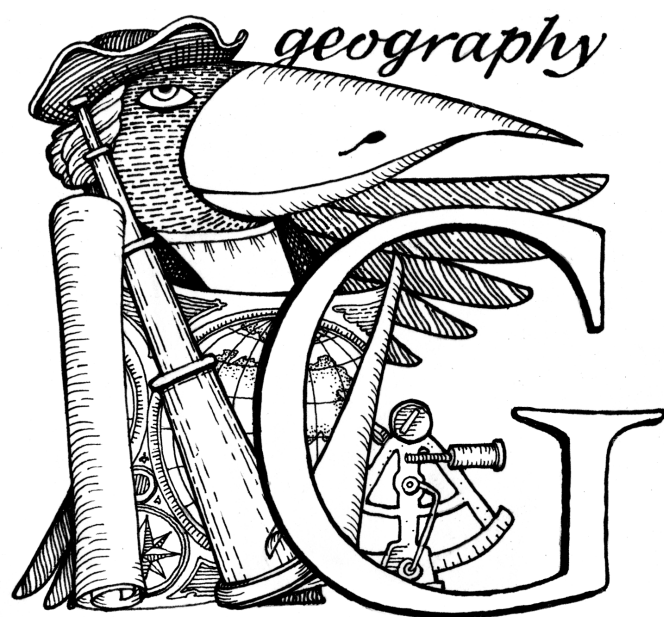


"To understand the things that are at our door is the best preparation for understanding those that lie beyond"

— Hypatia



geography of HSE University provides ample opportunities to experience and learn about nearly half of the country, and without understanding each of the campuses with their unique features there is no way to fully understand the idea of HSE on the whole. Last year The HSE Look began a series of articles focusing in-depth on each campus, starting with HSE St. Petersburg (see October 2017 issue), university's 2nd largest campus, and we would like to continue the series with devoting the summer issue to HSE Nizhny Novgorod. While being unmistakably a part of HSE University, each campus reflects the unique features of its region, and the readers can learn more about it in an interview with campus Director Valery Zusman. In this issue we also talk more about education programmes at HSE Nizhny Novgorod with Deputy Director Anna Blyakhman, get an inside look into the work of the Laboratory of Algorithms and Technologies for Networks Analysis with its head Valery Kalyagin, and travel to discover different Russias with Victor Albert, one of HSE's international faculty members.

Director of Internationalisation  
Yulia Grinkevich

## Nizhny Novgorod: Reaching Out Locally and Globally

As the second-oldest HSE campus after Moscow, HSE Nizhny Novgorod has over 2,700 students, over 300 faculty members, and offers 9 BA programmes and 11 MA programmes, as well as several double-degree tracks. In addition to its educational activities and research, the university also serves as a forum for the city's cultural life and carries out several projects aimed at ensuring the public good. In 2014, **Valery Zusman**, Doctor of Sciences in Literature of Western Europe, America and Australia, and the then Dean of the Faculty of Humanities at HSE Nizhny Novgorod, became the director of the campus. Professor Zusman talked to The HSE Look about the challenges and successes of global outreach projects at HSE Nizhny Novgorod and its proactive approach.

## What makes HSE Nizhny Novgorod special?

I would say that a lot of our interesting projects are the result of balancing the local, interregional and international dimensions of our activities. Concerning the city itself, Nizhny Novgorod has a complex history, and is quite a modern city with its own challenges. It is one of the two cities in the world with such a large presence of old wooden architecture and HSE is actively involved in initiatives to protect this heritage from deterioration and find ways of revitalizing the city's Old Town.

The multi-campus nature of HSE is a great asset for our interregional involvement, as we can learn from each other, while our shared reputation helps to attract students and partners. At present, over 30% of our undergraduate students come from other regions in Russia and around 7% of our students are international, including exchange students from HSE's partner universities.

International partnerships and projects are, in a way, a continuation of our inter-regional outreach. There are various challenges in terms of attracting students, but similar benefits in terms of enriching the learning experience, research activities, and our involvement in resolving the practical challenges now faced by today's society.

## Are there any other unique features which help the university stand out in the current academic landscape?

We are fortunate to be home to the Austrian Library at HSE Nizhny Novgorod, as there are only a few of them in other Russian cities – in Moscow, St. Petersburg, and Ekaterinburg, out of a total 60 worldwide. The library has a unique collection of over 6,000 books, covering such subjects as cultural and literary studies, history, art and fiction in different languages, but predominantly in German, English and French. We are doing our best to enlarge the collection by procuring quality books on mathematics, computer science, international law and economics.

The library is open to the public, not just to HSE students, and has also become a community-building space for those studying German and discussions on various cultural issues, as well as meetings with writers and artists.

## What is the major motivation for international students to come to HSE Nizhny Novgorod?

Obviously, we offer interesting courses and degree programmes, but typically Moscow or St. Petersburg would be the first options that cross the students' minds. So, we are doing our best to shape Nizhny Novgorod as a potential study destination.

Firstly, there is the appeal of learning what the country is like beyond its two largest metropolises, and the region of Nizhny Novgorod offers many small towns to visit, which is a unique experience, as well as a chance to explore the architecture and culture of the city itself.

Secondly, the natural beauty of the region is another way to appeal to our international visitors in addition to purely academic matters. In Nizhny Novgorod, visitors can take advantage of the difference between the low and high banks of the city and enjoy a view unhindered by tall buildings in the very heart of the city, overlooking the Volga River, and the confluence of Volga and Oka.

Naturally, we do our best to ensure more opportunities for international students to attend our programmes, as well as carry out joint research projects with international scholars. We offer a unique Master's programme in Global Business, which is taught entirely in English and brings together in one classroom students from HSE, University of Bergamo and Johannes Kepler University Linz. This programme features a jointly coordinated study plan between the three universities, and the first year is completely devoted to students spending one trimester in each country, taking classes and doing internships at local companies, as well as preparing and defending projects as participants on international teams.

## Could you tell us more about how the university is involved in the life of the city and the region?

It's really important for us to be perceived not just as a branch of a Moscow university, but as an intrinsic part of the city. We have been consistently working with schools in the city and the region, including professional development workshops for teachers, as well as in cooperation with other academic institutions. Nizhny Novgorod State Conservatory was the first of our partners, and currently one of our exchange students from Italy is actively involved in its choir programme.

There are also quite close ties with other universities - Nizhny Novgorod State University of Architecture and Civil Engineering (NNSUACE), Nizhny Novgorod State Technical University (NNSTU) and with Privolzhsky Research Medical University.

At present, we are engaged in two active projects together with NNSUACE, with the first one focused on environmental protection, while the second is devoted to preserving cultural heritage. As in many cities, Nizhny Novgorod has an outdated waste disposal system, and there's plenty of room for action. So, our Green HSE student club is helping with clearing lakes of plastic, as well as planting flowers and trees. Furthermore, we are looking for ways to use our proficiency in IT to develop sustainable solutions to the city's and the region's environmental issues. Regarding the preservation of cultural heritage, there are six engineering structures in the region which were designed by the Vladimir Shukhov, who is famous for his pioneering works, including hyperboloid towers. There used to be two towers over 125 meters high in the vicinity of the industrial town Dzerzhinsky, but unfortunately one of them was disassembled for scrap metal. Nizhny Novgorod State University of Architecture and Civil Engineering and HSE intervened just in time to spare the second tower a similar fate. Many architects and professors were involved in supporting the preservation of this building, and we are now trying to include the tower on the list of UNESCO World Heritage Sites.

### **You've also mentioned cooperation with a medical university. How does that fit with the research profile of the campus?**

This seems like an unusual partnership, but in fact, it is quite a natural one, especially if you think of HSE as a whole. The Center for Language and Brain at HSE in Moscow specializes in neurolinguistics, and together with my colleague **Natalya Gronskeya**, Professor at the School of Applied Linguistics and Foreign Languages, as well as a Deputy Director of the HSE campus in Nizhny Novgorod, they cooperate with neurosurgeons at the Privolzhsky Research Medical University. Our colleagues are mapping speech centres in patients' brains during so-called awake brain surgery, which vastly increases the chances of retaining one's speech after such treatment. These advancements have helped not only to save the lives of patients, but also to avoid or mitigate the loss of quality of life after surgery.

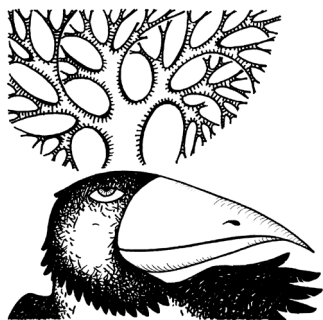
I believe that it's a very important part of our social mission, to use the research and innovations we produce in order to do things which impact people's lives in a positive way. To my mind, this is the only substantial way to 'promote' the campus as a potential partner and destination for research, be it locally or globally, as it helps to attract like-minded people with whom we can work.

Speaking of making an impact, HSE is a very strong analytical think tank. Could you name any examples of policy projects in Nizhny Novgorod that your campus is involved in?

Earlier this year, the newly appointed city administration reached out to us about an urban planning issue, specifically – transportation development. According to the estimates, in 7-10 years, around 80% of buses in Nizhny Novgorod should be driverless. However, this change requires that the city reconfigure its traffic system, improve the quality of roads and so on. In order to justify the potential investment, the city would like to have some quality analysis regarding bus-passenger traffic, peak flows at different locations, etc. This is where we come in: our Laboratory of Algorithms and Technologies for Networks Analysis, headed by **Panos Pardalos**, Distinguished Professor from the University of Florida, and **Valery Kalyagin**, Professor and Head of the Department of Applied Mathematics and Informatics, is uniquely equipped to deal with designing such complex algorithms, as they already have had a similar experience with an applied project for a logistics company.







## A Strong Profile in IT and Humanities

The HSE Look talked to **Anna Blyakhman**, Deputy Director of HSE Nizhny Novgorod and Associate Professor at the Faculty of Management, about the educational programmes offered at the campus and its international students.

### Does HSE Nizhny Novgorod have any special focus in terms of its programmes?

Regarding higher education programmes (BA, MA and PhD), obviously, we have 'core' topics at HSE, (i.e., economics, management and law). But one of our defining features is a strong education in all fields of IT and computer science.

Nizhny Novgorod is the birthplace of business informatics programmes at HSE. We've enrolled the first students in business informatics back in 2004, and the curriculum and educational standard for licensing the programme was largely developed by **Nikolay Petrukhin**, Professor of the Faculty of Informatics, Mathematics and Computer Science and Academic Supervisor of HSE Nizhny Novgorod, by the former director of the campus **Oleg Kozyrev**, and by **Valery Kalyagin**, Head of the Laboratory of Algorithms and Technologies for Network Analysis, Professor and Head of Department of Applied Mathematics and Informatics.

Applied mathematics and informatics, software engineering, as well as mathematical physics, are some of the strongest parts of our educational and research portfolio. It just so happens that the Faculty of Humanities at HSE Nizhny Novgorod developed initially as a part of our IT focus – through an MA programme in computer linguistics. Later, it encompassed a wide range of educational programmes, such as fundamental linguistics, philology, political linguistics, and even a PhD programme in language theory and foreign literature. It's rather unorthodox for the Faculty of Humanities to develop within the Faculty of Computer Science, but it has created unique opportunities for the natural development of multidisciplinary cooperation in teaching and research.

### What is the role of international partnerships in regards to the educational programmes offered at the campus?

We are interested in providing meaningful opportunities for international mobility to our students, so that this experience becomes an integral part of their educational life at HSE, rather than be a more or less well-matched range of courses taken at a partner university. For example, we are planning to launch an MA in fundamental mathematics together with two universities in Germany and the Czech Republic. We are currently hammering out the details with our Italian colleagues about academic mobility and internship placements for the lean management study track, which is still in the works. Moreover, we find programme-specific agreements to be especially useful for this, and we are doing our best to develop new programmes in close cooperation with our international partners from the very beginning.

### Could you tell us more about one of the current double-degree programmes?

One of the successful examples is an MA programme in Global Business, which has been offered by HSE since 2013 in conjunction with Johannes Kepler University Linz (Austria) and University of Bergamo (Italy). During the first year, students from each university - around 30 in total - all study together, taking courses and participating in internships in each of the three countries. The second year is spent at a home university and is mostly devoted to writing a thesis and specialized courses that are of interest to students.

The opportunity to study, do projects together and get familiar with the work of the companies in Russia, Austria and Italy during the first year provides students a unique

experience of multicultural environment and allows them to better understand the business environment of different countries, thus giving them an advantage in successfully navigating the international job market. Some of our alumni work abroad or at Russian branches of international companies, some come back and are glad to meet with current students and work closely with our Career Centre in helping them to find internships or job opportunities. All in all, they invariably say that the knowledge and practical intercultural experience they gained while taking part in the programme provided them with a practical advantage in their professional lives.

### How many international students are at HSE Nizhny Novgorod?

At the moment we have over 120 full-degree international students. Most of them come from post-Soviet countries and Mongolia. Occasionally, we get students from further away. For instance, one of our MA students in business informatics is from Puerto Rico. Speaking about our exchange students, there are around 30 of them and they mostly come from our partner universities in the USA, France, Belgium, Germany and Italy.

In terms of the overall number of students at HSE Nizhny Novgorod, over 150 international learners make up for 7% of the overall student body, and their presence influences campus life in many ways, both inside and outside the classroom. Concerning university life, our local students are very actively engaged in cultural events and mixers, which help international students become a part of our community faster, as well as participate in language clubs and a buddy system.

Speaking about the classroom side of things, obviously, a multicultural classroom is a challenge, but its benefits are immense. Our professors are encouraged to look for innovative approaches to teaching, and we are developing the number of courses and study tracks offered in English, so as to facilitate academic exchanges.

### Are there any educational projects in which the campus is actively engaged in the region?

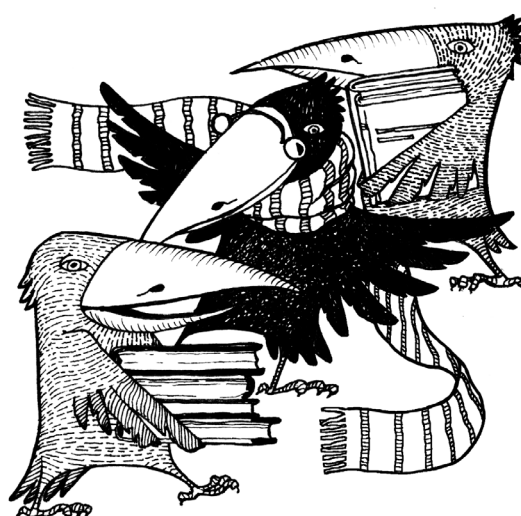
In terms of education, we play quite a significant role in facilitating the school-to-university transition. We work with school teachers and administrators, as well as pupils and their parents directly.

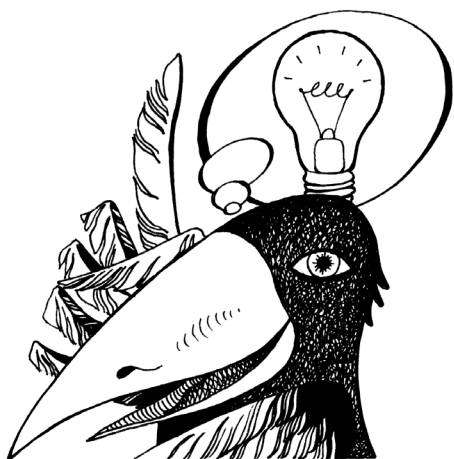
Most importantly, HSE Nizhny Novgorod is actively engaged in making career and vocational guidance available to minors and their parents. With this in mind, we organize events and workshops both at schools and the university itself. In close relation to that, we also hold webinars on preparing for the Unified State Exam, including a stress management course for students and their parents.

Another thing worth mentioning is the Smart Classroom project, which was launched by HSE five years ago. We've selected two typical schools in the city and, through partnership with them, we got actively engaged into the 10th and 11th-grade curricula. I think it's safe to say that there have been positive changes in the performance of students and the schools as a whole.

Last but not least, we have several 'evening schools', which are geared towards talented students. For example, the one in mathematics is run by **Dmitry Kuznetsov**, head of the IT and Math School for pre-university education. His students have won intellectual Olympiads in mathematics many times, thus gaining more opportunities to enrol in highly competitive university programmes.

We see this involvement in the campus and educational life of Nizhny Novgorod as an integral part of our mission as a university. Moreover, it is very important for us to contribute to the region's development through providing our resources to secondary education in this way.





## Developing New Research Tools

The Laboratory of Algorithms and Technologies for Networks Analysis (LATNA) in Nizhny Novgorod is one of HSE's international laboratories. It is co-supervised by **Panos Pardalos**, Distinguished Professor at the University of Florida, and **Valery Kalyagin**, Professor and Department Head at the Department of Applied Mathematics and Informatics. Professor Kalyagin told The HSE Look about the lab's research projects, its work with students, and engagement in the educational life of the campus and HSE at large.

### What is the laboratory's main research focus? What kinds of issues or thematic areas can network analysis be applied to?

Network analysis is quite a wide field of research, and HSE has developed several laboratories, which can study its different aspects. For instance, our laboratory LATNA focuses on algorithms, i.e. on developing the tools for network analysis, while our colleagues at International Laboratory for Applied Network Research focus closely on applications, in particular to social networks.

One of the important research areas regarding networks analysis is optimization on networks. In terms of theoretical research, we analyze computational complexity of different optimization problems on networks, which shows whether it is possible to get exact solution of the problem in a practical amount of time. Efficient algorithms give a solution close to the optimal for such tasks, and we use the theoretical advancement to develop efficient algorithms for addressing practical issues.

One of our projects is devoted to clustering and search techniques in large-scale networks, where we focus on efficient algorithms to find closely connected communities within the network using different criteria. It's applicable to a wide array of tasks, including analysis of social networks, gene expression networks, market networks and many others.

Another thing worth mentioning is our work on search algorithms, which has a particular focus on finding specific objects quickly in large databases. We rely on network analysis to make searches faster and more reliable, for example, in regards to image or face recognition.

### Are you engaged in many applied research projects? Who are the lab's major partners?

We have received a fair amount of such requests. Of course, not all of them turn into collaborations, but we've had several successful projects in logistics, optimization and data analysis. For example, a leading retail company needed to develop more optimal transportation routes. So, our researchers not only offered a practical solution for this client, but also found a way to develop a theoretical understanding of the tools used, and are currently working on that.

We've worked with INTEL Company on testing their Intel Data Analytics Acceleration Library and developing a series of laboratory works for students in applied mathematics. Recently we've started collaboration with Medical University together with our colleagues in cognitive sciences.

It is quite a monumental and cross-discipline task to develop rehabilitation devices, which can treat speech impairments or poor coordination. This project is going to be a blend of medical research, cognitive sciences, psychology and data analysis.

Professor Pardalos and I do our best to encourage young researchers in our laboratory to more boldly engage into applied projects, because their level of theoretical understanding allows to go deeper inside the problem and to use the latest advancements for practical application.

### **You hold regular seminars.**

#### **What is their goal?**

#### **Are they open to lab members only or can anyone join?**

Our seminars are a way for all lab members to discuss latest research developments and projects together. At the same time, it is open to everyone, and the schedule is available online, so that colleagues from other universities in Nizhny Novgorod can join us. It is a great way for young researchers to learn and grow as scientists, and we invite distinguished speakers when we get the opportunity. For instance, when **Maurice Salles**, Professor at Université de Caen Normandie (France), visited the April Conference earlier this year, he also gave a talk at HSE Nizhny Novgorod.

As a part of the laboratory's seminars, we also participate via videoconference in a seminar 'Mathematical methods of decision analysis in Economics, business and politics' organized by Professor **Fuad Aleskerov** at the Department of Mathematics on the Faculty of Economics HSE Moscow, as well as in the seminar for the PhD students of the Computer Science Faculty. It's a great way for our researchers not only to listen to the proceedings, but also to ask questions and participate in the discussion despite the physical distance between Moscow and Nizhny Novgorod.

### **How do you involve students in research?**

Around 70% of our laboratory is under 35 years of age, including two undergraduate students, two Master's and five PhD students. It is our strong belief that involving students in research is imperative. Prof. Pardalos pays a special attention to the support of young researchers; he is one of the most prolific academic supervisors in USA, with more than 50 successful PhD students.

We are closely involved in the Bachelor's programme in Applied Mathematics and Informatics, as well as the Master's programme in Data Mining. Many of our researchers teach courses for BA and MA students, so they

can offer the most recent knowledge and methodologies in the classroom, as well as encourage students' interest in research opportunities. Every year, we get around 20 students in total, who actively take part in the lab's projects.

In addition, we organize two schools for young researchers, both from HSE and other universities. This is the Summer School on Operational Research and Applications (since 2012) and Winter School on Data Analytics (since 2014). Students have a chance to meet with world-class experts in various fields of computer science and data analysis. This allows us to identify students with the potential for doing research, and they, in turn, can get familiar with the latest approaches to data analysis, as well as the current research activities being carried out at LATNA.

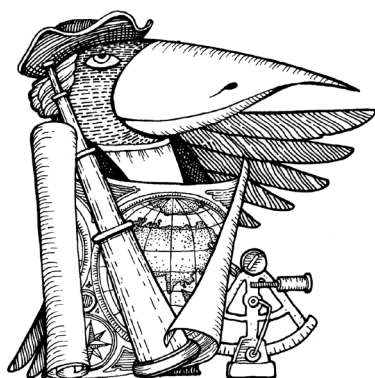
### **What other HSE labs and departments do you collaborate with?**

As a part of the Faculty of Informatics, Mathematics and Computer Science, we work closely with its other departments. What is perhaps less typical, but no less important for us, is our collaboration with Fundamental and Applied Linguistics Department, which began from a desire to find a common ground for researchers in humanities and IT to work together at HSE Nizhny Novgorod. We have a strong profile in natural language processing, both in theoretical research and offering practical solutions to some of the city's companies engaged in text analysis services.

If we talk about HSE at large, I've already mentioned that we collaborate with the Faculty of Computer Science, with the Department of Mathematics at the Faculty of Economics in Moscow and with the Laboratory of Applied Networks Analysis - we participate in each other's conferences and organize joint sessions, exchanging the latest algorithms and discussing research problems. This process is very fruitful, as our research areas do not overlap 100% but are nonetheless complementary.

Professor Pardalos encourages the lab staff to actively participate in the development of international visibility of the lab and its reputation among the professionals in Computer Science and Data Analysis, and we continue to focus on developing the fundamental research, with its strengths, but also to always look for new ways to use it for solving practical problems.





## Discovering HSE and Russia

**By: Victor Attila Albert**, Assistant Professor, Public Policy Department, Faculty of Social Sciences. Victor completed his PhD in Social Anthropology at La Trobe University (Australia) in 2013. His research interests include social movements and participatory democracy, urban planning, and a range of public policy issues, including housing and environmental policy.

### Discovering Russia(s)

People often tell me that Moscow is not the ‘real’ Russia. I’ve heard this said of many other cities: London is not the real England; New York is not the real US; Rio is not the real Brazil. However, the notion of a real Russia is quite misleading, unless we only think in stereotypical terms. Perhaps one day I’ll find this ‘real Russia’: at the dacha, while playing chess and drinking vodka and eating Olivier-style salad – a living and breathing Russian stereotype (disclaimer: I have done most of these things and confess that it did feel ‘really Russian’, but I digress!). In the meantime, it would seem better to assume that in a massive, multi-ethnic, multi-faith federation of continental size, there are – to borrow a phrase from my other adopted home, Brazil - many Russias, which interrelate and mutually influence each other.

Like many of my fellow colleagues (and students), I am curious by nature. Even though that curiosity can be satisfied in a place like Moscow, as it’s the centre of politics and business, cultural and leisure activities, it is important to push yourself out of your comfort zone go travelling, to discover and explore these ‘other Russias’. Of course, like other visitors to Russia I’ve been to St. Petersburg (and more than once), which is impressive and – despite its status as a big modernizing project - has a more human scale than Moscow. While I do enjoy galleries, museums and so on, I’m just as happy to explore everyday life, experience and try different *stolovayas*, local cafes and bakeries, or to see a local band or even a good street musician (if you can dodge the swarms of Peters the Great that crowd the centre of town and offer to be photographed with them).

In addition to St. Petersburg, I’ve also spent a few days in Nizhny Novgorod, which, a few hours from Moscow,

was an obvious place to continue this exploration. We stayed over the river from the old centre, near a square that featured a large statue of Lenin pointing the way forward. This part of the city, characterized by the modern functionalism of the Soviet era contrasted sharply with the baroque buildings lining the streets of the old centre, which is a place for tourism and commerce. The most impressive thing for me, though, was the white Kremlin and the view it afforded of the confluence of the Oka and Volga Rivers. The immensity of the Russian steppe is hard to gauge from just a train window, but this view at the intersection of two such important rivers helped me to understand how Russia’s geography has helped to shape its history, as Trotsky famously notes in his introduction to the Revolution.

My department has helped me in my cultural exploration, through various teaching and study trips. Most notable among them (as my colleague Arnab mentioned previously in these pages) was to Rostov Veliky last year, which is home to a large monastery by the shore of Lake Nero. Visiting this monastery, in the cold and under overcast skies, you are struck by the solitary beauty and solemn life of the devout.

These are big, geographic explorations, which I love. At the same time, you don’t have to travel far to explore. You can do your own exploration in the kitchen, by learning to cook new dishes, by reading a history book, by joining a sports team or checking out a band, or (like I do!) explore via the language, a long and arduous process, but one so necessary for anything much that is socially meaningful. Yes, the grammar is hard (and the genitive plural case, e.g. “bratiev”... was that really necessary?), but if anything can be said to be the ‘Real Russia’, it is the Russia experienced every day through conversations and interaction in its native language. This is what I plan to do.