DFG DAAD

THE SIXTH GERMAN-RUSSIAN WEEK OF THE YOUNG RESEARCHER

"URBAN STUDIES: THE CITY OF THE FUTURE"

Moscow, September 12–16, 2016

Deutsches Wissenschafts- und Innovationshaus – Moskau
Deutschland Land der Ideen

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Welcome to the „Sixth German-Russian Week of the Young Researcher“!

Dr Peter Hiller

Dr Jörn Achterberg

Dear colleagues from Russia and Germany,

We would like to offer you a warm welcome to our Sixth Week of the Young Researcher! When we convened the “German-Russian Year of Science“, six years ago, the idea was born to invite young researchers from both 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 encouraged us to turn it into an annual event. The following years we met in Ekaterinburg (2012), Novosibirsk (2013), St. Petersburg (2014) and Moscow (2015). The main goal of these meetings is to foster collaboration among young scientists and researchers who will be setting the agenda of scientific cooperation between Russia and Germany in the near future.

Research organizations and institutions of higher education of both our countries will be presenting their funding programmes and describing the platforms that they can offer to both Russian and German PhD students or PostDoctoral researchers. The over arching principle behind these presentations is to facilitate collaboration and to broaden research networks. The brochure will illustrate how young and experienced scientists can work across borders with local authorities, associations and industry in order to develop new approaches to global challenges.

This week we are glad to discuss matters of urbanism at the Moscow Institute of Civil Engineering (MGSU). Urban Studies comprise a wide range of interdisciplinary research areas from urban planning to civil engineering. With the sub-theme “City of the Future” we will also include ecological, social and economic aspects of the sustainable development of our cities. Our host university MGSU is famous for its participation in designing and constructing international giant building projects like the Aswan High Dam in Africa. MGSU is the top Russian university in the area of civil engineering and was granted the status of a National Research University by the Russian government. In November 2016 MGSU celebrated the 95th anniversary of its foundation.

We would like to express our deepest gratitude to the Moscow State University of Civil Engineering and its academic hospitality, to the German Embassy in Moscow for its kind support, as well as to the Moscow Government. And, of course, we thank all of you, the participants, for your involvement and cooperation in this conference.

СПАСИБО ВАМ!

Dr Peter Hiller

German Academic Exchange Service
Head of DAAD Office Moscow
Managing Director of DWIH Moscow

DAAD

Dr Jörn Achterberg

German Research Foundation
Head of DFG Office Moscow
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**ПРОФЕССОР, Д.ТЕХН.Н.
АНДРЕЙ ВОЛКОВ**

Ректор Московского государственного
строительного университета
(Национального исследовательского
университета)

Член-корреспондент
Российской академии архитектуры
и строительных наук

Sehr geehrte Kolleginnen und Kollegen! Liebe Freunde!

Ich freue mich sehr, Sie, Teilnehmer der 6. Deutsch-Russischen Woche des jungen Wissenschaftlers „Urbanistik – Stadt der Zukunft“, in der ältesten Hochschule für Bauwesen in Russland – in der Nationalen Forschungsuniversität Staatlichen Universität für Bauwesen Moskau – zu begrüßen!

Dieses Forum, an dem Sie teilnehmen, hat eine besondere Bedeutung nicht nur für unsere Universität, sondern auch für die Entwicklung der Branche in der ganzen Welt. Kurz vor dem 95. Jubiläum der MGSU haben wir die Durchführung der 6. Deutsch-Russischen Woche des jungen Wissenschaftlers an unserer Universität initiiert, deren Ziel es ist, sowohl den Erfahrungsaustausch zwischen einzelnen Fachdisziplinen zu ermöglichen als auch internationale wissenschaftliche Zusammenarbeit im Bereich Urbanistik zu stärken.

Ich freue mich ganz besonders, unsere Kolleginnen und Kollegen und Gäste aus Deutschland begrüßen zu dürfen, denn gerade zu deutschen Hochschulen bestehen unsere langfristigen und dauerhaftesten Kontakte. Gerade diese enge und vertrauensvolle Zusammenarbeit im Bildungs- und Forschungsbereich, die tief in der Geschichte verankert sind, hat unsere Entscheidung beeinflusst, die 6. Deutsch-Russische Woche des jungen Wissenschaftlers „Urbanistik – Stadt der Zukunft“ an der MGSU durchzuführen.

Heute entsteht im Baubereich und in der Wohnungs- und Kommunalwirtschaft ein neues Paradigma: Die Verantwortung der Erbauer endet nicht mit dem Durchschneiden des roten Bandes. Gleich beim allerersten Entwurf für ein Gebäude soll man sich genau vorstellen, was damit später passieren wird, wie man es nutzen soll und wie viel das kosten wird. Sie, junge Forscher, kontrollieren die wichtigste Phase des technologischen Lebenszyklus eines Wohnbaus. Um dieser Aufgabe gerecht zu werden, muss man lernen. Heute ist in der ganzen Welt und auch in Russland das Prinzip „Lernen für das Leben“ vom Prinzip des „lebenslangen Lernens“ abgelöst worden. Denjenigen, die bereit sind, sich zu entwickeln und Neues zu erlernen, stehen unsere Türen stets offen!

Ich bin froh, dass am Forum so viele Nachwuchswissenschaftler aus Russland und Deutschland teilnehmen. Das Forum gibt Ihnen die Möglichkeit, in die wunderbare Welt der Wissenschaft hineinzublicken, es lehrt Sie, wissenschaftliche Sprache zu sprechen, zu hören, zu verstehen, von den besten Lehrern und weltweit führenden Forschern zu lernen. Ich bin sicher, dass Ihre Energie und Hingabe, Ihr Eifer in Zukunft gefragt sein werden und der Renaissance der Wissenschaft und des Kaderpotenzials in der Baubranche dienen werden.

Sicherlich wird ein direkter und unmittelbarer Erfahrungs- und Ideenaustausch im Rahmen des Forums an der MGSU, einem Diskussionsstandort von Weltbedeutung, es Ihnen ermöglichen, unter den wissenschaftlichen Vorreitern zu sein und in Ihrem Arbeitsumfeld Fortschritte zu erzielen.

Vom ganzen Herzen wünsche ich Ihnen viel Erfolg bei der Erschließung Ihres wissenschaftlichen Potenzials!

Уважаемые коллеги! Дорогие друзья!

Я рад приветствовать вас, участников VI Германо-Российской недели молодого ученого «Урбанистика: город будущего», в стенах старейшего учебного заведения России в области строительства – Национальном исследовательском Московском государственном строительном университете!

Форум, в котором вы принимаете участие, знаковый не только для нашего университета, но и для всей отрасли в мировом масштабе. В канун 95-летнего юбилея НИУ МГСУ мы выступили с инициативой проведения VI Германо-Российской Недели молодого ученого, цель которой – не просто обмен опытом по ряду направлений научно-исследовательской деятельности, но и применение на практике результатов и международного научного сотрудничества в области урбанистики.

Мне особенно приятно приветствовать коллег и гостей из Германии, так как именно с вузами Германии у нашего университета установились давние и крепкие связи. Именно очень тесное и доверительное сотрудничество в научно-образовательной сфере, уходящее корнями в историю, и повлияло на наше решение провести Германо-Российскую неделю молодого ученого, посвященную тематике: «Урбанистика: город будущего», на базе НИУ МГСУ.

Сейчас в отрасли строительства и ЖКХ формируется новая парадигма: ответственность строителей не заканчивается на этапе разрезания ленточки – ещё на этапе творческого замысла необходимо моделировать, что будет со зданием потом, как его эксплуатировать и сколько это будет стоить. Вы, молодые исследователи, контролируете важнейший этап этого технологического жизненного цикла жилого здания. Для того чтобы выполнять эту задачу эффективно, нужно учиться. Сегодня во всем мире, в том числе в нашем государстве, принцип «Обучение на всю жизнь» сменился принципом «Обучение через всю жизнь». Для желающих учиться и развиваться профессионально наши двери всегда открыты!

Я рад, что в форуме принимает участие такое количество молодых ученых России и Германии. Форум дает вам возможность прикоснуться к удивительному миру науки, учит говорить на научном языке, слушать, слышать и усваивать лучшие уроки преподавателей, научных руководителей и ведущих мировых ученых. Я уверен, что ваши энергия, энтузиазм и трудолюбие будут востребованы и послужат великой миссии возрождения науки и кадрового потенциала строительной отрасли.

Я уверен, что прямой и непосредственный обмен опытом и новыми идеями в рамках форума, который проходит в НИУ МГСУ на дискуссионной площадке мирового уровня, позволит вам и впредь находиться на переднем крае отраслевой науки и не терять темпов профессионального роста.

От всей души желаю вам больших успехов в раскрытии своего научного потенциала!

PROF. DR. HABIL.
VALERY TELICHENKO

Präsident der Staatlichen
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Liebe Freunde!

Die Nationale Forschungsuniversität Staatliche Universität für Bauwesen Moskau hat eine lange Tradition der Zusammenarbeit mit Hochschulen vieler Länder. Ich spreche von bilateralen Studiengängen, vom Studenten- und Wissenschaftleraustausch, von internationalen Konferenzen und Seminaren. Breit sind sowohl das wissenschaftliche Spektrum als auch die Geografie dieser Kontakte. Besonders eng und effektiv ist die Zusammenarbeit der MGSU mit deutschen Hochschulen. Unsere Partner sind bekannte Universitäten wie TU Berlin, Bauhaus-Universität Weimar, FH Aachen, TU München und andere Hochschulen.

An der Deutsch-Russischen Woche des jungen Wissenschaftlers nehmen junge Menschen teil – Studierende, Doktoranden, Hochschullehrer. Das ist sehr wichtig, denn gerade in ihren Händen liegt die Zukunft dieser Zusammenarbeit. Bei jeder gemeinsamen Tätigkeit sind persönliche Kontakte und der sogenannte menschliche Faktor wichtig, der für persönliche Beziehungen zwischen konkreten Menschen steht. Ein gutes Beispiel dafür ist die langjährige Zusammenarbeit der MISI/MGSU mit der TU Berlin.

Am 10. Mai 1969 wurde von dem Rektor des MISI Professor N.A. Streltschuk und dem Rektor der TU Berlin Professor Hans Wever ein Kooperationsvertrag zwischen der TU Berlin und dem Moskauer W.W. Kujbyschew-Institut für Ingenieur- und Bauwesen unterzeichnet. Die Universitäten arbeiten eng in vielen Bereichen der Bildung und Forschung zusammen: Architektur, Städtebau, Baumaterialien, Umweltschutz, Energieeffizienz, Bodenmechanik, Rekonstruktion von Wohnbauten, Bauinformatik.

Zur Entwicklung der Zusammenarbeit und Realisierung gemeinsamer Projekte haben seitens der TU Berlin ganz besonders Prof. Nedeljkov, Prof. Künkel, Dr. Hempel, Prof. Hillemeier und andere Kollegen beigetragen.

Seitens der MGSU wurde ein wesentlicher Beitrag von Prof. N.A. Streltschuk, Prof. G.I. Gortschakow, Prof. G.L. Chessin, Prof. A.K. Solowjew, Prof. W.F. Kassjanow geleistet.

In den 90er Jahren begann die Entwicklung einer neuen Bildungs- und Forschungsrichtung – moderne Informationstechnologien und Bauinformatik. Hier möchte ich die besondere Rolle von Prof. P.J. Pahl und seinen Lehrstuhlkollegen Prof. Kochendörfer und Dr. Liebchen seitens der TU Berlin und Prof. G.G. Malychi, Prof. P.A. Lawdanskij, I.W. Biltschuk seitens der MGSU betonen. 2008 wurde als Ergebnis langer gemeinsamer Arbeit an der Anpassung der Studieninhalte ein Doppeldiplomabkommen unterzeichnet und somit der gemeinsame Bachelorstudiengang „Informations- und Bauengineering“ ins Leben gerufen.

Ich bin überzeugt, dass Nachwuchswissenschaftler im Bereich Bauwesen diese guten Traditionen im Interesse der Hochschulen der ganzen Welt fortsetzen und pflegen werden.

Дорогие друзья!

Национальный исследовательский Московский государственный строительный университет имеет давние традиции сотрудничества с вузами разных стран. Совместные образовательные программы, обмен студентами, стажировки научных сотрудников, проведение международных конференций, семинаров. Обширна как тематика, так и география этих контактов. Но наиболее тесную и плодотворную работу МГСУ ведет с университетами Германии. Нашими партнерами являются такие известные университеты, как Технический университет г. Берлина, Баухаус-университет г. Веймара, Высшая техническая школа г. Ахена, Технический университет г. Мюнхена и другие.

Сегодня в Российско-Германской неделе молодых ученых принимают участие молодые люди: студенты, аспиранты, преподаватели. Это очень важно, так как будущее международного сотрудничества в их руках. В любой совместной деятельности важны личные контакты и так называемый человеческий фактор – персональные отношения между конкретными людьми. Характерным примером является долговременное сотрудничество МИСИ-МГСУ и Технического университета г. Берлина.

10 мая 1969 г. ректором МИСИ проф. Н.А.Стрельчуком и ректором Технического университета г. Берлина проф. Гансом Вефером был подписан договор о сотрудничестве между вузами. С тех пор сотрудничество велось по многим направлениям строительного образования и науки: архитектура, градостроительство, строительные материалы, охрана окружающей среды, энергосбережение, механика грунтов, реконструкция жилых зданий, строительная информатика.

В разные годы большой вклад в развитие сотрудничества и реализацию совместных проектов внесли такие сотрудники ТУБ, как проф. Недельков, проф. Кюнкель, доктор Хемпель, проф. Хилемайер и др.

Со стороны МИСИ-МГСУ – проф. Н.А. Стрельчук, проф. Г.И. Горчаков, проф. Г.Л. Хесин, проф. А.К. Соловьев, проф. В.Ф. Касьянов.

В 90-ые началось развитие нового научно-образовательного направления – современные информационные технологии – строительная информатика. Здесь следует отметить особую роль проф. Я.П. Паля и его коллег по кафедре проф. Кохендорфера и д-ра Либхена, со стороны МГСУ – проф. Г.Г. Малыхи, проф. П.А. Лавданского, И.В. Бильчук. В 2008 г. в результате большой совместной работы по гармонизации учебных программ было подписано соглашение о совместной подготовке бакалавров по специальности «Информационно-строительный инжиниринг».

Я уверен, что молодое поколение ученых в области строительной науки и образования продолжит эти традиции в интересах университетов разных стран.

RÜDIGER VON FRITSCH

Botschafter
der Bundesrepublik Deutschland
in der Russischen Föderation

РЮДИГЕР ФОН ФРИЧ

Посол Федеративной Республики
Германия в Российской Федерации

Sehr geehrter Herr Rektor, Professor Volkov,
sehr geehrter Herr Präsident
Professor Telichenko,
sehr geehrter Herr Professor Allgöwer,
sehr geehrter Herr Grothus,
meine sehr verehrten Damen und Herren!

Es ist mir eine große Ehre und Freude, heute Morgen hier zu sein. Es gibt Wochen, die gut beginnen, – und diese hier beginnt richtig gut. Denn das, was Sie tun, ist gut für die Wissenschaft und gut für unsere Beziehungen. Was Sie hier tun, reicht über das hinaus, was Wissenschaft üblicherweise schon tut und leistet. Dies ist die sechste Deutsch-Russische Woche des jungen Wissenschaftlers. Sie ist ein ganz wichtiger Leuchtturm in den deutsch-russischen Wissenschaftsbeziehungen. Ich schätze diese Initiative außerordentlich, die Bundesregierung schätzt sie außerordentlich. Die Zusammenarbeit Ihrer Universitäten, der MGSU und der Bauhaus-Universität, wird daher aus Deutschland sehr nachdrücklich gefördert.

Sie tun das, was unsere Länder gut können, – die Zusammenarbeit im Wissenschaftsbereich fördern. Sie schöpfen die Potentiale aus, die es in unseren Ländern gibt. Denn der Bereich der Wissenschaften ist einer der reichsten, wir haben einander viel zu geben. Das ist Zusammenarbeit auf Augenhöhe. Es gibt in beiden Ländern bedeutende Wissenschaftsfelder, bedeutende Wissenschaftlerinnen und Wissenschaftler, und es gibt – ich freue mich immer wieder, dies festzustellen – eine ungeheuer vielfältige Kooperation vom studentischen Austausch bis hin zu den bekannten Großprojekten XFEL und FAIR, die immer wieder als Beispiele angeführt werden und wirklich wichtig sind, weil sie wertvolle Arbeit für beide Seiten leisten.

Wenn wir sagen, unsere Wissenschaftszusammenarbeit ist wichtig, dann ist das keine hohle Phrase: das lässt sich allein schon daran sehen, wie stark die deutsche Wissenschaftslandschaft in Moskau, in Russland vertreten ist, durch viele unserer bedeutenden Einrichtungen – DAAD, DFG, Helmholtz-Gemeinschaft. Wir haben hier ein Deutsches Historisches Institut, und wir versuchen, die Zusammenarbeit auf vielen Feldern weiter zu bringen. Gute Beziehungen zwischen zwei Ländern sind ein großes Mosaik, das viele Bausteine braucht, – viele kleine Steine, viele große Steine, – und Sie fügen dem ganz viele hinzu.

Dieses Mal widmet sich die Woche des Jungen Wissenschaftlers einem Thema, das interessanter kaum sein könnte für das konkrete Zusammenleben der Menschen, für das Leben der Menschen: die Stadt der Zukunft. Es ist etwa zehn bis fünfzehn Jahre her, als Wissenschaftler ausgerechnet hatten, dass mehr Menschen auf der Erde in Städten leben als auf dem Land. Und der Trend nimmt ja weiter zu. Wir brauchen gute Lösungen für unsere Städte, denn unsere Städte wachsen, ihre Komplexität wächst. Ich darf auf persönlicher Basis hinzufügen, ich bin immer wieder beeindruckt, wie sehr man sich gerade in dieser Stadt, in Moskau, um gute Lösungen bemüht, wie sehr sich diese Stadt entwickelt, wie modern hier gefundene Lösungen sind. In unseren beiden Ländern wird an interessanten Pro-

jekten gearbeitet, für die Komplexität der Städte, für die Komplexität unserer Häuser, für die Komplexität unserer Mobilität, um hier Lösungen zu finden. Manches macht mir etwas Sorge. Etwa wenn ich mir überlege, dass das Auto von Morgen weiß, wo ich am liebsten hinfahre, dann ist es nicht unbedingt etwas, was ich mir wünsche, aber vielleicht habe ich noch einen verbleibenden Einfluss darauf. Aber andererseits gibt es Lösungen, die ich sehr schätze. Ich selber nutze Carsharing in Deutschland. So kann ich, ohne ein eigenes Auto zu haben, ein Auto nutzen, wenn ich in Deutschland bin. Diese Autos werden sehr intelligent und sparsam genutzt, das ist eine überzeugende Lösung. Wie können wir Städte bauen, die die Energie, die wir haben, sinnvoll und gut nutzen, Städte, die grün sind und noch grüner werden, die sauber sind, in denen Menschen sich wohlfühlen, in denen sie sich sicher fühlen, Städte, wo Lösungen intelligent gesucht und gefunden werden? Das ist die entscheidende Frage, vor der wir stehen, wenn wir über die Stadt der Zukunft sprechen. Und ganz wichtig dabei ist, darauf zu achten, dass die Bürger unserer Städte einbezogen bleiben, und auch darauf richten sich Ihre Überlegungen.

Ich freue mich, dass dieses Projekt „Stadt der Zukunft“ von zwei Hochschulen vorangetrieben wird, die eine bald 50-jährige Tradition der Zusammenarbeit haben und die jeweils in ihrem Land für gute Lösungen stehen. Sie haben gerade dargelegt, Herr Rektor, an welchen Projekten die MGSU beteiligt ist. Als eine der führenden Universitäten Ihres Landes steht sie für viele gute Lösungen großer Aufgaben, und Russland hat weiterhin große Aufgaben vor sich. Ich bin ganz begeistert, wenn ich daran denke, welche. Nämlich die Fußballweltmeisterschaft 2018, das ist eine große, komplexe Aufgabe, die es zu bewältigen gilt, und das ist, soweit wir sehen, auf gutem Wege. Gerade mit der Bauhaus-Universität gibt es eine sehr gute Zusammenarbeit. Die deutsch-russische Kooperation im Bauwesen reicht weiter zurück als die konkrete Zusammenarbeit der Hochschulen. In den 20er Jahren sind junge sowjetische Architekten nach Weimar und Dessau gefahren und haben am Bauhaus studiert, sind zurückgekehrt und haben hier hochinteressante Lösungen realisiert. Denken Sie an das Narkomfin-Gebäude in Moskau, denken Sie an die Gebäude aus jener Zeit in Jekaterinburg. Das ist eine reiche Tradition der Zusammenarbeit, gerade auf dem Feld, auf dem Sie hier arbeiten.

Ich wünsche Ihnen eine gute Konferenz, eine gute Zusammenarbeit, eine gute Zukunft der Zusammenarbeit. Ich danke Ihnen für den großen Beitrag, den Sie zum deutsch-russischen Wissenschaftsaustausch und zu unseren Beziehungen insgesamt leisten.

Alles Gute und herzlichen Dank!

Уважаемый профессор Волков,
уважаемый профессор Теличенко,
уважаемый профессор Альгёвер, уважаемый господин Гротус,
уважаемые дамы и господа!

Для меня большая честь и радость присутствовать здесь сегодня утром. Бывают недели с хорошим началом, и начало этой недели действительно отличное, потому что то, чем вы занимаетесь, приносит пользу науке и нашим отношениям. То, что Вы делаете, выходит за рамки того, чем наука и так обычно занимается: этот проект служит очень важным маяком в германо-российских научных отношениях. Эта Германо-Российская неделя молодого ученого уже шестая по счету. Я очень ценю эту инициативу, Федеральное правительство также придает ей большое значение. Поэтому Германия оказывает активную поддержку сотрудничеству Ваших университетов, МГСУ и Университета Баухаус.

Вы занимаетесь тем, что хорошо удается нашим странам – поддержкой сотрудничества в научной сфере. Вы реализуете имеющиеся в наших странах потенциалы. Потому что сфера науки является одной из самых богатых, и мы можем предложить друг другу очень многое. Это сотрудничество на равных. В наших странах проводятся исследования по важным научным направлениям, у нас трудятся именитые учёные, кроме того, наше сотрудничество – я всегда говорю об этом с радостью – крайне разносторонне: начиная со студенческого обмена и заканчивая такими известными крупными проектами, как XFEL и FAIR, которые часто приводят в качестве примера и которые имеют действительно большое значение благодаря этой ценной для обеих стран работе.

Когда мы говорим о том, как важно наше сотрудничество в научной сфере, мы произносим не пустые слова – это можно увидеть уже лишь по тому, насколько широко представлена германская наука в Москве, в России нашими важными организациями: DAAD, DFG, Объединение им. Гельмгольца. Здесь работает Германский исторический институт, и мы стараемся расширить наше сотрудничество во многих областях. Добрые отношения между двумя странами представляют собой мозаику, состоящую из многочисленных фрагментов – многих малых и многих крупных – и многие из этих фрагментов являются Вашей заслугой.

В этом году Неделя молодого учёного посвящена теме, которая едва ли может быть интереснее для совместного проживания людей, для жизни людей – теме «Город будущего». Прошло около 10–15 лет с тех пор, как учёные подсчитали, что по всему миру в городах проживает больше людей, чем в сельской местности. И сегодня эта тенденция по-прежнему остается восходящей. Нам нужны хорошие решения для наших городов, потому что наши города растут, растёт их комплексность. Я позволю себе добавить, что меня не перестает восхищать, насколько старательно именно в этом городе, в Москве, ищут удачные решения, как развивается этот город, какие современные решения здесь находят. В обеих странах ведётся работа над очень интересными проектами с точки зрения комплексности городов, комплексности наших домов, комплексности нашей мобильности.

Кое-что меня даже несколько беспокоит: например, когда я представляю себе, что автомобиль будущего будет сам знать, куда мне лучше всего поехать, то это будет не совсем то, чего бы я хотел, но, быть может, у меня еще останется возможность как-то на это повлиять. Однако, с другой стороны, есть и такие решения, которые я считаю очень полезными. Я сам пользуюсь услугами каршеринга в Германии. Благодаря им, находясь в Германии, я могу воспользоваться автомобилем, не имея собственного. Такие автомобили используются очень рационально и экономично, это решение убеждает своей практичностью. Каким образом мы сможем строить города, разумно использующие имеющуюся в нашем распоряжении энергию, зеленые города и города, которые со временем станут еще более зелёными, чистые города, города, в которых людям комфортно жить, в которых они ощущают себя в безопасности, в которых ищут и находят рациональные решения? Это главный вопрос, стоящий перед нами, когда мы говорим о городе будущего. И очень важно при этом не забывать о том, что и жители наших городов должны оставаться вовлеченными в эту работу, и этот аспект вы также учитываете.

Я рад, что проект «Город будущего» реализуется двумя вузами с 50-летней традицией сотрудничества, вузами, которые славятся в своих странах удачными ини-

циативами и успешными решениями актуальных проблем. Вы, господин ректор, только что рассказали о тех проектах, в которых участвует МГСУ. Будучи одним из ведущих университетов страны, МГСУ имеет на своем счету многочисленные удачные решения масштабных задач, а многие масштабные задачи России ещё только предстоит выполнить. Меня самого восхищает мысль о том, какие это задачи: например, проведение Чемпионата мира по футболу 2018 г., представляющее собой серьёзную, сложную задачу, которая, судя по всему, на пути к успеху. С Университетом Баухаус установлено очень хорошее сотрудничество. Германо-российское сотрудничество в строительной сфере имеет более продолжительную историю, чем сотрудничество конкретных университетов. В 20-е годы молодые советские архитекторы приезжали в Веймар и Дессау, обучались в Школе Баухаус, возвращались на родину и реализовывали здесь крайне интересные проекты. Достаточно вспомнить Дом Наркомфина в Москве, вспомнить здания той эпохи, возведенные в Екатеринбурге. Речь идёт о богатых традициях сотрудничества именно в сфере вашей работы.

Желаю вам успешной конференции, доброго сотрудничества и его дальнейшего развития. Благодарю Вас за огромный вклад в германо-российский научный обмен и отношения между нашими странами в целом.

Всего наилучшего и большое спасибо!

MARAT KHUSNULLIN

Stellv. Bürgermeister von Moskau in der Stadtregierung in Fragen der Baupolitik

МАРАТ ХУСНУЛЛИН

Заместитель Мэра Москвы
в Правительстве Москвы
по вопросам градостроительной
политики и строительства

Sehr geehrte Damen und Herren!

Ich bin froh, alle Veranstalter, Teilnehmer und Gäste der 6. Deutsch-Russischen Woche des jungen Wissenschaftlers „Urbanistik – Stadt der Zukunft" begrüßen zu dürfen!

Heutzutage ist eine Stadt, besonders eine Megapolis, ein komplizierter Organismus, wo Millionen Menschen leben, arbeiten und sich entspannen, Sport treiben oder künstlerisch tätig sind. Klar ist, dass es bei der Bestimmung und Erforschung verschiedener Lebensvorgänge einer Stadt und bei der Beschreibung ihrer wichtigsten Entwicklungsrichtungen Wissen aus beinahe allen ingenieurwissenschaftlichen und geisteswissenschaftlichen Teilbereichen herangezogen wird. Ingenieur- und Geisteswissenschaften bilden die Basis für eine junge Wissenschaft – Urbanistik.

Die Hauptstadt Russlands wächst und entwickelt sich rasant. Bauindustrie hat nach wie vor Vorrang für Moskau. Um das Leben in einer modernen Stadt komfortabler zu machen, muss man viele Faktoren berücksichtigen, die das menschliche Leben beeinflussen.

Es werden in Moskau Wohnhäuser und Objekte der sozialen und Ingenieurinfrastruktur gebaut. Es gibt viele Bau- und Umbauprojekte: Modernisierung des Verkehrsnetzes, Erneuerung der Ausfallstraßen, Umgestaltung der Industriegebiete, Ausbau des U-Bahn-Liniennetzes in einem unglaublichen Tempo, Vollendung der Abrissarbeiten baufälliger sowjetischer Plattenbauten, Bau moderner Wohnviertel, Business- und Einkaufs-, Kultur- und medizinischer Zentren und sonstiger komplizierter Bauobjekte.

Die unterschiedlichsten Forschungsrichtungen, die die Teilnehmer des Forums vertreten, befassen sich mit fast allen Aspekten des Lebens einer modernen Stadt, darunter auch Architektur und Bau. Ich bin überzeugt, dass eine gründliche Analyse und die Umsetzung Ihrer Ideen uns neue Entwicklungshorizonte öffnen und uns helfen werden, unsere Städte schöner und komfortabler zu machen!

Vom ganzen Herzen wünsche ich allen, die an der 6. Deutsch-Russischen Woche des jungen Wissenschaftlers „Urbanistik – Stadt der Zukunft" teilnehmen, eine ertragreiche Veranstaltung, viele neue Ideen und interessante Projekte!

Уважаемые дамы и господа!

Сердечно приветствую всех организаторов, участников и гостей VI Российско-германской недели молодого ученого «Урбанистика – город будущего»!

Современный город, тем более мегаполис, – это сложный организм, в котором живут, работают и отдыхают, занимаются спортом и творчеством миллионы людей. Очевидно, что при определении и изучении процессов, происходящих в городе, и разработке ключевых направлений его развития в той или иной степени используются практически все существующие на сегодняшний день инженерные и гуманитарные научные дисциплины, которые определяют базовую платформу молодой науки – урбанистики.

Столица России растет и бурно развивается. Строительство было и остается для Москвы важнейшей отраслью. Для того чтобы современный город был комфортным для жизни, необходимо учитывать десятки различных факторов, влияющих на жизнь человека.

В Москве строятся жилые дома и объекты социальной и инженерной инфраструктуры. Реализуются важнейшие градостроительные проекты: модернизируется транспортный каркас столицы, реконструируются вылетные магистрали, реформируются промзоны, беспрецедентными темпами ведется строительство метро, завершается снос ветхих пятиэтажек, строятся современные жилые кварталы, деловые, торговые, культурные и медицинские комплексы, другие сложнейшие здания и сооружения.

Многогранная научная деятельность, которая ведется участниками форума, охватывает практически все сферы жизни современного города, в том числе градостроительство. Уверен, что всесторонний анализ и внедрение созданных вами научных разработок откроет новые горизонты для развития, позволит сделать наши города более красивыми и удобными для человека!

От всей души желаю всем, кто принимает участие в работе VI Российско-германской недели молодого ученого «Урбанистика – город будущего», плодотворной работы, новых идей и интересных проектов!

PROF. DR. FRANK ALLGÖWER

Vize-Präsident
der Deutschen Forschungsgemeinschaft

Direktor des Instituts für Systemtheorie
und Regelungstechnik,
Universität Stuttgart

ПРОФ. Д-Р ФРАНК АЛЬГЁВЕР

Вице-президент
Немецкого научно-исследовательского
сообщества

Директор Института теории систем
и автоматизированных систем
управления, Университет г. Штутгарт

Sehr geehrter Andrej Anatolevich,
Sehr geehrter Valerij Ivanovich,
Ihre Exzellenz Herr Botschafter,
Sehr geehrter Herr Khusnullin,
Sehr geehrter Herr Grothus,

meine sehr geehrten Damen und Herren, ich freue mich sehr, dass Sie der gemeinsamen Initiative des Deutschen Akademischen Austauschdienstes und der Deutschen Forschungsgemeinschaft gefolgt sind, und begrüße Sie als deren Vizepräsident ganz herzlich zur sechsten Nachwuchswoche! Als vorletzter Redner in einer Reihe von Grußworten noch etwas Neues hinzuzufügen, fällt schwer. Aber lassen Sie mich doch kurz auf die Entstehung der Wochen und die besonderen Rahmenbedingungen eingehen, unter denen wir diese sechste Woche hier bei Ihnen in Moskau an der renommierten Bauuniversität veranstalten dürfen.

Grundsätzlich verfolgen wir mit den Nachwuchswochen zwei strategische Ziele: Zum einen werden durch die Präsentation von Spitzenforschung und den wissenschaftlichen Austausch zu globalen Themen zentrale Aspekte der bilateralen Zusammenarbeit zwischen Deutschland und Russland aufgegriffen; und zum anderen wird dabei vor allem die Vernetzung des Nachwuchses in den Vordergrund gestellt. Und der zweite Punkt gilt umso mehr in diesem Jahr, da sich unsere Woche in das offizielle Jahr des Deutsch-Russischen Jugendaustauschs eingliedert und sicher auch einen wertvollen Beitrag zum Aufbau von Vertrauen und Partnerschaften unter der jüngeren und zukünftigen Generation von Wissenschaftlern leisten kann.

Bereits vor fünf Jahren wurde anlässlich eines anderen Kreuzjahres, des Deutsch-Russischen Wissenschaftsjahres 2011/12, eine neue Idee verfolgt: Jungen Wissenschaftlern beider Länder ein Forum des Austauschs zu bieten, auf dem sie selbst aus ihren wissenschaftlichen Arbeiten berichten und Vorträgen erfahrener Wissenschaftler beiwohnen können. Wir hatten 2011 auf der ersten Woche in Kazan die Hoffnung geäußert, dass sich die Idee verstetigen möge, einmal pro Jahr an wechselnden Standorten zu wechselnden Thematiken bilaterale Nachwuchswochen in Russland durchzuführen. Nachdem wir uns in den ersten Jahren mit Kazan und Jekaterinburg zunächst an den Ural heran und dann mit Novosibirsk sogar darüber hinaus nach Asien gewagt hatten, kehrten wir mit St. Petersburg nach Europa zurück und näherten uns mit Dolgoprudny im letzten Jahr immer mehr Moskau an. Umso mehr freut es mich, dass wir heute nun nicht mehr nur vor den Toren Moskaus, sondern tatsächlich in der Hauptstadt Russlands hier bei Ihnen zu Gast sind.

Was soll man zu dieser Stadt sagen? Außer dass sie mit ihren 15 Millionen Einwohnern mittlerweile die größte Stadt Europas ist und mit ihren über 250 Forschungs- und Bildungseinrichtungen eines der größten Wissenschaftszentren der Welt ist. Wir Deutschen freuen uns natürlich sehr darauf, diese pulsierende Metropole im Laufe der Woche etwas intensiver kennenzulernen. Aber es ist doch die besondere Beziehung zur Wissenschaft und zur Kultur, die Moskau in diesen politisch angespannten Tagen als geradezu idealen Standort für unsere Nachwuchswoche erscheinen lässt. Zum einen ist es die historische Bedeutung Ihrer Stadt für unsere beiden Länder und zum anderen ist es die Geschichte Ihrer Universität, lieber Herr Rektor Volkov, die mit ihrer Beteiligung an internationalen Großprojekten – ob in Afrika, Asien oder Europa – immer ein Stück

zum Austausch zwischen den Kulturen beigetragen hat. Ich denke, das wird ganz bestimmt auch ein Leitthema ihrer Feierlichkeiten zum 95-jährigen Jubiläum, das Ihre Hochschule in den nächsten Wochen begeht. Dazu schon einmal die allerherzlichsten Glückwünsche!

Diese besondere Mittlerfunktion Ihrer Hochschule wollen wir auch in diesen Tagen nutzen, um den Austausch von Ideen zu einem aktuellen Thema zwischen unseren Ländern, das heißt eben auch zwischen Ost und West, voranzutreiben. Im Mittelpunkt steht nach den Jahren zuvor mit Fragen zur „Energie", zur „Gesundheit", zur „Luft- und Raumfahrt", zur „Geschichte" und zur „Mathematik" mit der Urbanistik wieder ein Thema, mit dem wir uns am vergangenen Wissenschaftsjahr in Deutschland zur „Zukunftsstadt" orientieren.

Mit unserer gemeinsamen deutsch-russischen Veranstaltung zeigen wir, dass weite Bereiche von Wissenschaft, Bildung und Kultur eine Brücke sein können – und davon bin ich überzeugt – auch weiterhin eine Brücke sein werden. Wir treten miteinander in den Dialog – primär zu technischen Themen, aber wir werden diesen Austausch hoffentlich auch in Zukunft pflegen und über den fachwissenschaftlichen Diskurs hinausführen und dabei neue Partnerschaften eingehen können, insbesondere die jungen Wissenschaftlerinnen und Wissenschaftler unter uns. Insofern ist die Eröffnung dieser Woche heute aus unserer Sicht bereits ein großer Erfolg für alle Beteiligten. Lassen Sie mich daher den Organisatoren und Teilnehmern hier in Moskau herzliche Glückwünsche aussprechen und persönlichen Dank sagen! Meine Damen und Herren, Sie alle tragen dazu bei, unsere noch junge Veranstaltungsreihe selbst in schwierigen Zeiten fortzuführen!

Und lassen Sie mich daran erinnern, dass die Deutsche Forschungsgemeinschaft bereits in den 1920er Jahren mit der Sowjetischen Akademie der Wissenschaften gemeinsame Wissenschaftswochen organisiert hat. Als herausragendes Kooperationsinstrument erwiesen sich dabei die bilateralen Forscherwochen, die zu den Naturwissenschaften (1927), zu den Geschichtswissenschaften (1928), zu den Technikwissenschaften (1929) und zu den Medizinwissenschaften (1932) durchgeführt wurden. Und bereits auf den damaligen Wochen kam dem Nachwuchs besondere Beachtung zu. Wir werden ohne unseren Nachwuchs weder in der Wissenschaft noch in sonstigen Bereichen der Gesellschaft die Zukunft gestalten können. Darum gilt es auch und vor allem den Nachwuchs durch Veranstaltungen wie diese zu fördern.

Gestatten Sie mir hier einige weitere Ausführungen zur DFG. Die Deutsche Forschungsgemeinschaft ist heute der größte Forschungsförderer in Europa. Mit einem Jahresbudget von knapp drei Milliarden Euro unterstützen wir die Entwicklung der Grundlagenforschung an Hochschulen und Forschungsinstitutionen. Im internationalen Förderhandeln der DFG spielt Russland eine führende Rolle, denn seit 2003 ist die DFG mit einer eigenen Auslandsrepräsentanz in Moskau vertreten. Aber bereits seit 1970 besteht ein Abkommen mit der Akademie der Wissenschaften, um den Austausch zwischen unseren Forschernationen zu befördern. Neben regelmäßigen Beratungen und Veranstaltungen in Deutschland und Russland führt die DFG aber auch gemeinsame Ausschreibungen mit ihren russischen Partnerorganisationen, der RFBR, der Russian Foundation for Basic Research, und der RSF, der Russian Science Foundation, deren Vertreter ich ganz herzlich begrüße.

Mittlerweile arbeiten deutsch-russische Forschungsgruppen von Kaliningrad bis Vladivostok und vom Nordkaukasus bis zur Kola-Halbinsel an gemeinsamen DFG-Projekten. Gut ein Zehntel aller ausländischen Gastwissenschaftler an den DFG-Sonderforschungsbereichen in Deutschland stammt aus Russland. Damit rangiert die Russische Föderation gleich nach den USA an zweiter Stelle. Auch in der Nachwuchsförderung der DFG-Graduiertenkollegs zählt Russland mit China, Indien und Italien zu den vier größten „Entsenderländern" der Promovierenden. Allein in den letzten Jahren finanzierte die DFG fast 300 Projektanträge mit Beteiligung russischer Forscher. Beispiele dafür finden sich natürlich auch an Ihrer Universität. Und viele Vertreter deutscher Hochschulen und Wissenschaftsorganisationen sind extra für diese Woche angereist, um mit Ihnen ins Gespräch zu kommen.

Meine Damen und Herren, lassen Sie uns daher diese Tage in Moskau nutzen, um unserer Kooperationsbereitschaft Nachdruck zu verleihen. Es ist uns ein besonderes Anliegen, die institutionelle Kooperation mit den hiesigen Partnern vor Ort auszubauen. Ich wünsche Ihnen und uns allen eine erfolgreiche sechste Deutsch-Russische „Woche des Jungen Wissenschaftlers" und hoffe sehr, dass wir im nächsten Jahr gemeinsam die siebte Woche begehen können.

Уважаемый Андрей Анатольевич,
уважаемый Валерий Иванович,
Ваше превосходительство господин Посол,
уважаемый господин Хуснуллин,
уважаемый господин Гротус,
уважаемые дамы и господа,

я очень рад, что вы поддержали совместную инициативу Германской службы академических обменов (DAAD) и Немецкого научно-исследовательского сообщества (DFG), и сердечно приветствую Вас как вице-президент DFG на открытии шестой Недели молодого ученого!

Когда выступаешь с приветственным словом предпоследним, трудно добавить что-то новое к уже сказанному. Но я сделаю попытку и кратко расскажу вам об истории возникновения Недели и особых условиях проведения шестой Недели в ведущем инженерно-строительном университете Москвы.

Неделя молодого ученого имеет две стратегические задачи: во-первых, презентация результатов передовых научных исследований и обмен информацией по вопросам глобального характера позволяют нам затронуть важнейшие аспекты двустороннего сотрудничества между Германией и Россией; во-вторых, акцент при этом делается на расширение сети научных контактов между молодыми учеными. Вторая задача в этом году выходит на первый план, поскольку наша Неделя стала частью программы Российско-германского Года молодежных обменов и обязательно внесет свой ценный вклад в упрочение доверия и научного сотрудничества молодых ученых сегодняшнего и завтрашнего дня.

Пять лет назад, в рамках другого перекрестного года – Года образования, науки и инноваций 2011/12 – возникла новая идея: предложить молодым ученым двух стран мероприятие такого формата, чтобы они смогли и сами рассказать о своей научной работе, и услышать доклады более опытных коллег. В 2011 г. на первой Неделе в Казани мы выразили надежду на то, что наше начинание будет иметь продолжение, что раз в год молодые ученые двух стран будут встречаться в разных городах России для обсуждения разных тем. Сначала Неделя побывала в Казани и Екатеринбурге, на Урале, после чего мы осмелились на вылазку в Новосибирск, в Азию, чтобы затем вернуться в европейскую часть России, в Санкт-Петербург, и, погостив в Долгопрудном, вплотную приблизиться к Москве. Тем больше я рад, что мы смогли побывать не только у ворот Москвы, но и в самом центре столицы России, у вас в гостях.

Что сказать о Москве? Что здесь пятнадцать миллионов жителей и что это крупнейший город Европы, а также один из крупнейших научных центров мира, где сосредоточено более двухсот пятидесяти научных и образовательных учреждений. Мы, немцы, конечно, очень рады возможности поближе узнать этот мегаполис, где круглые сутки пульсирует жизнь, на предстоящей нам здесь неделе. Именно особое отношение к науке и культуре делает Москву в такой непростой политической ситуации идеальным местом для проведения нашей Недели молодого ученого. Под особым отношением я имею в виду, с одной стороны, историческое значение вашего города для двух наших стран, а с другой, историю вашего Университета, дорогой господин Волков, который на протяжении всего своего существования способствует культурному обмену, принимая участие в крупных международных проектах по всему миру, будь то в Африке, Азии или Европе. Полагаю, что международная деятельность станет одной из ключевых тем на предстоящих торжествах по случаю девяностопятилетия Университета. Примите наилучшие пожелания в связи с таким событием!

Уникальная посредническая функция вашего университета сыграет важную роль и в ближайшие дни, поскольку она будет способствовать обмену идеями между учеными наших двух стран, т.е. между Востоком и Западом. В прошлые годы мы обсуждали вопросы, связанные с энергетикой, здоровьем, авиацией и космосом, историей, математикой, сегодня в центре нашего внимания урбанистика – тема прошедшего в 2015 году в Германии года науки, сформулированная как «Город будущего».

При помощи нашего совместного германо-российского мероприятия мы хотим показать, что такие обширные сферы, как наука, образование и культура могут служить связующим звеном между людьми из разных стран, и я уверен в том, что они и в дальнейшем останутся мостом между нашими народами. Мы вступаем друг с другом в диалог преимущественно на технические темы, но мы надеемся на продолжение этого обмена опытом и в будущем и на его выход за пределы научной сферы, надеемся на то, что на форуме завяжутся новые партнерские отношения, особенно между молодыми учеными двух стран. И потому мы считаем, что открытие новой Недели – это уже большой успех для всех ее участников. Позвольте мне поздравить организаторов и участников конференции в Москве и лично поблагодарить их за работу! Дамы и господа, усилиями каждого из вас мы проводим нашу еще такую «юную» Неделю молодого ученого даже в такие непростые времена!

Я хотел бы напомнить вам о том, что уже в двадцатые годы двадцатого века Немецкое научно-исследовательское сообщество и Академия наук СССР проводили двусторонние недели науки. Огромное значение для развития партнерства имели совместные недели по вопросам естественных (1927), исторических (1928), технических (1929) и медицинских (1932) наук. И уже тогда большое внимание уделялось воспитанию научной молодежи. Без молодого поколения нельзя строить будущее ни в науке, ни в других сферах общественной жизни. Такие мероприятия, как наша Неделя, направлены именно на поддержку молодежи.

Позвольте мне сказать еще несколько слов о Немецком научно-исследовательском сообществе. Оно сегодня является крупнейшим фондом поддержки науки в Европе. Наш годовой бюджет составляет почти три миллиарда евро, эти средства мы направляем на проведение фундаментальных исследований в вузах и научно-исследовательских институтах. Россия играет ведущую роль для нашей деятельности за рубежом, поскольку с 2003 г. у нас существует представительство в Москве. Еще в 1970 г. мы подписали соглашение с Академией наук, чтобы совместно поддерживать научный обмен между нашими нациями исследователей. Наряду с регулярными консультациями и организацией мероприятий в Германии и России, Немецкое научно-исследовательское сообщество реализует совместные грантовые программы с российскими организациями-партнерами – РФФИ и РНФ, представителей которых я рад видеть на нашем мероприятии.

Германо-российские научные группы сегодня работают над совместными проектами с участием DFG на всей территории России – от Калининграда до Владивостока, от Северного Кавказа до Кольского полуострова. Одна десятая часть всех приглашенных для работы в центрах совместных исследований DFG в Германии ученых представляет Россию. По этому показателю Россия занимает второе место после США. Что касается привлечения молодых исследователей для работы в аспирантских школах DFG, то и здесь Россия, наряду с Китаем, Индией и Италией является одним из четырех крупнейших поставщиков молодых кадров. Только за последние годы Немецкое научно-исследовательское сообщество поддержало почти триста заявок с участием российских исследователей. Среди них, разумеется, есть заявки от представителей вашего Университета. Многие представители вузов и научных организаций Германии специально приехали в Москву, чтобы пообщаться со своими российскими коллегами в рамках Недели.

Дамы и господа, давайте используем это благодатное время, чтобы сделать акцент на нашей готовности к сотрудничеству. Мы очень заинтересованы в расширении и упрочении связей с нашими российскими партнерами. Я желаю Вам и всем нам плодотворной «VI Российско-германской Недели молодого ученого» и очень надеюсь, что в следующем году мы вместе будем праздновать открытие седьмой Недели.

ULRICH GROTHUS

Stellvertretender Generalsekretär
des Deutschen Akademischen
Austauschdienstes

УЛЬРИХ ГРОТУС

Заместитель Генерального секретаря
Германской службы академических
обменов

Sehr geehrter Andrej Anatolevich,
Sehr geehrter Valeriyj Ivanovich,
Sehr geehrter Herr Botschafter,
Sehr geehrter Herr Khusnullin,
Sehr geehrter Professor Allgöwer,

Als Stellvertretender Generalsekretär des Deutschen Akademischen Austauschdienstes, des DAAD, darf ich Sie hier in der Universität für Bauwesen Moskau im Namen des DWIH, des Deutschen Hauses für Wissenschaft und Innovation, begrüßen und heiße Sie zur Eröffnung der „6. Deutsch-Russischen Woche des jungen Wissenschaftlers" herzlich willkommen.

Ich freue mich, dass Sie der Einladung zur Eröffnung unserer Woche in so hoher Zahl gefolgt sind. Ihr Interesse ehrt unseren Gastgeber, die Universität für Bauwesen Moskau, die deutsch-russische wissenschaftliche Zusammenarbeit, aber auch die Vertreter der deutschen Hochschulen und Organisationen, die an der Ausgestaltung der „6. Deutsch-Russischen Woche des jungen Wissenschaftlers" mitwirken.

Persönlich, lieber Herr Volkov, bin ich nicht zum ersten Male in Russland, genauer gesagt, schon zum zehnten Mal. Aber zum ersten Mal habe ich Gelegenheit, Ihre Hochschule zu besuchen, die in diesem Jahr ihr 95-jähriges Bestehen feiert. Hierzu möchte ich Ihnen herzlich gratulieren!

Lassen Sie mich Ihnen persönlich dafür danken, dass Sie uns Ihre Universität für unsere Veranstaltung zur Verfügung stellen. Mein Dank richtet sich auch an alle Kolleginnen und Kollegen Ihrer Hochschule, die sich an der Vorbereitung der Woche des jungen Wissenschaftlers beteiligt haben.

Die zentrale Aufgabe der Deutschen Häuser für Wissenschaft und Innovation ist die Präsentation des Forschungsstandortes Deutschland im Ausland und die Vermittlung von Kooperationen zwischen den Institutionen und Wissenschaftlern der Gastländer und Deutschlands. Im Moskauer Wissenschaftshaus sind es seit 2009 die Deutsche Forschungsgemeinschaft, die Helmholtz-Gemeinschaft, die Deutsch-Russische Auslandshandelskammer, die Alexander von Humboldt-Stiftung und der DAAD, die diese Aufgabe gemeinsam wahrnehmen. Mit der Freien Universität Berlin und den Bundesländern Nordrhein-Westfalen, Thüringen und Niedersachsen haben wir in den letzten Jahren weitere starke Partner als Mitglieder des Hauses gewinnen können.

Der DAAD ist die weltweit größte akademische Austauschorganisation. Es ist kein Geheimnis, dass der DAAD seit vielen Jahren die höchste Zahl der Stipendienbewerbungen eines Landes aus Russland erhält, und die russischen DAAD-Stipendiaten besetzen auch zuverlässig einen der ersten beiden Plätze in der jährlichen Stipendienstatistik.

Das zeigt die außergewöhnliche Dichte der deutsch-russischen Hochschul- und Wissenschaftsbeziehungen, und ich denke, lieber Herr Allgöwer, dass auch die DFG aus ihrer Arbeit heraus die außerordentliche Intensität der deutsch-russischen Wissenschaftskooperationen bestätigen kann.

Russland und Deutschland blicken auf eine 1000-jährige gemeinsame Geschichte zurück, die auch im wissenschaftlichen Bereich eine lange Tradition aufweist: Die ersten russischen Studenten haben sich bereits im gleichen Jahr, in dem Kolumbus nach Amerika kam, 1492, an der Universität Rostock imma-

trikuliert. Russische Studenten und Wissenschaftler waren seit dieser Zeit beständig zu Studium, Forschung und Lehre an deutschen Hochschulen. Umgekehrt waren deutsche Dozenten und Professoren in Russland in allen wissenschaftlichen Bereichen tätig. Ich erinnere Sie nur an die Beteiligung deutscher Gelehrter am Aufbau der Russischen Akademie der Wissenschaften.

Diese langjährigen Beziehungen haben auch den schrecklichen Krieg überstanden, mit dem Nazi-Deutschland die Sowjetunion überzogen hat. Bald nach 1945 konnten zunächst vor allem ostdeutsche Hochschulen, bald aber auch die in der alten Bundesrepublik Kontakte wiederherstellen und neue Kooperationen aufnehmen.

Die Beziehungen zwischen Ihrer Hochschule, Herr Volkov, und den deutschen Partnern, sind nachhaltig, effizient und wissenschaftlich herausragend. Der DAAD unterstützt beispielsweise seit 2013 im Programm „Strategische Partnerschaften und thematische Netzwerke" enge Kooperation mit der Bauhaus-Universität Weimar. Mit diesem Programm fördert der DAAD unter anderem die Entwicklung gemeinsamer Forschungsprojekte, die Internationalisierung des Ingenieurstudiums und der Doktorandenqualifikation sowie die internationale Arbeitsmarktbefähigung der Absolventen. Daneben fördert der DAAD Sommerschulen, Kurzzeitdozenturen und unterstützt weitere Maßnahmen, an denen Ihre Universität aktiv partizipiert.

Ihre Kooperation mit deutschen Partnern ist nur ein Beispiel aus einer Fülle von deutsch-russischen Hochschulkooperationen, die in großer Vielfalt existieren.

Die Beziehungen zwischen unseren Regierungen, aber auch zwischen unseren Gesellschaften sind heute schwieriger und gespannter als je seit den 80er Jahren. Gemeinsame Werte, gewachsene Beziehungen und völkerrechtliche Regeln werden grundsätzlich in Frage gestellt. Das reicht vom Umgang mit kultureller und sozialer Vielfalt über den Respekt vor internationalen Vereinbarungen bis zur Beurteilung der Lage in anderen Weltregionen.

Aber gerade in solchen Zeiten ist es wichtig, dass wir im Gespräch bleiben und versuchen, andere Standpunkte wenigstens zu verstehen. Dafür haben Wissenschaftler eine besondere Verantwortung. Die akademische Kooperation hält viele Kanäle offen, während andere verstopft zu sein scheinen. Gerade heute sollten wir uns darauf besinnen, dass wir gemeinsam viele gute Erfahrungen gemacht haben, gemeinsam Grenzen der Erkenntnis erweitert haben, gerade im wissenschaftlichen Austausch der jungen Generation, Ihrer Generation, liebe Teilnehmer und Teilnehmerinnen der Konferenz. Diese Tradition wollen wir fortsetzen, und dazu bietet die „6. Deutsch-Russischen Woche des jungen Wissenschaftlers" einen guten Anlass und viele Gelegenheiten zum Gespräch.

Die diesjährige „Woche" nimmt sich eines Themas an, das aus unserer Sicht in ganz besonderem Maße geeignet ist, deutsche und russische Erfahrungen in einen Dialog zu bringen, da es einen Fragenkomplex in den Focus stellt, der alle uns am Ende des Tages ganz direkt als Menschen betrifft: Wie können wir die Herausforderungen an unser Leben in den Städten im 21. Jahrhundert meistern? Wie können wir den Zuzug in die Metropolen meistern und das Leben in ihnen attraktiv und würdig halten oder erst machen? Sie setzen sich aus wissenschaftlicher Perspektive mit diesen Fragen auseinander, aber viele von Ihnen sind ja selbst auch persönlich von ihnen betroffen.

Mit der Themenwahl „Urban Studies – The City of the Future" will das DWIH Moskau russischen und deutschen Nachwuchswissenschaftlern und Wissenschaftlern aus einem bewusst breit angelegten Spektrum an Fachdisziplinen ein Forum bieten, das den Austausch von Gedanken und Ideen zu diesem Themenkomplex unterstützt. Hierzu haben wir renommierte deutsche und russische Fachwissenschaftler für die Diskussion mit den Nachwuchswissenschaftlern beider Länder eingeladen. Aus München und Berlin, aus Weimar und Aachen, aus Dresden und Köln, aus Stuttgart und Bochum kommen die jungen deutschen Wissenschaftler, ihre russischen Kolleginnen und Kollegen kommen aus Moskau und Petersburg, aus Tomsk und Irkutsk, aus Stavropol, Cheljabinsk, Samára, Wolgograd, Orjol und Belgorod. Für Ihre Bereitschaft, an der „6. Deutsch-Russischen Woche des jungen Wissenschaftlers" mitzuwirken, spreche ich Ihnen an dieser Stelle meinen Dank aus.

Ich bin überzeugt, dass die Veranstaltung für Sie alle ertragreich sein und zu neuen Erkenntnissen und guten Kontakten führen wird. Ihnen wünsche ich gute Gespräche und danke für Ihre Aufmerksamkeit!

Уважаемый Андрей Анатольевич,
уважаемый Валерий Иванович,
уважаемый господин Посол,
уважаемый господин Хуснуллин,
уважаемый профессор Альгёвер,

я, заместитель генерального секретаря Германской службы академических обменов (DAAD), сердечно приветствую Вас в стенах МГСУ от имени Германского дома науки и инноваций (DWIH) на открытии «VI Российско-германской Недели молодого ученого». Добро пожаловать!

Я рад тому, что такое большое количество гостей откликнулось на наше приглашение. Ваш интерес – знак признания и уважения для МГСУ, принимающего у себя Неделю, для германо-российского научного сотрудничества, а также для представителей немецких вузов и организаций, участвующих в проведении «VI Германо-Российской Недели молодого ученого».

Что касается меня лично, дорогой господин Волков, я в России уже не в первый раз, а в десятый. Но я впервые оказался в вашем Университете, отмечающем в этом году свое 95-летие. Поздравляю вас с этой замечательной датой!

Позвольте мне также поблагодарить Вас лично за гостеприимство. Я благодарю всех коллег, сотрудников московского Университета, принимавших участие в подготовке Недели молодого ученого.

Основные задачи Германских домов науки и инноваций – презентация потенциала Германии как места для проведения научных исследований и поддержка сотрудничества между учеными и научными организациями страны, где находится DWIH, и немецким научным сообществом. В Доме науки и инноваций в Москве с 2009 года эту задачу совместно реализуют Немецкое научно-исследовательское сообщество, Объединение им. Гельмгольца, Российско-Германская Внешнеторговая палата, Фонд им. А. фон Гумбольдта и DAAD. В последние годы нашими новыми сильными партнерами и членами нашего Дома стали Свободный университет г. Берлина и федеральные земли Северный Рейн-Вестфалия, Тюрингия и Нижняя Саксония.

Германская служба академических обменов DAAD – крупнейшая в мире организация в области академических обменов. Не секрет, что уже много лет подряд Россия является лидером по числу заявок в DAAD из одной страны, и что российские стипендиаты DAAD неизменно занимают первое или второе место в ежегодной статистике распределения стипендий.

Эти факты отражают невероятную плотность германо-российского взаимодействия в сфере высшего образования и науки, и я полагаю, дорогой господин Альгёвер, что и Немецкое научно-исследовательское сообщество также может подтвердить, что германо-российское научное сотрудничество является чрезвычайно интенсивным.

Россия и Германия опираются на тысячелетнюю историю отношений, за это время сложились хорошие традиции в области научных контактов: первые студенты из России стали слушателями Университета г. Росток в 1492 г. – в том же самом году, когда Колумб открыл Америку. С этого момента университеты Германии постоянно принимали студентов, ученых и преподавателей из России. В свою очередь, немецкие доценты и профессора также работали в России во всех научных областях. Здесь хотелось бы вспомнить о вкладе немецких ученых в создание Российской Академии Наук.

Эти многолетние отношения пережили даже страшную войну, которую нацистская Германия развязала с Советским Союзом. Вскоре после ее завершения немецкие вузы – сначала в основном восточно-немецкие, а потом и западные – смогли восстановить научные контакты и создать новые совместные проекты с советскими коллегами.

Ваш университет, господин Волков, поддерживает долговременные, эффективные и невероятно перспективные отношения с немецкими партнерами. Один из

примеров тому – тесное сотрудничество с Университетом «Баухаус» в г. Веймаре, которое с 2013 г. получает поддержку DAAD в рамках программы «Стратегические партнерства и тематические сети». Данная программа DAAD поддерживает в том числе развитие совместных научных проектов и интернационализацию обучения и аспирантуры в области инженерных наук с целью обеспечить востребованность выпускников на международном рынке труда. Кроме этого, DAAD осуществляет поддержку летних школ, краткосрочных доцентур и других мероприятий, в которых ваш Университет принимает активное участие.

Поддерживаемые вашим Университетом партнерские связи с немецкими коллегами – лишь один из многочисленных примеров успешного сотрудничества вузов наших стран в самых разных научных областях.

Отношения между нашими странами на политическом и общественном уровне сегодня можно назвать самыми сложными и напряженными за весь период с начала 80-х гг. Под сомнение ставятся не только международно-правовые нормы, но и общие ценности, сложившиеся за это время сотрудничества. И это касается всех сфер: от обращения с культурным и социальным многообразием, от соблюдения международных договоренностей и до оценки ситуации в других регионах.

Именно в такие времена важно сохранять диалог и пытаться хотя бы понять позицию партнера. Здесь на людях науки лежит особая ответственность. Академическое взаимодействие поддерживает открытость многих каналов, в то время как по другим каналам сотрудничество, кажется, переживает сложный период. Именно сегодня нам стоит вспомнить о нашем совместном положительном опыте, о том, как мы вместе расширяли границы познания, особенно в рамках научного обмена для молодого поколения – вашего поколения, дорогие участники конференции. Мы хотим продолжить эту традицию, и «VI Германо-Российская Неделя молодого ученого» поможет нам в этом.

Шестая Неделя посвящена теме, которая, на наш взгляд, особенно подходит для того, чтобы обсудить опыт России и Германии в рамках диалога, поскольку в центре внимания оказывается вопрос, напрямую касающийся каждого из нас: как нам справиться с вызовами, с которыми сталкиваются жители городов в 21-м веке? Как справиться с притоком населения в мегаполисы и сохранить в них комфортные условия для жизни, сделать эти условия привлекательными и достойными? Вы занимаетесь этими вопросами как ученые, но многих из вас они затрагивают лично, в бытовом контексте.

Тема «Urban Studies – The City of the Future» была сформулирована DWIH максимально широко, чтобы дать молодым и зрелым ученым России и Германии, представляющим на форуме самые разные научные дисциплины, возможность обменяться идеями решения данных проблем.

С этой целью мы пригласили на форум известных немецких и российских специалистов в данной области, которые проведут дискуссии с молодыми учеными обеих стран. Мюнхен и Берлин, Веймар и Ахен, Дрезден и Кёльн, Штутгарт и Бохум – все эти города представляют на форуме молодые немецкие ученые, их российские коллеги приехали сюда со всех концов огромной страны – из Москвы и Петербурга, из Томска, Иркутска, Ставрополя, Челябинска, Самары, Волгограда, Орла и Белгорода. Я благодарю Вас за готовность принять участие в работе «VI Российско-германской Недели молодого ученого».

Я уверен в том, что Неделя будет для всех Вас плодотворной и подарит Вам новые знания и хорошие контакты. Желаю Вам увлекательных бесед и благодарю за внимание.

Interview mit der Generalsekretärin der Deutschen Forschungsgemeinschaft Dorothee Dzwonnek

Dorothee Dzwonnek ist seit 2007 Generalsekretärin der Deutschen Forschungsgemeinschaft. Sie studierte Rechtswissenschaften an der Ruhr-Universität Bochum und stellte danach ihre berufliche Karriere ganz in den Dienst von Wissenschaftssystem und Wissenschaftsmanagement. Ob als Abteilungsleiterin im Ministerium für Wissenschaft und Forschung des Landes Nordrhein-Westfalens, als Kanzlerin der TU Dortmund, als stellvertretende Vorstandsvorsitzende des Forschungszentrums Jülich, als Staatssekretärin im Ministerium für Wissenschaft, Weiterbildung, Forschung und Kultur des Landes Rheinland-Pfalz oder nun bei der DFG – Wissenschaft und Forschung sowie deren organisatorische, rechtliche, finanzielle und politische Rahmenbedingungen standen und stehen im Mittelpunkt ihres Interesses. Im Rahmen der Nachwuchswoche hielt sie einen Vortrag zu aktuellen Themen der Forschungspolitik und stellte sich anschließend den Fragen der Nachwuchswissenschaftlerinnen und -wissenschaftler.

Frau Dzwonnek, mittlerweile ist dies ja bereits die sechste Deutsch-Russische Nachwuchswoche. Wie wurde die Idee zu dieser Veranstaltungsreihe ins Leben gerufen?

Die Nachwuchswochen wurden 2011 auf Initiative von DAAD und DFG im Rahmen des Deutsch-Russischen Jahres der Wissenschaft, Bildung und Innovation ins Leben gerufen, um die wechselseitigen Kooperationen auf der Ebene des wissenschaftlichen Nachwuchses zu intensivieren. Seitdem finden sie einmal pro Jahr an wechselnden Standorten und mit wechselnden Themen in Russland statt. Veranstaltet werden die Wochen in Zusammenarbeit mit den bedeutendsten Universitäten und Forschungszentren des Landes. So tagten die Konferenzen in den letzten Jahren in Kazan (2011), Jekaterinburg (2012), Novosibirsk (2013), St. Petersburg (2014) und Moskau (2015). Dabei greifen die Konferenzen interdisziplinäre und zukunftweisende Themen auf, die zugleich aktuelle Schwerpunkte der bilateralen Zusammenarbeit zwischen Deutschland und Russland berücksichtigen.

Der intensive fachliche Austausch über einen Zeitraum von mehreren Tagen soll Impulse setzen, persönliche Netzwerke zwischen den Nachwuchswissenschaftlerinnen und -wissenschaftlern zu initiieren. Nicht selten sind es die Kontakte, die man in jungen Jahren am Anfang der Karriere aufbaut, die sich später auszahlen und in internationale Forschungsprojekte münden. Und so profitieren die jungen Teilnehmerinnen und Teilnehmer in mehrfacher Hinsicht von den Wochen: Zum einen durch den fachlichen Austausch auf Augenhöhe mit anderen Nachwuchswissenschaftlerinnen

und -wissenschaftlern, aber auch durch die Kommunikation mit renommierten Professorinnen und Professoren, die beratend zur Seite stehen. Zum anderen durch die Vernetzungsmöglichkeiten auf internationaler Ebene und die interdisziplinären Impulse zum eigenen Forschungsthema. Und nicht zuletzt erhalten die jungen Leute oft zum ersten Mal die Chance, ihre eigenen Arbeiten vor einem breiteren Publikum auf Englisch zu präsentieren.

Thema dieser Nachwuchswoche war „Urban Studies: City of the Future". Mit dem Thema „Urbanistik" wurde ein aktueller Fragenkomplex in den Fokus gestellt, der uns alle betrifft – wie können wir die Herausforderungen an unser Leben im 21. Jahrhundert meistern? Was sehen Sie als die zentralen Herausforderungen der kommenden Jahre?

Ich bin sicher keine Spezialistin auf diesem Gebiet, aber die Zukunft klopft ja täglich an die Tür. Fahren wir morgen noch selbst Auto oder wird ein Computer diese Aufgabe übernehmen? Was ist mit künstlicher Intelligenz möglich? Wie können wir einen guten Lebensstandard in dieser zunehmend komplexen und vernetzten Welt für alle Menschen gewährleisten? Wie interagieren wir umsichtig und nachhaltig positiv mit unserer Umwelt? Wirklich spannende Fragen. Wichtig wird auch sein, den technischen Fortschritt zu begleiten und uns selbst und unsere Gesellschaften und unser Handeln zu reflektieren und zu hinterfragen. Hier werden sich besonders für die Geisteswissenschaften spannende Forschungsbereiche ergeben. Ein sehr interdisziplinäres Feld.

Nachwuchsförderung gehört zu den Satzungsaufgaben der Deutschen Forschungsgemeinschaft. Wie kann die DFG den jungen Forschern exzellente Rahmenbedingungen garantieren?

Nachwuchsförderung ist in der Tat ein sehr zentrales Element der DFG-Förderarbeit. Um Nachwuchs bedarfsgerecht zu fördern, orientieren sich unsere Förderangebote an den verschiedenen Phasen einer wissenschaftlichen Karriere. Bereits während des Studiums und der Promotion kann man von diesen Mitteln profitieren, etwa als studentische Hilfskraft in einem DFG-Projekt oder mit einem Stipendium oder einer Stelle in einem internationalen Graduiertenkolleg. Forschungsstipendien für Auslandsaufenthalte, die eigene Stelle in Deutschland oder eine Stelle in Forschergruppen, Schwerpunktprogrammen, Sonderforschungsbereichen oder der Einzelprojektförderung können Nachwuchswissenschaftlerinnen und -wissenschaftler jedoch erst nach der Promotion beantragen.

In der Postdoc-Phase bietet das Emmy Noether-Programm zusätzlich die Möglichkeit, eine eigene Nachwuchsgruppe zu leiten, um sich so für eine Professur zu profilieren. Wenn dann die Berufung auf eine Professur nicht sofort klappt, überbrückt das Heisenberg-Programm bis zu fünf Jahre die Zeit bis zur Berufung auf eine Professur. Das DFG-Förderportfolio ist sehr komplex und zugleich modular aufgebaut, da die Bedarfe der Nachwuchswissenschaftler individuell unterschiedlich sind und mitunter auch von der Fachdisziplin abhängen. Wir achten auch darauf, dass die Vereinbarkeit von Familie und Beruf ermöglicht wird – ein sehr wichtiger Aspekt in dieser frühen Karrierephase, da diese häufig mit der Familienplanung konkurriert. Und wir wollen ja auch morgen noch exzellente Forscherinnen und Forscher fördern.

Seit 2006 läuft in Deutschland die Exzellenzinitiative (ExIn). Im Juni dieses Jahres beschlossen der Bund und die Länder die Weiterentwicklung und Fortführung dieses Wettbewerbs, der jetzt „Exzellenzstrategie" heißt. Welche Wirkung hat die ExIn bislang auf das deutsche Wissenschaftssystem entfaltet?

Die Exzellenzinitiative dürfte die deutsche Wissenschaftslandschaft in den vergangenen zehn Jahren so nachhaltig und strukturbildend geprägt haben wie vielleicht kein anderes Förderprogramm. Das Leistungsniveau wissenschaftlicher Forschung wurde beträchtlich erhöht; neue Vernetzungen zwischen den Disziplinen sind entstanden; und es hat zu einer spürbaren Internationalisierung des wissenschaftlichen Personals beigetragen. Neue Kooperationen zwischen Universitäten und Forschungseinrichtungen sind erwachsen. Universitäten haben durch die Möglichkeiten der Schwerpunktsetzung an Profilschärfe gewonnen und ihre Strategiefähigkeit somit gestärkt. Und auch wenn daneben zwei weitere Pakte (der

Pakt für Forschung und Innovation sowie der Hochschulpakt) Wirkungen entfaltet haben, so hat gerade die Exzellenzinitiative eine positive Dynamik in unserer Wissenschaftslandschaft und in unserer Spitzenforschung ausgelöst. Die DFG, die bereits mit der Umsetzung der Exzellenzinitiative betraut war, freut sich, dass es nun mit der „Exzellenzstrategie" eine Fortsetzung gibt, die vor allem mit der neugestalteten Förderlinie der Exzellenzcluster darauf abzielt, an Universitäten projektförmige Forschung auf zukunftsträchtigen Feldern und international wettbewerbsfähigem Niveau zu fördern.

In Russland wird die Reform der russischen Hochschulbildung fortgesetzt. Sie zielt unter anderem darauf ab, mehr Wissenschaft in die Universitäten zu bringen. Können Sie für unsere russischen Leserinnen und Leser kommentieren, welche Rolle den Universitäten in der deutschen Forschungslandschaft beigemessen wird?

Wir verstehen die Universitäten als das Herzstück des Wissenschaftssystems in Deutschland. Sie sind gleichermaßen Orte der Forschung wie der Lehre, an ihnen geht es um grundlegende wissenschaftliche Erkenntnisse und ebenso um Problemlösungskompetenzen, sie bilden den hochqualifizierten Nachwuchs für die Wissenschaft und auch für weite Teile des Arbeitsmarktes außerhalb der Wissenschaft aus. Deshalb kommt den Universitäten so eine zentrale Rolle zu. Die Entwicklungen der Reform der russischen Hochschullandschaft lassen erkennen, dass sich auch hier die Sicht auf die Universitäten und ihre Aufgaben wandeln und ihnen eine zentralere Rolle im Forschungssystem zugesprochen wird.

Deutschland verfügt über eine große Vielfalt von wissenschaftlichen Organisationen zur Förderung von Spitzenforschung. Wie gelingt es den vielen Akteuren, Konkurrenz zu vermeiden?

Diese strukturelle Vielfalt der wissenschaftlichen Organisationen bildet vor allem die funktionale Ausgestaltung des deutschen Wissenschaftssystems ab. So unterscheiden wir Wissenschaftsorganisationen, in denen erkenntnisgeleitete Grundlagenforschung, programmorientierte Forschung – also Forschung im Rahmen politisch oder gesellschaftlich definierter Programme – oder anwendungsorientierte Forschung bzw. Industrieforschung durchgeführt wird. Diese arbeitsteilige Ausdifferenzierung bietet Räume für die Bearbeitung unterschiedlicher wissenschaftlicher Aufgaben und Aufgabentypen und wahrt gleichermaßen die institutionelle und finanzielle Balance zwischen den Forschungstypen. Dennoch gilt: trotz komplementärer Strukturen sind diese Bereiche eng miteinander verzahnt und befruchten sich wechselseitig. Wenn eine solche Wissenschaftslandschaft zusätzlich durch starke Förderorganisationen wie der DFG mit einem hohen Grad an Handlungs- und Entscheidungsautonomie komplementiert wird, dann ist das sicherlich ein wesentlicher Garant für die Leistungsstärke und Innovationskraft des deutschen Wissenschaftssystems.

Deutschland und Russland haben eine lange Tradition der wissenschaftlichen Zusammenarbeit. Wie sehen Sie die Perspektiven dieser Kooperation? Bleibt Russland trotz der politischen Turbulenzen nach wie vor ein wichtiger Partner?

Es gibt in der Tat eine lange wissenschaftliche Tradition mit russischen Partnern, die wir als DFG im Bereich der erkenntnisgeleiteten Forschungsförderung seit vielen Jahren pflegen. Wir streben neben der finanziellen Förderung von deutsch-russischen Forschungsprojekten vor allem danach, die Rahmenbedingungen der internationalen Kooperation dauerhaft und ganz unabhängig von politischen Entwicklungen beider Staaten zu optimieren. Somit ermöglichen wir den Wissenschaftlerinnen und Wissenschaftlern und den deutschen Universitäten sich auf das Wesentliche zu konzentrieren nämlich auf Ihre Forschung, gerne zusammen mit russischen Partnern.

Dafür ist die enge Zusammenarbeit mit russischen Förderorganisationen sehr wichtig, und wir freuen uns, dass wir sowohl in der Vergangenheit als auch in der Zukunft auf verlässliche Partner set-

zen konnten und können. Sowohl mit der RFBR als auch der RSF bieten wir aktuell erneut deutsch-russische Projektförderung in einem sehr breiten Fächerspektrum an. Um diese Form der Zusammenarbeit intensiv zu begleiten und auszubauen, unterstützt das Moskauer Büro der DFG diese Aktivitäten vor Ort und berät zudem kooperationsinteressierte Wissenschaftler. Diese Kooperation mit russischen Partnerorganisationen hat beispielsweise im Jahr 2015 den ersten deutsch-russischen Sonderforschungsbereich hervorgebracht. An diesem sogenannten Transregio (TRR), der sich auf mehrere Forschungsstandorte verteilt, arbeiten neben der TU Dortmund, der Ruhr-Universität Bochum und der Universität Paderborn das Ioffe-Institut und die Staatliche Universität St. Petersburg (SPSU) auf russischer Seite mit und erforschen im großen Verbund das Thema „Kohärente Manipulation wechselwirkender Spinanregungen in maßgeschneiderten Halbleitern".

Solche Projekte stärken die russisch-deutsche Forschungslandschaft und ermöglichen Wissenschaftlerinnen und Wissenschaftlern beider Länder voneinander zu profitieren. Wir gestalten diese Kooperationen, weil sie große Perspektiven für beide Länder bieten, und unterstützen bilaterale Zusammenarbeit, weil Russland ein wichtiger Partner für unsere Forschungslandschaft ist.

Die DFG ist aktives Mitglied im Deutschen Wissenschafts- und Innovationshaus. Wie wichtig ist der DFG diese Aufgabe?

Als Mitglied im DWIH sind wir seit 10 Jahren regelmäßig über unser Moskauer Büro präsent. Das DWIH spielt für uns eine wichtige Rolle. Zum einen ermöglicht es uns die Durchführung einer Wissenschaftswoche wie dieser hier. Es bietet uns und den anderen teilnehmenden Institutionen aber auch eine gemeinsame Plattform, um unseren Themen der Forschungsförderung mehr Sichtbarkeit zu verleihen. Besonders wenn wir in den Regionen Russlands präsent sein möchten, bringt uns das DWIH etwa mit gemeinsamen Informationsseminaren einen echten Mehrwert. Deshalb werden wir auch künftig das DWIH über unser Moskauer Büro aktiv mitgestalten. Dieses Büro hat ja nun seit September dieses Jahres mit Frau Dr. Wilma Rethage eine neue Leitung, deren Amtsübernahme ein weiterer Programmpunkt auf meiner Reise war. Sie sehen also: Wir sind in vielen Bereichen der deutsch-russischen Kooperation engagiert und setzen auf Russland als einen sehr wichtigen Partner für die deutsche Wissenschaft.

Интервью с генеральным секретарем Немецкого научно-исследовательского сообщества (DFG) Дороттеей Дзвоннек

Доротее Дзвоннек с 2007 г. занимает пост генерального секретаря Немецкого научно-исследовательского сообщества. Она изучала право в Рурском университете Бохума и полностью посвятила свою карьеру вопросам организации и менеджмента в научной сфере. Где бы она ни работала – руководителем отдела в Министерстве науки и исследовательской деятельности земли Северный Рейн-Вестфалия, канцлером Технического университета Дортмунда, заместителем председателя правления исследовательского центра Юлиха, статс-секретарем Министерства науки, повышения квалификации, исследовательской деятельности и культуры земли Рейнланд-Пфальц или в Немецком научно-исследовательском сообществе, – ее всегда интересовали наука и исследовательская деятельность, а также связанные с ними организационные, правовые, финансовые и политические вопросы. В рамках Недели молодого ученого госпожа Дзвоннек выступила с докладом об актуальных проблемах научной политики, после которого молодые ученые могли задать ей вопросы.

Госпожа Дзвоннек, это уже шестая Неделя молодого ученого. Как возникла идея проведения данного мероприятия?

Неделя молодого ученого впервые была проведена в 2011 г. по инициативе Германской службы академических обменов и Немецкого научно-исследовательского сообщества в рамках Российско-Германского года образования, науки и инноваций и имела целью сделать сотрудничество между молодыми учеными двух стран более интенсивным. С этого момента Неделя ежегодно проходит в различных городах России, и посвящена она самым разным темам. В организации Недели принимают участие ведущие университеты и научно-исследовательские центры страны. Неделя уже побывала в Казани (2011), Екатеринбурге (2012), Новосибирске (2013), Санкт-Петербурге (2014) и Москве (2015). Тематика Недели носит междисциплинарный характер и ориентирована на будущее, кроме того, она выбирается с учетом современной повестки дня двусторонних отношений между Германией и Россией.

Интенсивный обмен профессиональным опытом на протяжении нескольких дней дает молодым ученым импульс для налаживания личных контактов. Именно такие контакты, которые возникают в самом начале научной карьеры, часто оказываются хорошим заделом на будущее и перерастают в международные исследовательские проекты. Таким образом, для молодых участников конференции Неделя оказывается привлекательной сразу с нескольких сторон: с одной стороны, молодые ученые могут обменяться опытом с научной молодежью другой страны, а также пообщаться с учеными с именем, готовыми поддержать их советом. С другой стороны, Неделя помогает выстроить научное взаимодействие на международном уровне и дает новые, междисциплинарные импульсы для расширения собственных исследований. Не стоит забывать и о том, что в рамках Недели молодые ученые получают возможность представить результаты своей работы широкой публике на английском языке, причем многие из них делают это впервые.

Тема Недели в этом году: «Урбанистика: город будущего». В центре внимания ученых окажутся вопросы, касающиеся нас всех: как справиться с вызовами 21-го века? С какими основными проблемами, на Ваш взгляд, мы столкнемся в ближайшем будущем?

Я, конечно, не специалист в данной области, но будущее напоминает о себе каждый день. Будем ли мы завтра сидеть за рулем автомобиля, или вместо нас им будет управлять компьютер? Чего можно достичь с помощью искусственного интеллекта? Как нам обеспечить хорошее качество жизни для каждого человека в мире, который с каждым днем становится все сложнее? Что такое бережное обращение с природой? Это очень интересные вопросы. Кроме того, важно идти в ногу с техническим прогрессом, постоянно анализируя собственное развитие, поведение и изменения в жизни общества. Здесь открываются интересные перспективы для исследователей в гуманитарной области. И нужно задействовать достижения своей научной

дисциплины и результаты исследований в других областях.

Поддержка молодых ученых является задачей Немецкого научно-исследовательского сообщества, об этом написано в уставе организации. Каким образом Сообщество может гарантировать научной молодежи превосходные условия для проведения исследований?

Поддержка молодых ученых действительно является важнейшим элементом деятельности Немецкого научно-исследовательского сообщества. Ее необходимо оказывать с учетом потребностей исследователей, именно поэтому наши грантовые программы привязаны к конкретным ступеням научной карьеры. Уже во время учебы в университете или аспирантуры можно получить нашу финансовую поддержку, став помощником в одном из наших проектов, получив стипендию или место в одной из международных аспирантских школ. Заявку на стипендию для проведения исследования за рубежом, на открытую вакансию в Германии или на место в одной из научно-исследовательских групп, на стипендию по программам исследований по приоритетным направлениям, место в одном из центров совместных исследований, а также заявку на финансирование отдельного проекта молодые ученые могут подавать только после защиты диссертации.

На этапе после защиты программа «Эмми Нётер» дает возможность руководить собственной группой молодых ученых, чтобы выстроить свой научный профиль для дальнейшей работы в профессорской должности. Если получить место профессора удается не сразу, можно воспользоваться программой «Хайзенберг», рассчитанной на срок до пяти лет, с тем чтобы впоследствии стать профессором. Пакет программ Немецкого научно-исследовательского сообщества очень комплексный и представляет собой модульную систему, поскольку потребности молодых ученых достаточно индивидуальны и часто зависят от их научной дисциплины. Для нас также важно, чтобы ученые могли совмещать семью и карьеру, это очень значимый аспект, особенно на ранних этапах профессионального становления, когда работа конкурирует с планированием семьи. А талантливая молодежь будет нужна нам не только сегодня, но и завтра.

С 2006 г. в Германии реализуется программа по поддержке лучших университетов страны (Exzellenzinitiative). В июне этого года федерация и федеральные земли приняли решение о ее продолжении и расширении, но уже под новым названием – «Стратегия по поддержке лучших университетов Германии». Какое влияние данная инициатива оказала на немецкую науку?

Данная программа оказала на немецкую науку за несколько прошедших лет такое системное и структурирующее влияние, какого не оказала, пожалуй, ни одна другая программа поддержки. Существенно повысился уровень достижений исследовательской работы, возникли новые связи между отдельными научными дисциплинами, заметно выросло число ученых из-за рубежа. Возникли новые совместные проекты между университетами и научными учреждениями. Благодаря возможности расставить научные приоритеты университеты смогли уточнить стратегии профильного обучения, что укрепило их позиции. И хотя наряду с данной программой определенную роль сыграли две другие (Пакт об исследованиях и инновациях, а также Пакт о вузах), именно инициатива по поддержке лучших вузов страны стимулировала положительную динамику развития научного ландшафта и передовых исследований в Германии. Немецкое научно-исследовательское сообщество, которому была поручена реализация этой программы, радуется ее продлению, а также открытию нового направления – направлению поддержки исследовательских кластеров, – которое призвано создать на базе университетов проектные группы, разрабатывающие перспективные научные задачи на серьезном международном уровне.

В России продолжается реформа высшего образования. Она, кроме прочего, направлена на то, чтобы увеличить научный потенциал университетов. Не могли бы Вы рассказать российским читателям, какое значение университеты имеют для немецкого научно-исследовательского ландшафта?

Университеты являются ядром системы немецкой науки. Они одновременно занимаются исследовательской и образовательной деятельностью, дают основополагающие научные знания и формируют умение решать научные проблемы, здесь растет высококвалифицированная смена, которая впоследствии идет в науку или на широкий рынок труда. Именно поэтому университеты играют для нас такую важную роль. Реформа российского вузовского ландшафта показывает, что и в России взгляд на университеты и их задачи со временем меняется, что университетам отводится более значимая роль в общей системе организации исследовательской деятельности.

В Германии существует большое количество разных научных организаций, поддерживающих передовые исследования. Как им удается решить проблему конкуренции?

Структурное многообразие научных организаций отражает само функционирование системы науки в Германии. Мы разделяем организации, занимающиеся наукой, на те, где ведутся фундаментальные исследования, программные исследования, т.е. исследования в рамках политически или общественно направленных программ, и те, где развивается прикладная наука, где ученые работают на промышленность. Подобное разделение функций открывает возможности для решения различных научных задач и позволяет поддерживать институциональный и финансовый баланс между всеми видами исследований. Но, несмотря на комплементарность структур, все эти виды тесно связаны между собой и стимулируют друг друга. Дополнение подобного научного ландшафта сильными фондами, такими, как Немецкое научно-исследовательское сообщество, имеющее высокую степень независимости в при-

нятии решений, – это уже серьезная гарантия продуктивности и инновативности немецкой науки.

Германия и Россия имеют давние традиции научного сотрудничества. Каковы его перспективы, на Ваш взгляд? Останется ли Россия важным партнером Германии, несмотря на сложную политическую ситуацию?

Отношения с российскими партнерами действительно имеют давние традиции, и мы как Немецкое научно-исследовательское сообщество уже многие годы поддерживаем наше сотрудничество в области финансирования фундаментальной науки. Помимо финансовой поддержки германо-российских исследовательских проектов мы стремимся к постоянному улучшению общих условий сотрудничества, которые не должны зависеть от политической ситуации в двух странах. Таким образом, мы даем ученым и университетам Германии возможность сконцентрироваться на главном – их работе, и мы готовы поддержать их совместную работу с российскими коллегами.

Для достижения этой цели важно тесное сотрудничество с российскими фондами, и мы рады, что они всегда были и остаются нашими надежными партнерами. Сегодня мы, как и в предыдущие годы, предлагаем программы поддержки германо-российских проектов по очень широкому кругу дисциплин совместно с РФФИ и РНФ. Чтобы более интенсивно курировать и расширять такие формы сотрудничества, наше представительство в Москве поддерживает совместные проекты на месте и дает консультации заинтересованным в сотрудничестве ученым. Одним из результатов такого взаимодействия с российскими организациями-партнерами стало, например, открытие в 2015 г. первого германо-российского центра совместных исследований. География подразделений центра «Трансрегио» (TRR) очень широка, в рамках проекта сотрудничают Технический университет Дортмунда, Рурский университет Бохума, Университет Падерборна и ФТИ им. А.Ф. Иоффе РАН и СПбГУ с российской стороны. Тема, которой посвящены совместные разработки участников – «Когерентная манипуляция взаимовлияющими возмущениями спинов в специальных полупроводниковых системах».

Подобные проекты усиливают позиции двух стран в сфере науки и дают немецким и российским ученым возможность взаимовыгодного сотрудничества. Мы помогаем совместным проектам оформиться, потому что они открывают большие перспективы для Германии и России, и поддерживаем двустороннее сотрудничество, поскольку Россия является важным партнером для немецкой науки.

Немецкое научно-исследовательское сообщество является активным членом Германского дома науки и инноваций. Насколько значима для Сообщества эта работа?

В качестве члена Германского дома науки и инноваций мы уже десять лет работаем в нашем представительстве в Москве. Германский дом играет для нас важную роль. Например, он дает нам возможность проведения недель науки, таких, как эта. Кроме того, он предоставляет нам и другим организациям в его составе общую платформу для совместного обсуждения вопросов по поддержке исследовательской деятельности. Особенно если мы хотим усилить присутствие в российских регионах, Германский дом серьезно облегчает нам эту задачу при помощи, например, совместных информационных семинаров. Потому наше московское представительство и в дальнейшем будет существовать на базе Германского дома науки и инноваций и вносить свой вклад в его деятельность. В сентябре 2016 г. наше представительство в Москве возглавила госпожа доктор Вильма Ретхаге, ее вступление в должность стало еще одним пунктом программы моей поездки в Россию. Как Вы видите, мы вовлечены в разные сферы германо-российского сотрудничества и делаем на Россию ставку как на очень важного партнера для немецкой науки.

"What will we be talking about?"

Introductory Remarks

Deputy Secretary General of the DAAD, Ulrich Grothus

Dear Prof. Allgöwer,
Esteemed colleagues,
Dear young researchers, and students,

Before giving start to this year's "Sixth German-Russian Week of the Young Researcher" on Urban Studies and hearing your lectures, we would like to provide you with some more general information on who we are and what we do.

Let me start with some words on the DAAD.

The DAAD is the German higher education institutions organization devoted to making the system of scientific research and innovation international. By awarding scholarships and providing customized programs which promote transnational cooperation and university partnerships, the DAAD provides to students, researchers and instructors the chance to study, work and conduct research at the best institutions in Germany. These efforts correspond to the goals of German cultural diplomacy, education and research policy, as well as development cooperation.

We are happy to offer scholarships for the best things: based on its long-term success in supporting outstanding students and researchers, the DAAD would like to prepare students to take their place as responsible professionals and leaders of tomorrow. In addition to establishment of a sustainable network throughout the world, the DAAD brings more focus on strengthening academic and cultural bonds between its scholarship holders and alumni in the future.

We keep our doors open for international cooperation: the DAAD will develop its programs in such a way to make them available for universities to implement their own internationalization strategies. To ensure Germany retains its position as one of the most popular destinations for international mobile students, we need to have 350,000 international students attracted by 2020.

The aim is to raise their academic success rate to meet the one of German students. By the end of this decade, we wish to ensure that every second German graduate gains substantial academic experience abroad. The DAAD is a standard-bearer for German as a language of science and scholarship and advocates multilingualism everywhere.

We create expertise for academic collaboration: the DAAD's activities are based on extensive and differentiated knowledge about the structures of university cooperation and the systems of higher education and research throughout the world. The DAAD relies on professional experience of its employees and its worldwide network of branch offices, information centers and lectors. This expertise is updated on a continual basis and is made available for strategic decision-making purposes. Based on this expertise, the DAAD will play a more active role in advancing the academic system internationalization.

This is why the DAAD enhances the dialogue between academic and civil societies as an instrument for mutual understanding. Why is this important? Looking back at the last century, we can see a century full of wars, catastrophes and the highest death toll mankind has ever paid for the lack of communication or the denial of it. So, the main reason why the DAAD was founded in 1924/25 was to resume broken commu-

nications with Germany's neighbor states and World War I opponents. On the other side, the 20th century has brought about a completely new phenomenon, the globalization, which opens new chances as well as new challenges.

We all know that science and research play a significant role in this respect and we are to find answers and to face the challenges of the 21st century. Therefore, Germany invests considerable finances into research and has developed a differentiated landscape of research institutions. Besides universities, which combine teaching and research, there is a great number of organizations doing independent researches or financing them.

The most commonly known organizations, both in Germany and abroad, are the Deutsche Forschungsgemeinschaft – DFG – (German Research Foundation), the Max Planck Society, the Leibniz Society, the Helmholtz Association and the Fraunhofer Society.

All these organizations support science and research as such, finance projects, materials, expeditions, technology, experiments and the scientific personnel involved.

As science and research have become more and more vital for development, society, progress and stability, alongside with the ideas globalization and economy, Germany has introduced the idea of a new foreign policy branch, the "Außenwissenschaftspolitik". We can translate it as 'foreign policy for science and research'.

It was Mr Frank Walter Steinmeier, Minister of Foreign Affairs, who had proclaimed this new branch of foreign policy in 2007 and developed the idea to establish German Centers for Research and Innovation – DWIH –, to represent Germany as the country of research and innovation abroad.

This is why we now have Centers in scientifically prospective countries, such as Brazil/Sao Paolo, India/New Delhi, USA/New York, Japan/Tokyo and Russia/Moscow. In Egypt/Cairo, the DAAD runs a German Scientific Center (DWZ).

Science and research are inevitable prerequisites for innovation and technological progress, but to be successfully launched, innovation itself does require management skills and capabilities as well as economic experience and know-how. Therefore, besides research organizations, the German economy is integrated into the concept of the Centers.

The mission of the Center in Moscow is to establish a forum, where German research can be represented, where German-Russian dialogue can be practiced. Research institutions and innovative enterprises should be represented, strategic topics may be discussed.

There will be marketing for German research; the Center provides information for Russian and German scientists in various forms. Outstanding German scientists are invited for lectures, scientific discussions arranged, workshops organized, and the Moscow Center is taking part in conferences. The Moscow Center's particularly important goal is to bring together young researchers from Germany and Russia as future colleagues. This is the reason for the "German-Russian Week of the Young Researcher" to be developed.

Starting with the "First German-Russian Week of the Young Scientist" in Kazan, in 2011, followed by the second week in Yekaterinburg, in 2012, and the third one in Novosibirsk, in 2013, the topics ranging from Energy and Health to Aviation and Spaceflight have been discussed. In 2014, in St.Petersburg, we selected a historic topic and held the "Fourth Week" on Global History. In 2015, we turned towards mathematics.

Today, I am glad to welcome you at the "Sixth Week" which is dedicated to the city of the future. An increasing urbanization is the key trend, and the design of city systems will play an essential role in development of a sustainable future. Today's cities often use systems and infrastructure based on outdated technologies, which makes them unsustainable, inflexible, inefficient, and difficult to change. In order for both people and natural systems to thrive, the city of the future will have to be fundamentally different. To face the big challenges of the next decades, city systems must be innovative, flexible, liveable, and sustainable.

I could not image a better place for discussion of these and other questions related to the "City of the Future" than Moscow, the largest city in Europe and one of the World's Mega-Cities.

I wish you all fruitful discussions, new ideas and contacts and all the best for the future.

Thank you for your attention and for your participation in the "Sixth Week"!

"What will we be talking about?"

Introductory Remarks

Vice President of the DFG, Professor Dr Frank Allgöwer

Dear Distinguished Guests,
Dear Colleagues and Friends,
Lieber Herr Kollege Grothus!

thank you very much for turning the floor over to me. It is a great pleasure to do this introduction together with you, especially because it is a debut for both of us! We are both new to the Week, but not the Agencies that we represent. It has always been either President or Vice President of DAAD or DFG who officially opened the 'Weeks of the Young Researcher'. But today, we even had the pleasure to enjoy the presence of the German Ambassador. Also, later this week, the Secretary General of the DFG, Dorothee Dzwonnek, will give a lecture and hold a discussion with you, young scientists! This all shows that the format and the importance of the Week have significantly grown over the years.

It is a little bit difficult to make a clear cut here, because, in fact, both of our organizations – the DAAD and the DFG – are responsible for science and development of fundamental research. Indeed, it is this "Week of the Young Researcher" when the two funding agencies DAAD and DFG meet: Supporting the mobility of young scientists and their research activities.

Abroad especially – here in Russia, in Moscow – it all makes so much sense to combine the DAAD on-site experience and the DFG research expertise, that has funded quite a few projects at local research institutions over the last decades. That is why we originally had the idea to hold such kind of a conference together and that is why we are doing this introduction together.

Mr Ulrich Grothus has already pointed out that the German Centre for Research and Innovation – das Deutsche Haus für Wissenschaft und Innovation – is hosting much more German organizations apart from the DFG and the DAAD. That is why I am very happy to see here, in Moscow, the representatives from the Alexander von Humboldt-Foundation, the Helmholtz Association of German Research Centres, Ms Elena Yeryomenko, Head of the Moscow-Office, and Mr Tobias Stüdemann from the Freie Universität Berlin, who will support us during the week. Furthermore, we are very grateful to the German Embassy in Moscow for their support – not only during this week! Our special gratitude goes to Mr Michael Dobis, Head of the Science Department, and Mr Mikhail Rusakov, his colleague.

But, as a matter of fact, we have to be even more grateful to all the researchers who have come to Moscow. Without your involvement, this Week would not have been possible. Many thanks to all the German participants from Aachen, Berlin, Bonn, Bochum, Cologne, Dresden, Munich, Weimar – and finally – if I may add… from Stuttgart, because this is where I come from!

Yet, some of our Russian colleagues had to make a longer and more tiring journey to come here, because they live further away from Moscow than most Germans do. So, it is a great pleasure to welcome you who have come from various parts of the vast territory of the Russian Federation: from Belgorod, Chelyabinsk, Irkutsk, Oryol, Rostov, Tomsk, Samara, Stavropol, Saint Petersburg, Volgograd, and last but not least, from Moscow. Indeed, without assistance of our friends from MGSU, Ms Elena Gogina, Vice Rector, and Ms Natalya Samotyosova, we would not be able to celebrate this Week opening today in the same manner.

From my welcoming address, you've learnt that the DFG is a central, self-governing research funding organization in Germany. But why has the DFG been active in Russia for many decades now? We do believe that there is considerable research potential to be unlocked in many scientific and humanitarian areas. We have always put a great focus on the countries allowing scientific cooperation to be carried out on an equal footing. Within our agreements and bilateral programmes with the Russian Academy of Sciences, the Russian Foundation for Basic Research – RFBR, and the Russian Science Foundation – RSF, there have been a great number of conferences, symposia, visits and research projects in all areas of research, often resulting in sustainable integrated networks. Our liaison office in Moscow, being one of seven only DFG representations worldwide, emphasizes the fact that Russia plays a key role as one of our most important strategic partners. But, I'm stopping here, at this point, because my

DFG-colleagues Mr Jörn Achterberg and Ms Wilma Rethage from Moscow as well as Mr Michael Lentze and Mr Sebastian Granderath from Bonn will go into detail later this week and present how the DFG fosters international collaboration and facilitates cooperation especially among young researchers.

We have heard now why the DFG is in Russia. And we have heard why we are in Moscow today. And we have already heard why we focus on supporting young researchers this week. But we have not heard yet about the actual subject of this conference! Why did we choose "Urban Studies" as our major topic? Let my briefly explain it. There are three good reasons for it.

First of all, we change location and topic every year! It is part of the general idea of these weeks. Usually, we choose Host University first and then agree on the topic. Therefore, last year we were contacted by MGSU and we were happy to accept their invitation. We selected MGSU as Host University, because it is one of Russia's leading universities and the top university in the area of civil engineering.

The second good reason to decide on Urban Studies is the topic's interdisciplinarity that allows us to invite many different researchers from various areas to set up interdisciplinary networks. We believe that this diversity will become a source of new ideas. Identifying and exploiting synergies between various aspects and various scientific approaches will surely be the key to tackle global challenges.

And third, the 'Urbanism' topic is a critical issue at the moment and appeals to both our countries. Also, the subtopic of our Week 'City of the Future' can foster a dialogue in our societies about the objectives, challenges and fields of modern scientific approaches in many ways. We saw this happen in Germany last year, when our Ministry ran the official 'Year of Science' under the same name. We hope that MGSU will be a perfect place to initiate this discussion on a bilateral level, because this is the University, where Germans and Russians have been working together very successfully for a very long time.

But now, Mr Ulrich Grothus and I have talked a lot and we do not want to repeat ourselves here any longer. I promise you will not have to listen to us again this week. Also, we have already said quite a few words in German and in English – and there are so many great young minds among us that have not even said a single word in either language yet. So, it is high time for us to finish and let the young scientists speak!

But before we do so, can we, please, invite the Rector, Mr Andrey Volkov to give the second key-note of this opening day. Professor Volkov, the floor is yours!

"What will we be talking about?"

Introductory Remarks

Dr Michael Lentze, Programme Director, Chemistry and Engineering Sciences

Dear readers and young scientists,

Mr Frank Allgöwer, our Vice-President, has already sent the warmest regards of the Executive Board of the Deutsche Forschungsgemeinschaft to you. Now, it is a great pleasure and honor for me to welcome you on behalf of the Divisions of Engineering Sciences within the DFG to this sixth German-Russian Week of the Young Researcher in Moscow. Me, I am a scientist by training, but now I am responsible for science administration more than for actual research, which is carried out by the scientists we have invited to the Week.

A few years ago, I had the chance to participate in the Second Week, which focused on "Aviation and Space". Of course, I am convinced that there are many other topics that would be worth strengthening the cooperation between Russian and German young scientists. Especially, in the field of engineering sciences, as there is already a well-grounded cooperation between research groups in both countries. German and Russian scientists engaged in mechanics, civil engineering, fluid dynamics and other disciplines work hard to solve relevant research problems in joint projects.

This year, I am very happy, that we could focus our event on "Urban studies: The City of the Future".

From my point of view, urban development is among the most important social issues of today. Even large cities are constantly growing as it could be seen here, in Moscow. More and more people live and work in these megacities. As a result, demand for housing is growing steadily. It is obvious, that new solutions are required, such as building houses under the current standards

and without pollution to the environment. The basic research on new materials is an important element in solving these issues. The challenge requires new architectural concepts. Only new tools in construction mechanics may enable implementation of very complex projects. As a result, at the meeting, we are dealing with construction informatics, which is a very interdisciplinary field. The scientists are going to cover some of these aspects. An increasing traffic is another problem in modern cities around the world. Exhaust gas pollutes the air. Too many cars are stuck in daily traffic jams. For people, it is extremely difficult to reach their workplace. Even public transport services have to use their maximum capacity, as we can see in large cities. Scientists in the field of road construction, traffic engineering and control engineering work hard to provide solutions for the relevant problems.

I am very happy that our guest institution here, in Russia, the Moscow State University of Civil Engineering (MGSU) can provide outstanding scientists in many of these fields. It is a pleasure for me to welcome also the experts from other Russian Universities as well as famous representatives from German institutions. I do hope that our Week and the brochure give an insight to the topic. Certainly, it won't be a great surprise if further close collaborations between young scientists from Germany and Russia follow.

The DFG, as a funding agency, has supported quite a few projects here, in Moscow, as well as in other Russian cities over the last decades. Major bilateral projects on "Urban studies" are important elements of that event. Many more projects prove that this University is the right choice for the Week venue.

I would like to wish you to enjoy reading of the brochure and hope you will get into current research projects. This is an exciting science on a very important topic!


Германский
инноваций в
Герман
страна

PARTICIPANTS OF THE WEEK OF THE YOUNG RESEARCHER

Oliver Barfusz
Research Fellow
Institute of Applied Mechanics,
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SUSTAINABLE STRUCTURES OF THE FUTURE – FOCUS ON FINITE ELEMENT TECHNOLOGY (FET)

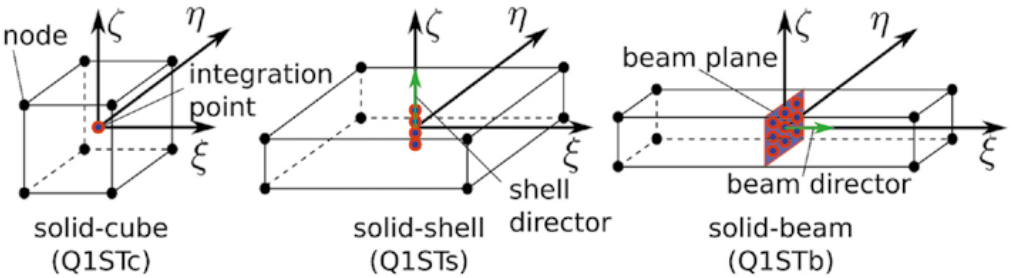
In the last decades, finite element simulations of engineering processes often have been carried out by means of structural elements like beams or shells including different properties and assumptions, e.g. rotational degrees of freedom or the assumption of a plane stress state in shell-elements. Such formulations reach its limit if fully three-dimensional material models are required to take into account the structural behavior.

In this context, a new family of solid finite-elements is presented as a competitive alternative. These elements are based on classical continuum finite elements, but they include kinematic concepts which allow the use of only one element over the thickness of the structure. Due to their three-dimensional nature, the implementation of arbitrary three-dimensional material models can be easily accomplished.

This presentation focuses on derivation and application of a new family of solid finite elements called Q1STx. In particular, the Q1STx is a combined solid-cube, solid-shell and solid-beam element. All three versions have a common feature – they are based on an isoparametric concept and reduced integration with hourglass stabilization. The main difference between the element formulations is the integration scheme.

In order to overcome artificial stiffening effects (called locking), the derivation of the elements requires implementation of finite element technology (FET) techniques. The relevant locking phenomena are treated by a combination of the assumed natural strain method (ANS) and the enhanced assumed strain method (EAS).

As an example of a structure with complex geometry, an orthotropic plate under uniform pressure is considered. The numerical results of Q1STx are presented and discussed by means of a convergence study with deflection curves. The new element family shows superior results compared with the commonly used element formulation C3D8 from the commercial FE software Abaqus.



PARK-AND-RIDE VALUE UNDER INTERMODAL TRANSPORTATION SYSTEM INTEGRATION

Nowadays, a significant attention in the field of public transportation in big cities and agglomerations of the Russian Federation is paid to the development of intermodal transport system. It is supposed to ensure comfort, safe and speed for transportation services together with making combined trips accessible for all groups of population in order for them to use advantages of different modes of city transport. According to the city Transport Planning Documents, the development of intermodal transportation includes the process of public transport and its infrastructure modernization, integration of public transport transit hubs and park-and ride facilities systems, as well as actions developed to gain consumer loyalty for public mass transportation services among the population. The author's research is mainly focused on the value of park-and-ride facilities and issues of its integration in the city intermodal transportation system. There are some results of the original author's work and analysis of foreign and domestic experience that served as a base for setting the main long- and short-term goals and requirements for park-and-ride facilities. The model of park-and-ride system was developed for the purpose of feasibility studies inside the city and regional public transport transit hubs system.

Dr Nina Danilina

Associated Professor

Architecture and Urban Planning Department,
Moscow State University of Civil Engineering
(National Research University)

BIM AND SENSOR DATA FUSION FOR PROJECT LIFECYCLE MANAGEMENT

It is generally known that the costs of operating a facility are usually much higher than the initial costs for its planning and building. Therefore, the cost optimization at the operation stage seems to be a long lever for the overall volume of life cycle costs. However, strategic decisions in the area of facility management (FM) must be based on proper information. This is the point where Building Information Models (BIM) and sensor data come into play. Very often FM starts upon the building completion with building up a new information base. This base is nowadays called Facility Information Model (FIM) and makes typically only a partial use of the existing data (e.g. from BIM or 2D-drawings). In these cases, where the data is used, FM has to deal with the uncertainty whether the physical building really corresponds to that data or not. Sensors provide up-to date information about the facility. This can be data about temperature, humidity or about other facility related characteristics. Together with the static but consistent information from BIM, a dynamic and reliable information base for FM strategy alignment can be created to contribute to an increased cost efficiency of buildings. Within the research project, questions have to be answered in relation to the relevance of information and their timing for FM as well as the storage of raw and processed sensor data in FIM.

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Dr Sten Gillner
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ENHANCING URBAN TREES MULTIFUNCTIONALITY CONSIDERING SITE AND HUMAN FACTORS

In urban areas, trees, shrubs and green spaces generally have to be considered under diverse aspects of human demands and under manifold environmental conditions. At many urban sites, e.g. highly sealed areas, the trees frequently suffer from heat stress, low air humidity and soil drought. Under these conditions, tree physiology, optimal growth and, consequently, long-term vitality are strongly restricted.

While maintaining vitality and promoting a rapid establishment, as well as ecosystem services of the urban trees, it is important to select trees adapted to diverse environments.

This complex task calls for interdisciplinary collaboration: thus, the Department of Forest Botany, the Department of Forest Biometry and Systems Analysis (both in School of Civil and Environmental Engineering, TU Dresden), and the Centre for Interdisciplinary Research in Technology Development (School of Humanities and Social Sciences, TU Dresden) joined their efforts. Within this project, scientists with different academic backgrounds were collaborating in development of this solution for urban forestry at the intersection of environment, health and urban planning. Information about trees species and urban sites were used for development of urban woody species databases – Citree (citree.ddns.net).

As the first step, some important aspects, especially for urban planting, were collected. Second, species, subspecies, varieties, hybrids and cultivars were evaluated in terms of their characteristics, sensitivities and resistance to various factors, including aesthetic, environmental and growth characteristics. In total, specific characteristics of more than 390 woody plants were investigated, focusing on urban growth conditions. The large data pool enssures a wide range of plants suitable for different demands. For decision-makers, such as landscape architects/planners, the developed urban tree database with different compounds (botanical, urban tree locations, ecosystem services, and psychological aspects) provides guidelines for trees selection, following the principle of having the right tree for the right place.

Denis Gritsiyenko
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REFLECTED SUNLIGHT RADIATION TO IMPROVE INSOLATION CONDITION IN URBAN ENVIRONMENT

In this study, the urgency for development of new solutions to use reflected sunlight radiation has been shown in order to improve insulation conditions of the shadowed city's buildings in terms of hygiene. Moreover, the method of using reflected sunlight radiation to improve insulation conditions in shadowed city areas has been provided. The experiment results implemented during the thesis work on determination of the reflective facade features in ultraviolet sunlight spectrum have been presented.

URBAN MOBILITY AND STARTUPS – ANALYSIS OF THE SPECIAL REQUIREMENTS OF NEW ENTERPRISES

Stefanie M. Halwas

Research Associate

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Entrepreneurship can be defined as one of the driving forces of economic growth ensures the competitiveness of regions as entrepreneurs are recognizing opportunities and take actions (e.g. Bodell, R. et al., 1991; Cuervo, Ribeiro and Roig, 2007, p.1). In Germany, Startups create 16.6 jobs after 3 years (DSM, 2015, p.6). Startups are also important for innovation as they are key to industries and countries already profiting from efficiency and effectiveness effects.

Startups and city are closely linked. The link can be seen in local differences: from research, it is apparent that a number of determinants influence new business formations (Mack and Qian, 2016). Amongst these determinants you find motivation and ability of the entrepreneur, but also external, rather regional determinants, such as qualification of workforce, innovation or supporting services (Fritsch and Wyrwich in Mack and Qian, 2016, p.51). These differences lead to different climates for Startups, sometimes supporting their success more, but sometimes, rather block development. Berlin, for example, has a share of 44.17% Startups in digital companies, compared to Cologne with only 34.57% in the same industry. Berlin ranks 3rd for business registrations compared to business closures, while Cologne ranks 13th (WirtschaftsWoche, 2015).

The carried out research project was designed to identify connections between social Starups and urban mobility. 12 social entrepreneurship projects based in Cologne were regularly observed and interviewed for over a 12 months period. During this time, several projects changed locations due to capacity issues. The effect of changes lead an increased productivity and motivation. The study revealed results regarding 3 theses set out in the beginning.

Startups need good infrastructures of agglomerations in order to have a diverse environment and have access to up-to-date knowledge, be flexible in terms of e.g. working hours or changing locations and for. In Cologne distance matters: Participants were not willing to cross the River Rhine separating the city to take advantage of lower office rent. Therefore, startups depend on closeness to educational institutions, libraries, cooperation partners and services that are offered flexibly. Of the surveyed projects, only 45% reached their own goals. But out of those 100%, had access to diverse knowledge, 81% were interdisciplinary and 50% relied on internet based collaboration.

The study also revealed that **Startups require modern and flexible forms of infrastructure.** Flexibility, connectivity and availability are essential for motivation. Therefore, startups depend on flexible access to office buildings, car parks, internet and other services. Of the 45% successful projects 100% claimed flexibility as the most important factor for reaching their goals. A 10% increase in efficiency was achieved after changing access to resources from limited to unlimited and online based.

City development has impact on creativity and entrepreneurship as Startups depend mostly on flexibility to cater for the core essence of their success: creativity and entrepreneurial action. Increased motivation was found in 50% after changing work to more flexible and less hierarchical. Also 50% of members perceived creativity increased.

Therefore, city development and Startups are depending on each other: cities need Startups to ensure economic growth and establish an entrepreneurial spirit attracting creative people as well as Startups need cities to be flexible and to offer services to increase productivity. The task of city development – from the perspective of new businesses – therefore, is to ensure flexibility and allow demographic, economic and environmental changes to be catered for fast.

Professor Dr Reinhard Hinkelmann
Chair of Water Resources Management and Modeling of Hydrosystems
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Reinhard Hinkelmann is Professor at the Chair of Water Resources Management and Modeling of Hydrosystems, Institute of Civil Engineering, Technische Universität (TU) Berlin. In 1991, he graduated from the University of Hannover where he studied Civil Engineering. He obtained his PhD in 1997 at the same University with the thesis on Parallelization of a Lagrange-Euler Method for Flow and Transport Processes in Surface Water Systems. In 2003, he obtained Doctor's Degree at the University of Stuttgart. Before starting his job at the TU Berlin, in 2007, he conducted research at the Universities of Braunschweig (1997–2000) and Stuttgart (2000–2004).

DFG – RESEARCH TRAINING GROUP "URBAN WATER INTERFACES"

Water quality and quantity in urban water systems of metropolitan areas face a number of threats. Climate and demographic changes enhance the occurrence of extreme hydrological events, as well as new and persistent substances in the water cycle, thus, further increasing pressure on urban water systems. This suggests that a management based on solid system understanding is required to ensure sustainable functioning of urban water systems under both current and future conditions.

Interfaces play key roles in the urban water cycle. The processes and fluxes of water, matter and heat across interfaces are characterized by steep hydrodynamic and biogeochemical gradients, non-linear interactions between biotic and abiotic system components, as well as heterogeneous and dynamic structures. Because of this complexity, the current understanding of the processes at urban water interfaces (UWI) is notably incomplete. In our opinion, understanding the functioning of natural interfaces and technical interfaces requires a broader integrative framework than the one which is commonly used. It calls for interdisciplinary approaches, especially for processes at interfaces between natural and technical compartments, such as bank filtration used for drinking water production in waterworks.

Our research training group, which started in July 2015 with 13 doctoral students, offers unique opportunities to investigate urban interfaces within a common framework by involving both natural and technical systems in an interdisciplinary environment. Based on collaborations between engineers and natural scientists, we aim at a new quality of general process understanding. We work on three research foci (vertical pillars): 1) Enhanced understanding of interface processes in natural and technical urban water systems, 2) Development of conceptual models and predictive computational tools, and 3) Application of new knowledge to urban water system management. Further, we identified several common topics (horizontal pillars) to enhance the collaboration among the PhD projects. We are developing innovative links between empirical methods, experiments (laboratory and field) and models (conceptual and numerical) to describe the dominant interface processes in urban water systems on different scales of space and time as well as across scales. Interdisciplinary training of the doctoral students is instrumental in accelerating knowledge transfer from fundamental research and innovation to water management practice.

The research training group creates a unique platform for urban water research at the Technische Universität Berlin (TUB) and the Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB) together with associated partners from research institutions, the water industry and local authorities.

This presentation aims to provide an overview on the research framework and qualification concept, while an overview on the common topics and selected doctoral thesis projects will be given by four doctoral students. Finally, experiences, perspectives and drawbacks will be discussed as far as they are obvious after about one year of collaborative work.

Authors: R. Hinkelmann, B. Kleinschmit, M. Gessner, S. Hilt, M. Jekel, G. Nützmann & G. Porst

URBAN WATER INTERFACES: SURFACE WATER – GROUNDWATER INTERACTIONS

Mikael Gillefalk

PhD student

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Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Berlin

As more and more people are moving into urbanized areas, the issues of urban water are becoming more and more important. In order to address these issues, there is a need for professionals from different fields to cooperate. In the DFG, the research training group Urban Water Interfaces (UWI) natural scientists and engineers are working on their own relevant project, but at the same time, they are brought together by common activities and interaction between projects within different thematic groups. The thematic group "Surface water – groundwater interaction" deals with both sediment surfaces in lakes and the hyporheic zones in rivers. The five projects within the group touch upon a broad range of topics, focusing both on how ecosystem services can help the urban environment (e.g. by reducing pollutants through bank filtration), but also what adverse effects urbanisation may have on the natural environment (e.g. by toxic effluent from wastewater treatment plants and extensive water abstraction).

In Berlin, approximately 75% of the drinking water is supplied with some sort of artificially recharged groundwater, mostly bank filtrate from lakes. Bank filtration is a water abstraction technique inducing groundwater recharge through riverbanks and lakeshores and represents a widely used method in many regions worldwide. At present, around 16% of the drinking water in Germany is produced from bank filtrate or from other types of artificially restored groundwater and more than 300 water works use bank filtration. The research concerning bank filtration has almost exclusively focused on the purification efficiency and infiltration capacity. Consequently, the knowledge about its potential effects on lake and stream ecosystems is very limited. Surface water infiltration mainly occurs in the littoral zone of lakes. This habitat is usually covered with submerged macrophytes, which play a key role for numerous ecosystem functions. Specifically, they can stabilize clear water conditions by controlling phytoplankton abundance through several mechanisms and prevent sediment resuspension. One of the UWI projects hypothesizes that various effects of bank filtration on physical and chemical parameters in lakes may result in adverse effects on the biological structure, and specifically, macrophyte abundance. This may result in their decline and consequently poorer water quality. Physical parameters include water level and temperature while chemical parameters include nutrient, oxygen and carbon dioxide availability as well as contents of organic matter and toxic substances in the sediment. The potential effects will be researched using a combination of field measurements and experiments, lab work and by modelling work using the ecosystem model PCLake.

Bank filtration also plays a central role in another project aimed to achieve a comprehensive understanding of the reductive metabolism of iodinated contrast media as important organic pollutants in urban surface and bank filtered groundwater. The hyporheic zone, the zone just below a river bottom where surface water and groundwater mix, is of interest since it is a place with high chemical turnover rates. Within UWI, there are two projects dealing with this; one focusing on fieldwork and the other one on modelling. The projects are able to benefit from each other and the common aim is to better understand the closely coupled hydrological and biogeochemical processes in the hyporheic zone of urban streams. The aim of the fieldwork is also to develop and improve measurement techniques for hydrological and biogeochemical processes at groundwater-surface water interfaces which can cope with the characteristics and challenges of urban freshwaters. The aim of the modelling is also to develop an integral single domain model for the flow, transport and reaction processes that occur in the interface domain of surface water and groundwater.

Authors: M. Gillefalk, T. Broecker, F. El-Athman, J. Schaper, R. Hinkelmann, S. Hilt

Robert Ladwig

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URBAN WATER INTERFACES: INTERFACES IN URBAN SURFACE WATERS

Urban surface waters are heavily modified systems that face various challenges caused by interactions between technical and natural compartments. The morphological degradation of surface waters due to water management can cause a disruption between water systems and their riparian area, floodplains, the hyporheic zone and aquifers. Further, high loads of pollutants, nutrients and organic carbon are discharged into the recipients from various sources like wastewater treatment plants (WWTP), industry, road runoffs, paved surfaces and atmospheric deposition. Eventually, this can result in the eutrophication of urban surface waters. In comparison to low affected surface waters, the water quality and quantity of urban ones are altered on microscale to macroscale spatial and temporal levels when flows across different interfaces appear. These deep gradients occur between (1) aquifers and surface waters, (2) atmosphere and surface waters, and (3) sediment and surface waters. In addition, all these interfaces are also affected by urban technical systems. Within the DFG research training group Urban Water Interfaces, these interfaces are investigated in seven dissertation projects.

The main focus of the research is the semi-closed water cycle and management in the city of Berlin, Germany. The urban water management aims to manage a secure water supply for domestic and industrial consumption, an adequate sanitation, the protection of humans and infrastructure as well as urban ecosystems and the conservation of biodiversity. Treated effluents from WWTPs are discharged into rivers which eventually are fed into lake systems. Drinking water abstraction in Berlin depends on bank filtration. Hence, the water works are abstracting a mix of surface water and groundwater, which at the end is clarified in the WWTP. Such a system is vulnerable to changing meteorological conditions as well as pollutant loads. Due to lack of knowledge, unwanted and unforeseen consequences can occur that can threaten the water quality and quantity. For example, in the past, sewage farms were used in Berlin as state of the art wastewater treatment technique. This resulted in the discharge of highly heavy metal contaminated and nutrient rich waters into the receiving water bodies leading to eutrophication. In recent times, the elimination techniques in a WWTP can cause unwanted effects. The common chemical precipitation of phosphorus in a treatment plant with iron-sulfates can cause increased concentrations of sulfate in the receiving water bodies. Under anaerobic conditions this can cause the release of previously settled phosphorus from the sediment due to the formation of iron-sulfides. To assess water management measures, paleolimnological methods are used to investigate sediments of urban lakes in Berlin. These natural archives give information about past pollutant loadings and can act as internal sources. The sediment cores are analyzed by x-ray fluorescence spectroscopy and interpreted by using multivariate statistical methods like principal component analysis and self-organizing maps. Further, with the help of coupled numerical models for hydrodynamics, water chemistry and diagenesis, it is possible to optimize current and future lake water management as well as to find weaknesses and potential threats. This will be done by formulating different management scenarios using 1D as well as 2D lake models.

Further research activities include the investigation of the groundwater-surface water interface by extensive monitoring of a river field site and formulating an integral single-domain transport reaction model. Laboratory and modeling studies are used to explore the effects of bank filtration on lake ecosystems as well as drinking water purification. Also a major field campaign intends to monitor gas emissions between surface waters and the atmosphere. We are aiming to increase the understanding of urban flow dynamics, interactions between surface waters and their surrounding interfaces as well as the metabolism of surface waters to improve urban water management.

Authors: R. Ladwig, M. Gillefalk, C. Romero, S. Herrero, T. Broecker, F. El-Athman, J. Schaper, R. Hinkelmann, M. Hupfer

URBAN WATER INTERFACES: BIOGEOCHEMICAL PROCESSES

Clara Romero

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Urban water bodies are strongly modified ecosystems. They typically receive large loads of nutrients, organic carbon, suspended solids and a wide variety of other macro- and micropollutants such as heavy metals, pharmaceuticals and personal care products. Furthermore, the morphology of urban water bodies has usually been changed and habitat heterogeneity has been reduced, which limits the ability to support aquatic biodiversity. Within the DFG Research Training Group Urban Water Interfaces, we aim to enhance understanding of interface processes in natural and technical urban water systems. The group consists of 13 doctoral students in total, which cover a range of disciplines in engineering and natural sciences. The overarching objective is to generate knowledge that serves to improve future urban water system management. This will be achieved by a collaborative research organized in different thematic groups. One of these is the "Biogeochemical Processes" group, where 5 doctoral students work on different biogeochemical processes associated with urban water interfaces (Fig. 1).

The first topic is the degradation of recalcitrant organic trace pollutants in biofilms at solid-water interfaces. It specifically addresses the potential of both defined and natural biofilm communities to degrade (recalcitrant) pollutants such as paracetamol, diclofenac, carbamazepine and iodinated contrast media in urban water systems. The second topic aims to understand the patterns and controls of greenhouse gas (GHG) fluxes in urban waters, with special emphasis on methane emissions. The third thesis is closely coordinated with that one on GHG fluxes, focusing specifically on ecosystem metabolism in urban aquatic environments. The objectives are to: (i) estimate whole-ecosystem metabolism based on diel O_2-dynamics in a variety of urban water bodies; (ii) estimate CO_2 concentrations, their dynamics and resulting fluxes across the water-atmosphere interface; (iii) scale up aquatic ecosystem metabolism and CO_2 fluxes to the metropolitan area of Berlin, and (iv) identify the key drivers and gradients of metabolism and CO_2 fluxes. The forth topic is sulphur cycling in sewers, specifically at the interface defined by wastewater – the atmosphere – biofilm – construction material. Finally, the fifth thesis aims to improve our understanding of deiodination of iodinated contrast media during bank filtration of urban waters. Mass balances of iodine will be established to consider both abiotic and biologically mediated transformations.

Authors: C. Romero, D. Despot, F. El-Athman, S. Herrero, M. Nega, G. Singer

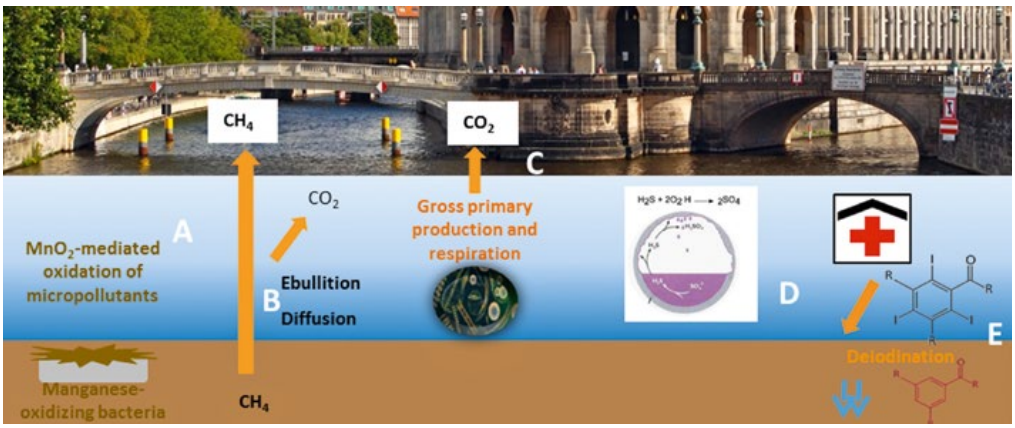

Figure 1. Biogeochemical processes in urban water systems. Letters A to E refer to the different doctoral thesis. A: Degradation of recalcitrant organic trace pollutants, B: Greenhouse gas formation and fluxes, C: Ecosystem metabolism, D: Corrosion, sulphur transport and conversion in sewers and E: Deiodination of iodinated contrast media.

Katharina Teuber
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URBAN WATER INTERFACES: INTERFACES IN SEWER SYSTEMS

During its transportation, wastewater in sewer systems undergoes a number of physical, biological and chemical processes and transformations. Under certain conditions such as high detention times formation of hydrogen sulphide (H_2S) in sewer systems leads to odour in the sewer atmosphere and corrosion at sewer walls (Error: Reference source not found). High concentrations of odorous substances in the atmosphere can even lead to death of sewer workers. Jiang et al. (2016) estimate the annual costs for rehabilitation and replacement of damaged sewers in the USA to be in a range of US $14 billion. Within the DFG research training group Urban Water Interfaces, two driving aspects are focused on three dissertation projects: The enhanced understanding of odour and corrosion mechanisms and the development of a decision support tool.

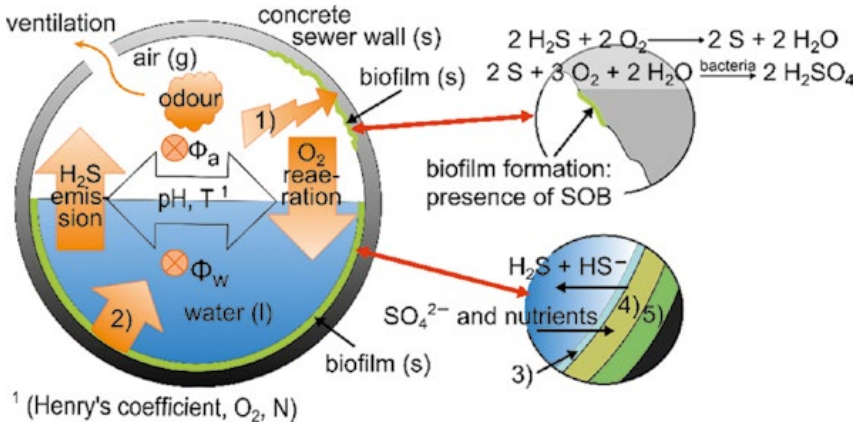

Figure 1. Reaction pathways for sulphur conversions in sewers: SRB – Sulphate Reducing Bacteria, (g) – gas, (l) – liquid, (s) – solid, 1) sulphide oxidation, corrosion, 2) sulphate reduction by SRB, 3) laminar flow layer, 4) sulphide production (SRB) zone, 5) inert anaerobic zone, Φ_a – air flow, Φ_w – water flow (following Hvitved-Jacobsen et al., 2013).

An enhanced understanding of the conversion of sulphurous compounds in sewers is gained by operating and maintaining a research pilot plant of the Berliner Wasserbetriebe and the influence of different countermeasures is analyzed. A conceptual model for transformation processes at the biofilm-wastewater interface is being developed in order to identify key parameters contributing to transformations within the sulphur cycle in sewers. Biogenic sulphuric acid corrosion (BSC) is investigated on the interface between water, sewer atmosphere and building material. Concrete samples of different compositions are being exposed to acid under field and laboratory conditions. New information is being gained on the comparability between BSC of concrete in real sewer systems and laboratory acid resistance tests as well as among those acid resistance tests themselves and more detailed insights are gained concerning corrosion mechanisms caused by BSC.

A decision support tool is being developed by simulating the three-phase water-air-solid system of a sewer by using a three-dimensional Computational Fluid Dynamics (CFD) tool. The focus of the CFD model lies on the correct description of in-sewer water-air flow and transformation processes, reaeration and H_2S emission which highly depend on the three-dimensionality of the hydraulic behavior. After a thorough validation of the hydraulic behavior, transport processes including reaction mechanisms and transfer processes across the water-air interface including their dependencies on factors such as pH and temperature are implemented. Data is obtained from the research pilot plant. First results concerning the hydraulic behavior show a good agreement of the model results with measured water velocities and a physical behavior of the water surface.

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Authors: K. Teuber, M. Grüneberger, D. Despot, D. Stephan, M. Barjenbruch, R. Hinkelmann

BIM FOR PRODUCTION IMPLEMENTATION AND EDUCATION IN SMALL CONSTRUCTION COMPANIES

Sebastian Hollermann

Zimmerei Sieveke

Bauhaus-Universität Weimar

Most construction companies are small and have few resources to change themselves to the processes of BIM. They require support in adopting best BIM practices to their business world. The research project BIM@work therefore investigated new ways how craft personnel can work successfully with BIM. This presentation focuses on the results of the research project BIM@work. While it explains how smaller companies can leverage BIM, for example by modifying existing worker training concepts, the presentation also demonstrates the use of BIM in automated manufacturing of timber products for the residential construction industry.

Sebastian Hollermann is a civil engineer in the Institute of Construction Engineering and Management, Bauhaus-University Weimar and is currently working for Zimmerei Sieveke GmbH as responsible manager for Building Management and Research & Development. He defended his dissertation in construction management. Before moving to academia, he gained several years of construction site management experience for bridges at Bilfinger Berger Ingenieurbau GmbH, Scandinavian Branch, Göteborg, Sweden, awarding authority for bridges with subsidence caused by mining, Water and Shipping Administration of the Federal Republic of Germany, Hamm, Germany. He received an engineering degree at University of Applied Sciences Münster, Germany, a Scholarship of German National Academic Foundation, a journeyman's certificate of the Chamber of Crafts, Vechta, Germany, and a research grant of the German Academic Exchange Service for a research about shear connectors for timber concrete composite bridge constructions, Joensuu, Finland. His research interests include construction process simulation and building information modeling.

Frederik Hupperts

Dipl. Ing., Head of Infrastructure Location and Transportation Sector, Cologne Chamber of Commerce and Industry

DECISION MAKING IN URBAN MOBILITY – CAPACITY ANALYSIS OF DIFFERENT TRAFFIC-INFRASTRUCTURES IN LIMITED PUBLIC AREAS USING THE EXAMPLE OF COLOGNE

The goal of this research project is to find the scientific optimum for the modal split (traffic flow and transfer of goods), carried out by the restricted capacity of different modes of transport under limited urban space.

The actual state of research is a social discussion concerning the usage of public space.

The future of mobility will lead to an ongoing and constant conversion of public areas and public transport system.

The challenge in Cologne is that there are many different user requirements under strictly limited urban spaces, e.g. inhabitants (~1 Mil.), Workforce (~519.000, ~344.000 commuters), Tourists (~3,3 Mil.), Trade Fair Visitors (~2,1 Mil.), Students (~94.000), Transshipment at Cologne Ports (~12.430.000 tons). There are about 1.255 Mil. ways overall, the local public transport system covers about 138,1 Mil. Transportation by heavy trucks will increase by about 1.000 up to 5.000 Trucks per day in 2030.

Cologne Administration has different concepts to solve the upcoming problems, like Cologne Mobile 2025, a truck guiding system or a cycling system. The problem is that all the concepts are forming different needs which are partly inconsistent with another. A mathematical model shall optimize the sizing of the public infrastructure.

A political target of the administration is to influence the upcoming traffic and to strengthen public transport system, cyclists and pedestrians. It is the main goal to influence the actual modal split to 1/3 individual traffic, 1/3 public transport and 1/3 cyclists and pedestrians.

Large cities like Copenhagen, Vienna or Zurich have already changed their modal split and become more interesting places to live. In this context, it is a political decision to improve infrastructure for cyclists. However, there is a lack of scientific research for the potential of private transport replacement by cars. The research project aims at filling this gap.

ENVIRONMENTAL PRIORITIES OF MOSCOW TERRITORIAL PLANNING

Dr Irina Ivashkina

Head of Sector of Environmental Protection Department,
Genplan Institute of Moscow

Today, Moscow is one of the largest cities and the northernmost metropolis in the world. Its population amounts to 12,5 million, but the day-time population is more than 15–17 mln people. According to official statistics, around 10% of the population of the Russian Federation lives in Moscow city and approximately 25% of Russia's GDP is produced there. On 1st July 2012, by its territorial expansion southwest into the Moscow Region, the total area of the Russian capital increased 2.5 times, from 1,080 up to 2,560 square kilometers.

In urban planning documents, we are using simple general terms to describe the urban areas – 'Old Moscow' and 'New Moscow'. 'Old Moscow' covers the area within the Moscow Ring Road (MKAD). 'New Moscow' is the area that has been identified by the government in the Southwest expansion area as room for further city growth.

Now, one city has two symmetrical strategies, urban-planning activities as well as ecological policy require a balanced approach to both 'New Moscow' and 'Old Moscow'. 'Old Moscow' needs a comprehensive strategy for revitalization of historic and older districts, reconstruction of high polluted industrial zones, creation of public realms, improvement of transport system. The key task of the environmentally sound development of 'New Moscow' is to maintain a rational balance of built-up areas, natural and rural landscapes, protect vital natural features – forests and waterways, create favorable environment within the green frame. It will be one city where new growth is managed in a way to offer top quality living and protect and enhance the environment for a truly sustainable urban future, but also where the existing city is carefully protected and revitalized.

The great advantage of the new Moscow areas is a favorable ecological situation. Taking into consideration the actual environmental condition and the urbanization path, the south-western sector is favorable for mid- and low-rise construction and recreation zones development, as well as an innovation economy based on science, technology, medicine, education and culture.

A particular attention is paid to development of new parks. As for today, Genplan Institute of Moscow has elaborated drafts for 4 large parks in 'New Moscow': 'Russian Villa' Historical Megapark, Children's megapark 'Park of Russian Tales, Megapark for sports and recreation 'Red Pahra', 'Zosimova pustyn' Historical megapark.

On the areas incorporated into Moscow, it is possible to distinguish three planning belts with different requirements for the urban planning development in terms of ecology.

It is offered to consider allocation of the urbanized objects within the Ring Road closest to Moscow, so that creation of such centers will be aimed at elimination of the disproportion in population resettlement system and working places in the south-western part of Moscow and Moscow Region. On the territory of the New Moscow middle planning belt, it is offered to establish local complexes of scientific, educational, medical objects and eco-friendly enterprises with preservation of the natural and agricultural landscapes. The valuable natural landscapes in the periphery planning belt of the south-western sector of the perspective Moscow are planned to be preserved through the establishment of national parks and specially protected natural areas.

The rapid transport and utilities development on the new territory of Moscow will go polycentric that meets modern standards of clean environment.

So, ecologically focused territorial planning in the Greater Moscow is based on prioritizing environmental requirements for the period up to 2035, as well as maintenance of the best balance between built-up and open spaces, conservation of picturesque natural and rural landscapes, provision of joint control for the urban development and economic activities, development of smart transportation, green industries and utilities, development of recreation and tourism, creation of a favorable environment for people's residence and leisure, preservation of natural and cultural heritage.

Irina Ivashkina graduated from Lomonosov Moscow State University. Now she works at the Genplan Institute where her responsibilities include environmental assessments, urban planning, strategic issues and environmental risks at the regional and city levels. The most famous projects with her participation are the General Plan of Moscow City Development up to 2025, Strategy of Spatial Development of Irkutsk, draft of General Plan of Kazan City Development up to 2035. She has at least 20 years of experience at the international level, including "Metropolis" (World Association of Large Cities), in different fields of environmental policies, namely, analysis and assessment of global, regional and subregional environmental and urban planning cooperation. She participated in the Metropolis 9th and 10th World Congress in Sydney (Australia, 2008) and Porto Allegro (Brazil, 2011) with case study presentations. During the period from 1995 to 2000, she was the Project Manager for international ECOS-OUVERTURE Programme: Athens, Rome, Berlin, Milan and Moscow. She has more than 80 publications in Scientific Papers. Now, she is Deputy Editor-in-Chief of the scientific magazine "Ecology of urban areas". Also, Irina Ivashkina has been teaching at Geography Faculty of Lomonosov Moscow State University since 2010.

Dr Ekaterina Kalemeneva
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IMAGINING A COMFORTABLE CITY IN THE ARCTIC: LENINGRAD ARCHITECTS IN SEARCH OF NORTHERN URBAN PLANNING IN THE 1960s

This research examines connections between urban imagination and particular social changes in the case of the urban modernist projects of cities with "artificial microclimate" (domed cities, etc.) created by the group of Soviet architects for Arctic towns in the 1960s. These projects mirrored the Soviet architects' aspirations to create a new concept of a 'northern city' during the Thaw in the Soviet Union. Creation of such projects of cities with artificial microclimate resulted from multiple shifts in Soviet official policy related to the North, by social changes in arctic settlements, as well as by international cooperation on the issue of northern architecture in 1950–1960s. The particular space for these projects played a significant role. First industrial towns in the Soviet Far North in the 1930s were established side by side with GULAG labor camps without considering harsh northern environment. The attempt of technical, social and visual re-conceptualization of urbanization of Soviet Arctic took place only in the 1950s. It was connected with establishment of a special Department for Northern Urban Planning in Leningrad, which became responsible for creation of new basic principles of northern urban development. Thus, specialists from Leningrad were determined to create urban projects for the region whose conditions were almost unknown to them. This paper analyzes how the architects from Leningrad used northern urban projects for implementation of their professional and personal strategies creating modernist-looking projects for the Arctic in the era of mass standardized construction in the Soviet Union, trying to represent them as the most rational way of urban-planning in the North in order to create 'normal cities' with a developed infrastructure in arctic climate. While most of those projects were not implemented, the appearance of such projects shows the shift of the attitude towards the North in the USSR, as well as the controversial changes of experts' position since the 1950s.

BUILDING INFORMATION MODELING (BIM) IN ACADEMIC EDUCATION AND INDUSTRY APPLICATIONS

The use of modern computer technology has become an integral part of most of today's construction industry organizations. Building Information Modeling (BIM) in building and civil engineering projects is a process that enables timely communication of project-essential information among interdisciplinary working teams. While BIM theoretically aims for earlier and more open exchange of quality information throughout a project's entire lifecycle, the construction industry has yet to adopt it to change its existing processes. Since BIM is about to become more important to a global construction industry as a whole, Dr. Kirschke introduced BIM as an important topic of education as well. In his presentation, he reviewed the history of BIM from early research to commercial development and then provided a definition of the term. "While BIM is very important to the way we work across business units, many organizations are in high demand for skilled personnel to have successfully implemented", argued Dr. Kirschke in his presentation. He continued that "only proper education will solve this problem". Dr. Kirschke also outlined a successful example of BIM implementation in coursework at the Bauhaus-University Weimar in Germany. He demonstrated the BIM's impact on existing teaching modules within the study programs in the Architecture, Engineering and Facility Management (AEC/FM) realm.

In her presentation "Teamwork makes the dream work! Global Collaboration in Construction Project Planning", Dipl.-Ing. Olga Golovina highlighted independent experiences from a collaborative coursework environment that has been taught by Stanford University. She described the course as a "leading example to have students from different disciplines and from around the world to collaborate on one project in the respective roles of architects, structural engineers, mechanical, electrical and plumbing, construction managers, and facility managers. She reflected positively upon the issues of engaging instead of consuming course material, learning from collaboration technologies for multidisciplinary, geographically distributed teamwork and e-learning, and the impact of technology on learning, team interaction, and assessment. When she stressed the importance of the deployment of collaboration technologies that include web-based team building, synchronous and asynchronous knowledge capture, sharing and re-use, project memory, corporate memory, and mobile solutions for global teamwork and e-learning, Olga Golovina concurred with Dr. Heiko Kirschke on enhancing existing curricula at universities to increase the number of students skilled in BIM for the construction industry.

The third presentation given by Prof. Dr.-Ing. Markus König summarized the current efforts made in Germany to implement BIM into practice. To face the challenge of the constantly increasing complexity of construction projects, the German Federal Ministry of Transport and Digital Infrastructure (BMVI) passed a resolution to promote the Building Information Modeling (BIM) method for all infrastructure projects in Germany. For that purpose, the Ministry developed a roadmap for digital design and construction containing detailed information and milestones of the German BIM-Strategy. Prof. König stated reasons for BIM as a process to deliver more successful projects in the future, for example, by "reducing risks and costs of mega projects by building digitally first". He highlighted governmental as well as local initiatives in Germany that outline a roadmap for BIM implementation and showcased several examples, referred also to the first BIM pilot projects in Germany. While several construction projects use BIM in the project design and planning stages, few to date use it on construction sites. Therefore, Prof. König proposed that templates for employer's information requirements and execution plans that clas-

Dr.-Ing. Dr. h.c. Heiko Kirschke

Department of Computing in Civil Engineering,
Bauhaus-University, Weimar

Mr Kirschke is interested in new information technology applications in Civil Engineering and teaching. He obtained his graduate engineer qualification at Moscow State University of Civil Engineering (MGSU) in Russia specializing Automation of construction machines in 1975 and Dr.-Ing. at the Bauhaus-University Weimar specializing Automatic non-linear calculation of reinforced concrete structures in 1985. He has been working for various universities, as a researcher and a teacher (Mozambique, Russia, Germany).
Since 1987, Heiko Kirschke has been working as a guest scientist and lecturer at the MGSU National Research University. He is also an honorary doctor of this University.

Olga Golovina

Dipl.-Ing.
Ed. Züblin AG, Stuttgart

Professor Dr.-Ing. Markus König
Chair of Computing in Civil Engineering,
Ruhr-University Bochum

Markus König is Professor for Computing Engineering at Ruhr University of Bochum. He studied Civil Engineering and Applied Computing at Gottfried Wilhelm Leibniz University, Hannover, where he also obtained his Dr.-Ing. Before joining Ruhr-University Bochum in 2009, he had worked as a Research Assistant and Junior Professor at University of Hannover and Bauhaus-University Weimar. He is a speaker of the Research Unit 2363 "Evaluation of building design variants in early phases using adaptive levels of development" and an Executive Board Member of Research Center "Interaction Modeling in Mechanized Tunneling", both programmes coordinated by the DFG. Professor König is also member of German and international organizations like German Association of Computing in Civil Engineering, International Association for Automation and Robotics in Construction etc.

sify systems and define model content according to standards and specifications (LOI/LOD), and neutral data formats are important for the future of the BIM development in the construction industry. In his point of view, though, there is no doubt that "the use of innovative digital planning methods will significantly change the German construction industry sector".

The final presentation by Dr. Jochen Teizer focused on the future of BIM. Planning and tracking the vital status of project site resources at the proper time, understanding spatial relationship in a dynamically changing environment, as well as monitoring, analyzing, and visualizing site activities and conditions of progress, are a few of the issues that become increasingly important to base decision making through BIM on a solid information content. Dr. Teizer said: "Key values that are essential among the construction stakeholders to deliver successful projects are often not readily and reliably available". Pervasive computing in construction, for example, explores the creation of environments saturated with sensing, computing, and wireless communication in the harsh physical world. Dr. Teizer delivered the essence of this vision in lean and safe construction through real world applications of wearable alert and wireless networking devices, for example, using location sensing devices for resource tracking while managing potential risk to a project using Internet of Things platforms that support the needs in cognitive assistance of the individuals.

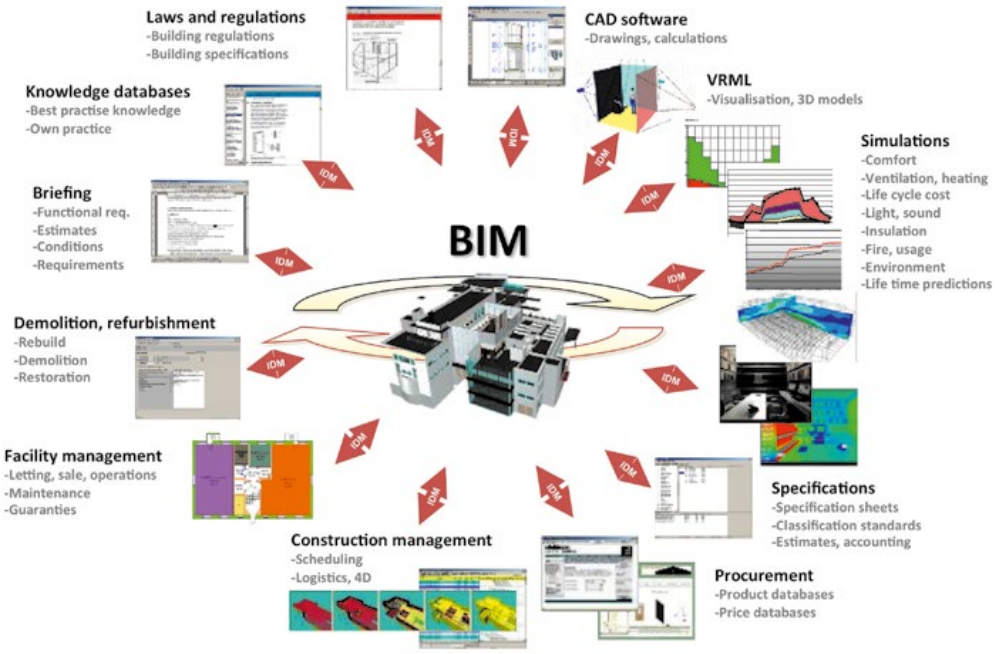
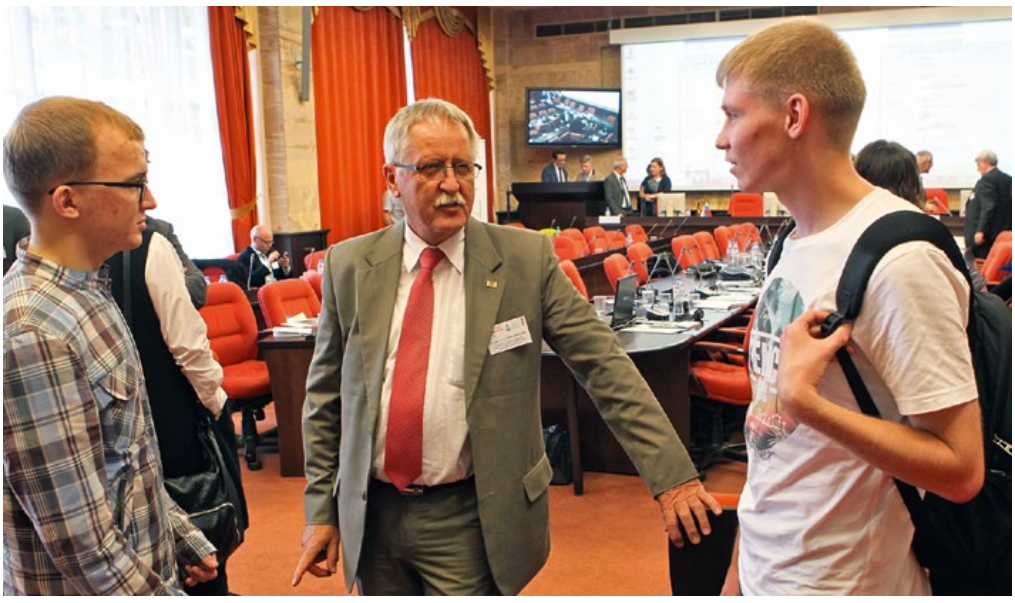


Figure 1: Building Information modeling (BIM) process.



Jochen Teizer

PhD, Dipl.-Ing.,
RAPIDS Construction Safety
and Technology Laboratory, Ettlingen

Jochen Teizer is a Senior Lecturer and Research Group Leader at Ruhr University Bochum, Chair of Computing in Civil Engineering. He graduated from Karlsruhe Institute of Technology and obtained his PhD at the University of Texas at Austin (USA). Jochen Teizer worked as a Research Assistant and later on as a visiting researcher, Assistant Professor, Teaching and Research Professor in Germany, the USA and in Japan. He also has national and international experience in industry with a wide range of construction projects. Till 2016, he was engaged in Construction Engineering and Management at Ed. Züblin AG (Stuttgart, Germany) as team leader.

Dr Ekaterina Korenkova
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Chair of Landscape Architecture,
Orel State Agrarian University

LANDSCAPE MANAGEMENT AND SOIL RECLAMATION IN DIFFERENT URBAN AREAS

The optimal landscape organization of modern urban spaces involves green plantings. The main components that determine the landscape quality in the city are vegetation and soil. Their condition shows the effectiveness of landscape structure creation: lithological basis, hydrogeological and hydrochemical conditions, etc. The soil and vegetation are the most degradable components of the urban landscape to determine the speed of the dynamic changes in the landscape as a whole. A huge number of chemical elements in urban areas contributes to the occurrence of technogenic anomalies with different degrees of environmental stress.

The studies of the local disturbances of ecological situation, changes in the degree of the soil-plant system openness provide some predictability of technogenic geochemical actions on the landscapes and its regulations. It makes possible to create the different types of geochemical barriers for the purposes of detention and neutralization of toxic products, which will lead to an increasing productivity of agro-landscapes and restoration of technogenic ecosystems without any additional expenditures of resources, finances and energy.

The influence of soils on the heavy metals toxicity is determined: 1) by the capacity of soils; 2) by the strength of their relation with the solid phase; 3) by the kinetics of passage from solid phase to solution; 4) by capability for migration beyond the limits of profile; 5) by inactivation by the biota; 6) by capability for the inactivation in the course of time of interaction with a change in the humidity and temperature.

The main results of the work are the following:

- development of the role of man-made natural recovery mechanisms for ecosystems;
- rate of profile differentiation of the soil profile;
- study of the rate of accumulation of humus and norms of soil fertility in man-made landscapes;
- technology for processing waste products and getting them on the basis of various organic-mineral soils for growing plants

This work is supported by the Grant of the Russian Foundation for Basic Research.

PUBLIC SPACE OF BUILT ENVIRONMENT

This report continues the series of publications on cognitive urbanism – a newly applied field of research and design in built environment studies. The topological structure of the Built Environment incorporates the latest developments in urban studies and planning, such as: 'Pattern Language', 'Environmental Behavior', 'Built Environment', 'Heterotopology', 'Space Syntax', 'Recombinant Urbanism', and others. Foucault considers the 'other place' as something that can change our lives, break the rules. In regular urban planning practice, however, we are facing the opposite issue: creation of a spatial model, appropriate to traditional socio-spatial relations to preserve the continuity of culture and lifestyle. This opposition and practical concern on the methods of design bring us to the idea of a new research strategy, named Cognitive Urbanism. Topological models of Cognitive Urbanism provide a conceptual framework for urban planning and design. Socio-spatial models of micro-, meso- and macro-levels have proven to be useful tools for the analysis, design and use of public space. Variations on basic 'morphotypes' can facilitate understanding of a traditional town landscape as a venue for social activities. The social aspects of topological modes can be described as episodes, scenarios, or social practices associated with certain space structures according to customs, traditions and norms of behavior.

More information on the subject can be found in three articles: Micro-space of Built Environment (2014), Mezz-space of Built Environment (2015) and Macro-space of Built Environment (2016) published in AMIT electronic journal (Moscow)

Acknowledgement: The study was financially supported by the Russian Foundation for Basic Research (RFBR) within the research project number 13-00-00001a.

Professor Dr Aleksey Krasheninnikov

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Title, position: D.Sc. in Architecture, Professor of Urban Planning and Design in Moscow Architectural Institute (State Academy), Professor in High School of Urban Studies in National Research University Higher School of Economics, Head of Research and Study Center Urbanistica-MARCHI; member of the Moscow Union of Architects, Council member of the International Federation for Housing and Planning.

Education and Work experience: graduated from Moscow Architectural Institute, worked as an architect in Research and Design Institute of Moscow Master Plan (NIIPI Genplan of Moscow); an expert and a group leader in Financial and Construction Company); Deputy Director in Architectural Design Bureau; Faculty member of the Moscow Architectural Institute since 1997; Leader of Educational Muster Program for Urban Designers.

Post-graduate education and research: Russia, Izrael, USA, Canada, Netherlands.

D.Sc. Alexey Krasheninnikov is both an architect and an urban planner with a wide range of interests, including cognitive models of public space, sustainable technologies and standards, morphology of city form. His PhD thesis was about "Social Aspects in Spatial Planning of Housing Areas" (1985, Rus). The post-doctoral thesis was entitled "Basis of Urban Residential Development under Market Economy" (1998, Rus). He has more than 60 publications, including 5 books in Russian.

Professor Dr Thomas Krupp
Chair for Logistics
Faculty of Economics, Business Administration and Law,
University of Applied Sciences Cologne

ENTREPRENEURS' VIEW ON URBAN MOBILITY IN COLOGNE – THE CASE OF A GERMAN METROPOLITAN AREA FROM AN ECONOMIC PERSPECTIVE

The topic of this report at the "Week of the Young Researcher" is the presentation of the study "Urban mobility from the economic point of view", conducted by Technische Hochschule Köln and ISI GmbH on behalf of the IHK Cologne (Cologne Chamber of Commerce) from June to November 2015. The main goal is to provide an approach to integrate the economy into the opinion formation on urban mobility and the requirements of Cologne businesses for city mobility.

Necessary preconditions for prosperous development of an economic metropolis are well functioning transport and information infrastructure. Modern cities have to adapt their infrastructures to rising population and modern mobility needs.

Although Cologne has extensive infrastructural assets on all modes of transport, the traffic situation in the Cologne area has dramatically deteriorated, especially in the last decade. Parts of the infrastructure – in particular Bridges – as well as the capacity of the road network in general are no longer capable to cover the ever-increasing traffic volume.

This study on urban mobility gives a broad overview of the status quo and the upcoming chal-

Abbildung 51: Auswertung Flughafen Köln / Bonn: Gewerblicher Güter- und Personenverkehr/Sonstige Logistikaktivitäten

Alle Angaben in Prozent, N = Anzahl der Antworten, N (gesamt) = 31

Thomas Krupp is Professor of Transportation and Traffic Logistics and academic leader of the master program Supply Chain and Operations Management (M.Sc.) at the Technische Hochschule Köln, Faculty of Economics, Business Administration and Law.
Previously, he held a professorship for logistics management at the European University of Applied Sciences in Brühl where he last was Dean of the Department of Logistics Management.
He has many years of experience in applied research and business consulting from his career as a management consultant at the Competence Center Transportation at Horváth & Partners and as a scientific associate at Fraunhofer ATL, today Fraunhofer SCS in Nuremberg.
After studying business administration in Nuremberg and Seville, he fulfilled his doctoral studies at the Chair of Logistics at the University of Erlangen-Nuremberg on the subject of benchmarking in contract logistics. His main areas of research besides traffic and mobility are strategic questions and process management in logistics services and supply chain management, information and communication technology in logistics as well as branch logistics, especially chemical logistics.

lenges from the point of view of both freight transport as well as commuters on road, rail, water and air transport.

The detailed inventory of the traffic situation in Cologne and the assessment from the economic point of view reveals a differentiated picture: On the one hand, the city of Cologne has comprehensive networks and infrastructures in all modes of transport. On the other hand, this transport infrastructure already has to cope with a high volume of traffic, with this volume set to increase in future.

The central part of the study is a survey among Cologne businesses – with more than 2,500 companies contacted and more than 150 completed questionnaires returned, as well as a practical workshop on urban mobility.

According to the survey result in terms of satisfaction and importance of the examined aspects of the traffic, the situation is generally assessed as critical. Over all modes of transport, about two-thirds of the interviewees are dissatisfied with the current situation.

After differentiation between the modes of transport, it becomes clear that this negative assessment is due to the road transport sector. The overwhelming majority of over 86% of the interviewees is not satisfied with the situation on the road, while "only" about half are dissatisfied with rail transport. On the other hand, almost two-thirds of the interviewees are at least satisfied with the traffic carrier Rhine / Harbors and more than 80% with the "highlight" of Cologne's mobility assets, the Cologne airport.

The following picture shows an example of the detailed survey results (satisfaction with and importance of the Airport of Cologne).

The entire traffic situation is also critically assessed in the workshop: for example, most important short-term action requirements are particularly seen in the areas of traffic control; Bridges over the Rhine as well as construction site management.

In summary, it can be said that action measures are urgently needed by the economy. A coordination of all efforts is necessary to achieve a holistic and sustainable approach to maintain and improve urban mobility in Cologne.

The study is available online (in German only):
https://www.ihk-koeln.de/Stadtmobilitaet_aus_Sicht_der_Wirtschaft.AxCMS

Professor Dr Hartmut Reinhard

Schmalenbach Institute of Business Economics,
University of Applied Sciences Cologne

Since 2010, Professor Dr **Hartmut Reinhard** has been Professor of Management, Controlling and Logistics at Schmalenbach Institute of Business Economics of Technische Hochschule Köln. He is founder of the joint logistics programs Bachelor "Logistics" and Master "Supply Chain and Operations Management" of the engineering Faculty Production and Logistics and the Faculty of Economics, Business Administration and Law. From 2008 to 2010, he was Head of location Neuss and Professor of Logistics- and Innovation management at the European University of Applied Science Rhein-Erft.
Prior to his academic career, he had several management positions at Deutsche Post DHL Group for about 17 years. Among others he has been Senior Vice President for Global Controlling Logistics and Strategy Logistics at DHL, for Controlling and Strategy of the Mail Division and for Global Controlling Logistics at Head office of Deutsche Post AG. From 1987 to 1991, he worked as a consultant mostly for Price Waterhouse Coopers. He completed his studies of Business Economics and his PHD at the Universities of Dortmund and Cologne.

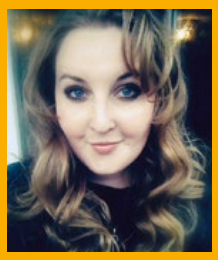
Maria Krutilova
PhD Student, Assistant Professor
Belgorod State Technological University named after V.G. Shukhov, Belgorod

METHODOLOGY OF COST-EFFECTIVE ECO-DIRECTED STRUCTURAL DESIGN

In the modern world, the buildings construction and investment activities are in cooperation with the environmental protection. Nowadays, the problem of the environmental construction's ecological safety is essential in all over the world. It is only possible to contribute to this problem solution by meeting the environmental requirements at all stages of construction. It should be noted that it affects the conservation of the whole ecosystem. By the way, the degree of exposure on the environment depends on the virgin and recycled materials, structures, technology of building construction, etc.

Sustainable design principles determine the development prospects of the construction industry and declare the preservation and stabilization of the ecology situation, but also require upgrading of the existing system of the construction environmental audit. It is necessary to carry out obligatory ecological certification of manufactured building materials. In order to determine the environmental damage caused by building materials production, first of all, all the pollutants emitted in its production must be collected. Moreover, it is possible to connect the environmental damage into monetary equivalent and to determine the environmental penalty cost of building materials and construction equipment.

The ultimate goal is to improve approaches to determination of the estimated cost of real estate construction in the eco-oriented direction. The entire environmental harm caused by constructed buildings could be estimated at the stage of compiling the design documentation. Environmental penalty cost is a cost of building materials and installation works that cause environmental harm which is transformed into monetary equivalent. The penalties should be considered for the environmental harm that was already caused some time ago. Therefore, the main principle to reduce the project's penalty cost is to reduce the number of most harmful materials, to substitute them by more green ones, to choose the most energy-preserving technologies. For this procedure to be effectively controlled, a specific upgraded software is highly recommended.



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COMPLEMENTARY FUNCTIONAL COMPONENTS OF INFORMATION MODELING FOR REORGANIZATION OF CITY ENVIRONMENT AND INFRASTRUCTURE IN AN INTERACTIVE MODE

This report contains description of reorganization complementary information model provided for the lifecycle stage of facility management. The main components or assets of that model are functional, structural, and organization-technological level of declination from the project perfect model. There are also three-level model of building reorganization type definition. It represents an operation-automated algorithm for updating the technical specification of building reorganization based on BIM.

MODERN APPROACHES TO ESTIMATION OF TRANSPORTATION DEMAND BASED ON GIS-TECHNOLOGIES

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Air Engineering and Transportation Institute

Irkutsk National Research Technical University

Modern transportation modeling tools appeared in the Russian market can significantly improve the efficiency of transportation planning process. At the same time, one of the most important problems of modern transportation planning is the task of input data collection.

In 2003, Scientific Research Transport Laboratory of Irkutsk National Research Technical University became the first customer and user of the PTV GROUP company and its software (Germany). We were the first to face the lack of constantly updated statistics on the characteristics of urban land use, as well as reference data on the transportation behavior of visitors of the facilities of different types.

An approach was proposed on the basis of the existing PTV software import interfaces and the use of geo-information databases in combination that can improve quality of the transportation models and accuracy of the transport demand estimation.

This solution involves constant examination of day cycle features of different type facilities and the development of data exchange procedures between such GIS-databases as OPENSTREETMAP and 2-GIS (Russia). Integration of transportation modeling tools and GIS-database can significantly reduce the time spent on the development of transportation models and to extend its scope of use on macro- and meso-levels.

APPROACHES FOR RECONSTRUCTION OF WASTE WATER FACILITIES ON THE ENERGY EFFICIENCY BASIS

Dr Nikolay Makisha

Director of Research and Education Centre "Water supply and waste water treatment"

Moscow State University of Civil Engineering (National Research University)

Energy efficiency becomes a top priority issue. It concerns various fields, and water and waste water facilities are not the exception. Energy efficiency principles should be applied to new construction and, which is more important, to reconstruction of the existing plants. However, if we mean energy efficiency, we face three questions to answer: Why? How? How much? It means that we need accurate goals and clear understanding of the best way to reach it with a shorter budget.

New technologies for water supply and waste water treatment often require more energy (and more money correspondingly) for their performance but they also provide much better quality. For an average Russian city, we have the following approximate values:

Water consumption – **100 000** cubic meters per day

BOD – **180 mg/l**; suspended solids – **200 mg/l**; ammonium – **30 mg/l**.

Energy consumption:

- Traditional scheme – **700 kW**
- Modern methods – **1500–1900 kW**

The values above exceed the relevant data in the countries with similar climate.

Why does energy consumption grow?

- Deep nitrogen oxidation = +300–500 kW;
- UV desinfection of waste water = +50–200 kW;
- Aerobic stabilization of sludge = +300–400 kW;
- Mechanical dewatering of sludge = +50–70 kW.

In this regard, the following basic rules of energy efficiency can be applied:

- Energy efficient technologies
- Energy efficient engineering solutions
- Methods and approaches for regulation of facilities and equipment operation.

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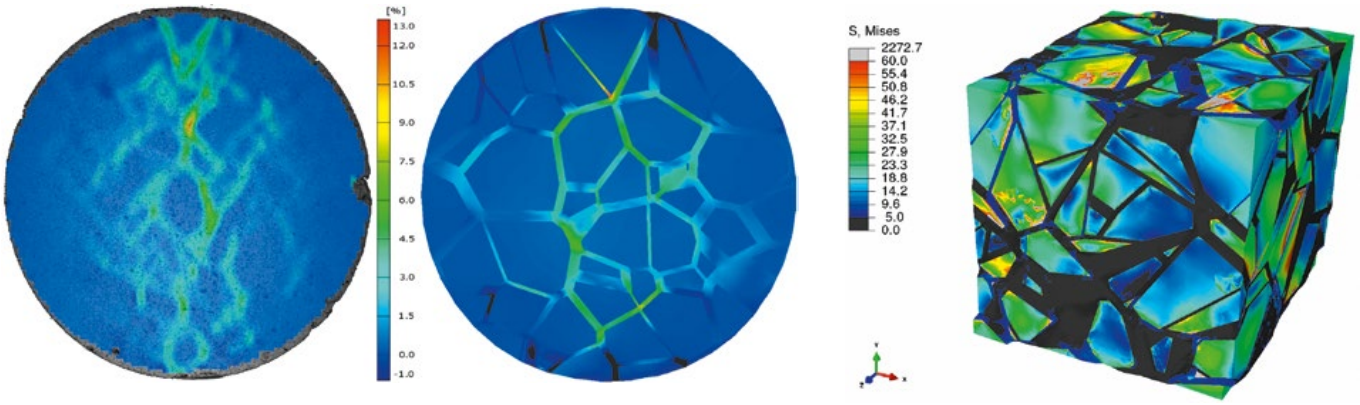
SIMULATION-BASED DEVELOPMENT OF ORIGINAL ROAD PAVEMENT MATERIALS

The performance and availability of the German road infrastructure is central to economic and social importance. A well-developed and efficient infrastructure is a prerequisite for an appropriate mobility of people and goods and thus represents a location factor which significantly affects the economic development. The transportation infrastructure provides a basis for employment and prosperity of our society. In an increasingly integrated Europe, and against the background of ever-increasing traffic loads, this outstanding significance of the German transport infrastructure will continue to grow. Road transport – particularly the heavy traffic – is rapidly increasing. For the period 2000–2015, the Federal Ministry of Transport, Building and Urban Development (BMVBS), now Federal Ministry of Transport and Digital Infrastructure (BMVI) was forecasting an increase in road transport by over 80%. This prediction is confirmed by the latest statistics.

To meet these challenges, it is necessary to optimize existing road construction materials and the development of innovative construction methods and building materials. Here, the improvement of the stability, drainage and acoustic adsorption are particularly in demand. A special attention is given to partial or total replacement of bitumen by innovative polymer-based binder materials. The analysis of the overall properties is traditionally done on specimens that were taken from the built-in pavement or were manufactured in the laboratory. However, the infliction of damage to intact pavements or the unrealistic compaction under laboratory conditions are problematic and should be avoided.

It is therefore necessary to develop a numerical simulation model which can be used as an optimization tool for an efficient development of new building materials, as well as for further development of the existing building materials. However, this can only be done by a combination of theoretical, experimental and technological bases with the aid of computer-based mathematical models. As part of the actions supported by the Federal Highway Research Institute project FE 07.0264/2012/ARB "Inno-Bond", a virtual laboratory for asphalt concrete is developed by the Institute of Applied Mechanics in cooperation with the Institute of Highway Engineering Aachen and Fa HanseGrand.

Since the mechanical properties of rock and binder are drastically different and both components are optimized separately, the involved



components must also be treated separately in the simulation. For the geometric representation of the asphalt concrete, the so-called Voronoi tessellation makes sense. In this method, the space is completely decomposed into convex polyhedra representing the fractured rock. In order to create space for the binder between the rocks, the rock polyhedra are subject to a shrinking procedure.

It's subject of the current development is the elasto-viscoplastic modeling of bitumen mortar which glues the larger rock grains together. Tensile test specimens are produced, which are then subjected to creep and relaxation experiments. In combination with a linear elastic modelling of the rock, simulations of the indirect tensile test are performed. These are validated experimentally. Here, cylindrical test specimens are subjected to a compressive load which results in tension orthogonal to the loading direction. With the aid of the digital image correlation system "Aramis", the strain is recorded over the entire surface. In the image below, the strain in horizontal direction is depicted for the real specimen (mastic asphalt, left) and for the FE simulation (150 grains, linear elastic binder and rock, right).

The project target is a simulation tool which enables the road engineer to investigate the overall properties of asphalt compositions numerically prior to paving. Furthermore, an innovative road surface layer with alternative binders is designed with the help of the simulation model, tested in the laboratory and installed on a pavement proving area. The insights gained are critically assessed for their practicality and contribute to the manufacturing implementation and installation of such road construction materials under real conditions.

BIM IMPLEMENTATION IN SMALL AND MEDIUM ENTERPRISES (SME)

BIM has become a popular buzzword in the construction industry around the world. The BIM method promises an improvement for management and performance in all phases of a construction project. This lecture presents lessons learned in the implementation of BIM applications in a medium-sized construction company. Focus is further set on applications that vary from visualization, scheduling and site facility planning to automatic quantity take-off for project estimation. The connection from theory to practice will be shown.

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INTEGRATED DECISION SUPPORT: NEW INTERACTION AND VISUALIZATION STRATEGIES IN URBAN PLANNING AND PARTICIPATION

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Urbanization has dramatically increased in German metropolitan regions over the second half of the 20th century, due to an attractive job market and a variety of good educational and cultural establishments. This has caused deficits in the housing market. To face these challenges and prohibit unchecked growth in cities, widespread planning methods and strategies are needed, in order to analyze, explore and exploit potentials in the existing building structures, in order to produce densification policies on a city-wide level, as well as within the context of specific neighborhoods.

In this publication, we describe the research project "Urban Strategy Playground" which aims to generate tools to identify and analyze potential development strategies for densification in urban settings, to aid decision-taking authorities devise city planning schemes and legislation. The topic ranges from fundamental research, for example information representation techniques, to the implementation of these methods through the conception, development and evaluation of concrete prototypes. A particular attention is paid to the use and expansion of established analogue planning methods by integrating 3D city models with multiple levels of digital data.

Within the scope of the USP research group, interactive digital tools are developed, that can serve as an informed basis for debate and argumentation in the political decision-making and planning process and in their turn support the development of re-densification strategies that are well-suited to their urban context. By monitoring the key building codes and visualizing their effects on the urban structure in real-time, they enable planners to check various strategies and their execution variants and to compare several alternative approaches. In addition, individual profiles and evaluation keys can be created and then applied to various planning areas. The direct visualization of results provides a quick overview of the qualities of different scenarios to citizens and authorities alike and provides information on the feasibility of the scheduled targets.

As a decision support system for inner-city planning, various functional modules have been designed and implemented as a prototype. The developed software prototypes are part of an interactive expandable IT concept. It was evaluated by means of exemplary inner-city planning scenarios. The system is based on a software core that provides basic functions

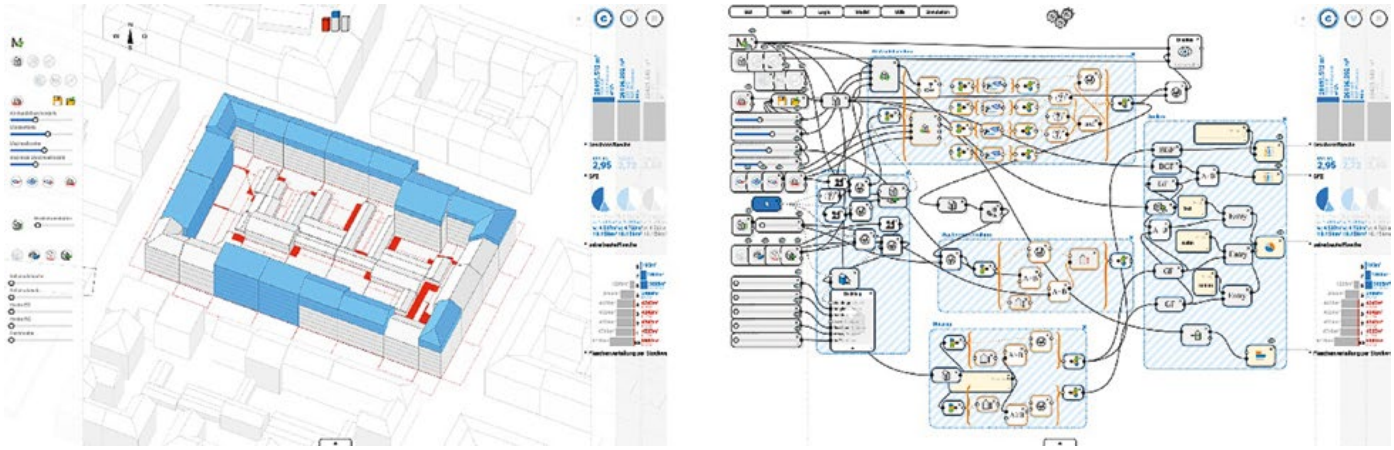

Figure 1: Two modes of the software prototype: planning mode (left) and programming mode (right).

Figure 2: Export of planning results: data sheets (left), rapid prototyping (right).

regarding user interaction, data management and program interfaces. Like an expandable tool box, it can be complemented by plug-ins due to the modular structure of the program. As a consequence, when new requirements arise or needs are identified in the process of working with the tools, it is always possible to integrate the desired functionality into the system at a later stage.

As a basic form of interaction, the core provides a visual programming interface (see figure 1). It enables the user to develop and customize desired functionality in a real-time mode and thus implement user defined analysis and calculation methods. Visual programming has several advantages, especially for users with little or no programming knowledge, as they can work with the system without having to know textual programming details.

Several data interfaces enable the exchange of city model data and the direct export of planning results in a way that no further post-processing is necessary. Data sheets showing selected properties (e.g. floor area, number of residential units, floor area ratio) are instantly available and can be used to communicate the results and act as a basis for further discussion. To allow the results to be reviewed using a real, haptic model, the tool has a three-dimensional geometry exporter which outputs data that can be used directly – i.e. without the need for further preparatory steps – producing real models of the result using digital fabrication methods (CNC-milling, rapid prototyping, see figure 2).

DEVELOPMENT OF BUILDING INFORMATION MODELING IN RUSSIAN CONSTRUCTION INDUSTRY

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Building Information Modeling is a process of generating, storing, managing, exchanging, and sharing building information in an interoperable and reusable way. These technologies are widespread in the world but they are at the beginning of their emergence and development in Russian architectural, engineering, construction (AEC) companies.

The aim of this research is to investigate the status of BIM technologies development in Russia. One of the motivators for BIM spread is a governmental plan of activities for its implementation. The roadmap analysis presents the consistent phases and milestones reached in Russian construction area for today.

At the same time, the results of 20 real case studies show the benefits and pitfalls of BIM application by AEC companies during project and product life cycle. The study revealed that the design and architectural companies become a driver of BIM spread in Russia. It correlates with the in-

ternational experience of BIM implementation. The noted time saving of BIM use in the cases reaches 1.5–2 times in comparison with the traditional design. The accuracy of design, working and tender documentation is increased, which allows reducing mistakes in construction budget planning to 5–7% and cutting project budget at the construction stage by 10–30%.

Also, the cases demonstrate the problems faced by practitioners such as lack of educated specialists, lack of standards and lack of unified library of elements. Small number of companies using BIM throughout the project and product life cycle can't fully demonstrate the opportunities of BIM application and value provided for clients.

The results of this research might be useful for companies which are at the beginning of BIM implementation and allow them to avoid mistakes of their predecessors. A further development of BIM technologies in Russia has a great potential and the governmental support is really favourable.

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MODERN TRENDS AND PROBLEMS OF URBAN AREAS DEVELOPMENT

Urbanization is one of the main tendencies in modern global development. Cities concentrate human and investment resources on their territory, so, in a large part, the cities provide competitiveness to the regions in the global market. In this regard, socio-economic trends of regions and countries depend largely on urban development. However, modern cities represent a big concern for the world community, as urban areas frequently turn from growth points into epicenters of social, economic and environmental problems.

To solve the above problems and save competitive advantages in the global competition, the cities should create a favorable environment not only for business, but also for everyday life of people. It is the human capital, which is the main driving force of progressive socio-economic development.

We suggest taking into account the quality of urban built environment in management of urban development. The purpose of this research is to develop a system of quality indicators of urban built environment and justification of their application in city development management. The authors propose a system of indicators for quality assessment of urban built environment and a method of their integration in complex indicator – Index of Urban Built Environment Quality – IUBEQ. Indicators offered by the authors characterize supply of basic facilities to the population and state of capital construction objects. These indicators calculated using the authors' methods allow assessing the current state of the urban built environment, determining the strategic priorities of territorial development and making interregional comparisons and forecasts. The authors made a quality assessment of urban built environment for Russian regions. The proposed indicators of urban built environment quality are recommended to be used for planning urban areas development.

FEATURES OF WATER MANAGEMENT IN THE UTILITIES SECTOR OF RUSSIA

Professor Dr Evegeny Pupyrev

President of the Interregional Union of Designers (IRUD), Moscow

Management is a set of enterprise management methods. Water supply and sanitation systems of every state ensure its existence and survival in all situations. According to official statistics, the urban population in Russia is 106 million people and the rural one is 39 million people.

Russia has some specific features in comparison with other countries. Firstly, most of the country is located in the cold zone. Secondly, for long decades, Russia has had a centralized government system and the local government is not developed. Thirdly, Russia is spread on a vast territory, has a great geographic diversity. Finally, now, the state is in crisis and according to some estimates, this situation will last for several years.

In total, 115 million people (80%) in Russia have access to centralized water supply. The length of the central water supply network is 570,000 km. Water delivery in the centralized water supply systems has fallen from 15 bn. cu. m. in 2002 to 9.7 bn. cu. m. in 2014.

While the water supply condition is relatively good in the big and medium-sized cities, the situation in the water supply market of the small cities (16 million people) and rural settlements (39 million people) is quite different. The number of rural settlements in Russia exceeds 150 thousand, while the number of rural public water conduits is about 16 thousand, a little more than 10%.

The management of water supply and sanitation in Russia is decentralized, and is developing towards concession agreements. Principal parameters of water supply and sanitation, especially, its tariff policy, are under control of federal departments and, taking into account the financial features of cities or rural settlements, modernization or construction of new facilities and networks can be partially or fully subsidized from public funds.

Since the beginning of the 2000s, Russia was actively approaching the global market. The world's leading manufacturers such as GE, CNIM, Wilo, KSB, Bilfinger, Penetron, OTV, Suiz, WTE, Veolia, MC – Bauchemie and others work effectively on the Russian market, some of them arranged their own production.

Summing up the above analysis, we can point out the following features of Russian water management:

- Geographic diversity;
- Economic diversity;
- Undeveloped local self-government;
- Insufficient production base;
- Poor technical condition of water supply and sewerage systems, especially in small towns and rural areas;
- Lack of control over the quality of drinking water and disposal of waste water in small towns and rural areas.

It's necessary to apply the governmental measures to improve the situation:

- Concentration of production, engineering, scientific potential;
- Involvement of private capital;
- Domestic support.

Evegeny Pupyrev graduated from Kuybyshev Polytechnic Institute (now State Technical University of Samara). He obtained his PhD and later habilitation at the Institute of Problems of Control, Academy of Sciences of Soviet Union, Moscow. Since 2016, he is President of the Interregional Union of Project Engineers and Chairman of the Expert Council of Russian Association of Water Supply and Water Disposal Board. He is also Professor at Moscow State University of Civil Engineering at the Chair of Hydraulic Power Engineering and Water Management. Professor Pupyrev is also member of a number of governmental and educational organizations. Numerous projects in the field of construction and water management in Moscow Region were developed under his command.

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SIMULATION OF LOGISTIC PROCESSES FOR MECHANIZED TUNNELING PROJECTS IN URBAN AREAS

The construction procedure in mechanized tunneling is affected by a complex interaction of logistic processes. Due to restriction factors, such as limited space on construction sites, a prompt delivery of the materials is required for production purposes. Slight differences of the production rate of a Tunnel Boring Machine (TBM) have a huge impact on the logistics chain. Due to a high amount of goods that have to be delivered to and disposed from a TBM jobsite, the logistics chain significantly influences traffic infrastructure and can lead to a complete collapse of the system in urban areas with a high population density. Thus, the jobsite logistics management has to be adjusted to meet specifications and requirements of the public traffic infrastructure. The presentation shows a simulation-based approach adopted to analyze and minimize the negative influence of a TBM jobsite on the public traffic system.

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INTERACTIVE INTERFACES: TANGIBLE TOOLS FOR ARCHITECTURAL DESIGN

Overview and Aims: The use of computers in everyday architectural practice is mainly restricted to the later detailed planning phases – they rarely appear in the early design phases. Architects still prefer to design by using working models and hand-drawn sketches. But in today's modern planning processes, digital calculations, analyses and simulations are more and more required at early design stages. These are typically adopted separately from the ongoing design development activities. The lack of suitable interfaces and insufficient software concepts results in a disjointed working process where the designers switch between different media: the physical model, analogue sketches and digital tools. The research group aims to resolve this prevailing discrepancy by filling the gap between the established ways of working and digitally supported tools. The project occupies an interdisciplinary area between architecture, perception psychology and information science. The central focus is on definition of a use concept for an urban design system augmented by additional information to assist the designer in making informed decisions. This form of design support reduces dependency on individual interpretation of a situation. As a tool for interactively comparing different alternative solutions, it is also suitable for use in public participation processes and in political decision-making processes by presenting objective design parameters.

Concept: The basic premise of the project is not to replace the architects' established design tools with their digital equivalents. The discrepancy between the use of design tools and the use of computers is simply too great. Rather, new ways need to be found for exploiting the benefits of both worlds while, at the same time, catering for the needs of the user. The answer lies in a fusion of both worlds in which design-supporting digital tools such as analyses and simulations can be incorporated flexibly into the architectural design process.

System requirements: To put the conceptual idea into practice, a combined system approach can be outlined along with their corresponding requirements. The technological basis of the concept is a large-format multi-touch table that serves as an interactive digital display. This is a design platform for working with a physical model and for sketching in the urban plan. With the help of an on-top depth-sensing camera, design information is reconstructed in three dimensions in real-time without intermediary steps. This facilitates a seamless connection between design ideas and the digital model and in combination with a semantic GIS-based digital city model, serves as the basis for computing design-specific simulations and analyses. A vertical-mounted touch screen shows a perspective view of the current design situation. Here too, sketches and annotations can be added via the touch screen to the scene. The physical model and hand sketch are directly linked so that changes to the physical model have a direct effect on the digital sketch. The flexible integration of other interaction media makes it possible to extend the hardware setup as required. Examples include linking up the model to a VR-CAVE application or incorporating other Augmented Reality services. The second component of the system is the software framework. A key requirement here is the ability to flexibly link, select and use different design-supporting interactive tools and a corresponding intuitive user interface that can be referenced from the model or by using a pen in the different design views. As such, the software setup cannot be a fixed system but must, like the hardware setup, provide a flexible, individually extensible structure. The software framework therefore employs a plug-in architecture comprising two sub-systems. Firstly, the host application that provides all system-relevant functions, including the semantic GIS data basis, the interaction possibilities and output of the results on the different devices. And secondly, the plug-ins which can be used in different combinations as required, providing a flexible toolkit of different design-supporting tools such as calculations, analyses and simulations (for example wind simulations, shadow projections, route analyses, etc.). By linking them to the host application, they can contribute directly to the architects' design process.

MODEL-BASED CONSTRUCTION SITE LAYOUT PLANNING

Site layout and logistics planning generally plays an important role in a successful execution of construction activities. The allocation of the right amount and size and the prompt use of resources play critical roles. Compared to other industrial sectors, the construction industry shows a lack of technological progress in site logistics and fabrication planning. The automotive or ship building industries, for example, have stringent production planning methods in place to the point that almost every step in the planning and manufacturing processes is supported by digital simulation and optimization. On the other hand, construction planning appears to remain a manual process slowly taking advantage of Building Information Modeling (BIM) processes and techniques. BIM describes model-based process optimization during the lifecycle of a building. This research investigates automated rule-based checking in construction site layout planning tasks to simplify the existing manual processes. A rule-based checking algorithm for site layout planning embedded in a commercially-available BIM-platform was created and tested on specific cases in the site layout planning process of a realistic building. Promising results and a discussion to the existing limitations of rule-based checking approaches for site layout planning are presented. A short outlook towards future research gives a potential path forward in advanced construction site layout planning.

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Building Information Modeling (BIM) – based Construction Site Layout & Safety Planning

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EVALUATION OF TRANSPORT ACCESSIBILITY OF TERRITORY

The concept of a sustainable development and a comfortable city suggests a prioritized development of public transport systems and 'green' mobility (non-mechanized movement).

A prioritized development of public transport systems is provided by both technical decisions and town-planning. In modern foreign town-planning theory and practice, there is a number of most common town-planning decisions with a priority focused on the development of public transport systems, such as:

- multipurpose use of territory (mixed-use development) when the necessity in travelling for long distances decreases;
- territories' planning with due consideration of public transport systems (transit oriented development), including creation of an attractive and comfortable environment with public transport infrastructure;
- increase in the use of territories adjacent to public transport corridors.

The improvement in public transport accessibility and territories attractiveness results in the increased concentration of service provision institutions and working places.

In order to increase public transport accessibility on Irkutsk city territory, the following options of the system's improvement should be considered:

1. Increase in the density of routes network of Irkutsk city. This issue is caused by the fact that the main part of routes in Irkutsk city is concentrated on the main city highways. It leads to the fact that the average time of the approach to the stops increases and congestion of the transport network rises, which results in the increase in the general time of movement.
2. Change in the method of payment for journeys. For the time being, in Irkutsk public transport, the driver has to collect payments, which increases an average idle time at the stops.
3. Selection of the optimal transport fleet based on the passenger flow volume. In the result of using small capacity buses on the routes with a high passenger flow, the expecting passengers are left on the stops, which increases the average waiting time.
4. Development of a high-speed rail transport which does not have any communications with the city transport network.
5. During the construction of new microdistricts, consideration of the possibility to change existing routes networks or to open new routes in order to maintain transport communications.
6. Increase in the efficiency of the traffic organization taking into account application of the allocated lanes, separate places on stops for different routes, etc.

DAIRY WASTEWATER TREATMENT USING MEMBRANE BIOLOGICAL REACTOR (MBR)

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Treatment of dairy processing wastewater has become an important issue due to the growth of dairy industry following the increased demand in dairy products. Dairy processing effluents generated from cleaning of transport lines and equipment between production cycles can result in environmental problems in terms of high organic load on the local municipal sewage treatment systems. Dairy wastewaters are typically characterized by their high concentrations of organic matters resulting from protein, fat, and carbohydrate in forms of lactose. The waste also contains high levels of nitrogen and phosphorus as well as various cleaning and sanitizing agents, which results in a difficult waste for treatment systems.

This paper investigates the effectiveness of a membrane biological reactor (MBR) for the treatment of wastewaters produced by a company manufacturing dairy products. In bench scale study, the used model wastewater includes milk, ammonium chloride, potassium and phosphorus. The present article describes the results obtained in the first 4 months of operation of a system composed of MBR. The initial concentration of BOD was 480–960 mg/L, NH_4-N – 24–48 mg/L, Phosphorous – 4.8–7.2. At the end of the process, the concentration of NO_3-N and NO_2-N was equal to 2.5–9.1 mg/L and 0.01–0.03 mg/L, respectively, the concentration of BOD in permeate was 1–8 mg/L. The sludge concentration was 2.78–8.25 g/L.

The results of experimental studies on model solution allowed establishing kinetic dependence of the specific oxidation rate on the concentration of organic contaminants evaluated by BOD, nitrification and denitrification, and showed an increase in the oxidative capacity of 1.46 times structures with increasing concentration of sludge from 4 to 10 g/l. This can significantly reduce the amount of biological treatment plants using membrane bioreactor by reducing its volume and exclusion from the scheme of secondary clarifiers and tertiary treatment facilities.

During experimental studies using model wastewater solution dairy pilot plant MBR and kinetic experiments in the contact conditions, were identified factors inhibiting the activated sludge metabolic products cp, l/r: for oxidation of organic matter by BOD – 0.39, for nitrification – 0.19 for denitrification – 0.22. The magnitude of the temperature constant x, deg-1 was found using the graph-analytical method for: aerobic heterotrophic conversion – 0,091, for nitrification – 0.096, for denitrification – 0.13, which is important for the calculation of wastewater treatment plants in the dairy industry enterprises with significant fluctuations in the temperature of wastewater.

TERRITORIAL PLANNING AS AN INSTRUMENT FOR QUALITY URBAN ENVIRONMENT CREATION

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Yulia Strashnova has been teaching at Moscow State University of Civil Engineering since 2014. She has about 20 publications in Scientific Papers.

This report is focused on the issues of urban environment improvement to a more comfortable level, for which purpose the territorial planning documents are suggested to be supplemented with new parameters. The urgency is due to the urban environment quality influence on psychological and physical health, creative activities and socialization level. The existing territorial planning documents are reviewed, and proposals are made on supplementing them with new parameters characterizing public buildings areas and their attendance by population.

A comfortable urban environment should satisfy a wide range of human demands. The main instrument to create such an environment is the territorial planning documentation. First of all, it is the General Plan of the city. We're going to talk about General Plan of Moscow. It includes direct indicators which guarantee the level of life comfort for the population. But the current number of indicators included into the General Plan and Rules of Land Utilization and Development needs to be expanded with regard to the day-time distribution of the population over the city territory and spread of the public construction volumes based on its functionality. In other words, to guarantee a high level of urban comfort, it is necessary to consider additional indicators such as territorial attractiveness in terms of public attendance, easy accessibility and diversity of social facilities. Ignoring the above may implicate the danger of the territorial 'overload' (an excessive day-time concentration of people) or, the opposite, a 'dying out effect' of the night-time. Also, it enhances the situation when people are forced to spend extra time in transport to reach their cultural or commercial objectives.

Territorial planning may become even more powerful tool for creation of a comfortable urban environment, if it is supplemented by the indicators of its public functions development and its day-time public attendance.

A comfortable urban environment stimulates and promotes people's self-implementation. In terms of quality of life preservation and enhancement, the comfort of urban development has always been a crucial vital issue for big cities.

While structuring the main requirements for urban environment, we are perfectly aware of the fact, that they will differ and depend on whether we take the day-time population at their work places or permanent residence, or their vocational time areas. When we are actively engaged at work, we need a dense urban development equipped with good transport links and a broad spectrum of permanent and one-time services at hand.

Once we come home, we prefer quite different conditions, like low-density development abundant in greenery where shopping and entertainment openings are easy to reach. Thus, indicators of a comfortable urban environment will vary depending on its functionality: public, residential, industrial or recreational. This report focuses on public development of urban environment.

A few words about territorial planning. This process involves planning territorial development of the city to establish functional borders, special use areas, territories with preplanned objects or capital construction sites for the needs of the state or municipalities. In accordance with the City Development Code of Moscow, the documents of territorial planning include the General Plan of the city.

There is a more detailed document within its framework – the Rules of Land Utilization and Urban Development. The chart 'Functional zones within the borders of new territories of Novomoscowsky and Troizky administrative districts' demonstrates the functional zones borders, as well as indicators of the zone's functionality type. These may include specialized zones: such as public, residential, industrial, natural zones, and zones of mixed functionality, for example, public-residential, public-industrial, natural-public and other types. Each zone has its specific identification number. It is important to stress that the

General Plan's documentation defines the volume of the development's estimated fund. The volume is summarized without being divided into functional types of development (either residential, public or industrial). The volume is attached to each functional zone, which helps to provide the optimum density for each zone's development.

The chart 'Scheme of planned distribution of social infrastructure objects' demonstrates perspective objects of social infrastructure. It shows perspective objects of education, public health care, social insurance, culture, sports, retail, tourism, etc. It is clear that the following educational facilities such as kindergarten, schools, colleges, institutions of higher education, public health facilities such as out-patient clinics, hospitals, disease-prevention medical centers, maternity houses, sport facilities such as sports centers, stadiums, indoor skating rings, adventure sports centers, swimming pools, etc. will be build on the territory of each particular functional zone. The type of objects to be constructed on each specific zone territory will be determined by the development projected plan.

The document 'Rules of Land Utilization and Development'. This document provides a detailed picture of the General Plan as adapted for the territory owners and developers. The Rules of Land Utilization and Development facilitate the General Plan status. The territory is subdivided into smaller, more detailed sections – territorial zones. Each territorial zone is provided with its type of the land plots authorized utilization and the permitted construction maximum parameters, such as maximum percentage of the plot's development, its height and density.

I have generally introduced you to the territorial planning documentation's content with regards to its further specification. We suggest including additional indicators to enhance the urban environment level of comfort, embracing four aspects:

- density of day-time population (total of daily population per 1 hectare of territory; it reflects social status of the territory, its well-being;
- index of this territory attendance (populated and frequented); it reflects relation of the number of day-time population to the permanent night-time population, it is a very significant indicator as it allows to evaluate the daily incoming number, secure the optimal attendance in order to avoid 'overload' or 'dying out' effects through certain hours of the day;
- density of public functions – the density of public construction per hectare of land; the goal to achieve is to create a number of social facilities necessary to satisfy the population maximum needs for services and to ensure enough job openings;
- structure of the public development fund – it safeguards the format of complex infrastructure to provide residents and visitors of this territory with sufficient services; this indicator permits to find an adequate correlation between objects of social, administrative and public, and business infrastructures, as well as to diversify activities forms within this infrastructure (education, public health, culture, sports, social insurance, etc); the goal to achieve is to provide the residents and visitors with an overall scope of services and thus to reduce possible transfers in the city, to optimize the time budget per person.

The interrelation between these indicators allows managing the urban environment development. For example, while changing the volume of public development or its functional structure, one can solve different urban development tasks, such as lowering or increasing attendance of this territory to an optimal level, evenly distributing the numbers of visitors during the day time.

Comfortable environment of central, middle and peripheral zones of the city has different characteristics. Environmental comfort, its indexes will dramatically vary if we consider a functional zone with the identical index in different areas of the city. For example, the farther the area is from the city center, the less is the public development density. Besides, even its structure is due to a continuous modification: the number of social objects increases, the number of administrative and business functions reduces. Based on the documentation of the General Plan of Moscow, the functional zones are split into 7 belts, so we suggest considering the urban environment typology in connection with different zones' remoteness from the city center.

The achieved result is the matrix of indicators of comfort for all types of urban environment.

During our research, we will have to fill in the tables on the screen with numerical symbols of 4 main indicators of comfort.

How do we define the indicators value? Our research will cover the following steps:

- defining different types of urban environment on the basis of functional zoning of territories in accordance with the General Plan and their varying distances from the city center;
- conducting sociological public opinion poll, taking into consideration the ideas of the administration, property owners and leaseholders in order to: a) clarify preferences and wishes of the residents, temporary populace, immigrants as for improvement of this territory development; b) find out the administrative option for social and economic effectiveness of this territory (indicators of social well-being, volumes of taxes brought to the budget, etc).; c) learn the investors' opinion about the prospects of economic effectiveness of objects of social, public and business infrastructure of this territory;
- define actual indicators of urban environment comfort and correlate them with the social studies results;
- research and demonstrate the best examples of territorial functionality, analyze its main properties with regard to experiences in big cities of the developed countries of Western and Eastern Europe;
- implement the projected experiment on the basis of Moscow territory: a) define architectural and planning methods of improving urban environment with regard to positive experience of European cities; b) develop a model of urban environment development types; c) calculate the comfort indicators for the projected models;
- verify the obtained values of comfort indicators;
- finally, calculate the indicators of social and economic effectiveness from creation of a comfortable urban environment.

To conclude, I would like to point out actual importance and high necessity of comfort indicators to be included into territorial planning documentation. The indicators may be practically used: to define the real problems on the territory, to adopt well grounded plans for their perspective development and to structure planning projects; to generate technical tasks for planning projects development; to provide an unbiased assessment the projected suggestions feasibility on this territory.

This research is at its initial stage of implementation. We sincerely hope to have it completed by 2017 with some specific results to be seen.

URBAN OPEN SPACES. INFRASTRUCTURE FOR A GOOD LIVING IN THE CITY'S NEIGHBORHOODS

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'Green spaces', 'open areas' or 'open spaces' are areas without buildings intended mostly for recreation and leisure use as well as for urban aesthetics. 'Open spaces' (within built-up areas) are not only green spaces like parks, but also spaces without vegetation like plazas or pedestrian roads. Open space planning means the planning of socially, ecologically and aesthetically consistent open space structures in an integrative context with buildings structures in settlements (cities, suburbs, towns, villages). In this paper, some short theories about the reasons why we need open spaces, how they are organized and what 'relations' exist between buildings and open spaces are presented. Also, the implementation of these ideas (from different points of view) is shown on the example of Stavropol city.

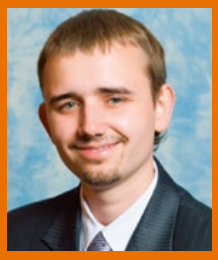
URBAN FREIGHT: A LITERATURE REVIEW

Sergey Tsiulin

PhD Student

South Ural State University,
Chelyabinsk

We are presenting literature review for a better understanding of the contents of urban freight transport practices. This research studies current challenges such as a poor integration of networks between/inside cities, the lack of scientific data, pollution reduction and others. This research argues that heterogeneity of interests between stakeholders, local authorities and business representatives leads to a financial, social and administrative unbalance in implementing Urban Freight Centres (UFC). Freight consolidation plays the key role in improvement initiatives. Also, this research dedicates a lot of attention to policy strategies aimed at reduction of pollutants (e.g. CO, CO_2, NO_x, and particulate emissions) emitted by freight vehicles, circulating inside the cities or nearby areas. Based on this review, we identified areas of concern and the impact of possible new changes; solutions are provided together with emphasizing the importance of implementation of flexible policies, restrictions and preferences regarding urban freight.



Aleksandr Tunik

PhD Student, Research Fellow, Engineer

Chair of Engineering Communications and Life Support Systems

Institute for Architecture and Construction, Irkutsk National Research Technical University

Dr Michael Tolstoy

Associate Professor

Head of the Department of Engineering Communications and Life-Support Systems

COMPLEX MOBILE INDEPENDENT POWER STATION FOR THE URBAN AREAS

There is not a secret that traditional power engineering has some disadvantages, such as

- Ecological consequences from processing fuel for energy supply system.
- Decrease of the fuel reserves and increase in the energy consumption.
- Increase in fuel prices.
- Impossibility of the energy supply to remote areas

For this reason, the renewable energy sources are so required. The mobile independent power station developed by our University is intended for a full power supply for residential and production buildings that do not have central power supply.

There are some existing similar stations, like Power container (EWA) or EcosPowerCube, but they contain only solar panels, wind turbines, accumulators and, sometimes, diesel generators to produce electric energy. In addition to electric power production, our station produces heat energy. For that, it is equipped with a heat pump, and also a solar collector, which is constructed and patented by INRTU. It has a simple design, spline tubing shape to speed up the process of the heat-transfer in medium heating, and improved heat-insulating properties.

In order to produce more electric energy, this station contains a microbial fuel cell, which takes microbial medium from Wastewater treatment plant, which is also a part of our station. This plant uses a new Pneumatichydraulic aerator, which is constructed and patented by INRTU. It ensures various productivity on a gas phase, obtains sizes of gas bubbles from 0,2 to 5,0 mm, simple design and is easy in operation.

The station has a new control system, which has such advantages as complex control of all power station systems, possibility to save the station's operational data; possibility to transmit data to the remote server by means of the GSM module.

The complex mobile independent power station can be used in the Far North Regions, hard to reach areas, children's and sports camps, military camps, rescue service camps, building sites, urban infrastructure objects, industrial facilities.

BUILDING INFORMATION MODELING & LIFE CYCLE SUPPORT: RUSSIAN EXPERIENCE AND PROSPECTS

Solution of the complex task to create a comfortable, energy efficient, environmentally clean and safe environment for human living and activities is based on development and application of the system engineering of modern design technologies, construction and operation management of buildings, facilities and areas with a unified system of target functions which are continuous at the transition points of lifecycle phases. To this extent, the actual level of the construction industry and general economy development suggests transition from the short-term planning to the medium-term and strategic ones. Building Information Model (BIM) represents a highly effective instrument for this approach implementation.

Building Information Models ensure continuous tracking and management of the facilities construction at all lifecycle stages – from conceptual planning to demolition, construction materials recycling and/or reuse, as well as territory renovation. At the conceptual development stage, Building Information Models can analyze within reasonable time the required number of alternatives to select the optimal solution. Further, at the design stage, an information model of the construction object is created to provide assistance up to its removal from operation. Another big task associated with transition to the BIM use within the Russian Federation is to develop and support federal classifiers of construction materials, engineering structures, technical equipment and solutions.

Apart from development and storage of data on materials, engineering structures and technical equipment of the construction projects, BIMs help solving the issues of engineering solutions optimization in a number of fundamentally important criteria. Thus, energy modeling for the buildings at the design stage allows optimizing buildings location on the ground, architectural and engineering solutions, and, in the future, saving resources for up to 30–40% during the buildings operation.

Emergency situations modeling at the design stage can effectively adjust architectural and planning decisions and engineering systems composition, so as to improve safety of people and preservation of material assets in case of an emergency.

Information technologies for construction management provide a reliable work performance quality control, compliance with schedule and ensure a high reliability of the construction control system, which reduces risks and costs of the investment projects. A significant reduction in construction operations terms through an effective planning using BIM at the construction stage pays for additional costs of resources at buildings and structures design.

The use of Building Information Model at the operation stage represents a huge practical interest. In this case, information model is the basis of operation management information system. This system provides data support and work performance control by Operation Department. Similar to the vehicle board computer, operation management information system provides data on the maintenance regulations for the object's engineering systems and structures. Daily, monthly and quarterly tasks to Operation Department are generated in an automatic mode. The work performance quality control is also automated, which significantly increases labor efficiency and, consequently, reliability of the operated buildings' engineering systems.

Russian Ministry for Construction is currently implementing the plan of a gradual introduction of BIM-technologies. A huge work to create conditions for the actual application of BIM-information, to create legal and regulatory technical documentation is being done.

In spite of all the objective difficulties of BIM implementation in construction and housing and utility services in Russia, some effects from the use of such technologies are obvious, namely, increase in comfort, safety and cost-effectiveness of buildings and structures under construction and operation.

Professor Dr Andrey Volkov

Rector

Moscow State University of Civil Engineering
(National Research University)

Andrey Volkov graduated from the Moscow State University of Civil Engineering (former Kuibyshev Institute of Civil Engineering) in 1996. He obtained his PhD in 1999 and completed in 2003 his doctoral dissertation in the specialty on "Methodology of design of functional control systems of buildings and constructions". Since 1994, he has been working at MGSU where he worked his way up through the positions of laboratory assistant, engineer, assistant, teacher, associate professor and professor. In 2005, he was appointed the Dean of the Department of Information Systems, Technologies and Automation in Construction (ISTAS); in 2008, he became Vice-Rector for Information and Information Technologies, then, in 2013 –Vice-Rector for Science and First Vice-Rector. In December, 2013, Professor Volkov was selected and approved for the position of Rector of MGSU. Professor Volkov has received several recognitions for his work and is also the President of the International Association of Institutions of Higher Education in Civil Engineering.

Olga Yantsen

Research Fellow

Deputy Director of Institute of Engineering and Ecological Construction and Mechanization

National Research Moscow State University of Civil Engineering

SOLUTION OF WATER ENVIRONMENT ISSUES IN CITIES AND LOCALITIES

The water bodies are the basis of environmental safety and comfort of the population living in cities and towns. Availability of water and wastewater systems is a mandatory element of a comfortable environment for human life. Wastewater treatment system must ensure the water quality in the water bodies. This issue is as relevant for small towns as it is for big cities.

Eutrophication is a result of the natural aging of water bodies and anthropogenic impact. The presence of biogenic compounds (NH_4, PO_4) in the water body is one of the reasons of eutrophication. Consequences of eutrophication is the deterioration of water quality, death of fauna, increase in the cost of water treatment.

Why is it important?

- Water bodies are the basis of environmental safety and comfort of the population living in cities and towns.
- Availability of water and wastewater systems is a mandatory element of a comfortable environment for human life.
- Wastewater treatment system must ensure the water quality in the water bodies. This issue is as relevant for small towns as it is for big cities. In small towns, less attention is usually given to the WWTP condition.

In small towns, less attention is usually given to the WWTP condition. At least 70% of waste water treatment plants of small capacity in Russia include biofilters, which makes development of new technologies for treatment and reconstruction methods the points of a great interest.

There were researches conducted on the waste water treatment on biofilters with alternating aerobic and anaerobic zones. These researches included the following technological schemes:

- **4 alternating zones of biofiltration** (2 aerobic and 2 anaerobic) without nitrate water recirculation
- **4 alternating zones of biofiltration** (2 aerobic and 2 anoxic) with nitrate water recirculation

The research results:

1. A significant effect of ammonia nitrogen removal has been achieved.
2. The secondary pollution caused by the peculiarities of the biofilm was found. Water recirculation is required to maintain the biofilm in a working condition.
3. The technological scheme with 4 biofiltration zones and nitrate water recirculation proved a significant efficiency.
4. Further researches should be performed with different types of feed, varying hydraulic load and degree of recycling nitrate.

METHODICAL ASPECTS OF ENVIRONMENTAL IMPACT ASSESSMENT RELATED TO MSW (MUNICIPAL SOLID WASTE) LANDFILLS

Ekaterina Zyryanova

PhD Student

Irkutsk National Research Technical University

Nowadays, the most widespread method of MSW sterilization in Russia is landfilling using the most primitive landfilling technology. On average, 3–4% of municipal solid waste is recycled, waste is taken to dumps — there are about 11 thousand in Russia with an area of more than 11,000 hectares of land (not including the area of sanitary protection zone of from 500 to 1,000 metres in width). About 82 billion tonnes of waste is buried in them. This fact requires that a full-fledged and accurate assessment of this activity influence on environment be carried out before its implementation.

An analysis of current guidelines and regulations with regard to designing has revealed that environmental impact assessment for MSW landfills is performed only for construction, operation and remediation stages. However, the period of potential negative influence which the landfill is able to exert on the environment exceeds the said period of time and may last as long as hundreds and thousands years until full assimilation of the landfilled waste by natural environment. For this purpose, legal aspects of waste handling, environmental impact assessment procedure, international standards of lifecycle estimation, landfill lifecycle, landfilling technologies and processes happening inside a landfill body were studied.

Big European corporations more and more often carry out assessment of environmental impact of lifecycle of a product or an activity. In Russia, the lifecycle estimation method is hardly ever applied. Nowadays, the lifecycle estimation method may be applied for most practical purposes of investment activities as a promisingly developing and standardized instrument of assessment of the environmental impact of a site in accordance with its lifecycle stages.

The guidelines are aimed at specifying and classifying studies of environmental impact assessment to exclude insufficiency of study of specific impacts and taking an unbiased decision on acceptability of the projected activity implementation. The method is industry-specific and is intended for use when designing municipal solid waste landfills.

The principal regulatory document governing environmental impact assessment is the Regulation Concerning Assessment of Environmental Impact of Projected Economic and Other Activities in the Russian Federation. This document describes assessment procedure without dealing with its technology issues, thus, making it necessary to develop and approve departmental and industry-specific techniques like the one intended for MSW landfill designing.

In spite of a number of studies, forecasting amounts of generated biogas and filtrate in landfills remains a difficult task. To cope with it, it is possible to use process simulation on pilot plants.

The next strategic step after creating a model set is to develop software for carrying out environmental impact assessment.

Environmental impact assessment is one of the most important ways and instruments of managing and regulating natural resources which play the principal role in environmental problems prevention now and in the future. The main task of the environmental impact assessment is to reveal nature, intensity, danger degree of projected activity impact on environment condition and human health for the purpose of deciding on principle admissibility or inadmissibility of the projected activity.

The use of the developed guidelines will enable assessment performance in accordance with expected impacts and natural conditions in which the activity will be implemented with due regard to the nature of its influencing factors.

PUBLICATION OF SCIENTIFIC RESEARCH IN JOURNALS, CONFERENCE PROCEEDINGS, BOOKS

Daria Iovcheva

Head of Sales
and Customer Relations
Department

100K20 LLC,
Representative
of Springer Nature

Some key facts about Springer Nature

Springer Nature is a scientific publishing company formed in May 2015 through the merger of Springer Nature Science into Business Media and Georg von Holtzbrinck Publishing Group's Nature Publishing Group, Palgrave Macmillan, and Macmillan Education.

Springer Nature is the world's largest academic book publisher, publisher of the world's most influential journals and a pioneer in the field of open research. Our mission is to enable the advance of research and to help the research community to improve outcomes. Through our portfolio of journals, books, databases and solutions, we enable researchers, students, teachers and professionals to access the full depth and breadth of science, technology, medicine, social sciences and humanities. Each year, we publish some 2,400 English-language journals and more than 9,000 books in the field of science, technology, medicine, business, transport. Springer Link is one of the leading internet science portals offering over 9 million documents. Springer Nature counts more than 200 Nobel Prize laureates among its authors of books and journal articles and is presented in 25 countries worldwide.

Why publish, and why publish in English? Publishing makes an integral part of the research whose aim is to make available and to share new and original results or methods. It is the scientists' obligation to advance scientific knowledge and help to enhance scientific progress. In order to be able to take part in scientific communication, a good knowledge of English as the scientific international language is required.

Status of scientific publications in Russia. Research output measured by the number of quoted documents per year is growing in Russia. However, in comparison with neighboring regions or countries of the same population size, the output and growth rate of research in Russia is lagging behind. With 57,881 documents published in 2015, Russia ranks 14th in the Scimago Country Rank after Brazil, South Korea and Spain.

Current trends in scientific publishing – Open Access

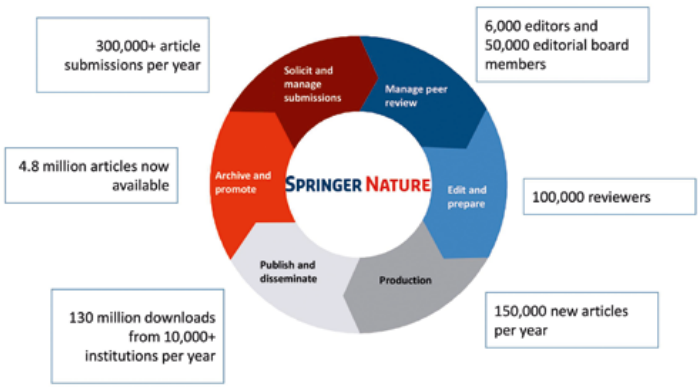
Open Access publishing is digital, online, free of charge and free of most copyright and licenses restrictions. More and more universities, research institutions and funding agencies are adopting open access mandates. Researchers are required to provide open access to their peer-reviewed research articles by depositing them in open access repositories.

Over the last ten years, the number of fully open access journals has dramatically increased from under 2000 in 2005 to over 10,000 in 2015 around 130 countries and with a total of over 2 million articles. Springer Nature publishes over 550 fully Open Access journals under the brands Biomed Central, Springer Nature Open, Nature Research and Palgrave Open. In addition, authors can choose to publish their articles in Open Access format in traditional journals under the Open Choice Program provided.

Springer Nature's role in the value chain

Journal editors are the key players in the publications value chain. They are responsible for the

Springer Nature's role in the journal value chain



journal's scientific quality as a cornerstone of its reputation. The scope is defined in the Aims & Scope published on the journal's homepage.

For the authors, the most important factors affecting their selection of a journal include the journal's reputation, quality of the papers published, and quality of peer review, international scope, publication speed and coverage in abstracting and indexing services.

In addition to the reference list of the paper for submission, Springer Nature offers a helpful tool: Springer Journal Suggester (journalsuggester.springer.com).

Instructions 'For Authors' lead the authors through the manuscript preparation process. A special attention should be given to the wording of the title, spelling of authors' names and consistency in affiliations. The abstract should contain a summary specifying objectives and results and the paper's key message. Keywords serve as terms in search engines. Preferably, they should not repeat the terms from the title.

Research evaluation. There are constant debates over the Impact Factors in the scientific community, particularly, with regard to the system fairness. However, there is no doubt that an Impact Factor is seen as a benchmark of the journal's quality in many academic communities. As an ample, the 2015 is calculated using the formula below: number of quotations in 2015 to articles published in 2013+2014.

Total citable articles published in 2013+2014. The Impact Factor is discipline specific and depends on publishing and quotation context, size of the field, number of articles published per year, etc. Other metrics include Google Scholar, Microsoft Academic Search, and the Scimago Journals Ranking (calculated according to a similar formula but based on journals listed in SCOPUS).

However, getting a paper in Web of Science or Scopus should not have higher priority than publishing in a reputable venue, which brings your research to scientists of your field. In Russia and Kazakhstan, the number of publications in dubious journals is increasing.

Book publishing

Academic books have a different purpose than academic journals. An academic book is a complete scholarly work on a specific topic. Book chapters have their role similar to review articles, with books representing a collection of manuscripts on related topics, whereas review articles published in journals are usually unrelated to other articles in the same issue. Books include a large bibliography, recommended readings, summaries, an index and sometimes exercises.

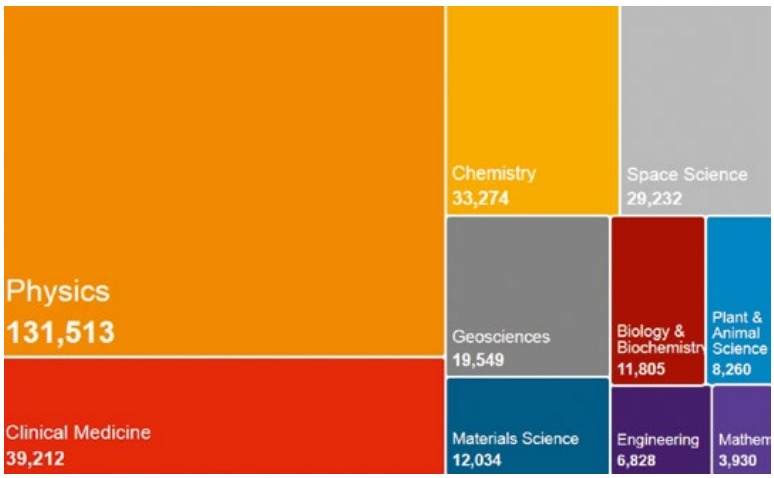
Different types of books include monographs, edited volumes, textbooks, professional texts, reference works, handbooks, popular science books and proceedings.

The publishers' evaluation is based on a short description of the planned book, its aims & scope, main emphasis, main target group, prerequisites needed to understand the book, and its relation to other publications in the field.

Furthermore, the publisher needs a table of contents, including a rough page estimate and a short summary of the main chapters (similar to conference papers) as well as some information on the book's authors or editors. For an edited book, a list of contributors will be helpful. Finally, an estimated submission date should also be included.

Editorial contacts and helpful information on how to prepare book and journal manuscripts can be found on the publishers' homepage at www.springer.com.

Matthias Aicher
CEO
100K20 LLC,
Representative
of Springer Nature



Number of quotations of the articles written by Russian scientists.
Source: Thomson Reuters In Cites, 2011–2015.

SCIENTIFIC ORGANIZATIONS

NATIONAL RESEARCH MOSCOW STATE UNIVERSITY OF CIVIL ENGINEERING (NRU MGSU)

Professor Dr
Elena Gogina
Vice-Rector
for International Affairs

National Research Moscow State University of Civil Engineering (NRU MGSU) is the leading Russian institute of higher education in the field of civil engineering. The MGSU mission includes creation of a talent pool to get ready in advance for a high-quality upgrade of the investment and construction complex to find efficient solution for top priority government tasks in high-technology and social development of the Russian Federation.

National Research Moscow State University of Civil Engineering was established in 1921. Before 1993, it was known as Moscow Institute of Civil Engineering named after V.V.Kuibyshev (MISI).

Through its history, the University had trained more than 130,000 highly-skilled civil engineers, experts and all-level managers in industrial construction, civil construction, energy construction, water engineering, special-purpose construction and one-off construction as well as in economics, planning and management of construction operations, information systems and technologies, design and automation of buildings, constructions and complexes.

MGSU has a vast experience of fruitful international cooperation with 80 universities and research and education centers in 35 countries of the world, which enables the University to make a significant contribution to the integration of the Russian construction education into European educational environment.

MGSU runs the Academic Methodical Association (AMA) of the Russian Civil Engineering Institutions and the International Association of Educational Civil Engineering Institutions (AECEI), which includes more than 150 educational institutions and its branches. MGSU is the only Russian educational institutions having the BREEM license.

In 2010, the University was awarded the status of "National Research University". The University comprises 6 big institutes, more than 50 departments and 40 specialized scientific laboratories; more than 50 innovative structures are making scientific and venture research in the field of design and construction of safe and comfortable buildings, structures and complexes, being an innovative pool of new knowledge in civil engineering. There are now more than 18,000 students at the University.

Today, MGSU is one of the top construction universities with its long-term academic and research traditions, with cutting-edge research and development educational centers, and takes an active part in the development and creation of the professional and intellectual talent pool in the Russian Federation.

THE GERMAN HOUSE FOR RESEARCH AND INNOVATION (DWIH) MOSCOW

Deutsches Wissenschafts- und Innovationshaus – Moskau

Deutschland
Land der Ideen

The German Houses of Research and Innovation (DWIH) provide a platform for the German research and innovation landscape, showcasing the accomplishments of German science, research, and research-based companies and promoting collaboration with Germany and innovative German organizations. They are part of the Internationalization Strategy of the German Federal Government and the Federal Foreign Office's Research and Academic Relations Initiative. The Federal Foreign Office is implementing this project in cooperation with the Federal Ministry of Education and Research and in close collaboration with the Alliance of German Science Organizations, which includes the Alexander von Humboldt Foundation, Fraunhofer-Gesellschaft, German Academic Exchange Service (DAAD), German Council of Science and Humanities, German National Academy of Sciences Leopoldina, German Rectors' Conference (HRK), German Research Foundation (DFG), Helmholtz Association, Leibniz Association, Max-Planck-Gesellschaft – as well as the Association of German Chambers of Industry and Commerce (DIHK).

The houses were created for various goals:

- Promote Germany as a research location
- Provide a forum for international dialogue and scientific exchange
- Provide support and services (advising for international researchers; organizing educational events; facilitating collaboration)

The German House for Research and Innovation in Moscow goes back to a June 2009 meeting between Germany's then Foreign Minister Frank Walter Steinmeier and his Russian counterpart Sergey Lavrov, when both agreed with expanding the institute under the leadership of the DAAD. In 2011 a joint declaration between Dr. Guide Westerwelle and Sergey Lavrov on the establishment of a German House of Research and Innovation in Moscow was signed. Currently the DWIH project in Moscow is lead jointly by the German Academic Exchange Service (DAAD) and the German Research Foundation (DFG) and comprises partners with a representation/representative in Moscow like the Helmholtz Association of German Research Centres, Alexander von Humboldt-Foundation, the Freie Universität Berlin and the German Historical Institute (DHI) Moscow. The German Russian Chamber of Foreign Commerce (AHK), the Ministry of Innovation, Science and Research of Northrine-Westfalia and the Federal States of Thuringia and Lower Saxonia are also members of the DWIH. DWIH Moscow´s current director is Dr. Peter Hiller (DAAD), it´s office is headed by Dr. Martin Krispin (DAAD).

In its various activities the DWIH Moscow focuses mainly on the topics of the German-Russian Modernization Partnership, i.e. climate, energy, health care, resource management, logistics and legal cooperation. Beside these, it has established an event portfolio on additional fields of German Russian scientific interest as aviation and space, energy saving technologies, bioenergy and many more.

The DWIH regularly organizes and supports German-Russian events like e.g.:

- Science Lectures of outstanding German scientists
- Science Talks with high-ranked representatives of German and Russian
- The „German-Russian Week of the Young Researcher", once a year on varying subjects in the Russian regions
- Regular meetings with rectors of leading Russian universities
- Symposia/Conferences on current scientific topics
- Information seminars in centres of scientific and innovative research in Russia
- Economy and innovation: participation in economic conferences on innovative topics
- Participation in fairs in the field of German research marketing

In 2015, the German House of Research and Innovation in Moscow participated in more than 40 events and organized itself several high-ranked scientific events.

Dr Peter Hiller
Managing Director
of DWIH Moscow

Dr Martin Krispin
Project Coordinator

DFG Deutsche Forschungsgemeinschaft

DEUTSCHE FORSCHUNGSGEMEINSCHAFT GERMAN RESEARCH FOUNDATION

Dr Sebastian Granderath
Programme Director
Group of Research Careers

Dr Wilma Rethage
Director
DFG Office Russia/CIS

Dr Jörn Achterberg
Director
International Affairs
DFG Bonn

The Deutsche Forschungsgemeinschaft (German Research Foundation) is the biggest funding agency in Europe for the development of fundamental research with an annual budget of approximately 3 billion Euro. Most of the German research universities, non-university research institutions, scientific associations and the Academies of Science and the Humanities are members of this organisation. The DFG has expanded its presence in other research regions around the world with its 7 liaison offices. The office Russia/CIS was opened in Moscow in 2003. Framework agreements on the co-funding of research projects and researcher mobility exist with the Russian Foundation for Basic Research (RFFI) and the Russian Science Foundation (RSF).

How does the DFG promote young researchers?

Creative and intelligent minds are the key to successful science and research. That is why the Deutsche Forschungsgemeinschaft (German Research Foundation) places a special focus on promoting young researchers. We are committed to helping young talents pursue cutting-edge investigations in top-level settings and help them to become independent early on in their careers.

Flexible individual funding and customised excellence programmes give young researchers the opportunity to advance in their careers and undertake projects from all branches of science and the humanities. The DFG accepts funding proposals from researchers with a doctoral degree (PhD) who live and work in Germany or plan to do so in the future. PhD students are not supported individually, but can be, indirectly through the funding of programmes and projects.

Project-based doctoral and post-doctoral qualifications

For doctoral researchers, who like working in a team and value a well-designed framework, a **Research Training Group** (RTG) may be the right choice. It combines an ambitious research programme with target-oriented supervision and academic freedom to form an ideal environment for a successful doctorate. Post-docs help design the research and qualification programmes of an existing RTG and explore new research topics for your future career.

Following completion of the doctorate there is the possibility to assume responsibility as an **investigator in an existent DFG-funded project**. This will give young researchers the opportunity to advance their qualifications and improve their career prospects by gaining experience and by building new networks.

The **Temporary Position** is a funding mechanism that provides young researchers with funding for a temporary post-doctoral position in conjunction with a proposal for a research grant. Researchers may select the scientific setting in Germany that they think will provide the best conditions for their project.

Excellence programmes

The **Emmy Noether Programme** is aimed at outstanding scientists and academics with at least two and no more than four years of post-doctoral research experience (or up to six years for licensed medical doctors). It allows young researchers to head their own independent junior research group that will work on a project for five or, in exceptional cases, six years. It offers a fast-track opportunity to qualify for a leading position in research.

For young researchers, who have all the qualifications for a professorship, the **Heisenberg Programme** may be the right option. This programme provides them with funding for up to five years so they can distinguish themselves further academically. There are two variations of the programme: the portable Heisenberg fellowship, which also allows one to go abroad for some time; and the Heisenberg professorship, which offers the prospect of acquiring a tenured position at a German university, provided the candidate receives a positive review.

THE GERMAN ACADEMIC EXCHANGE SERVICE (DAAD)

DAAD Deutscher Akademischer Austausch Dienst
German Academic Exchange Service

Dr Peter Hiller
Head of DAAD Office
Moscow

The German Academic Exchange Service (DAAD) is the largest funding organisation in the world supporting the international exchange of students and scholars. Since it was founded in 1925, more than 1.5 million scholars in Germany and abroad have received DAAD funding. It is a registered association and its members are German institutions of higher education and student bodies. Its activities go far beyond simply awarding grants and scholarships. The DAAD supports the internationalisation of German universities, promotes German studies and the German language abroad, assists developing countries in establishing effective universities and advises decision makers on matters of cultural, education and development policy.

Its budget is derived mainly from the federal funding for various ministries, primarily the German Federal Foreign Office, but also from the European Union and a number of enterprises and organisations. Its head office is in Bonn, but the DAAD also has an office in the German capital, Berlin, to which the famous Berlin Artists-in-Residence Programme (Berliner Künstlerprogramm) is closely affiliated. It maintains contact with and provides advice to its main partner countries on every continent via a network of regional offices and information centres.

In 2015, the DAAD funded more than 127,000 German and international scholars worldwide. The funding offers range from a year abroad for undergraduates to doctoral programmes, from internships to visiting lectureships, and from information gathering visits to assisting with the establishment of new universities abroad. Voluntary, independent selection committees decide on the funding. The selection committee members are appointed by the DAAD's Executive Committee according to certain appointment principles. The DAAD supports the international activities of German institutions of higher education through marketing services, publications, the staging of events and training courses.

The DAAD's programmes have the following five strategic goals:

- to encourage outstanding young students and academics from abroad to come to Germany for study and research visits and, if possible, to maintain contact with them as partners lifelong;
- to qualify young German researchers and professionals at the very best institutions around the world in a spirit of tolerance and openness;
- to promote the internationality and appeal of Germany's institutions of higher education;
- to support German language, literature and cultural studies at foreign universities;
- to assist developing countries in the southern hemisphere and reforming countries in the former Eastern Bloc in the establishment of effective higher education systems.

HELMHOLTZ ASSOCIATION OF GERMAN RESEARCH CENTRES MOSCOW OFFICE

Dr Elena Eremenko
Head of Helmholtz
Moscow Office

The Helmholtz Association researches major challenges to secure the future of our society. With almost 38,000 staff and an annual budget of almost €4 billion, the Helmholtz Association is Germany's largest scientific organization. The Helmholtz Association brings together 18 scientific-technical and biological-medical research centers.

The Helmholtz Association contributes to solving large-scale challenges which face society, science and industry – by undertaking top-rate research in strategic programs in the fields of Aeronautics, Space and Transport, Earth and Environment, Energy, Health, Matter as well as Key Technologies. We research systems of great complexity with our large-scale facilities and scientific infrastructure, cooperating closely with national and international partners. As Germany's largest scientific research community we contribute to shaping our future by combining research and technology development with perspectives for innovative applications and provisions for tomorrow's world.

To answer these challenges, the Association combines knowledge and resources from various disciplines and centers and creates strategic international alliances. Cooperation and networking with national and international partners from science and research, and especially from the universities and industry, are its key to producing outstanding research findings – more efficiently and quickly.

An excellent research infrastructure – in some cases with unique major scientific facilities and instrumentation – clearly demonstrates the strength which has made the Helmholtz Association a much sought-after research partner. Each year, several thousand visiting scientists from all around the world use the research opportunities which the Helmholtz Centers offer. The Association acts as a core focal point for worldwide research project – whether in the observation and study of the global climate or in the field of basic research in physics.

The Helmholtz Association aims to be an active and driving force in establishing the research area worldwide. This is why Helmholtz opened branch offices in Brussels, Moscow and Beijing. The Helmholtz Association chose Russia to be one of its key strategic partners to jointly face the challenges of the future through scientific cooperation. Partners in Germany looking for specific information about Russia and Russian seeking contacts in Germany have an excellent starting point in identifying the right people for their special interests. The transfer of new technologies and the exchange of promising young research talent hold great potential for the future development of both Germany and Russia.

The Moscow Office represents the interests of Helmholtz Association as a whole in Russia. It serves both Helmholtz scientists and Russian researchers interested in mutual cooperation. Its main tasks are to provide help for scientific partners to establish contacts, to promote joint projects and to foster the exchange of scientists, with the goal of helping initiate and establish new strategic networks of scientific excellence between Russia and Germany.

THE ALEXANDER VON HUMBOLDT FOUNDATION

Alexander von Humboldt
Stiftung/Foundation

The Alexander von Humboldt Foundation promotes academic co-operation between excellent scientists and scholars from Germany and abroad. AvH research fellowships and research awards allow scientists to come to Germany to work on a research project they have chosen themselves together with a host and a collaborative partner. As an intermediary organization for German foreign cultural and educational policy AvH promotes international cultural dialogue and academic exchange.

What is important to us? Only one thing is important to becoming a member of the Humboldt Family: your own excellent performance. There are no quotas, neither for individual countries nor for particular academic disciplines. AvH selection committees comprise of academics from all fields of specialisation and they make independent decisions based solely on the applicant's academic record. So in this case people are supported, specific not projects. After all, even in times of increased teamwork, it is the individual's ability and dedication that are decisive for academic success.

Roots of the AvH: Alexander von Humboldt was a discoverer and cosmopolitan. He was a fighter for the freedom of research, a humanist and a patron of excellent academic talent. Shortly after his death, the Alexander von Humboldt Foundation for Nature Research and Travel was established in 1860.

Today's Alexander von Humboldt Foundation was established by the Federal Republic of Germany on 10 December 1953. With Humboldt as a model, the Foundation maintains an international network of academic co-operation and trust. It links more than 25,000 Humboldtians throughout the world together, including 49 Nobel Laureates. The Foundation is funded by the Federal Foreign Office, the Federal Ministry of Education and Research, the Federal Ministry for Economic Co-operation and Development, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety as well as a number of national and international partners.

Become a Humboldtian: Whether you are a young post-doctoral researcher at the beginning of your academic career, an experienced established academic, or even a world authority within your discipline – our research fellowships and research awards offer you sponsorship specifically tailored to you and your career situation.

Key Sponsorship Programmes:

- Research Fellowships for post-doctoral researchers and for experienced researchers (up to 24 months of stay in Germany).
- Awards (Sofja Kovalevskaja Award, Friedrich Wilhelm Bessel Research Award, Humboldt Research Award, Alexander von Humboldt Professorship and others)

Professor Dr Vladimir Tishkov

Ambassador Scientist of Humboldt Foundation

Moscow State University, Faculty of Chemistry

- German Chancellor Fellowships to prospective leaders from the USA, the Russian Federation and China who have shown an outstanding potential for leadership in their careers thus far. For representatives of all professions and disciplines, giving special preference to the humanities, law, social science and economics.

LIST OF PARTICIPANTS

THE SIXTH GERMAN-RUSSIAN WEEK OF THE YOUNG RESEARCHER: URBAN STUDIES

Moscow, September 12–16, 2016

TITLE	LAST NAME	FIRST NAME	STATUS / INSTITUTION
Dr.	ACHTERBERG	Jörn	Head of DFG Office Moscow, Deputy Head of DWIH Moscow
Prof. Dr.	ALLGÖWER	Frank	Vice-President of the DFG; Director of the Institute for Systems Theory and Automatic Control, University of Stuttgart
Dr.	ANTYUFEEVA	Olga	Senior Lecturer, Volgograd State University of Architecture and Civil Engineering
Mr.	BARFUSZ	Oliver	Research Fellow, Institute of Applied Mechanics, RWTH Aachen University
Dr.	BERGHORN	Gregor	Deutsch-Russisches Forum
Dr.	DANILINA	Nina	Senior Lecturer, Moscow State University of Civil Engineering (National Research University)
Mr.	DEGTYAREV	Sergey	Deputy Head of the Department of Urban Policy, Government of Moscow
Mr.	DOBIS	Michael	Head of Division for Science and Research, Embassy of the Federal Republic of Germany to the Russian Federation, Moscow
Mrs.	DOBROWOLSKAYA	Natalya	Project Manager, DFG Office Moscow
Mrs.	DZWONNEK	Dorothee	Secretary General of the DFG, Bonn
Dr.	EREMENKO	Elena	Head of Moscow Office, Helmholtz Association of German Research Centres
Mr.	FEINE	Immo	PhD student, Research Associate, Bauhaus Universität Weimar
Mr.	FREIHERR VON FRITSCH	Rüdiger	Ambassador of the Federal Republic of Germany to the Russian Federation, Moscow
Mr.	GILLEFALK	Mikael	PhD student; DFG-RTG "Urban Water Interfaces"; Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Berlin

TITLE	LAST NAME	FIRST NAME	STATUS / INSTITUTION
Dr.	GILLNER	Sten	Research Fellow; Chair of Forest Botany, Technische Universität Dresden
Prof. Dr.	GOGINA	Elena	Vice-Rector for International Affairs, Moscow State University of Civil Engineering (National Research University)
Mrs.	GOLOVINA	Olga	PhD student, Ed. Züblin AG, Weimar
Mr.	GRAF	Thomas	Head of Economic and Science Department, Embassy of the Federal Republic of Germany to the Russian Federation, Moscow
Dr.	GRANDERATH	Sebastian	Programme Director, Group of Research Careers, DFG Bonn
Mr.	GRITSIYENKO	Denis	PhD student, Moscow State University of Civil Engineering (National Research University)
Mr.	GROTHUS	Ulrich	Deputy Secretary General, DAAD, Bonn
Mrs.	HALWAS	Stefanie	PhD student, Research Fellow, University of Applied Sciences Cologne
Dr.	HILLER	Peter	Head of DAAD Office Moscow, Director of DWIH Moscow
Prof. Dr.	HINKELMANN	Reinhard	Chair of Water Resources Management and Modeling of Hydrosystems; DFG Research Training Group " Urban Water Interfaces"; Technische Universität Berlin
Dr.-Ing.	HOLLERMANN	Sebastian	Zimmerei Sieveke; Bauhaus-Universität Weimar
Mr.	HUPPERTS	Frederik	Head of Infrastructure Location and Transportation Section, Cologne Chamber of Commerce and Industry
Mrs.	ILINA	Julia	Project Manager, DFG Office Moscow
Mrs.	IOVCHEVA	Daria	Head of Sales and Client Relations "100K20" LLC; Representative of SpringerNature in Russia
Prof. Dr.	IVANOVA	Zinaida	Department of Social, Psychological and Juristic Communications, Moscow State University of Civil Engineering (National Research University)
Dr.	IVASHKINA	Irina	Head of Environmental Protection Department, Genplan Institute of Moscow

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Mrs.	KADANTSEVA	Maria	DWIH Office Moscow
Mrs.	KALEMENEVA	Ekaterina	PhD student, Higher School of Economics (National Research University), St. Petersburg
Mr.	KHUSNULLIN	Marat	Deputy Mayor for Urban Development and Construction, Government of Moscow
Dr.-Ing. Dr.h.c.	KIRSCHKE	Heiko	Research and Teaching Associate, Chair of Computing in Civil Engineering, Bauhaus-Universität Weimar
Dr.	KORENKOVA	Ekaterina	Lecturer, Landscape Architecture, Orel State Agrarian University
Prof. Dr.	KÖNIG	Markus	Vice-Dean, Department of Civil and Environmental Engineering, Ruhr Universität Bochum
Prof. Dr.	KRASHENINNIKOV	Aleksey	Moscow Architectural Institute MARKHI (Academy of Architecture); Higher School of Economics (National Research University) Moscow
Dr.	KRISPIN	Martin	Project Coordinator, DWIH Moscow
Prof. Dr.	KRUPP	Thomas	Chair for Logistics, University of Applied Sciences Cologne
Mrs.	KRUTILOVA	Maria	PhD student, Assistant Professor, Belgorod State Technological University named after V.G. Shukhov
Dr.	KUZINA	Olga	Associate Professor, National Research University Moscow State University of Civil Engineering
Mr.	LADWIG	Robert	PhD student; DFG-RTG "Urban Water Interfaces"; Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Berlin
Mrs.	LANDYSHEVA	Olga	Head of International Academic Mobility Department Moscow State University of Civil Engineering (National Research University)
Dr.	LENTZE	Michael	Programme Director, Group "Engineering Sciences", DFG Bonn
Dr.	LEVASHEV	Aleksey	Associate Professor, Irkutsk National Research Technical University

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Mr.	MAGOMEDOV	Marat	International Projects Department, Moscow State University of Civil Engineering (National Research University)
Dr.	MAKISHA	Nikolay	Director of Research and Education Centre "Water Supply and Waste Water Treatment"; Moscow State University of Civil Engineering (National Research University)
Mrs.	MARTIN	Katharina	Research Fellow, Institute of Applied Mechanics, RWTH Aachen University
Mr.	MEITZNER	Andreas	Minister, Deputy Head of Mission, Embassy of the Federal Republic of Germany to the Russian Federation, Moscow
Mrs.	MELNIKOVA	Galina	Project Coordinator, DFG Office Moscow
Mr.	MELZNER	Jürgen	PhD student, W. Markgraf GmbH & Co KG
Prof. Dr.	MIKHAILOV	Aleksandr	Professor, Department of Transport Management and Logistics, Irkutsk National Research Technical University
Mr.	MÜHLHAUS	Michael	Chair for Architectural Informatics, Department of Architecture, Technical University of Munich
Mrs.	NECHAEVA	Irina	PhD student, National Research University Higher School of Economics, Moscow
Mrs.	NIKOLAENKO	Mariya	Senior Lecturer, Tomsk University of Architecture and Building
Mrs.	PRELOVSKAYA	Yana	PhD student, Institute of Engineering and Ecological Construction and Mechanization (IEECM), Moscow State University of Civil Engineering (National Research University)
Dr.	PRESTEL	Joseph	Research Fellow, Friedrich Meinecke Institute, Freie Universität Berlin
Prof. Dr.	PUPYREV	Evgeny	President of Interregional Union of Designers; Chairman of Expert and Technological Council of Russian Association of Water Supply and Sewerage
Prof. Dr. Dr. rer. pol.	REINHARD	Hartmut	Faculty of Economics and Law University of Applied Sciences Cologne
Dr.	RETHAGE	Wilma	DFG Office Moscow

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Mrs.	ROMERO	Clara	PhD student; DFG-RTG "Urban Water Interfaces"; Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Berlin
Mr.	RUSAKOV	Mikhail	Division for Science and Research, Embassy of the Federal Republic of Germany to the Russian Federation, Moscow
Mrs.	SAMOTESOVA	Natalia	Head of Department for International Coordination of International Cooperation, Moscow State University of Civil Engineering (National Research University)
Mrs.	SAVOSTINA	Anna	DWIH Office Moscow
Mr.	SCHEFFER	Markus	PhD student, Research Associate, Ruhr-Universität Bochum
Dr.-Ing.	SCHUBERT	Gerhard	Chair for Architectural Informatics, Department of Architecture, Technical University of Munich
Mr.	SCHWABE	Kevin	PhD student, Research Associate, Ruhr Universität Bochum
Mr.	SEIFERT	Nils	Chair for Architectural Informatics, Department of Architecture, Technical University of Munich
Dr.	SHAROV	Maksim	Research Fellow, Irkutsk National Research Technical University
Mr.	SHIPILOV	Aleksey	Project Coordination and Public Relations, Helmholtz Association of German Research Centres, Moscow Office
Mrs.	SOLKINA	Olga	PhD student, Samara State University of Architecture and Civil Engineering
Dr.	STRASHNOVA	Yulia	Head of Scientific Development and Planning Department "Social Infrastructure", Genplan Institute of Moscow
Mr.	STÜDEMANN	Tobias	Head of the Liaison Office of Freie Universität Berlin in Moscow
Mr.	SUGAROV	Khazbi	PhD student, Senior Lecturer, North Caucasus Federal University, Stavropol
Dr.-Ing.	TAUSCHER	Eike	Research Fellow, Chair of Computing in Civil Engineering, Bauhaus Universität Weimar
Dr.	TEIZER	Jochen	Director, Rapids Construction Safety and Technology Laboratory

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Prof. Dr.	TELICHENKO	Valery	President, Moscow State University of Civil Engineering (National Research University)
Mrs.	TEUBER	Katharina	PhD student, DFG Research Training Group “Urban Water Interfaces”; Technische Universität Berlin
Prof. Dr.	TISHKOV	Vladimir	Ambassador Scientist of Humboltd Foundation; Faculty of Chemistry, Moscow State University
Mr.	TSIULIN	Sergey	PhD student, South Ural State University, Chelyabinsk
Mr.	TUNIK	Alexander	PhD student, Research Fellow, Irkutsk National Research Technical University
Prof. Dr.	VOLKOV	Andrey	Rector, Moscow State University of Civil Engineering (National Research University)
Mrs.	YANTSEN	Olga	Deputy Director of the Institute of Engineering and Ecological Construction and Mechanization, Moscow State University of Civil Engineering (National Research University)
Prof. Dr.	ZADKOV	Viktor	Ambassador Scientist of Humboldt Foundation; Faculty of Physics, Moscow State University
Mrs.	ZYRYANOVA	Ekaterina	PhD student, Irkutsk National Research Technical University

PROGRAMME

SEPTEMBER 11, SUNDAY

Arrival of Participants

19:00 **Words of Welcome** to the participants of the week by
- Dr. Peter Hiller, DAAD Moscow
- Dr. Jörn Achterberg, DFG Moscow
- Dr. Martin Krispin, DWIH Moscow
- Prof. Dr. Andrey Volkov, Rector of MGSU

SEPTEMBER 12, MONDAY

09:00 **Transfer from the Hotel**

09:30 **Registration of Participants**

10:00 **Official Opening of the Week**

Presentation of MGSU

Welcome Addresses by
- Prof. Dr. Andrey Volkov, Rector of MGSU,
- President of AECEI (Association of Educational Civil Engineering Institutions)
- Prof. Dr. Valery Telichenko, President of MGSU,
- Honorary President of AECEI
- Rüdiger Freiherr von Fritsch,
- Ambassador of the Federal Republic of Germany
- Marat Khusnullin, Deputy Mayor for Urban Development and Construction
- Prof. Dr. Frank Allgöwer, Vice-President of DFG
- Ulrich Grothus, Deputy Secretary General of DAAD

11:15 **Opening Lecture** "From the Classical Feedback Loop to the New Cybernetics of the 21st Century"
Professor Dr. Frank Allgöwer,
Vice-President of DFG,
Institute for Systems Theory and Automatic Control, University of Stuttgart
– Discussion –

12:30 **Light lunch**

13:30 **Introductory Remarks to The Sixth German-Russian Week of the Young Researcher**
- Ulrich Grothus, Deputy Secretary General of DAAD
- Prof. Dr. Frank Allgöwer, Vice-President of DFG

14:00 **Prof. Andrey Volkov**,
Rector of MGSU
"Building Information Modeling & Life Cycle Support: Russian Experience and Prospects"
– Discussion –

15:00 **Coffee Break**

15:30 **Scientific Lectures of Young Researches**

Chair:

• Prof. Dr. Frank Allgöwer, DFG; University of Stuttgart

• Prof. Dr. Andrey Volkov, MGSU

Marija Nikolaenko (Tomsk University of Architecture and Building):
"Modern Trends and Problems of Urban Areas Development"

Yana Prelovskaya (MGSU):
"Creation of Modern Urban Space. Methodology of Reorganization of Typical Private-home Districts"

Ekaterina Kalemeneva (HSE St. Petersburg):
"Imagining a Comfortable City in the Arctic: Leningrad Architects in Search of Northern Urban Planning in the 1960s"

Joseph Prestel (FU Berlin):
"Shared Visions of the Urban Future: The Allure of Suburbs around the World at the Beginning of the Twentieth Century"

17:00 **University Tour: Campus, Labs, Museum**

18:00 **Opening of the Exhibition "Architectural and Construction Projects"**

18:15 **Evening Reception**

19:30 **Transfer to the Hotel**

SEPTEMBER 13, TUESDAY

08:30 **Transfer from the Hotel**

09:00 **DWIH Moskau**
Deutsches Haus für Wissenschaft und Innovation / German House for Research and Innovation
Dr. Martin Krispin, Project Coordinator

09:30 **DFG – Deutsche Forschungsgemeinschaft / German Research Foundation**
Dr. Michael Lentze,
Programme Director, Group of Engineering Sciences
"DFG – Funding Engineering Sciences in Germany"

10:15 **Prof. Dr. Thomas Krupp,**
Prof. Dr. Hartmut Reinhard,
University of Applied Sciences Cologne
"Entrepreneurs´ View on Urban Mobility in Cologne – the Case of a German Metropolitan Area from an Economic Perspective"
– Discussion –

11:00 **Coffee Break**

11:30 **Scientific Lectures of Young Researches**

Chair:

• Prof. Dr. Thomas Krupp, University of Applied Sciences Cologne

• Prof. Dr. Hartmut Reinhard, University of Applied Sciences Cologne

Stefanie Halwas (University of Applied Sciences Cologne):
"Urban Mobility and Startups – Analysis of the Special Requirements of New Enterprises"

Frederik Hupperts (Cologne Chamber of Commerce and Industry):
"Decision Making in Urban Mobility – Capacity Analysis of Different traffic-infrastructures in Limited Public Areas Using the Example of Cologne"

Nina Danilina (MGSU):
"Park-and-ride Value Under Intermodal Transportation System Integration"

Aleksey Levashev (Irkutsk National Research Technical University):
"Modern Approaches to Estimation of Transportation Demand Based on GIS-technologies"

Sergey Tsiulin (South Ural State University, Chelyabinsk):
"Urban Freight: A Literature Review"

13:15 **Lunch**

14:00 **Prof. Dr. Alexander Mikhailov,**
Irkutsk National Research Technical University
"Proposals for German-Russian Collaboration in Urban Transportation Planning"
– Discussion –

14:45 **Scientific Lectures of Young Researches**
Chair:
- Prof. Dr. Thomas Krupp, University of Applied Sciences Cologne
- Prof. Dr. Hartmut Reinhard, University of Applied Sciences Cologne
- Prof. Dr. Mikhailov, Irkutsk National Research Technical University

Maksim Sharov (Irkutsk National Research Technical University):
"Evaluation of Transport Accessibility of Territory"

Olga Antyufeeva (Volgograd University of Architecture and Civil Engineering):
"Urban Planning Aspects of Development of Museums in the City Structure"

Maria Krutilova (Belgorod State Technological University named after V.G. Shukhov):
"Methodology of Cost-effective Eco-directed Structural Design"

15:45 **Coffee Break**

16:15 **Dr. Yulia Strashnova,**
Genplan Institute of Moscow
"Territorial Planning as Instrument for Creating Quality Urban Environment"
– Discussion –

17:00 **Scientific Lectures of Young Researches**

Khazbi Sugarov (North Caucasus Federal University, Stavropol):
"Urban Open Spaces"

Ekaterina Korenkova (Orel State Agrarian University):
"Landscape Management and Soil Reclamation of Different Urban Areas"

Olga Golovina (Ed. Züblin AG):
"Teamwork Makes the Dream Work – Global Collaboration in Construction Project Planning"

18:00 **Transfer to the Hotel and Dinner**

SEPTEMBER 14, WEDNESDAY

08:30	**Transfer from the Hotel**
09:00	**Dr.-Ing. Heiko Kirschke,** Bauhaus-Universität Weimar **Prof. Markus König,** Ruhr-Universität Bochum **Dr. Jochen Teizer,** Rapids Construction Safety and Technology Laboratory "Overview of BIM in Education, Research and Industry Application" *– Discussion –*
10:00	**Prof. Aleksey Krasheninnikov,** Moscow Architectural Institute MARKHI (Academy of Architecture) / Higher School of Economics Moscow "Public Space in Built Environment" *– Discussion –*
10:40	**Coffee Break**
11:00	**Scientific Lectures of Young Researches** Chair: • Dr.-Ing. Heiko Kirschke, Bauhaus-Universität Weimar • Prof. Aleksey Krasheninnikov, MARKHI / HSE **Jürgen Melzner** (W. Markgraf GmbH): "BIM Implementation in Small and Medium Enterprises" **Immo Feine / Eike Tauscher** (Bauhaus Universität Weimar): "BIM and Sensor Data Fusion for Project Lifecycle Management" **Olga Kuzina** (MGSU): "Complementary Functional Components of Information Modelling for Reorganization of City Environment and Infrastructure in Interactive Mode" **Irina Nechaeva** (Higher School of Economics, Moscow): "Development of BIM in Russian Construction Industry"
12:30	**Lunch**
13:30	**Kevin Schwabe** (Ruhr-Universität Bochum): "Model-Based Construction Site Layout Planning" **Markus Scheffer** (Ruhr-Universität Bochum): "Simulation of Logistic Processes for Mechanized Tunneling Projects in Urban Areas" **Sebastian Hollermann** (Bauhaus University Weimar): "BIM to Production Implementation and Education in Small Construction Companies" **Gerhard Schubert** (TU Munich): "Interactive Interfaces: Tangible Tools for Architectural Design" **Nils Seifert / Michael Mühlhaus** (TU Munich): "Integrated Decision Support: New Interaction and Visualization Strategies in Urban Planning and Participation"

15:15	**Coffee Break**
15:45	**SPRINGER-Workshop** "Publishing Scientific Research in Journals, Conference Proceedings, Books" **Daria Iovcheva,** Representative of SpringerNature in the Russian Federation
17:00	**Excursion to Ostankino TV Tower**
20:00	**Transfer to the Hotel and Dinner**

SEPTEMBER 15, THURSDAY

08:30	**Transfer from the Hotel**
09:00	**DAAD – Deutscher Akademischer Austauschdienst / German Academic Exchange Service** **Dr. Peter Hiller,** Head of DAAD-Office in Moscow
09:45	**DFG – Deutsche Forschungsgemeinschaft / German Research Foundation** **Dr. Sebastian Granderath,** Group of Research Careers "Promoting Research Careers"
10:30	**Coffee Break**
11:00	**Honorary lecture** **Dorothee Dzwonnek,** Secretary General, DFG "Current Prospects of Germany's Science and Research System" Chair: • Prof. Dr. Andrey Volkov, Rector of MGSU • Prof. Dr. Valery Telichenko, President of MGSU *– Discussion –*
12:00	**Lunch**
13:00	**Prof. Dr. Reinhard Hinkelmann,** Technical University Berlin DFG-Research Training Group 2032 „Urban Water Interfaces" „Simulation-based Design for Restoring a Small Urban River" *– Discussion –*
14:00	**Prof. Dr. Evgeny Pupyrev,** The Interregional Union of Designers, Expert and Technological Council of The Russian Association of Water Supply and Sewerage "Special Aspects of Water Management in the Communal Services of Russia" *– Discussion –*

14:45	**Scientific Lectures of Young Researches** Chair: • Prof. Dr. Reinhard Hinkelmann, • Dr. Michael Lentze, DFG **Nikolay Makisha** (MGSU): "Approaches for Reconstruction of Waste Water Facilities on the Energy Efficiency Basis" **Olga Yantsen** (MGSU): "The Solution of Water Environment Issues in Cities and Localities"
15:30	**Coffee Break**
16:00	**Clara Romero** (TU Berlin): "Urban Water Interfaces: Biogeochemical Processes" **Robert Ladwig** (TU Berlin): "Urban Water Interfaces: Interfaces in Urban Surface Waters" **Katharina Teuber** (TU Berlin): "Urban Water Interfaces: Interfaces in Sewer Systems" **Mikael Gillefalk** (TU Berlin): "Urban Water Interfaces: Surface Water – Groundwater Interactions" **Olga Solkina** (Samara State University of Architecture and Civil Engineering): "Dairy Wastewater Treatment in Urban Environment"
17:40	**Transfer to the Hotel and Dinner**

SEPTEMBER 16, FRIDAY

08:30	**Transfer from the Hotel**
09:00	**Helmholtz Association of German Research Centres** **Aleksey Shipilov,** Project Coordination and Public Relations
09:30	**Alexander von Humboldt Foundation (AvH)** **Prof. Dr. Vladimir Tishkov,** Ambassador Scientist of Humboldt Foundation; Lomonosov Moscow State University
10:00	**Dr. Irina Ivashkina,** Genplan Institute of Moscow "Environmental Priorities of Territorial Planning of Moscow" *– Discussion –*
10:45	**Coffee Break**
11:15	**Scientific Lectures of Young Researches** Chair: • Dr. Martin Krispin, DWIH-Moscow • Dr. Irina Ivashkina, Genplan Institute of Moscow

Oliver Barfusz (RWTH Aachen):
"Sustainable Buildings of the Future – Focus on Finite Element Technology"

Katharina Martin (RWTH Aachen):
"Simulation-Based Development of Original Road Pavement Materials"

Ekaterina Zyryanova (Irkutsk National Research Technical University):
"Methodical Aspects of Environmental Impact Assessment Related to MSW (Municipal Solid Waste) Landfills"

Sten Gillner (Technical University Dresden):
"Enhancing Multifunctionality of Urban Trees – Considering Site Factors and Human Demands"

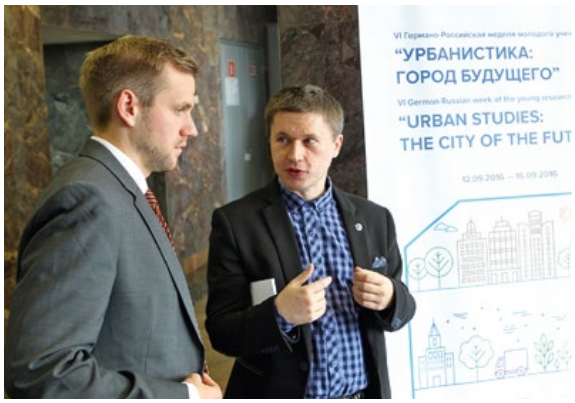
Denis Gritsiyenko (MGSU):
"Reflected Sunlight Radiation to Improve Insolation Condition in Urban Environment"

Alexander Tunik (Irkutsk National Research Technical University):
"The Complex Mobile Independent Power Station for the Urban Areas"

13:15 **Lunch**

14:00 **MGSU Scientific Seminar and Discussion**
Prof. Zinaida Ivanova,
Department of Social, Psychological and Juristic Communications, MGSU
"Social Integrative Architecture, Urban Design and Political-administrative Solutions – New Tendencies in Germany and Russia"

15:00 **Closing remarks**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“URBAN STUDIES:
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