<b>Lev Shabanov</b> (Higher School of Economics, Moscow): "Distance Graphs in the Plane"	

15:45-16:05	<b>Dmitry Gorbachev</b> (Tula State University): "Asymptotic Lower Bound and Parametric Family of Weighted Spherical Designs"	
16:10-16:30	<b>Aleksei Berdnikov</b> (MIPT): "The Chromatic Numbers of Metric Spaces with Several Forbidden Distances"	
16:30	Coffee Break	
16:45-18:15	<b>SPRINGER-Workshop</b> "Publishing scientific research in journals, conference proceedings and books"  <b>Mrs. Erdmuthe Raufelder,</b> Springer-Verlag GmbH, Heidelberg	
18:15	Transfer to Hotel	
19:00	Transfer to Bowling Club „Kosmos“  <b>Dinner and Bowling Evening</b>	<i>Khimki, Leninskij Pr. 2b</i>
22:30	Transfer to Hotel	
<b>September 10, Thursday</b>		
08:30	Transfer from Hotel	
09:00-12:30	<b>Scientific Lectures</b> Chair: <ul style="list-style-type: none"> <li>• Dr. Andrei Kupavskii, MIPT</li> <li>• Prof. Dr. Karim Adiprasito, Einstein Institute for Mathematics, Hebrew University of Jerusalem</li> </ul>	<i>MIPT, Dolgoprudny</i>
09:00-09:40	<b>Professor Dr. Karim Adiprasito,</b> Einstein Institute for Mathematics, Hebrew University of Jerusalem  "Log-Concavity of Whitney Numbers of the First Kind"  – Discussion –	
09:45-10:25	<b>Dr. Benjamin Matschke,</b> Max Planck Institute for Mathematics, Bonn  "Solving Mordell Equations Via the Shimura-Taniyama Conjecture"	

	<i>– Discussion –</i>	
10:30-10:50	<b>Alexander Gaifullin</b> (Steklov Mathematical Institute, Moscow): “Volumes of Flexible Polyhedra in Lobachevsky Spaces” (Steklov Mathematical Institute, Moscow)	
10:50	Coffee Break	
11:20-11:40	<b>Ricardo Strausz</b> (Universidad Nacional Autonoma de Mexico): “On the MacPhersonian”	
11:45-12:05	<b>Iskander Aliev</b> (Cardiff University): “A Quantitative Doignon-Bell-Scarf Theorem”	
12:10-12:30	<b>Nikolay Vereshchagin</b> (Higher School of Economics, Moscow): “On Tilings of the Plane by Polygons”	
12:30	Lunch	
13:30	<b>Presentations of Members of DWIH Moscow</b> German Academic Exchange Service (DAAD) Helmholtz Association of German Research Centres Alexander von Humboldt-Foundation	
14:30-18:05	<b>Scientific Lectures</b> Chair: <ul style="list-style-type: none"> <li>• Prof. Dr. Andreas Holmsen, Korea Advanced Institute of Science and Technology</li> <li>• Prof. Dr. Iskander Aliev, Cardiff University</li> </ul>	
14:30-15:10	<b>Gaiane Panina</b> (Saint-Petersburg Institute for Informatics and Automation): “Cyclopermutohedron”	
15:15-15:35	<b>Ilya Nekrasov</b> (Saint Petersburg State University): “Volume and Lattice Points Counting for the Cyclopermutohedron”	
15:40-16:00	<b>Alena Zhukova</b> (Saint Petersburg State University): “Discrete Morse Theory for the Moduli Space of a Flexible Polygon, or Solitaire Game on the Circle”	
16:00	Coffee Break	
16:30-16:50	<b>Zuzana Patáková</b> (Charles University in Prague): “Multilevel Polynomial Partitions”	
16:55-17:15	<b>Edgardo Roldan-Pensado</b> (Universidad Nacional Autonoma de Mexico): “Shadows of a Circle”	

17:20-17:40	<b>Andrey Kupavskii</b> (MIPT): "Translative Covering of the Space with Slabs"	
17:45-18:05	<b>Aleksander Maksimenko</b> (Yaroslavl State University): "About Lower Bound for the Number of Facets of a k-Neighborly Polytope"	
18:15	Transfer to Hotel and Dinner	
<b>September 11, Friday</b>		
08:30	Transfer from Hotel	
09:00-13:00	<p><b>Scientific Lectures</b> Chair:</p> <ul style="list-style-type: none"> <li>• Prof. Dr. Rade Živaljević, Mathematical Institute of the Serbian Academy of Sciences and Arts</li> <li>• Prof. Dr. Gaiane Panina, Saint-Petersburg Institute for Informatics and Automation</li> </ul>	<i>MIPT, Dolgoprudny</i>
09:00-09:40	<p><b>Professor Dr. Siniša Vrećica</b> Faculty of Mathematics, University of Belgrade</p> <p>"Symmetric Multiple Chessboard Complexes and Some Theorems of Tverberg Type"</p> <p>– Discussion –</p>	
09:45-10:25	<p><b>Professor Dr. Rade Živaljević</b> Mathematical Institute of the Serbian Academy of Sciences and Arts</p> <p>"The Hyperplane Measure Equipartition Problem Revisited"</p> <p>– Discussion –</p>	
10:30-10:50	<b>Alfredo Hubard</b> (Institute National de Recherche en Informatique et an Automatique, Sophia-Antipolis): "Limits of Order Types"	
10:55-11:15	<b>Vladlen Timorin</b> (Higher School of Economics, Moscow): "Maps That Take Lines to Plane Curves"	
11:15	Coffee Break	

11:40-12:00	<b>Aleksander Magazinov</b> (Alfred Renyi Institute of Mathematics, Budapest): "Half-Space Depth of a Line"	
12:05-12:25	<b>Géza Tóth</b> (Alfred Renyi Institute of Mathematics, Budapest): "Saturated 1-Planar Graphs"	
12:30-12:50	<b>Gábor Tardos</b> (Alfred Renyi Institute of Mathematics, Budapest): TBA	
13:00	Lunch	
14:00-16:00	<b>Scientific Lectures</b> Chair: <ul style="list-style-type: none"> <li>• Prof. Dr. Andrei Raigorodskii, MIPT</li> <li>• Prof. Dr. Konrad Swanepoel, London School of Economics and Political Science</li> </ul>	
14:00-14:20	<b>Alexei Savvateev</b> (MIPT): "A General Equilibrium Approach to the Multidimensional Tiebout Hypothesis"	
14:25-14:45	<b>Alexey Glazyrin</b> (University of Texas Rio Grande Valley, Brownsville): "Linear and Semidefinite Relaxations for Spherical Codes"	
14:50-15:10	<b>Andrey Voynov</b> (Moscow State University): "Self-Affine Convex Bodies and Bounded Semigroups of Affine Operators"	
15:15-15:35	<b>Fedor Stonyakin</b> (Vernadsky Federal University): "Some Analogues of Fair Division Problem"	
15:40-16:00	<b>Philipp Pushnyakov (MIPT)</b> : "Around Turán's Theorem for Some Distance Graphs"	
16:00	Coffee Break	
16:15-17:15	<b>DWIH-Workshop and Panel Discussion with participants of the week</b>  Dr. Gregor Berghorn, DAAD Moscow Dr. Jörn Achterberg, DFG Moscow Dr. Jürgen Breittkopf, DFG Bonn Tobias A. Stüdemann, Freie Universität Berlin, Moscow	
	<b>Closing remarks</b>	
17:30	Transfer to Hotel and Dinner	

## NOTES