



# Saint Petersburg UNIVERSITY

HIC TUTA PERENNAT

## ST. PETERSBURG UNIVERSITY AT A GLANCE

A female scientist in a white lab coat, blue surgical mask, and safety goggles is in the foreground, holding a petri dish with red liquid. In the background, two other scientists in lab coats are working in a laboratory setting.

**POST-GRADUATE PROGRAMMES**

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Founded in 1724 by Peter the Great, St Petersburg University became the first university in Russia. St Petersburg University is a leading Russian university rated among the world's top universities in global university rankings:

- top 100 THE University reputation ranking
- top 60 2015 Financial Times Business School European Rankings
- Financial Times Business School European Rankings 2015 (60<sup>th</sup> position)
- Financial Times Masters in Management European Rankings 2015 (46<sup>th</sup> position)



9

Nobel Prize  
WinnersMORE THAN  
30,000  
studentsMORE THAN  
3,000  
international  
students6,000  
academic  
staffMORE THAN  
300  
international  
academic staff

47

main educational  
post-graduate  
programmes350  
partner  
universities  
worldwide12,800  
places  
in the halls  
of residenceDiploma  
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### DEAR FRIENDS,

For more than 290 years, St. Petersburg University has been committed to advancing science, generating knowledge and training outstanding professionals. The University is rich in history — it dates back to 1724, when Peter the Great founded the Academy of Sciences and Arts as well as the first Academic University in Russia.

The famous SPbU alumni are the source of pride and dignity, which inspires us to excel and maximise our potential in research and education. Among our alumni and staff, there is an extraordinary number of world-famous people, in particular, Nobel Prize winners: physiologist Ivan Pavlov, biologist Ilya Mechnikov, physical chemist Nikolay Semyonov, physicists Lev Landau and Aleksandr Prokhorov, mathematician and economist Leonid Kantorovich. SPbU is also an alma mater of outstanding researchers, scholars, academics, political and social leaders: Dmitry Mendeleev, Vladimir Vernadsky, and Dmitry Likhachev to name but a few. The world owes to our University most prominent cultural leaders, writers and artists: Ivan Turgenev, Pavel Bryullov, Alexander Blok, Alexander Benois, Sergei Diaghilev, and Igor Stravinsky. Among the University alumni, we are also proud to mention the leaders of the Russian Government: Boris Sturmer, Alexander Kerensky, Vladimir Lenin, Presidents of the Russian Federation Vladimir Putin and Dmitry Medvedev.

Today, three centuries after it was established, SPbU is striving, as before, to lead research and education on a national and global scale. By bringing together traditions and innovations, St. Petersburg University sets the pace for development of science, education and culture in Russia and across the world.

SPbU fully equips its students and staff for the best of the diverse range of opportunities for education, research and personal development: the richest Research Library named after M. Gorky, a state-of-the-art Research Park, laboratories headed by leading scientists, museums, a publishing house, sports clubs, a University choir, orchestras, drama and dance studios and so on.

In November 2009, President of the Russian Federation Dmitry Medvedev signed a law granting St. Petersburg University and Moscow State University the special status of 'unique scientific and educational complexes, the oldest institutions of higher education in Russia being of great importance to

the development of the Russian society'. SPbU was granted a privilege to set its own education standards and award its own diplomas.

Discover the first Russian University now.  
Welcome to SPbU!

Yours respectfully,

**SPbU Rector**  
**Nikolay KROPACHEV**



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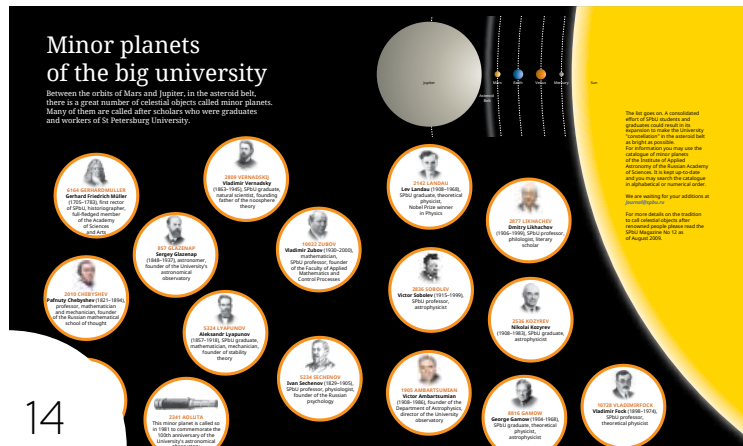
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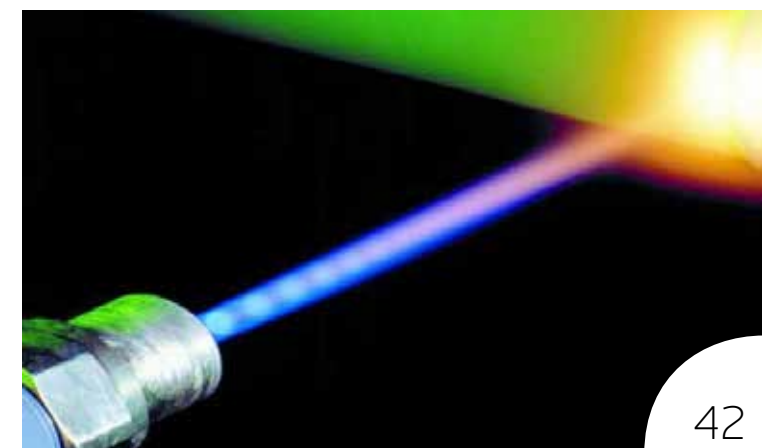
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**Andrey Vladimirovich YAKUNIN**, SPbU alumni, managing partner and co-founder of 'VIY Management LLP', Candidate of Economy; in spring 2014 — become the head of the initiative group on establishing SPbU Alumni Association



PHOTO: NATALYA SVIRIDOVA

# ‘I believe that the University is a unique phenomenon’

By Vera SVIRIDOVA

The ball was set rolling. Started in March 2014 from scratch, SPbU Alumni Association has been steadily growing so far.

**I**t couldn't be any other way. The Rector of SPbU Nikolay Mikhaylovich Kropachev set the task to start a comprehensive project on the University Alumni Association, initially with a specific focus on engaging people with a wide experience in starting projects from scratch. The choice was Andrey Vladimirovich Yakunin, who Natalya Petrovna Nesmeyanova, Rector's Advisor on alumni and corporate partners, asked first. For the last 10 years, Andrey Yakunin has successfully started more than 10 companies in Russia. As a head of the independent partnership 'VIY Management LLP', he attracted investments, thus creating more than 2,000 job opportunities across Russia.

Today, at the core of the project are SPbU alumni professionally engaged in economics across the world. It is as plain as a pikestaff that the project, last year formalised as a non-profit organisation 'SPbU Alumni Association', is destined to succeed. In November 2014, the University and the Association signed a cooperation agreement with the period of the agreement of 99 years at least.

**— As a head of the initiative group on SPbU Alumni Association, you see it as worthwhile, while it is hardly the thing for overwhelming majority in Russia. What are**

**the counter-arguments you can give to a sceptic?**

— For a start, one simple example. When the University came to think that it needed to build and improve the quality of our relationship with the alumni, we spread the information in search of those who would like to be engaged. As regards the statistics, only in social networks, by the most conservative estimate, there are 50,000 followers of SPbU. Today, the project involves almost 1,000 people: they express their ideas, sometimes diverge and opposite, on how to set up an initiative.

People feel involved and connected with the University. As soon as they understood that they could control the situation rather than respond, they seized the chance and started to come up with their ideas. No wonder, the great rush is on.

**— In any project, on alumni association especially, the leader forms a core of supporters that becomes a driving force. Who do you see as a core in this project?**

— The driving force behind the project is, obviously, Natalya Nesmeyanova, Rector's Advisor on alumni and corporate partners. Importantly, we have not had a situation, since the very beginning of the project in spring last year, when we would have failed to build a project team to face a specific challenge. If we need experts, no matter what the sphere is: mass media, IT, or others, we are exceptionally lucky to find them among our alumni, who willingly find time with a

busy schedule to make the project lively and engaging, with its specific aims and resources.

**— What have you achieved? What are the projects you are going to implement in the nearest future?**

— To start with, we faced a challenge, both simple and demanding, to give a legal and formal status to the alumni association. We, therefore, constituted a legal entity, which enables us to develop and implement various projects and promote cooperation.

Sharply restricted in resources, we, nevertheless, successfully appeared in all major social networks. These communication platforms are starting to gain momentum. In January, we launched a website of the association, where you can fill in an application form to register online at [www.alumnispbu.net](http://www.alumnispbu.net).

The top priority with us is definitely a meeting of the association's members which is to be held in March. We are going to identify the key areas for the association, among them is to draw up a budget and a short-term plan.

Concerning more global issues, we have some of them. The first is careers support. Naturally, the University feels concern and interest in how and where its students are employed, rather than it is content with a mere fact that they are employed. Importantly, we should track their career in 5-10 years after graduation in order to help perspective students to outline their career opportunities: if you



PHOTO: NATALYA SVIRIDOVA

**Andrey Vladimirovich YAKUNIN**

*In 1997 – graduated SPbU in Mathematical Methods in Economics.*  
*In 2001 – Candidate of Economics; thesis title: ‘Financial Assessment of New Hotel Projects’, Department of Theory of Credit and Financial Management, SPbU.*  
*In 2007 – MBA, EMBA Global, London Business School with Columbia University (USA), one of the world’s leading programme in executive business education, according to the Global MBA Ranking – Financial Times.*  
*Member of European and British Private Equity and Venture Capital Associations, member of EMPEA.*  
*In 2013 – elected as a chairperson of the Board of Directors of the Alternative Investment Management Association.*  
*Taught at St Petersburg State University.*  
*Managing partner and co-founder of ‘VIY Management LLP’ (VIYM).*

choose this field of study, you are more likely to pursue career in these spheres. One initiative, therefore, will primarily concern relationship between major departments and key employers. It mainly aims to introduce our students to the employers during the practice module rather than just after the graduation and put them in the picture about what the situation in the job market is.

The second initiative focuses on lack of information support, which is of primary importance to the graduates in natural sciences. To track their career in research is not idle curiosity. Many of them are top-ranked scientists, scholars and researchers. Should we create favourable conditions for them to visit the University as a visiting professor or to submit a manuscript for publication in SPbU, we would enormously contribute to the university

university traditions: it is not just about fanatically repeating ‘The University is the best’ in the form of mantra, but forming an opinion of the University as a long-established university combining excellence in education and research as compared to other universities in Russia and former USSR. Our graduates are willing to preserve and continue our traditions and to encourage the dialogue between generations. Our graduates of 1970s, 1990s and 2010s, they are all completely different people. They have different views on what makes SPbU/LSU unlike other universities, with its own unique traditions. Interesting to know how the University has been seen by its graduates and how it has changed through time.

**— Are you going to draw on experience of the leading**

— Any experience is good to take into consideration. I don’t mean whether it is positive or negative one. The latter is better not to be repeated, but that doesn’t mean we shouldn’t learn it.

If we think big, there is a considerable number of students who pursued their education in other universities after graduating SPbU. I can freely share my experience of working with the graduates of London Business School.

Among SPbU graduates, there are those who further study in America, Germany, Israel and other countries. Evidently, we know, not theoretically or speculatively, how the associations of the leading universities in the world work with their graduates. We have people who we can discuss these questions

with. What is a model for us to follow, you might ask. It is not an easy question. I believe that the University is a unique socio-cultural phenomenon, unlike any other university, and it could originate nowhere else but in the Russian Empire and achieved its eminence in education and research by suffering the oppression of the Soviet ideology. It implies that we should treat it in a unique way. I can say that we are doing our best to be on a par with MGIMO Alumni Association. It has an excellent network with its alumni.

Let us consider the practices adopted in different parts of the world. Importantly, there is a huge difference between European, Asian (South Korean, I mean) and American education in terms of funding of and interaction between education and research as well as fees for education. We should bear it in mind. Today, SPbU is, essentially, an institution of higher education funded by the Government. It implies both pluses and minuses. In this regard, the initiative to establish the University Endowment-Fund is, evidently, a huge step ahead, which leads to a rise of independent financial sources at an exponential rate. Abroad graduates are fully involved in the life of their universities, by making financial contributions, in particular. This is an example for us to follow. Another question you might ask is whether the university endowments will be more significant than Government funding. Does it happen within the next 10-15 years – it will come as a surprise.

We are definitely planning to draw on the experience of our foreign counterparts. We are particularly interested in how they build the network with their graduates to make them feel they both benefit from their cooperation and encourage them to share insights, advice and expertise as a researcher with the University. How we can achieve is to hold public lectures where our graduates are supposed to tell us about their rises and falls in career.

**— Are you willing to give an open lecture to the students?**

— Just last December, I had a lecture under the joint programme between MBA Kingston University and the Russian Presidential Academy of National Economy and Public Administration. The have developed a programme on visiting speakers with a specific focus on their mistakes that derailed their career.

**— In SPbU, there is a tradition to give open lectures by famous graduates, researchers, public figures...**

— These lectures, evidently, are integral part of education. However, they are not enough, as they focus on a specific professional sphere. For example, as a representative of the team of the practicing regulated management company (fund manager on the strategies of the private equity growth and hospitality real estate), I can share my experience in finance, financial tools, modelling and structuring: how to do it, how to earn money as a fund investor or in management and portfolio companies. Besides, I can shed light on more specific issues, namely risks of the usage of the systems on fighting financial fraud and control of compliance with the rules and regulations over unfair competition. They are all very specific issues. It

**IN BRIEF:**

SPbU Alumni Association primarily aims to help alumni to connect each other all over the world. We look forward to watching the association grow into a lively and engaging community to share professional, creative and research insights, advice and experience within the community and University. It also helps to make SPbU more competitive and to preserve and develop values of university education, culture and traditions

may be of interest to a hundred graduates at the most, who are professionally engaged in finance. And I can discuss it in their company with a cup of coffee. Conversely, lectures on couching and career focus on how to use knowledge and skills you have acquired, or have not acquired, at the university.

**— As a University graduate, what would you advise to final-year students just a couple of months before completing a degree?**

— I am not a person to give advice, but I will share the one I know: in a game of chess imagine a combination after the 32 move and perform a series of tactical moves to achieve this gain respectfully. Similarly, a student can draw a ‘picture’ of what he is going to be in 10 or 20 years after completing a degree. He has 2–4 months left, which means that he has a chance to identify what skills and knowledge he can still acquire at the University. Don’t think that you are hard pressed for time. You are wrong here. When you start working, you will realise at once: at the University you had plenty of time, the thing was to organise it wisely. Another thing to consider. We are likely to forget people we studied side by side during 4-6 years at the University. They will be in your life one way or another. Your life and career paths may diverge, or conversely meet at one point. Nevertheless, if your education background is alike, you will definitely have something to talk about after several years. Look around and see what your groupmates are now. Perhaps, a person next to you is a Premier Minister-to-be or top-manager of ‘Gazprom’.

**— What are the steps to make for a graduate to contribute to the University through the Association?**

— You are more than welcome to address any questions to Natalya Nesmeyanova. Her contact details can be found at <http://www.alumnispbu.net> and [linkedin.com/groups/Alumni-SPBU-6648291](https://www.linkedin.com/groups/Alumni-SPBU-6648291).

How to register. Fill in an application form at:

<http://www.alumnispbu.net/>

ranking position, both nationally and internationally. Research networking is of high priority with us.

Another initiative is

**universities in Europe and America? What associations do you think are model to follow and what their best practices should we adopt?**

# FINISH VS START

By: Vera SVIRIDOVA

In spring, over 6,000 students in their final year at St Petersburg University are about to enter the final stretch. After university, some are expecting to start a job, for others postgraduate study seems to be a very popular alternative and they are hoping to go on to further study.

In June, the Russian Public Opinion Research Center (VTsIOM) revealed an auto-stereotype of the young generation in Russia today. Seemingly, young people at 18-34 are more likely to see themselves as communicative, active, ready to face challenges, open and friendly, frank and supportive.

All these personality traits are definitely shared by the final year students and postgraduate students involved in the survey conducted by the magazine 'SPbU' (this year, they all are about to defend their theses). This list does not include one more trait, the one that should also be rated most highly — research interest. There is no bigger incentive for young researchers to get involved into activities at the forefront of research. There is no stronger temptation to delve into the world of science which has more questions than answers and makes you persist through failure in search for these answers. Finding them is still under way — while pursuing Master or postgraduate programmes, or even while working on a doctoral thesis, like Dmitry Bolotin who has set his heart on doctoral research.

As Andrey Chetverikov, another postgraduate student, said, they cannot think of any other alternative for themselves.

In 2013 SPbU was the first in Russia to reintroduce PhD SPbU, its own doctoral degree.

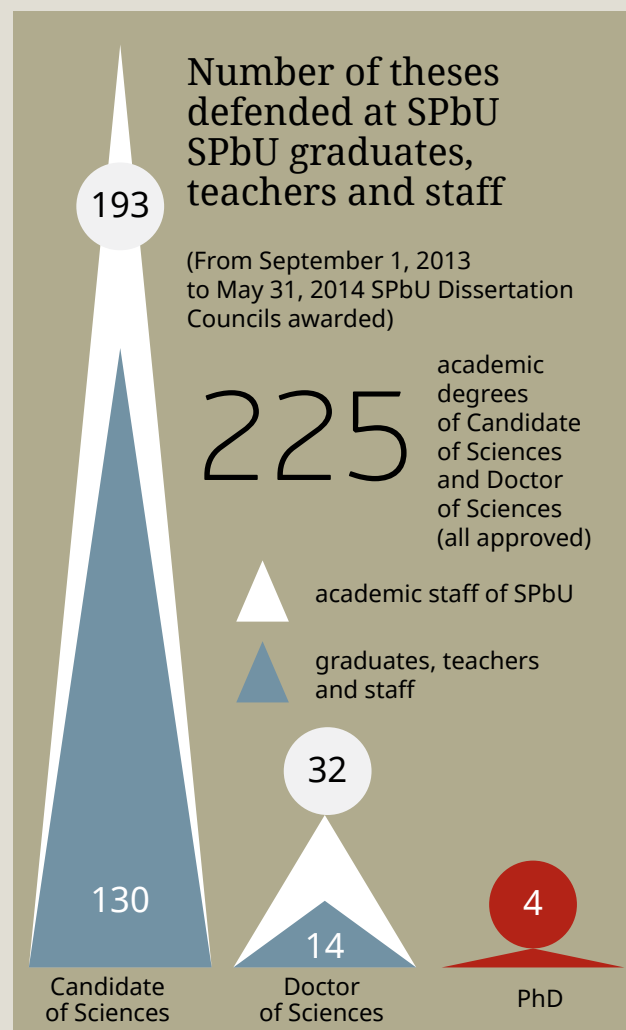


PHOTO: MIKHAIL VOLKOV



**ANDREY CHETVERIKOV,** doctoral student at St Petersburg University (Department of General Psychology)

## Emotions Support Creation of a Realistic Worldview

"What do emotions do and why do we need them? The past twenty years of research have shown that many old ideas like 'fear makes us get ready to flee' proved wrong. I study emotions from the standpoint of cognitive psychology. Our emotions, even the weak ones, are an important sign revealing how we process information.

The brain simultaneously solves a large number of tasks, including perception, remembrance, and understanding. As soon as one of them poses a problem, you feel a weak negative emotion. For example, one of our studies includes showing to the test person a series of pictures and then asking them to choose from a couple of pictures the one they have already seen. If the test person makes a mistake, the picture they could not recognise seems to them less pleasant and less pretty, even if they have not realised the mistake as a fact. Such influence of the mistakes manifests itself not only in the process of recognition but also when performing other tasks.

Our studies suggest in general that the function of emotions is reinforcement or change of cognitive hypotheses put forward by our brain in trying to understand the surrounding reality. Thanks to that, emotions support the creation of a realistic

world model in human consciousness. By knowing this, we can better understand what we should do to make a person learn faster, how to build an adequate level of confidence, and why disruption of emotions may lead to abnormalities in cognitive activity.

Before getting into psychology, I had been studying chemistry for two years. After that, while being an SPbU student, I worked for a while in a company engaged in web development. However, at some point, I realised that science is much more

**Subject of doctoral dissertation: "Affective evaluation of cognitive problem solving results"**

interesting. The challenges facing scientists seem to me much more attractive than those I can face in the fields of pure application.

Now I am compiling documents for my dissertation defense and I am not really sure what I'll do after that. In any case I am going to proceed as a scientist for I cannot see any other interesting options for myself."



PHOTO: MIKHAIL VOLKOV

**ANNA VASHURKINA,**  
SPbU master student  
(Department  
of Vertebrate Zoology)

## Closing the Gap

probably helps stallions to gain social experience and keep themselves in good physical shape. The obtained results support the hypothesis that for stallions play-wrestling is a kind of training. While playing, stallions run around biting each other's tail and mane, zooming up.

All of these as well as some other elements of playing can also be found in fights, and, when observed from afar, it is not immediately clear if the stallions are playing or fighting. The frequency and intensity of playing depend on the animals' temperament: there are more easy-going stallions and there are those who have to be persuaded into playing. The duration of such games may be from a few seconds up to 15–20 minutes. Stallions

*Subject of master's thesis: "Play-wrestling of stallions in the Equus ferus caballus population of feral horses"*

do not only play with their favourite mates but generally spend a lot of time with them. It is worth mentioning that after stallions start a family, they go on paying visits to their childhood playmates.

I am going to proceed with studying horses after I graduate."

"Play behaviour of animals is quite an understudied issue. It may perform different functions for different types of species. My work is focused on the study of stallions' play behaviour and it contributes to closing this gap. The research was conducted in the "Rostovsky" biosphere reserve.

Horses are social animals belonging to either a family group, which includes a harem stallion, several mares and foals, or a bachelor group consisting of single stallions ranging from 2–3 years of age. Stallions spend approximately 10% of their time on playing activity, which peaks in the morning and in the evening.

Interesting enough that not only young stallions like to play but also quite grown-up ones, who have already tasted family life and have become single again. As a rule, paired and young stallions play with each other more often than with their older companions.

According to my observations, such play

**TARAS PRIBYSHIN,**  
SPbU master student  
(Department  
of Regional Policy  
and Political Geography)

## "I Want to Continue My Studies and Perhaps to Teach Students"

"In my thesis, I tried to develop recommendations that will help the city authorities to understand how to plan innovative development. The global experience shows that the creation of a regional innovation system requires well-functioning and coordination of forecasting and strategic planning procedures at all levels.

As a result of my research, I came to the conclusion that the St Petersburg system of strategic planning of innovations should be formed around a strategy of innovative development of the region, taking into account the medium- and long-term forecasting of science, engineering and technology, strategic planning of socio-economic development as well as spatial planning.

My master's thesis was prepared as part of the project of St Petersburg Committee for Science and Higher Education, which annually announces

*Subject of master's thesis: "Development of a regional strategic planning system in the sphere of innovations"*

a theses competition by the order of the city's executive authorities. I chose a topic corresponding to my interests and submitted an application, which was accepted. Therefore the process of my thesis writing consisted of several stages. At first, I completed an internship at the Committee for Industrial Policy and Innovation where I obtained some recommendations for the thesis. I also wrote

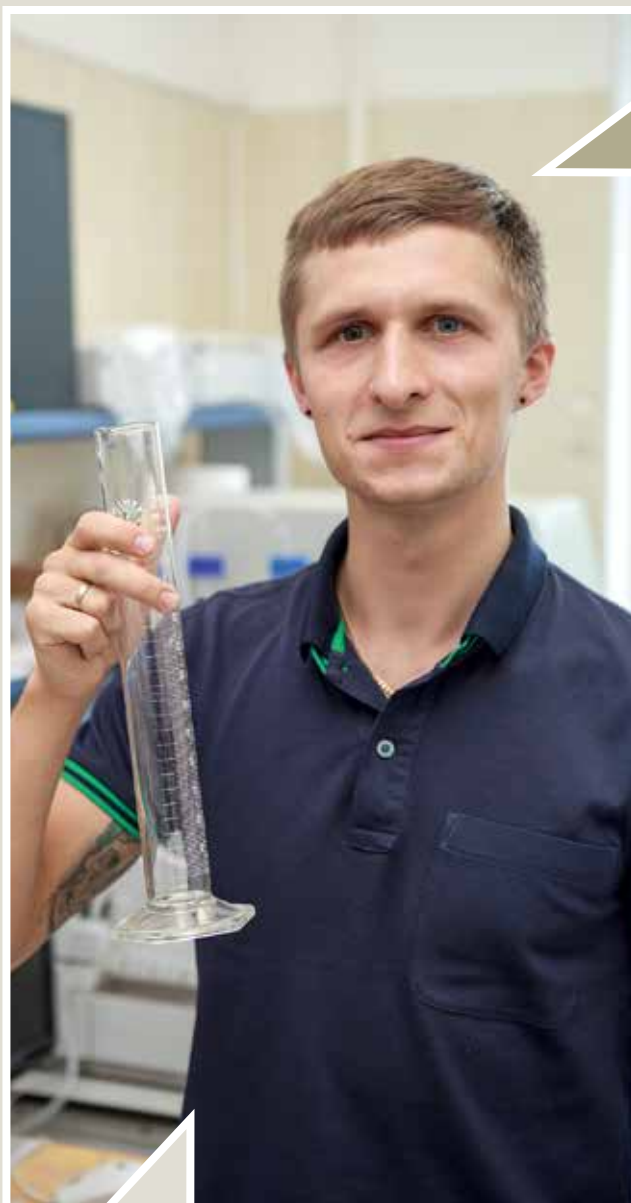


PHOTO: MIKHAIL VOLKOV

an article for the collection of selected papers "Application of the Results of St Petersburg Students' Theses to the Socio-economic Development of the City".

Participation in such a competition has its bonuses. For example, my work will be presented at the graduation projects exhibition called "Student-City Cooperation", which will be held in July.

I plan to build my career in St Petersburg. That is why I am already working within my specialty, as a junior researcher at the International Centre for Social and Economic Research "Leontief Centre". It was there that I applied the skills and knowledge acquired during my studies at St Petersburg University. I am engaged into real projects related to regional development."



**DMITRY BOLOTIN,**  
SPbU doctoral student  
(Department  
of Physical Organic Chemistry)

## Searching for an Effective Camel

a platinum metal centre. Its mechanism turned out to be a unique one since similar reactions occurring without metal usually lead to different products. I currently think it is the most striking of my achievement.

My dissertation (most of which I have done while still an undergraduate student) is devoted to the study of the platinum subgroup reactions on the metals. These are excellent reagents but they are expensive and their chemistry is sufficiently predictable. Now I am gathering material for another doctoral thesis on a related topic, but this time I use much cheaper metals. It is much more difficult to work with them, yet it is much more interesting. Potentially simple reactions involving such metals often lead to unexpected results.

To my mind, the reactions of nitriles (the reagents our research group is studying) in the presence of expensive metals have lost their

*Dissertation subject: "Nucleophilic addition of amidoximes to nitriles activated by platinum"*

importance or are at least close to losing it. A qualitative leap is near and I think the future belongs to cheaper metals that would help us generate new substances and carry out the said reactions in industrial processes, not only in the laboratory. And I am glad I can be part of such a leap."

"I study organic reactions that occur only in the presence of metal salts and without them they either do not take place at all or are very slow. The core of our work is well described by a parable. An old sheikh had three sons and 17 camels. Before his death, the sheikh told his children that he bequeathed to his eldest son half of the camels, to the middle son — the third part, and to the youngest son — the ninth. The sons scratched their heads for a long time but could not decide how to divide the camels.

Then they called a sage. He put his own camel with the others and then gave the eldest son half of the camels (9), to the middle son — the third part (6), and to the youngest son — the ninth (2), just as it was specified in the will. After he had distributed the 17 camels to the sons, he mounted his camel and left.

In terms of the parable, we are those wise men trying to find the "optimal and effective camel".

For example, one of my published works is devoted to a previously unknown rearrangement in

PHOTO: MIKHAIL VOLKOV



**IRINA ANTOSHCHUK,**  
SPbU master student  
(Department of Comparative  
Sociology)

## "My Interest Is Determined by Personal Circumstances"

"My master's thesis is devoted to serious leisure activities of young people in St Petersburg and Berlin as a biographical project. Our programme "Studies in European Societies" pays great attention to research as well as to development of students' scientific interests, and from the very beginning I grew interested in how young people spend their free time. Many of them are engaged into singing, music and dancing activities, and I wanted to understand this phenomenon from a sociological point of view. In the beginning I gave an overview of the free time in general, and particularly linked it to the value orientations of young people. Yet, delving into the subject, I found that the thing that makes me really interested is only part of the leisure, a special way of spending it, and I came across the concept of "serious leisure" introduced by the Canadian sociologist Robert A. Stebbins which describes this phenomenon.

I set a goal to determine how serious leisure is involved into a biographical project, how it influences its formation and why it becomes an important part of the lives of young people. When you are excited by your research, it is quite breathtaking to conduct it. Each stage opens up new facets of the studied phenomenon, enriches your understanding of it and makes you revise your own vision by finding unexpected interconnections. I managed to gather empirical material in Germany, and it was particularly interesting to compare how serious leisure is conceptualised and implemented by young people in St Petersburg and Berlin. Perhaps my interest is largely determined by personal circumstances: I have been engaged into

serious leisure myself for many years (the singing of traditional Russian songs), so my study has also made it possible to understand many things about my hobby and my own life. After I graduate I am

*Subject of master's thesis: "The serious leisure of young people in big European cities (St Petersburg, Berlin) as a biographical project"*

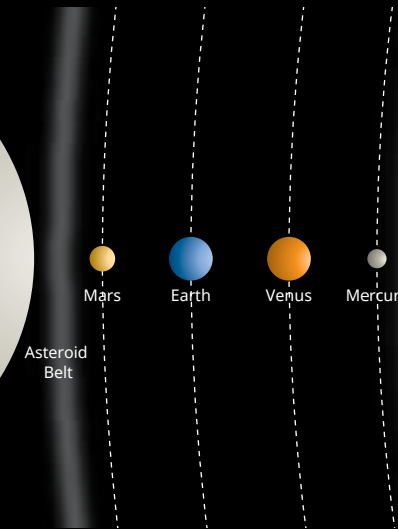
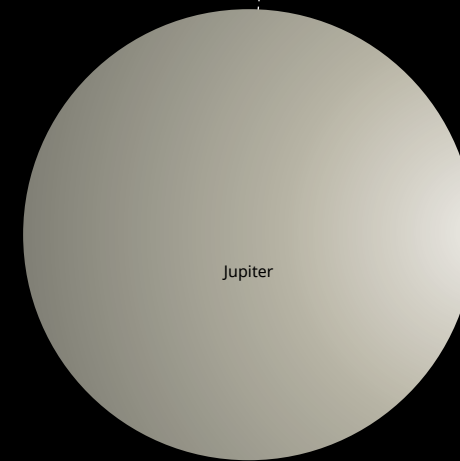
going to continue as a doctoral student and go on with my research work. I hope I will succeed at the examinations. I would also like to apply my analytical and language skills to an interesting job."

PHOTO: MIKHAIL VOLKOV



# Minor planets of the big university

Between the orbits of Mars and Jupiter, in the asteroid belt, there is a great number of celestial objects called minor planets. Many of them are called after scholars who were graduates and workers of St Petersburg University.



Sun

The list goes on. A consolidated effort of SPbU students and graduates could result in its expansion to make the University "constellation" in the asteroid belt as bright as possible. For information you may use the catalogue of minor planets of the Institute of Applied Astronomy of the Russian Academy of Sciences. It is kept up-to-date and you may search the catalogue in alphabetical or numerical order.

We are waiting for your additions at [journal@spbu.ru](mailto:journal@spbu.ru)

For more details on the tradition to call celestial objects after renowned people please read the SPbU Magazine No 12 as of August 2009.



**6164 GERHARDMULLER**  
**Gerhard Friedrich Müller**  
(1705–1783), first rector of SPbU, historiographer, full-fledged member of the Academy of Sciences and Arts




**2809 VERNADSKIJ**  
**Vladimir Vernadsky**  
(1863–1945), SPbU graduate, natural scientist, founding father of the noosphere theory




**2142 LANDAU**  
**Lev Landau** (1908–1968), SPbU graduate, theoretical physicist, Nobel Prize winner in Physics



**2877 LIKHACHEV**  
**Dmitry Likhachev**  
(1906–1999), SPbU professor, philologist, literary scholar



**857 GLAZENAP**  
**Sergey Glazenap**  
(1848–1937), astronomer, founder of the University's astronomical observatory




**10022 ZUBOV**  
**Vladimir Zubov** (1930–2000), mathematician, SPbU professor, founder of the Faculty of Applied Mathematics and Control Processes




**2836 SOBOLEV**  
**Victor Sobolev** (1915–1999), SPbU professor, astrophysicist



**2536 KOZYREV**  
**Nikolai Kozyrev**  
(1908–1983), SPbU graduate, astrophysicist



**2010 CHEBYSHEV**  
**Pafnuty Chebyshev** (1821–1894), professor, mathematician and mechanic, founder of the Russian mathematical school of thought



**5324 LYAPUNOV**  
**Aleksandr Lyapunov**  
(1857–1918), SPbU graduate, mathematician, mechanic, founder of stability theory



**1905 AMBARTSUMIAN**  
**Victor Ambartsumian**  
(1908–1986), founder of the Department of Astrophysics, director of the University observatory



**8816 GAMOW**  
**George Gamow** (1904–1968), SPbU graduate, theoretical physicist, astrophysicist



**3196 MAKLAJ**  
**Nicholas Miklouho-Maclay**  
(1846–1888), SPbU graduate, ethnographer, anthropologist, explorer



**2341 AOLUTA**  
This minor planet is called so in 1981 to commemorate the 100th anniversary of the University's astronomical observatory



**5234 SECHENOV**  
**Ivan Sechenov** (1829–1905), SPbU professor, physiologist, founder of the Russian psychology



**10728 VLADIMIRFOCK**  
**Vladimir Fock** (1898–1974), SPbU professor, theoretical physicist

# SPbU COMPUTER CENTRE: MORE RAPID, MORE POWERFUL, MORE EFFECTIVE

By **Tatyana SEMME**

Nowadays, the role of electronic data processing in science and research can hardly be underestimated. A typical example is a project carried out by one of the university physicists within several months in the SPbU Computer Centre. Calculating the same tasks with a personal quad-core processor computer would take more than 16 years.

In St Petersburg State University, science requires more powerful and effective computing resources. The computing complex dates back to 1967, and it is still the most important and needed help to physicists, mathematicians, chemists, and geologists. As a resource centre since 2010, the computing complex has got totally new opportunities.

## FROM MATHEMATICIANS TO RESTORERS

Today, the RC 'SPbU Computer Centre' primarily aims to provide equal access to the modern research equipment and software for the widest range of potential users, including SPbU staff and students, as well as others. The Centre's resources are widely used in science and education and facilitate the commercialisation of research results.

The services are pretty popular among geologists,

geographers, economists, and even philologists. 'A relevant and quite promising direction is the cooperation of the Computer Centre with the Department of Information Systems in Arts and Humanities', says Valeriy Zolotarev, Director of the RC. 'These interesting projects of virtual reconstruction of ancient ruined temples, mansions, and palaces are performed with our computing power'.

The Resource Centre offers more than 25 ready software systems. In particular, among them there is ANSYS, a popular general software system in demand by experts of computer engineering for solving linear and nonlinear, stationary and non-stationary spatial tasks of solid mechanics and structural mechanics, tasks of gas and fluid mechanics, heat transfer and heat exchange, electrodynamics, acoustics, and related fields in mechanics. According to Valeriy Zolotarev, calculations performed with ANSYS software system take about 40% of all working time that the users spend in the Resource Centre. In some industries modelling and analysis on this program eliminate the need to have costly and time-consuming development cycles of design-manufacture-test. A construction project of a gas injector in oil-field by one of the university physicists was implemented within several



PHOTO: MIKHAIL VOLKOV

**This seemingly unattractive equipment**, however, conceals huge computing power of SPbU Computational Centre

months in the SPbU Computing Centre. Interestingly, calculating the same number of tasks with a personal quad-core processor computer would take more than 16 years.

The software systems of the SPbU Computing Centre include Maple, a system for symbolic computation; Mathematica, a system of computer algebra; Crystal, a research software package for calculation in solid state quantum chemistry specifically designed to simulate 3- and 2-periodic crystal lattices and 1-periodic polymers; Scilab, a package of applied mathematics software for engineering and scientific calculations (solving linear algebra tasks, differential equations, signal processing, visualization); ArcGIS, software for working with maps and geographic information, and

other computer software systems for scientists.

Besides, in the SPbU Computer Centre the user can create his/her account and work with virtual personal computers with the familiar operating system like Windows or Linux. The effective functioning of the Resource Centre is due to the powerful

high-performance computing clusters named after their producers: T-Platforms, Hewlett-Packard and ALICE-CERN.

## CLUSTER HOUSE

The equipment of the RC 'SPbU Computer Centre' is located in a special room, a kind of 'a house inside a house', with fire alarm systems, a control system and a diesel generator for uninterruptible power supply. The racks with the elements of computing clusters are kept in the cabinets with latticed doors. They work continuously providing round-the-clock calculation 365 days a year. Most of the equipment is from Hewlett-Packard computer system acquired in 2011.

The integrated computing complex based on the hardware and software solutions provided by HP includes two subclusters: SMP and a hybrid cluster. These are servers, data storage systems, data storage and transmission networks, and software contributing to research in physics, chemistry, biology and other sciences that require powerful computing resources.

In the HP computing complex

## IN BRIEF

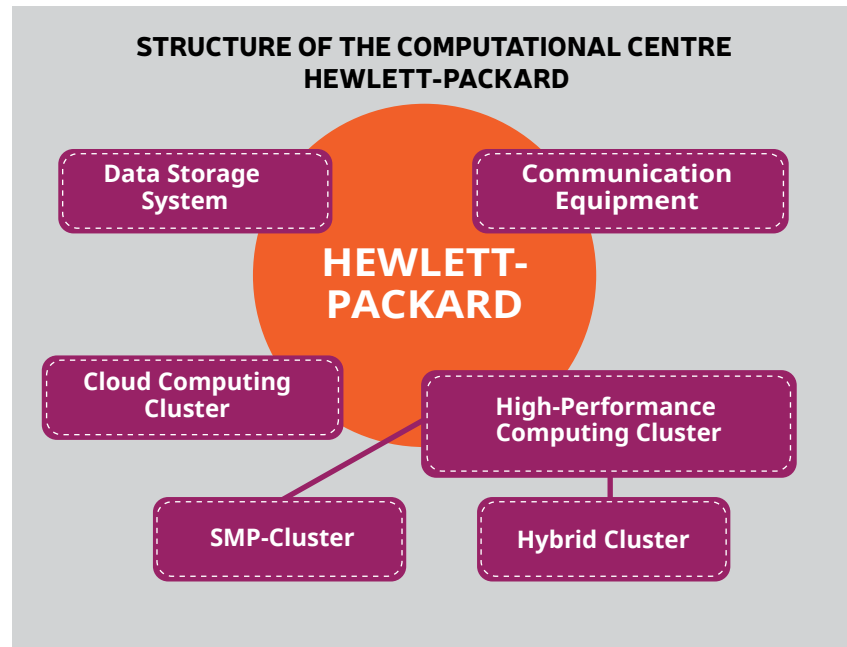
The SPbU Computer Centre offers comprehensive services in computing: SaaS (Software-as-a-Service), application software running in the cloud infrastructure and accessible from various client devices; PaaS (Platform-as-a-Service), an integrated platform for software development, testing, and deployment as well as calculations; and IaaS (Infrastructure-as-a-Service), cloud infrastructure for independent control of processing operations with data storage, networks and other fundamental computing resources.

a cloud computing cluster is deployed including virtual hosts, data storage and transmission networks, and software, providing the temporary use of virtual machines with the user-set characteristics for educational, research and administration departments of SPbU.

The HP computing complex includes a backup system and a data system. The latter is used to store user data, virtual machine images, and other information. It is a collection of disk arrays, virtual libraries, and gateways.

**SELF-DEVELOPMENT AND HELPING OTHERS**

An important advantage of the hybrid cluster of the HP computing complex is its NVIDIA Tesla graphics processing units, including 112 advanced graphics cards of NVIDIA that can significantly increase the speed of calculation. Since 2010,



a venue for the conference in St Petersburg (it is also held in Novosibirsk and Moscow) as the University is a recognised leader

be solved with a less powerful cluster. So for many our projects we already need more powerful resources', says Valeriy Zolotarev.

'Technology is enhancing, becoming more interesting, and involving more and more researchers; new programs are well underway. Theoretically, the Centre can represent the whole University', says the director of the RC 'SPbU Computer Centre'.

It is a catch-22 situation: easy operation in the Centre, efficient management and thoroughly prepared training attract more and more users, but one day the Centre may fail to accept them all. At the same time, ill-conceived amount of hardware purchased may stand idle waiting for its task. The solution can be hardware upgrading with the simultaneous mastering of new technologies. Right now the Resource Centre is going to have a new cluster 100 times more powerful than the available ones. The cluster house has specially left empty racks for it. 'New equipment will appear, and so will new interesting projects. We still have a long way to go. Certainly, the Centre does need continuous inflow, but everything is for our users and for the University. These are the investments that always pay off', concluded Valeriy Zolotarev.

in this field which strives both to develop itself and to raise its colleagues' awareness.

This year's 'Days of NVIDIA' conference took place in SPbU in April. The main topic to discuss and study was modern GPUs, including those used for video cards which are far superior to classical CPUs. They are the basis of hybrid computing systems with unique performance characteristics like the one that is part of the HP complex in the SPbU Computer Centre.

**AHEAD OF SCIENCE ADVANCEMENT**

The rapid science advancement and ever-growing demand for calculations condition the Resource Centre to develop correspondingly much faster. 'There are new tasks that cannot

Today, the advanced facilities and services of the Resource Centre 'SPbU Computer Centre' fulfill the needs for electronic data processing of more than

400

researches of SPbU, other universities and scientific centres of St Petersburg.

annual conferences and schools have been organised in SPbU together with the company's representatives to help users properly apply the processing power of the complex and master the programs that use NVIDIA graphics cards.

'Every year the conference attracts specialists from lots of companies using these technologies. They present their achievements and useful developments', says Valeriy Zolotarev. 'The participants of the first conferences equaled 30-40 people, but now they are about 70, among them are the students and academic staff of the University, as well as the representatives of St Petersburg Electrotechnical University 'LETI', Polytechnic University and other universities of the city'. SPbU was chosen as

# Science and Technology Park

By **Sergey MIKUSHEV**, Director of the SPbU Science Park

The SPbU Science Park, by its equipment and technologies, is a unique location on a national and, by some standards, global scale.

It comprises 21 resource centres, operating in a variety of research areas which correspond to the top priority fields of the University, thus setting the pace in research and science.

Under the Agreement on strategic partnership with the National Research Centre 'Kurchatov Institute', the University is planning to open three resource centres as early as this year: Neutron Physics — Neutron Research; Radiology Physics — Synchrotron Research; Aerodynamics Research. Besides, this year SPbU is to start to work on opening another two resource centres: Russian Language and Mechanics of Materials.

The Science Park offers comprehensive facilities that can be used in a variety of research areas to support both the University staff and others. So far, there have been made 8,347 measurements, including 7,255 completed projects and 1,092 projects in operation. In July 2014, the total number of the projects carried out in the Science Park equaled 1,137, including 267 completed projects and 870 projects with measurements interpretation phase.

In July 15, 2014 Web of Science and Scopus indicated 176 publications prepared by the researchers at the SPbU Science Park who carried out their research using the facilities and technologies offered by the SPbU Science Park. This index is, however, underestimated, since, due to financial



**Sergey MIKUSHEV**, Director of the SPbU Science Park

cycles and reporting dates, 3/4 of the manuscripts are published in autumn.

To know what are the most popular facilities and analysis methods intended for or suited to the research aims, we asked the Directors of the Resource Centres who have been carrying out the greatest number of research projects.



**PETR MIKHAYLOVICH TOLSTOY, DIRECTOR OF THE RESOURCE CENTRE FOR MAGNETIC RESONANCE:**

'In the Recourse Centre for Magnetic Resonance (RC MR), the most popular research technique is high resolution nuclear magnetic resonance (NMR) spectra, which allow to conduct standard measurements that do not have to be adjusted to conduct a research on specific samples and are extremely popular in chemistry. The RC staff primarily focuses on more sophisticated techniques, such as thermal methods and other techniques developed to a higher degree of complexity, which are time-consuming and require a series of experiments, developing a particular theoretical framework and big databases. Still, we don't receive a large number of requests to use these techniques compared to the NMR method. In enormous demand is high-resolution NMR spectroscopy in solids. Although pretty rare in the world, in RC MR this tool is in operation for 16 hours a day. Another popular technique in the RC is bimolecular NMR spectroscopy in liquids (proteins, oligopeptides, oligonucleotides, and others). Quite a new research area in SPbU, it appeared only after the Recourse Centre acquired advanced spectrometers. The RC MR offers a unique environment for electron paramagnetic resonance (EPR) spectroscopy, which is becoming increasingly popular with the researchers (it is the only one in North-West region in Russia). In physics, there is a great demand for nuclear quadrupolar resonance (NQR) spectrometer in magnetically

ordered materials. Today, the RC MR is concurrently conducting 90 projects, including those with foreign or Russian universities and under project agreements, which implies a wide range of applications of MR techniques for research'.



**PAVEL ALEKSANDROVICH ZYKIN, DIRECTOR OF THE RESOURCE CENTRE FOR MOLECULAR AND CELL TECHNOLOGIES:**

'Today, researchers have adopted a holistic and integrated approach in biology. Some measurements, although essential for the research to be completed and published, are nevertheless only possible to take once or twice per month.

The most popular research areas are electron microscopy for the most part, confocal laser scanning microscopy, metabolomics and proteomic methods and techniques in genomics.

Among current research methods and techniques, electron microscopy best enables high-resolution microscopy of biological specimen, e.g. cells, bioplasts, bacteria, viruses, bio-genous macromolecules. Although the classical methods prevail among others, the Centre nevertheless is planning to increase number of its employees and expand its facilities to offer more comprehensive services. Besides, plans to employ new methods, such as cryoelectron microscopy and electron microscope tomography, which hold promise in biology, are well underway.

Confocal laser scanning microscopy remains at the forefront of scientific research into biological specimen, as it allows to study

living organisms and eventually examine their behaviour on quite simple smear layers. Even now the demand for our facilities surpasses our time resources. The situation is going to worsen as the demand will dramatically increase after new facilities for the investigation of cells of the warm blooded vertebrates is put into operation in September.

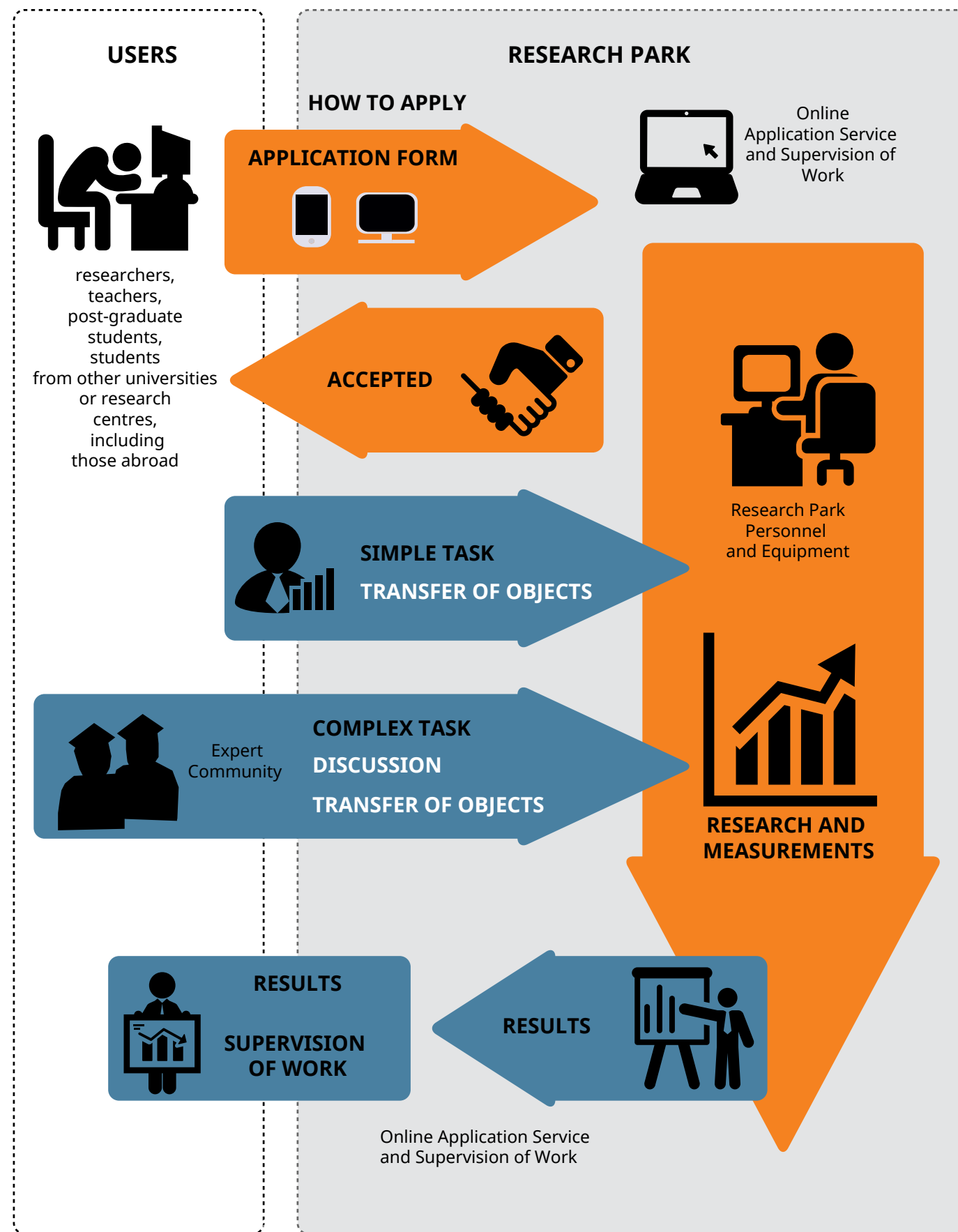
In metabolomics, as a scientific study of chemical processes involving metabolites, metabolite analysis holds promise as a molecular method within a systems biology context. As an alternative approach in biology, metabolite profiles provide a biochemical explanation in systems. Metabolomics determines resistance and dynamics of the processes and can be used in practically any experiments in biology, which can significantly elucidate the processes at the molecular level or even become the key in molecular control. There is a steady growth in demand for the research in these areas, in particular, several joint projects with Moscow Institute of Physics and Technology and Institute of Bioorganic Chemistry of the Russian Academy of Sciences, are well underway.

For proteome research, we offer services in mass spectrometry, chromatography, and analysis of biomolecular interactions. With the advent of the laboratory for biology of amyloids headed by Yuriy Olegovich Chernov, the proteomic approaches began to play essential role in research carried out in SPbU. Another contribution to proteome research has been made by the Resource Centre: on the recent symposium in the University of Hong Kong, Arseniy Lobanov, SPbU student, was honoured for his proteome research conducted in the RC.

Genomics is a discipline in biology that analyses the function and structure of genomes in the living organisms. Today in the RC, more than 80 projects on sequencing are well underway, which are critical for the research results to be contributed to international and Russian journals.

All these research areas hold promise for the next 10 years at

# How to use SPbU Research Park



least and the Centre has still a long way to go. Besides, we can now tentatively outline research areas which are likely to rapidly develop as well: cryoelectron microscopy, ultrahigh-resolution optical microscopy, and next-generation DNA sequencing'.



**OLEG SERGEEVICH GRUNSKIY, DIRECTOR OF THE RESOURCE CENTRE FOR XRD STUDIES:**

'Our centre, unlike any other centre in Russia, offers comprehensive services for investigation in materials science, physics and chemistry of solids, developing new materials, nanosystems and nanomaterials, synthesis of biologically active substances and modern drugs. The most popular research area is X-ray structural analysis, e.g. a diffraction method that provides most definitive structural information on symmetry, unit-cell parameters, atomic coordinates, thermal parameter, lengths and angles of atoms, and structural motifs (topological structures). The research is primarily concerned with mono- and polycrystalline samples recovered from nature and synthesised in the laboratory, both with actinide complexes. A comparative crystallochemical analysis of these samples elucidates how various structural complexes are formed and transformed, which eventually explains and enables us to control chemical reactions in uranium deposits or geological repositories for irradiated nuclear fuel.

High-resolution X-ray diffraction and microstructure analyses are another priority in our research. By detecting the crystalline phases and determining

their relative concentrations in mixtures based on the diffraction pattern analysis recorded from the powder samples, X-ray diffraction provides phase analysis of the metals, alloys, chemicals, minerals, and ores. Using X-ray diffraction analysis it is possible to determine the composition of non-metallic inclusions in metals (oxides, sulfides, nitrides, carbides), the distribution of alloying elements in multiphase alloys.

X-ray diffraction at various temperatures (thermal X-ray analysis) allows to determine the phase transition: solid-solid phase transformations (polymorphism, decomposition, new phase formation, amorphisation etc.), solid-liquid phase transformations (congruent, eutectic, peritectic, solid solution, crystallisation), solid-gas phase transformations (hydration, dehydration, devolatilisation) in the air, vacuum, nitrogen, or chemically inactive gases'.



**ALEKSEY LEONIDOVICH MOSKOVIN, DIRECTOR OF THE RESOURCE CENTRE FOR CHEMICAL ANALYSIS AND MATERIALS RESEARCH:**

'The Resource Centre for Chemical Analysis and Materials Research offers standard methods and analysis tools for investigations in natural sciences for the University staff and others. It primarily aims to support research and development with cutting-edge analytical control and diagnostic methods both for SPbU and other organisations.

The RC's staff ensures that the equipment is properly operated, supports development of new

methods and analysis procedures, as well as research carried out on the sample provided by SPbU or ordered by other organisations. Unlike classical research laboratories, the RC makes its analytical services available for all departments. All components necessary for research are made in close cooperation with the leading RC's specialists, thus enabling a detailed and in-depth discussion at any stage of the research.

The most popular research areas are liquid- and gas-phase chromatography, chromatography-mass spectrometry and MALDI mass spectrometry of organic compounds synthesised in laboratories and biological samples. Another popular area is ultimate analysis of synthesised samples and non-organic inclusions in water, geological and biological samples, investigations of transmittance and reflectance spectra of new materials with tailor-made optical properties, microinclusions in building materials, measurement of particle size distributions, and complex analysis of biologically active samples recovered from nature'.

In October 20-22, 2014 the SPbU Science Park will hold the first inter-disciplinary conference, a landmark in scientific community, on modern solutions for investigations of natural, synthesised and biological materials. The Conference primarily aims to bring together academic and established researchers from the leading scientific centres in Russia and abroad to investigate new natural, synthesised and biological materials, which hold promise in science, and to discuss how innovative approaches can benefit up-to-date issues by modern techniques and procedures at the forefront of science.

The Conference will include master-classes to provide a very special opportunity to investigate the participants' own samples by using the facilities offered by the SPbU Science Park and learn about cutting-edge technologies provided by the world's leading developers. Read more at: <http://researchpark.spbu.ru/ms2014>



Nanofilm sample

# THE SIZE MATTERS

By **Ekaterina KOVALEVA**

The SPbU Centre for Innovative Technologies of Composite Nanomaterials fabricates ultra-thin films which can be applied in micro- and optical electronics, in improving the efficacy of solar panel and memory components, and improving biocompatible coatings in biomedicine.

Apart from that, ultra-thin films are used as dielectric, semiconductor ultra-thin films and ultracapacitors. This is accomplished through applying of molecular layer deposition technique, introduced by the Russian scientists S.I. Koltsov and V.B. Aleskovsky as

far as 1960s, when it was not held by the majority of scientific community, at least in Russia and later, however, was further advanced abroad and referred to as Atomic Layer Deposition (ALD). Today at the University, the two atomic layer deposition systems, Nanosurf and Solar-MN, with reaction chambers of

various sizes and advanced key features and benefits, are the most popular in the recourse centre among their users in SPbU and other organisations. A very wide variety of materials is possible with Nanosurf and Solar-MN, such as Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, ZnO, HfO<sub>2</sub>, VO<sub>2</sub>, SnO<sub>2</sub> and others, with a control over film growth in the nanometer/sub-nanometer thickness regime and sequence of layers on the surface of flat, 3D and disperse materials.

**THE PRINCIPLE OF THIN FILM FORMATION**

‘The method uses sequential chemical reactions between small precursor molecules and the surface, — said Denis Nazarov, an engineer of the resource centre. — A typical example is synthesis of Al<sub>2</sub>O<sub>3</sub> thin films. The principle of thin film formations is as follows: Trimethyl Aluminum (TMA) is pulsed into the reaction chamber. TMA reacts with the adsorbed hydroxyl groups, until the surface is passivated. After the TMA and methane reaction product is pumped away, water vapor (H<sub>2</sub>O) is pulsed into the reaction chamber. H<sub>2</sub>O reacts with the methyl groups on the new surface, forming hydroxyl surface groups. The reaction product and excess TMA and H<sub>2</sub>O vapor are pumped away. One TMA and one H<sub>2</sub>O vapor pulse form one cycle and completes one monolayer, thus allowing atomic layer-by-layer growth to deposit pinhole free coatings that are perfectly uniform in thickness’.

**VAPORS INTO PORES**

In the resource centre, in Nanosurf and Solar-MN the ALD can deposit not only on the flat surface, but also in disperse materials, containing irregular particles. Due to the deposition being a sequence of chemical reactions, vapor precursors penetrate into the pores and successfully integrate even with those areas of the surface which are difficult to reach, thus allowing defect-and pinhole free layer growth of uniform thickness as in case of flat surfaces. Other methods for depositing thin films do not allow us to achieve such

**FACT**

In nanotechnologies, of great interest is Atomic Layer Deposition (ALD), a thin film deposition technique that is based on the sequential use of a gas phase chemical process. ALD uses sequential, self-limiting and surface controlled gas phase chemical reactions based on the binary reaction sequences. Self-limiting surface chemistry is a key feature of atomic layer deposition technique: the gases won't react until in touch with the surface, which means the film growth proceeds by consecutive atomic layers 'up' from the surface. This is accomplished through sequential pulsing of gas precursors, each of which forms one atomic layer during each pulse (reaction cycle). The film thickness is determined as a function of number of cycles, that is the film thickness can be precisely controlled on an angstrom scale, while its structural and chemical characteristics — by chemistry of precursors. Due to the film formation mechanism, the ALD film is dense, crack-, defect- and pinhole-free.

precise control of depositing coatings that are perfectly uniform in thickness on the porous and disperse surfaces.

The systems comprise several parts. The metallic reactor chamber can be operated with low-pressure inert gas of high frequency, which may require from a couple of hours to several days. Precursors are pulsed into the reactor chamber from a number of cylinders containing metal-organic compounds and water. Semi-volatile precursor can be pulsed in to the reactor chamber in solvents. The systems are equipped with electronic control module to programme and automatically control thin film deposition via a laptop, while low-temperature traps prevent excess gas precursors and reaction products from escaping into the atmosphere.

The key features and benefits of the systems are, essentially, the size of the reactor chamber (flat and three-dimensional surfaces) and number of lines to deliver precursors, with the film growth rate of up to 100 nm per hour. The patent for the inventions is owned by a SPbU researcher in physics and chemistry of thin-film nanotechnologies Viktor Evgenyevich Drozd, while a Russian company ‘Nanoengineering’ produced them. These systems, compact in size and cost-effective, come in on a par with their foreign counterparts. The resource centre is under continuous development to expand the range of capabilities to synthesise materials and to adjust the systems to new environments. In particular, the centre has developed and produced a number of cells for thin film deposition on the disperse substances, thus opening horizons for new research both in SPbU and other organisations.

**OPERATION MANUAL**

‘When we created the resource centre, we aimed to encompass the whole range of works we are concerned with in research and synthesis of materials. Our centre is equipped to enable us to study original substances and surfaces, their chemical composition, chemical and physical properties, specific surface, porosity, size of the particles, in particular, in powders, — said the head of the recourse centre Andrey Ivanovich Romanychev. — After technological processes, we obtain samples to further study electrophysical, dielectric, thermal, and mechanical properties. The recourse centre, therefore, offers opportunities for both new material synthesis and they property analysis’.

Atomic Layer Deposition provides a wide range of flexibilities and capabilities in microelectronics. For example, ALD can be applied to deposit layers to accelerate the speed of semiconductors or dielectrics. This method deposited



PHOTO: EKATERINA KOVALEVA

insulating layers for various semiconductors to stabilise their electrophysical parameters. RC is currently developing methods and techniques to produce new catalysts on the surface of disperse substances and to deposit oxide and sulphide films which can serve as catalysts in chemical processes.

Nanofilms are also used in

optoelectronics, namely they absorb light on the surface and serve as non-reflecting coating on the solar panels. Of great interest are multilayer coatings: the ALD, within a single synthesis process, produces films of various chemical properties. To this end, the method involves sequential use of chemical agents containing different oxides on the substrate

**FACT**

Today, materials science is primarily concerned with how to grow thin films. To this end, in the SPbU Centre for Innovative Technologies of Composite Nanomaterials there are a number of processes and techniques: cathode sputtering in vacuum, spin coating (usually a small amount of coating material is applied on the center of the substrate, which is either spinning at low speed or not spinning at all), dip-coating (i.e. immersing of a substrate into a tank containing coating material, removing the piece from the tank, and allowing it to drain), and Atomic Layer Deposition (ALD).

Denis Nazarov, engineer, SPbU Resource Centre ‘Innovative Technologies of Composite Nanomaterials’, shows how to operate ‘Solar-MN’

surface, thus producing layered structures with a precise control of thickness, including superlattices, which do not occur in nature and, due to their properties, are much-promising in science and industry.

Besides, the ALD holds tremendous promise in biomedicine, which is in focus of research of Ruslan Zufarovich Valiev, SPbU Professor, head of the laboratory ‘Mechanics of non-conventional massive nanomaterials for innovative engineering applications’. Under his scientific guidance, the researchers carried out works in the mechanics of nanomaterials, materials science in nanostructures and nanoengineering. Today, the resource centre is producing nanofilms for prosthesis and implants to make them more biocompatible with the human body.

# ‘Post-graduate studies at SPbU is a personal challenge’



PHOTO: FROM E.V. GURINOVICH'S ARCHIVE

By Vera SVIRIDOVA

Eduard Gurinovich, SPbU alumni and CEO of CarPrice, shares his experience on how to build a meaningful career before you gain an academic degree. Just a couple of months before he completed a degree, he had launched an online auction for used cars, with its turnover of 125 mln roubles in half a year.

**N**o time to rest on his laurels. Constantly plugged in his work and giving it 100%, he is pursuing his post-graduate studies at SPbU, trying to learn something new every day and provides career counselling for new entrepreneurs.

**— Eduard, you established your business at age 16, without having completing a degree, became CEO and, evidently, have built a successful career so far. Yet, you are pursuing your post-graduate studies at SPbU. Why?**

— Indeed, I became CEO when I was a final-year student at the University, just a couple of months before getting a degree. Why am I pursuing my post-graduate studies? I am doing what I love. That's the key. It is an incentive to find new literature recourses on risk management and research.

With a specific focus on used cars for sale, my current online project CarPrice is in no way concerned with my principal subjects and courses at the University, where I got a degree in insurance. I am always trying to move outside my comfort zone. In doing so, post-graduate studies at SPbU is a personal challenge and a chance to develop those competences which I would definitely fail to acquire by practice only, and vice versa. That's the very reason why I am planning to study management and complete MBA abroad. A whole year abroad, where they have a different vision of how to make business and how the world is organised, is just another personal challenge.

**— Have the facts, information, and skills acquired through education influenced how you make business? If so, how? If not, why not?**

— I got excellent education in economics, though when it comes to practice, it is definitely not enough. Apart from the University, I gained some practical experience from all successful people around: my parents, our family's friends, teachers, colleagues... I was extremely eager to get something new every day. For some reason, I had friends who were older than me rather than someone of my age and was keen to share my experience. I started work early in life, when I was a second-year student, and tried my luck in various spheres: banking, chamber of commerce and industry, insurance. Apparently, I acquired some of the 'mechanical skills' much faster than any of my peers: practical experience — from our family's friends and parents, while theory — from the University. These are the three critical factors that made CarPrice a success.

**— At University, some people may think, you should be fully engaged in study, while others prefer to put it in practice and take the field, even at the first year at university. Apparently,**

**you are more likely to support the second view.**

— As I took the field at my second year at the University, I am more likely to support practice-oriented people. Our education, evidently, needs reinventing. It should be more practice-oriented with a specific focus on current state of affairs in economy. However, such hectic lifestyle is only for active people who are business-minded and have reasonably active social life.

**— Well, you started to put your ideas into practice long before you entered the University...**

— In a way. It all started as a hobby. When I was 16, I started a micro-business, though it was neither registered nor constituted as a legal entity. The idea was simple: I got orders on products of FC 'Zenit' and delivered them to the regions across Russia. It was a kind of online shopping. It cost me nothing, I cranked it out and in 2007, when 'Zenit' was on a roll after the 2007 Russian Premier League, I effortlessly earned from 5,000 to 10,000 roubles a month. All in all, due to strong competition from the official e-shop, I was forced to close it up.

It was at the University when I officially gained some practical experience at the second year. I passed my practice module in the department of management accounting at the head-quarter of 'VTB-North-West', just when it was merged into JSC 'Bank VTB'. I worked three days a week, from 10 am till 11 pm, engaged in the process of merging and contrasting two banks which were completely different as chalk from cheese in terms of management accounting and motivation systems. After a year and a half, I learned how to manage huge databases and perform routine tasks in due course, pay close attention to details as well as spot and eliminate mistakes. It was a great experience. I am exceptionally lucky to have Dmitry Baldin as my supervisor during the practice module! Eventually,

## IN BRIEF

### EDUARD VLADIMIROVICH GURINOVICH

studies at SPbU; now pursues post-graduate studies at SPbU. Won several student Olympiads in risk management and insurance. Since June 2014 – co-founder and CEO of CarPrice. For the first 6 months, his company went from strength to strength with a turnover of about \$2 mln per month. Nominated for the World's Youngest Billionaires by Forbes.

I decided that I am not for a career in finance. I am open to something more dynamic and practice-oriented.

Another step I take up my career ladder was the department of evaluation and expertise in the chamber of commerce and industry of Leningrad region. It gave me a chance to face a real situation: I gained more insight into a number of industries and could understand how they made business while we were identifying and assessing their assets.

The last, but not the least, step in my career as an employed worker was in insurance. I started to find a placement for internship beforehand and was employed as an apprentice in the 'School RESO', provided within a course by Rosgosstrakh, in the department of comprehensive insurance in JSEC 'Energogarant'. During one year, I was in charge of several projects. As a result, I gained a better understanding of how to manage teams at work. Besides, I was a successful university student! For the most part, I simply studied at home reading up for exams, but occasionally attended some important classes at the University, that I asked some time off from my work. I could juggle my study with career and even personal life!

Just a couple of months before completing a degree, I set my heart on switching career paths and start my own business. That was how my career as a full-right entrepreneur took off. I launched an e-shop to sell souvenirs and gifts and at the same time started several projects in e-advertising with big companies, in particular, Yandex and Ulmart.

In the end of 2013, we discussed a project on CarPrice, and in June 15, 2014 we launched the service in Moscow, where I had moved in April 2014.

**— Today, in society there is a young ambitious generation and they start, as competent Internet users, their own business as early as at school. Do you think that building an**



ФОТО: ИЗ ЛИЧНОГО АРХИВА Э. В. ГУРИНОВИЧА

**empire is possible without a university degree and practical experience in big corporations? Starting your own business is not an easy task.**

— Possible, but not very probable in some cases. Experience might be a problem as it creates stereotypes and prejudice. If you are able to persist through failure, willing to take bold risks and take a fresh view, you are more likely to succeed! No matter what experience you have in corporate sphere. To be successful in business, you need to become business-minded, be able to weigh risks, take responsibilities, work hard and build a strong team. All these factors need to meet at one point. To build a business is all about undergoing pain, distress, and hardship. It is both rises and falls. This is the fact! We don't have a lot of entrepreneurs, because there is much at stake: there are few people who are willing to give up

their accustomed way of life to risk and win. People are not that adventurous.

**— What are you supposed to know, be able to do and strive to get, if you set your heart on building your business at age 16?**

— For a start, you should be willing to become better and striving towards achieving personal growth.

**— It is never too late to study. Similarly, it is never too early to build your own business, isn't it?**

— Absolutely! There are some mistakes that every person in business makes. I am more than sure the earlier you make them, the faster you will gain confidence in business and the less you will pay for them.

**— Apparently, you are and have always been striving to**

**give everything 100%, you are trying to achieve a work-study balance. If you consider all the things that competed for your time, what did you discard?**

— I don't have a diploma with honour. Feel like being stuck? Definitely not! Rather quite the opposite. I think that I could have been able to acquire more skills while studying at the University.

**— What are you studying right now? What are your research interests?**

— I am not a person of astonishing erudition. Still I am trying different spheres: from financial market insurance and legislation to the string theory (before the University, I studied at school with a specific focus on physics and mathematics, which instilled a passion into hard and natural sciences into me) and history of Europe. The lion's share in my self-education is psychology, business management, employee

motivation, client service and marketing.

**— What else would you like to study?**

— I am extremely eager to learn something new. Always! I am planning to study speed reading technique, psychoanalysis, and, presumably, hunting.

**— Today, there are lots of books on 'How to Become a Businessman in 10 Steps'. Are they useful?**

— No idea, I haven't read any. I am reading on marketing, management, time-management. I can recommend to entrepreneurs who are 1 or 2 years in business to read *No B.S. Ruthless Management of People & Profits* by Dan Kennedy.

**— Are you planning to share your experience and to write your book or start a career as a lecturer at university?**

CarPrice aims high by setting an ambitious goal to make a used car market civilised. From left to right: **Sergey TISSEN**, Financial Director; **Oleg ZANKOV**, Director of Engineering; **Eduard GURINOVICH**, Director General; **Artem BOLSHAKOV**, Director of Sales; **Aleksandr DANILOV**, Director of Marketing

— So I have been doing for a while. Several times, I was offered to write a book, but I mostly keep to mentoring programmes at the 'Fund of Russian economy'. I am a mentor for the beginners in business: I shared my experience and my views on how to make business. I do not give straightforward advice, rather ask questions to encourage search for answers.

As for teaching, it is inevitable for any post-graduate student. Someday, some students at the Faculty of Economics will come under my business-oriented influence, like it or not, and know how CarPrice started from the horse's mouth.

**— What would you advise to a first-year student and a final-year student?**

— I have one advice: successful people look for opportunities – ordinary people find excuses. Your priority should be self-growth: in education, career, sport or hobby. It is very important to be able to set right aims, to be fully aware of what you are doing and what you are doing for.

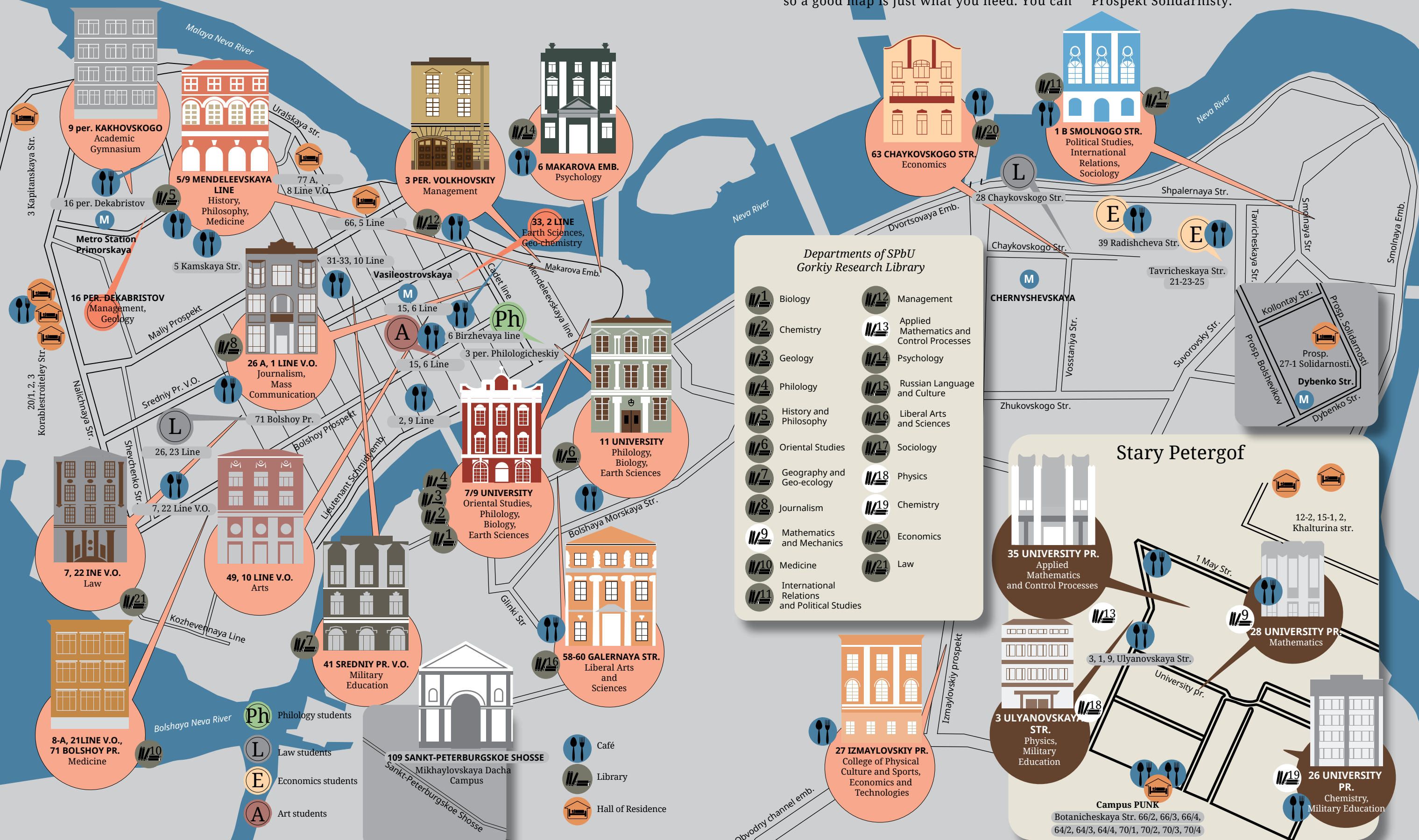
At the first year at university, you'd better adopt a wait-and-see attitude to your study and be active in looking for your place in the world rather than to wait to discover what will happen. So you'd better control a situation rather than just respond to it after it has happened and search for new ways how to express yourself. Not less proactive should you be at the final year at university. In this respect, both the first and the final years were alike for me.



# Learn, Live, Read

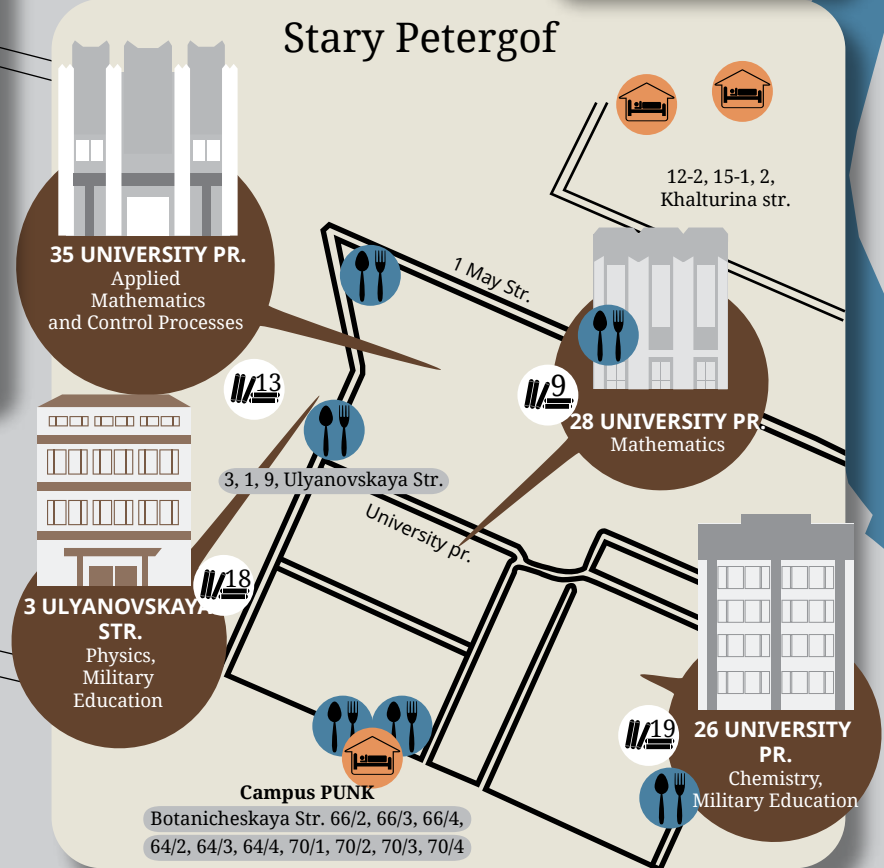
Each student should know where to attend best talks and lectures, to have a snack, find books and, finally, find rooms for students to live in at the University? St. Petersburg University is more than 300 buildings — so a good map is just what you need. You can

find everything here! Or nearly everything! The University is changing faster than ever — this year a new hall of residence has appeared on the map. It can accommodate up to 458 students and is located at 27/1 Prospekt Solidarnosti.



**Departments of SPbU Gorkiy Research Library**

1 Biology	12 Management
2 Chemistry	13 Applied Mathematics and Control Processes
3 Geology	14 Psychology
4 Philology	15 Russian Language and Culture
5 History and Philosophy	16 Liberal Arts and Sciences
6 Oriental Studies	17 Sociology
7 Geography and Geo-ecology	18 Physics
8 Journalism	19 Chemistry
9 Mathematics and Mechanics	20 Economics
10 Medicine	21 Law
11 International Relations and Political Studies	



- Ph** Philology students
- L** Law students
- E** Economics students
- A** Art students

- Café
- Library
- Hall of Residence

**Mikhail Valentinovich KOVALCHUK**

*Graduated LSU. Doctor of Physics and Mathematics, Professor, Corresponding Member of the RAS.*

*In scientific research, he has worked out a breakthrough method in structural determination of substances by combining diffraction with a multitude of spectroscopic techniques – the X-ray standing wave (XSW) technique, which is extremely powerful for obtaining information about nanosystems.*

*Leading scientist in X-ray physics, crystallography, and nanodiagnostics; worked out the ideology of nanotechnologies and supported a nanotechnology initiative in Russia.*

*From 1998 to 2013 – Director of A.V. Shubnikov Institute of Crystallography. 1999 – appointed as Director of ‘Kurchatov centre of synchrotron research’. Under his supervision, the Kurchatov source of synchrotron radiation was put in operation, which so far remains the first and the only specialised facility of its kind in Russia, and a new-generation high-precision X-ray equipment was created at the global scale.*

*Since 2005 – Director of the National Research Centre ‘Kurchatov Institute’. Started in the Institute of Crystallography in the RAS and further worked in the Kurchatov Institute, he has achieved his major breakthrough by combining nano-, bio-, info-, cognitive, social sciences and humanities, thus pushing the science to the next level. Worked out a strategy to develop this inter-disciplinary research and in 2009 created the Kurchatov NBICS-Center, the only one of its kind in the world. He is a scientific supervisor in convergence of modern technologies with the ‘structures’ of the nature.*

*Scientific supervisor at the Department of Nano-, Bio-, Informational and Cognitive Technologies at Moscow Institute of Physics and Technology.*

*Since 2012 – Dean of the Faculty of Physics at SPbU. Creator and presenter of a science popular TV programme ‘History from the Future with Mikhail Kovalchuk’.*



PHOTO: ANNA GRUZDEVA

**Mikhail V. Kovalchuk**, Dean of the Faculty of Physics, SPbU, Director of ‘Kurchatov Institute’, is obviously a charismatic and eloquent public speaker with great appeal to the public. He can talk about science in a vivid, engaging way to make even ordinary people get involved.

# TOWARDS NATURE

By **Vera SVIRIDOVA**

To study at the University is not all about scheduled lessons. Throughout the academic year, SPbU holds open lectures by the leading researchers who shed light on up-to-date scientific issues. In September, Mikhail Valentinovich Kovalchuk was the first to continue the tradition.

The famous Russian physicist, Dean of the Faculty of Physics at SPbU, Corresponding Member of the RAS, Director of the Kurchatov Institute and popular science communicator is always at its best. Small wonder! He can talk about science in a vivid, engaging way to make even ordinary people get involved. Today, he talked about new priorities in science and technologies and explained how current global problems can be solved by creating nature-like technologies.

#### STRUGGLE FOR RESOURCES

'For the first time in the recorded history, the mankind globally has faced an enormous challenge, and an armed stand-off is not the reason. It is universally acknowledged, we need energy, as this is the driving force for any development, which makes the civilization become more mature, advanced, and elaborate. Global technological advancements boost energy consumption and eventually destruct natural resources. Today, the mankind is about to reach its tipping point, a point of no return, when both energy and biological resources are likely to be depleted and drained. Drinking water, forests, agricultural lands, and especially supply of consumer goods and food are at their worst. The world's natural resources are obviously finite. For how long can we realistically expect to have them? Redistribution of resources is well underway at global scale. Is there any way out?'

#### TO OVERCOME ANTAGONISM WITH NATURE

'Nature is a holistic and synergetic system with a closed

loop circulation of resources. For billiards of years, all living organisms exist in this cycle. We were exceptionally lucky to have been able to advance our civilization thanks to science and systematic study of the laws and regularities of the physical and natural world which we have been transforming with increasingly complicated and advanced technologies. Throughout its history, the mankind has been persistent in improving workforce productivity and increasing the volume of goods and services with little care for the cost we are going to pay. It's an audacious attempt to put a value on nature. Eventually, we have created recourse-consuming technosphere, making irreparable harm to nature and creating a wide ever nature-industry divide. Essentially, we have been creating a parallel home or environment. It is a techno-sphere, which is safer, more comfortable, more easily controlled and exists in biosphere, uses its resources and imitates how it operates and works. It enables the humankind to transform naturally occurring processes, thus intruding into the nature. Today's technologies are nothing more than 'bad' copies of some elements of the natural processes. Thus, the overarching strategy in science is to incorporate technologies into the nature and to face towards the nature, its elements and experience. A new approach is convergence: we should make nature and technologies come together from different directions so as eventually meet'.

#### CONVERGENT TECHNOLOGIES

'Here I mean NBIC, that is nano-, bio-, informational and convergent sciences and technologies. Nanotechnology is manipulation of matter on an atomic, molecular, and supramolecular scale. We are all living organisms, consisting of proteins and DNA. In other words, we are biological elements on nanoscale. It enables expanding of the non-living, solid nano-world into nature. By combining nanotechnologies

with bio-technologies, we can grow a hybrid, for example, a semiconductor detector made of photorhodopsin-like photoresponsive material. Moreover, informational technologies make it a man-made object of intellect, namely it is not just a detector to measure, say, acceleration in a car or a plane, rather it transforms it in digital signals. At last, but not at least, research in cognitive science with a focus on mind and cognition in humans develops algorithms of how we can animate robots. To this end, several years ago we (the Kurchatov Institute. — editor's note.) created a unique Kurchatov NBICS-Centre with a specific focus on a wide range of research areas: from molecular biology, protein crystallography, physical and chemical technologies to robotic and micro(nano)electromechanical systems'.

#### RISKS IMPOSED BY NATURE-LIKE TECHNOLOGIES

'Although nature-like technologies evidently fight off global challenges: from new medicine, power industry, new materials to transport, communication and accommodation, they nevertheless impose some risks which we cannot ignore. The first risk is about a dual nature of nature-like technologies, which blurs the boundaries between civil and military applications, thus destroying the effective control, say, over the nuclear materials. Let us examine a case with a nuclear reactor. Today, we can say for sure in what cases it is a source of energy or weapon-grade plutonium. Power measurement through neutrino flux detection at the distance helps determine the fuel properties and its purposes: civil or military. Nature-like technologies are another story. Imagine we construct an artificial cage seemingly for new medical diagnostics. Interestingly, biogenetic weapon can also be used for that purpose. The second risk relates to whether these technologies are publically available and how much they cost. I mean, whether weapon of mass destruction can be



PHOTO: ANNA GRUZDEVA

produced not on industrial scale and without comprehensive and costly delivery vehicles. The third risk is that we cannot foresee all consequences followed from integration of nature-like technologies into nature'.

Expert in a particular subject vs a wide range of experience

'Today, the world entered a new stage. It is rather complicated, but still holds promise. It is a new challenge of XXI century (nature-like technologies. — editor's note.), a critical issue at the crossroad of sciences. For the last 50 years, fundamental science penetrated deep into the nature and explains how it is organised on atomic level. Today, however, we are still underway to meet new unique opportunities in combining technological opportunities of microelectronics and our understanding of nature. We are at the dawn of a new era in human development, when mechanical modelling of how a human is 'arranged' by means of relatively simple non-organic materials gives way to a method of how we can reproduce nature by means of convergent NBICS-

technologies. The core of scientific endeavours is in physics and you set your hearts on advancing physics. Still, you (students of the Faculty of Physics — editor's note) must constantly broaden your horizons in other spheres: in biology, chemistry, and even humanities. Eventually, we will set up the process of converging the sciences, slowly but surely. The University is well underway. The key issue in education is to preserve a holistic view of the world and nature typical to a child throughout his schooling years to the university. It should naturally come along with gaining specific knowledge in a particular subject with an understanding that the sciences are intimately interconnected and explicable only by reference to the whole'.

#### BRIEF OVERVIEW OF SCIENCE AND RESEARCH

'Today, science and research can be summed up as a nano-transition and manipulation of matter on an atomic, molecular, and supramolecular scale. In the middle of the last century, analysis, as a key process in

The audience asking questions after the talk

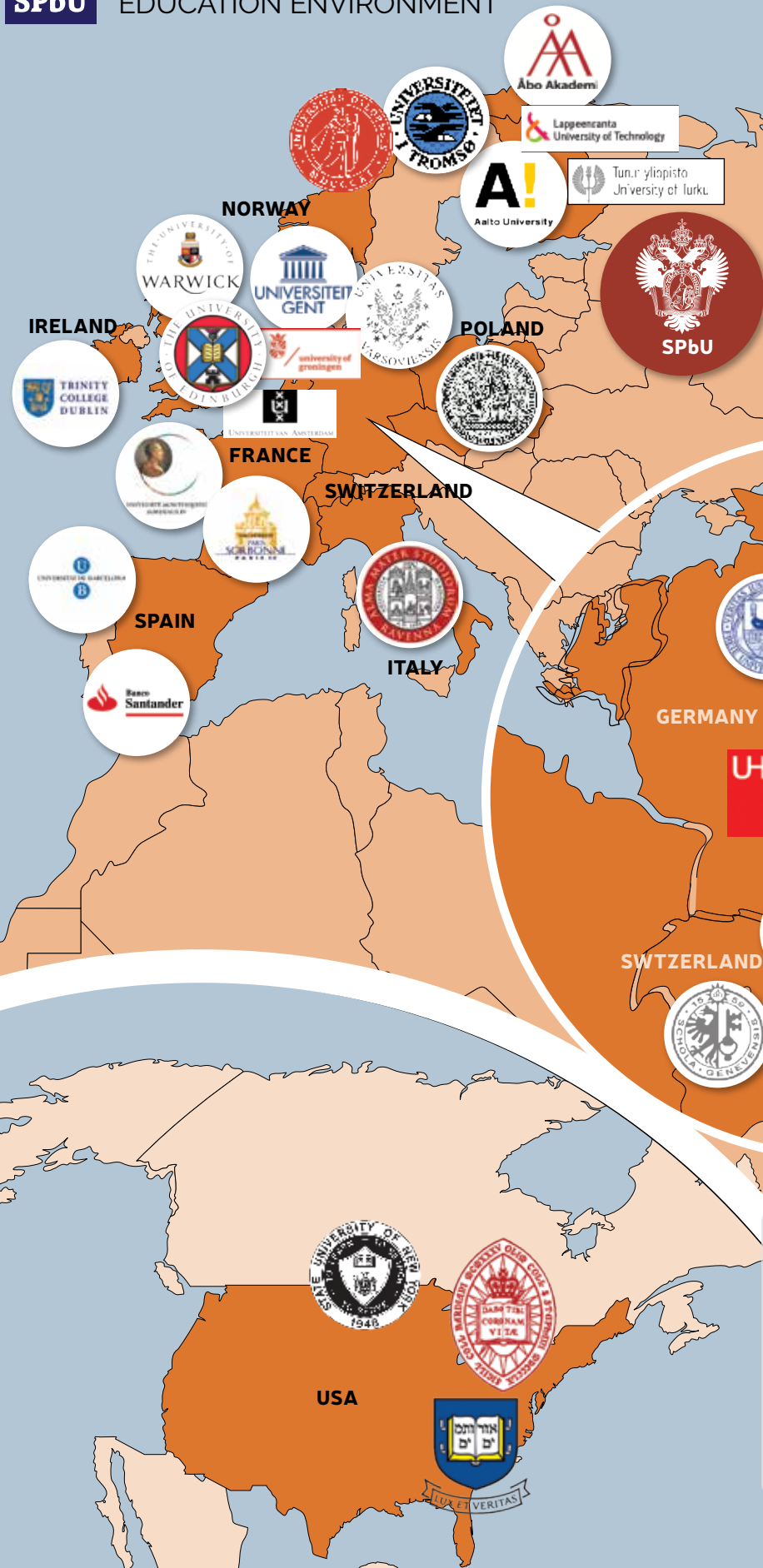
science, started to give way to synthesis, when scientists all over the world started to synthesise artificial materials, including those which do not occur in nature and have properties unlike those typical to naturally occurring materials. There was a paradigm shift in science from detailed examination and separating things into their constituent elements towards the combination of components or elements to efficiently form a connected whole. The second trend is gradual convergence of organic and non-organic worlds. Finally, the modern science and technologies are interdisciplinary in nature. We are returning to the holistic approach to the world, but from a new perspective'.

# Friendship between universities

Today's SPbU students and staff enjoy access to a range of international experiences, including study opportunities and research collaborations. Our extensive global links with more than 300 leading universities in 70 countries worldwide have been developed to serve these principles. Here you can find our 44 key international partners.

Students and researchers, through commitment to international engagement, share their experience that enable them to be the cutting-edge of the science innovations. Global academic community is one of the strong communities at a global scale, and SPbU is a member of this community.

- Belgium** Ghent University
- China** Capital Normal University
- China** Tsinghua University
- China** Fudan University
- China** Peking University
- Czech Republic** Charles University
- Finland** Åbo Akademi University
- Finland** Lappeenranta University of Technology
- Finland** Aalto University
- Finland** University of Turku
- France** University of Bordeaux
- France** Paris Sorbonne University (Paris IV)
- Germany** Universität Hamburg
- Germany** Ludwig Maximilian University of Munich
- Germany** Free University of Berlin
- Germany** Technical University of Dresden
- Germany** Technical University of Munich
- Germany** University of Hanover
- Germany** German Academic Exchange Service
- Great Britain** University of Warwick
- Great Britain** University of Edinburgh
- Ireland** Trinity College, Dublin
- Japan** Municipal University of Osaka
- Japan** University of Tokyo
- Japan** Kyoto University
- Japan** Japan Tobacco Inc.
- Japan** Mitsui & Co. Ltd.
- Netherlands** University of Amsterdam
- Netherlands** University of Groningen
- Norway** University of Oslo
- Norway** University of Tromsø
- Poland** University of Warsaw
- Republic of Korea** Korea University
- Spain** University of Barcelona
- Spain** Banco Santander S.A.
- Spain** University of Bologna
- Switzerland** University of Geneva
- Switzerland** University of Zurich
- Switzerland (CERN)** European Organisation for Nuclear Research
- Taiwan** National Taiwan University
- USA** Bard College
- USA** Yale University
- USA** New York University
- Vietnam** Vietnam National University, Hanoi



# Small Molecules against Dangerous Diseases

By **Elizaveta BLAGODATOVA**

St Petersburg State University is going to start developing small molecules as therapeutic agents that can become a basis for new medications, thus opening another research area of the Institute of Translational Biomedicine in SPbU.

The establishment of the Institute of Translational Biomedicine has been funded with a significant grant of 750 million rubles from the Russian Science Foundation. The financing has been calculated up to the end of 2018. The project aims to provide SPbU with a full cycle complex, from preparing and storing biomaterials to producing new medications. 'Earlier medications were produced more or less incidentally, sometimes quite successfully like in case of aspirin. Today, a much more thoughtful approach is applied. Before treating the disease, its mechanism is thoroughly studied', explains Professor Mikhail Krasavin, Doctor of Chemistry. 'We search for a potential target, either proteins or even cell systems. By influencing this target with a therapeutic agent like protein, peptide, or small molecule the proper functioning of our inner

mechanism can be adjusted. Still, the hypothesis has to be checked and confirmed. In broad terms, translation is transforming this knowledge into a particular therapeutic approach, from idea to medication'.

## STAGES OF LONG WAY

The whole way 'from idea to implementation' can be presented as follows. A biobank is created under the supervision of Professor Yury Olegovich Chernov (see 'SPbU To Have Its Own Biobank', 'SPbU' Issue 1, 2015). In fact, it is a properly assembled collection of biological samples associated with various pathologies. These biological samples can be genotyped by means of extracting information about genetic material and working with it as a mathematical object. This work is done by the algorithmic bioinformatics research area headed by Professor Pavel Arkadyevich Pevzner. By studying the differences between pathology and normal state, bioinformatics helps to identify biological targets, for example, an aberrant protein. The potential target has to be isolated, which will show whether this is the abnormal function of the protein that leads to a disease. This connection is studied within the third research area headed

by Professor Raul Radikovich Gainetdinov by applying transgenic animal models of diseases. New organisms are created with the inactive or active function of the 'suspected' protein. The target is validated if the protein is confirmed to cause the disease. At further stages, the same transgenic animals may be essential for studying the effectiveness of the developed therapeutic agent.

The biological target, not all types of them by any means, can be influenced by either large molecules like therapeutic proteins, peptides, or small molecules. In pharmaceuticals small molecules are preferred because they facilitate producing medication in a pill form. Protein-based preparations are injection, which makes them harder to be used for treatment and less easily taken by patients. SPbU has chosen the way of small molecules which is impossible without chemists. And this is where chemical pharmacology, the fourth research area guided by Mikhail Yuryevich Krasavin, comes into play. Synthetic chemists develop small molecules that are tested as a therapeutic agent capable of influencing the found target. Finally, the fifth research areas led by Professor Tatyana Borisovna

Tennikova is responsible for bringing the therapeutic agent to the target inside the human body. The task is quite complicated. 'We know the body at the level of its organs and pathologies seen with an aided eye, but the molecular mechanisms cannot be seen; we can draw the conclusions only on implicit evidence', explains Mikhail Krasavin. 'We need the substance of the pill, for example, to reach certain place in the body. This is a serious problem. There are many biological membranes to go through. A traditional example is the delivery of preparations to the central nervous system. It is one thing to infuse the preparation in blood, but it is another to make it pass through the blood-brain barrier (BBB) and reach the required point'.

All five research areas developed at the Institute of Translational Biomedicine, from idea to a clinical candidate, can take quite a lot of time and require additional financing. (For reference: by some estimates, the total cost of developing a new

medication, including clinical trials, may be up to a billion dollars). There is no financing scheme to pass all the stages at once. The main task in creating the Institute of Translational Biomedicine is to have an integrated system to launch the projects from different phases of the cycle, and eventually acquire a portfolio of projects with various stages of implementation. 'We are now developing our research area in SPbU and searching for common ground for the Institute to work as a single body', says Mikhail Krasavin. 'My research area is the easiest to establish interaction with other groups headed by

Raul Gainetdinov and Tatiana Tennikova. We have already had some mutual projects'.

## SCHOOL OF THERAPEUTIC SUPERAGENTS

Chemical pharmacology is a body of knowledge as well as calculation methods used to predict the type of biological activity of certain organic compounds. 'It is extremely engrossing experience', says Mikhail Yuryevich. 'As a keen synthetic chemist, I am immensely interested in how best to perform synthetic transformation, to bridge a particular molecular structure. There are lots of synthetic ideas; we try not to limit ourselves. However, we tackle the task on one condition: if we know where this development in the field of synthetic chemistry can find its application in terms of biology'.

But how is a new therapeutic agent created after all? First of all, each target requires a bioassay, an experiment to determine whether the compound can have

**Mikhail Yuryevich KRASAVIN,**  
Doctor of Chemistry,  
Professor,  
Department of Organic  
Chemistry



PHOTO: MIKHAIL VOLKOV

the desired effect. 'The bioassay generally includes the biological target itself and the biochemical system that measures the degree of the target response to the effect of medication', says Mikhail Yuryevich. 'When working with a particular biological target, we tend to have a certain hypothesis and test a reasonable number of two or three dozen of molecules. Yet, in case the target is absolutely new, high-throughput screening may be of use'.

HTS requires special collections of compounds that SPbU does not have now. But the team of Mikhail Krasavin is in partnership with the industrial organisations that can provide these collections if need be. His work experience in the industry comes in handy. 'The transition to academic research allowed me to keep my contacts in the industry. Moreover, we can choose which competing companies to work with', explains the scientist.

What happens if the therapeutic agent ends up failing and does not pass further tests like clinical trials? Normally, we should come back to the target and select new candidate agents. But in practice these failures happen to compromise the target. 'The problem is that the choice of developments to invest in is often based only on beliefs; there are no strict criteria, why this research area is better and that one is worse', says Mikhail Krasavin. 'Financial considerations do play a role: there are risky targets with a huge percentage of failure. And if the target has failed with one, two, three candidates, the industry tends to shun it. Therefore, active academic and university research makes a positive contribution into this field. Let's have an example: one of the targets we are working with is cyclooxygenase-2. Non-selective cyclooxygenase inhibitors comprising three different enzymes rather than just one are a well-known class of preparations including aspirin and ibuprofen. But the compounds that inhibit cyclooxygenase-2 are relatively new and have been on the market for more than 15 years. This class includes

the preparations produced by Merck and Pfizer's companies whose highest annual sales have reached 3 billion dollars. The year 2004 saw a sad story, when Vioxx produced by Merck was discontinued because of its side effects leading to heart diseases. There was talk that the problem might be in the target. Experts even said they didn't like our choice of cyclooxygenase-2 for academic grants. At the same time no one thought about lots of other possible applications of cyclooxygenase-2 inhibitors except treating rheumatoid arthritis. Why does a reviewer of academic grants think like an industrialist rather than asking these questions? After all, we are talking about fundamental research. It is not supposed to be like this, because university research has absolutely different objectives from those of the industry ..."

It is little wonder that cyclooxygenase-2 appears a target in various diseases. 'In the body everything is interconnected', says Michael Krasavin. 'When a new target appears, we try to determine which tissues of the body have this protein. Today, the role of cyclooxygenase-2 in the joints is more or less clear, but what does it do in the brain? For some reason it is needed there! This was the issue of a number of fundamental researches. It was found, for example, that in a number of psychiatric disorders cyclooxygenase-2 level is different from that in the normal condition; in certain types of cancer its level increases. There have already been some studies providing the use of cyclooxygenase-2 inhibitors to prevent these diseases'.

#### PROJECTS AND PARTNERS

By the way, the laboratory of Mikhail Krasavin is working with cyclooxygenase-2. 'The leading molecule' for future antiphlogistic medicine has already been found, and we've got the study of its effectiveness ahead. First projects have already started in cooperation with the associated research area of the Institute of Translational Biomedicine.

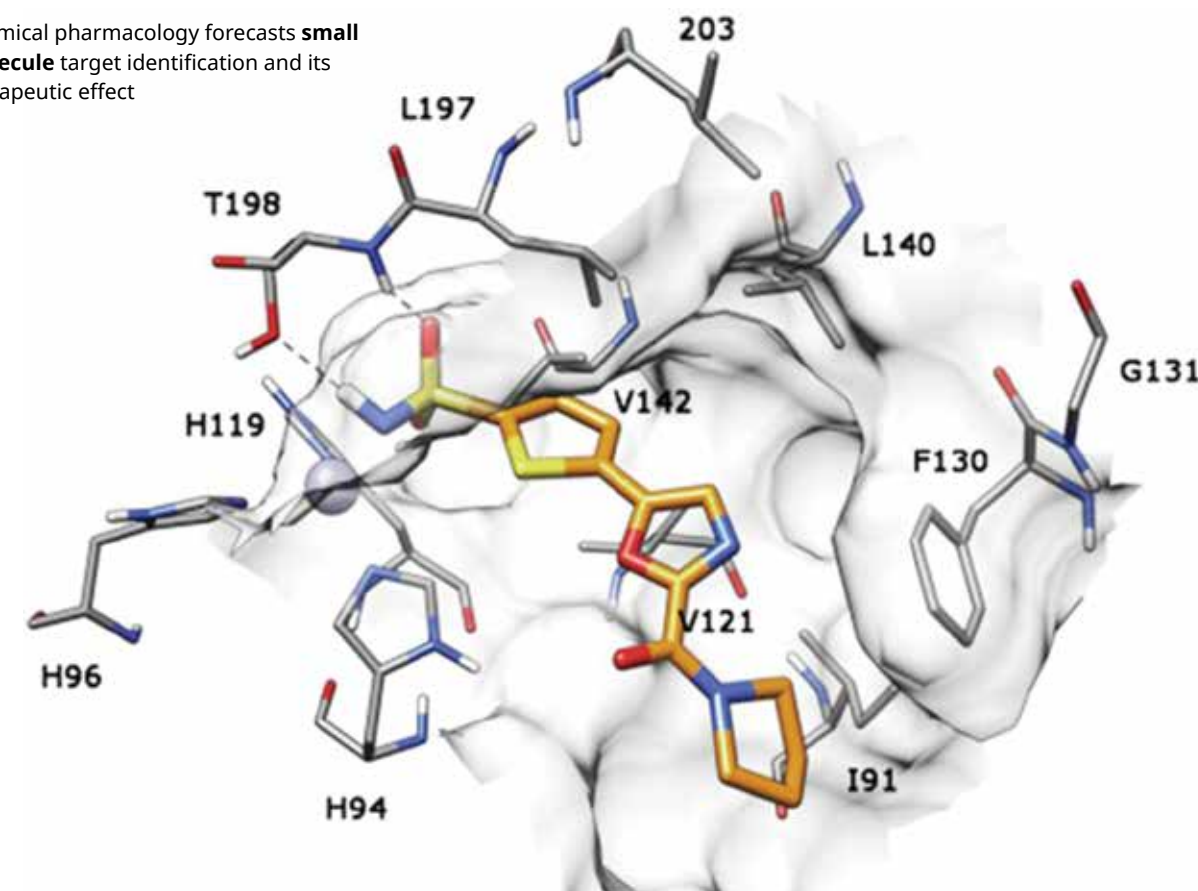
'Raul Gainutdinov has a

#### Mikhail Yuryevich KRASAVINH

Doctor of Chemistry, Professor, Department of Organic Chemistry, SPbU is the head of the scientific team in the Institute of Chemistry and research area of chemical pharmacology in the Institute of Translational Biomedicine of SPbU. Graduated from the Academic Gymnasium of SPbU where, influenced by Anna Alexeevna Kartsova, Professor and Doctor of Chemistry Sciences, he got engrossed in organic chemistry. Studied at SPbU and in 1999 took his master's degree in Johns Hopkins University in the USA. Then worked in the large industrial pharmaceutical companies of Millenium Pharmaceuticals, Abbott head of Laboratories, and ChemDiv. From 2004 to 2011 was the head of research areas of tailored synthesis and medical chemistry in the Chemical Diversity Research Institute in Khimki. From 2011 to 2013 was the head of the research team developing medication in Iskaitis Institute in Brisbane, Australia. Mikhail Krasavin has published more than 80 scientific articles in peer-reviewed journals, 9 patents and patent claims. H-index 14.

number of innovative biological targets in the central nervous system, and we will work together to find new modulators, small molecules that can influence them', says Mikhail Krasavin. 'With Tatiana Tennikova we are discussing the methods of delivery of antibiotics through the bacterial cell walls. After all, the target approach can be used not only to treat people, but also to kill bacteria. If to find the substance blocking vital targets and processes in bacteria, bacteria will die. But the task is more

Chemical pharmacology forecasts **small molecule** target identification and its therapeutic effect



complicated: this substance should be not just inside the body, but inside the bacteria inside the body. There are lots of substances that are effective against important bacterial biomolecules. But new classes of antibiotics on the market have not appeared on the market for a long time. Why? Mainly because the potential antibacterial preparations fail to be effective. Targeted delivery through the bacterial cell walls is a complex scientific task that we are going to work at'. Joint work with 'the institute neighbors' is by no means all. The team of Mikhail Krasavin has started cooperation with the University of Florence in the field of ophthalmology, or rather treating glaucoma. 'We are working with carbonic anhydrase inhibitors. It is a whole family of enzymes, and one of them is a validated target for the glaucoma preparations. Apparently, we did find some unique in terms of their activity substances. Now they are to be tested in animal models in Florence', says Professor.

The cooperation with the allied disciplines is of

fundamental importance. 'While working at a potentially interesting substance, we should already understand how promising it is in terms of biology', emphasizes Mikhail Krasavin. 'At that, finding a biologically active substance is not enough. It must have a number of properties to become a medication. It must show its stability in the manufacture process, survive on its way to the target, and overcome all the possible obstacles in the body. That is why we need the partners who would consider the applicability of organic compounds as medicine. Being the leader I can see my task as creating an effective partnership network, especially with biologists and pharmacologists. Due to our current contacts we can work effectively in the field of inflammation, oncology, infectious diseases, metabolic disorders, including diabetes. The research niche that we occupy and the partnership network we have let us work practically with any chemical idea'.

#### SEED MONEY

As Mikhail Krasavin thinks, working in a wide range of research areas does not mean that scientists spread themselves too thin. 'If you work with chemical pharmacology it will be difficult to raise fundamental questions without variety of chemical compounds or biological systems. We search for interconnections, and their understanding helps create selective compounds without toxic effect. We need to have access to a various infrastructure by means of partnership', explains the scientist.

Michael Krasavin calls the grant of the Russian Science Foundation 'a great success' and 'seed money'. 'Creating a real research area at the university from scratch is not a matter of one year', he says. 'I am glad that lots of talented people from the Institute of Chemistry take interest in cooperating with us. Biomedical issues that are relatively new for the University capture the many. With their help our research area is gaining its functionality state'.



# SCIENCE AND JOURNALISM

## AT THE SAME TABLE

By Yulia SMIRNOVA

How to popularise science? To this end, SPbU has started a new tradition to bring the journalists and scientists together to discuss how media can do a better job of reporting science.

In science, there is always something rather than nothing. And what we can see in non-specialised literature is only the tip of an iceberg. The rest of it remains hidden in the thick journals and scientific discussions. But how can science be understood well by the general public? Not infrequently, science journalism

is killing the curiosity. With the aim to support regular meetings between scientists and journalists, SPbU has launched a project 'SCIENCE-lunch'. It primarily focuses on communicating results of the research and reporting studies carried out at the University to the science journalists. The science journalists can ask any

questions to the leading SPbU researchers to get an insight into the most complicated things and, subsequently, make general public benefit from a better understanding of how science can work.

### NEUROPHARMACOLOGY

Our first guest is Professor Raul Gaynetdinov, who is to be a head of the laboratory to open shortly in SPbU, which is among the first to research and develop a new area of a use of transgenic technologies in pharmacology in Russia. There are estimated 20,000 human protein-coding



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### BOSONIC LASER

The second SCIENCE-lunch tells about a unique bosonic cascade laser, which is currently developed at the University under the scientific guidance of Professor Aleksey Kavokin, head of the SPbU Spin Optics Laboratory. In bosonic lasers, coherent light is emitted spontaneously, as in a candle, bulb, or Sun. The device produces coherent, monochromatic and unidirectional light, that is to say it has all the properties of laser light. Unlike similar devices, A. Kavokin's laser is cost-effective, small and can operate at as high as room temperature. The bosonic laser, subsequently, has a wider area of application. This is the only electromagnetic spectrum from microwaves to ultraviolet light with no reliable sources of coherent light. With the focal length of about 1 mm, the technology provides unprecedented opportunities in skin cancer treatment, Aleksey Kavokin said. SPbU medical community proposes to use the laser in cosmetology.

The third meeting will focus on a new Master programme 'Popular Science Journalism'.

# From Letters to Digits

By Tatyana SEMME, Vera SVIRIDOVA

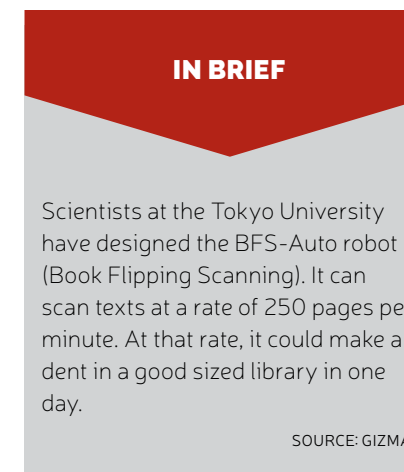
Started as far back as 2006, the electronic library of SPbU has digitised more than 1,100 volumes of pre-Revolutionary editions, making them universally available via Internet.

The electronic collection of the Gorky Research Library of SPbU comprises three sections: 'Russian Poetry of the 18th - the first third of the 19th centuries' (574 volumes), 'Periodicals of the 18th century' (249 volumes) and 'The Bestuzhev Courses Library' (298 volumes).

In 2005, specially for early printed books, the Library acquired Minolta PS 7000, a monochrome planetary scanner. For all these years, it has been the key tool for making e-copies.

The electronic library collection essentially comprises the materials from the historical collection that has been in the University Library for more than two hundred years. A number of books arrived in the 19th - the beginning of the 20th centuries as part of the libraries of K. N. Bestuzhev- Ryumin, N. N. Strakhov, and A. A. Polovtsov. Some editions in 'Russian Poetry of the 18th century' are absolute rarities that exclusively exist in a single copy in the Gorky Research Library of SPbU. They were all, in fact, composed by the long forgotten poets of the end of the 18th century. These are I.I. Zavalishin ('The Didactic Song about the Noble Alumni of the Emperor Szlachta Cadet Corps Moving from the Forth to the Fifth and the Last Age of their Education'. SPb, 1791), P. P. Lobysevich ('The Song to Catherine The Great Composed in Kherson In 1794'. SPb., 1794), A. A. Maykov ('On Making Peace between Russia and the Porte'. SPb., 1791). Some other noteworthy rare censored titles presented in the electronic library are the poem editions by G. R. Derzhavin ('Cloud, Thunder and Rainbow'. SPb., 1806; two copies are known to be kept in SPbU and the Library of the Russian Academy of Sciences), and F. P. Lvov ('To Gavrila Romanovich Derzhavin'. SPb., 1813; two copies are known to be kept in SPbU and the National Library of Russia).

The 'Russian Poetry of the 18th Century' mainly comprises, in all its diversity, the Russian poetry of the 18th and the



Scientists at the Tokyo University have designed the BFS-Auto robot (Book Flipping Scanning). It can scan texts at a rate of 250 pages per minute. At that rate, it could make a dent in a good sized library in one day.

SOURCE: GIZMAG

beginning of the 19th centuries: from its origin (A. D. Kantemir, V. K. Trediakovsky and M.V. Lomonosov) to its Golden Age (G. R. Derzhavin, N. M. Karamzin, and I. I. Dmitriev). The readers and researchers can now enjoy access to both rare lifetime editions of some famous writers and books by lesser-known poets with, presumably, no later editions (S.S. Bobrov, I.M. Dolgorukov, and V.P. Petrov).

Today, by keeping moving in the chosen direction, the librarians of 'The Rare Books and Manuscripts' department continue to create an electronic library of the Russian poetry of the Age of Pushkin (1800-1830). The library has already digitised about 150 editions (mainly, the authors from A to K). The gems of this electronic collection are the lifetime poetry collections by A.A. Delvig, E.A. Baratynsky, N.I. Gnedich, K.N. Batyushkov, V.A. Zhukovsky, and other famous poets of the Age of Pushkin. The first third of the 19th century is the Golden Age of the Russian poetry and the amazing rise of the book art. Many famous artists and engravers were devotedly decorating and illustrating books at this period. For example, I.V. Chesky engraved the front pages of the first edition of 'Experience in Poetry and Prose' (1817) in two volumes by K.N. Batyushkov. He used the drawings of A.N. Olenin, the first head of the Public Library, a historian, archeologist and artist. As he pursued many hobbies with keen enthusiasm, Alexander I called him 'a master

of a thousand crafts'. The second edition of 'Writings' by K.N. Batyushkov (1834) was engraved by S.V. Galaktionov, a famous illustrator of many Pushkin's editions. An engraved front page shows a portrait of Batyushkov on a frontispiece from the drawing by O.A. Kiprensky and a vignette of a romantic landscape from a drawing by A.P. Bryullov. A.P. Bryullov, the elder brother of the famous artist, was more known as a portraitist (the author of a famous portrait of N.N. Goncharova) and an architect (he designed the buildings of the Guards Corps Staff on the Palace Square and the Mikhaylovsky Theatre, though, it was K.I. Rossi who designed its facades).

## ACCESS FOR EVERYONE

The project on digitisation of rare, unique and fragile heritage editions pursues several goals at once. Scientific community may increasingly benefit from easier access to the books, most of which are the only one of its kind and preserved in a single copy in the libraries of St Petersburg and Moscow. Today, we can view a rare book without having to travel to another city or even at home. The Internet provides round-the-clock access to the electronic collections of libraries. The paper books remaining on the library shelves, the digital books can serve both science and culture. This is how it extends the life of the paper editions. Therefore, digitisation of books substantially contributes to preserving cultural heritage.

## IMPORTANT DETAILS

Electronic version, apparently, lacks some features of a tangible book like paper properties, the type and characteristics of its cover, and so on. 'Of course, if the researcher is primarily interested in the content of the book, the electronic variant is more than enough. Though, someone else may need the book itself, for example, those studying the history of printing, typography, or the history of science. If that is the case, we give the reader the original of the digitised edition',





said Alexey Alexandrovich Savelyev, the head of 'The Rare Books and Manuscripts' department of the Gorky Research Library of SPbU.

Bibliographic support, therefore, plays a key role in implementing the projects on digitising early printed books. Digitising a rare book should be preceded by its study that gives a detailed scientific description of both the edition and its specific copy. 'The process of creating an e-copy, at least of an early printed book, must be like that of facsimile editions. The publication of facsimile editions presupposes that all their available copies had been inspected, so did the bibliographic descriptions of the books in authoritative central catalogues. Assumedly, it was quite a research work. Essentially, it was required in case if the researcher needs to know whether this copy is full, while another one lacks a portrait or engraving, or this copy, unlike others, features a foreword or dedication. Some researches do require this feature. This bibliographic component is essential even at the top speed of digitising', said Alexey Savelyev. The transition from print to electronic format, consequently, takes a long time to perform, and the digital libraries are rare occurrence in Russia so far. SPbU boasts quite a comprehensive digital collection.

#### DIGITISING

Creating digital copies of old editions is not only time-consuming, but also quite complicated. Indeed, it is desirable to copy printed book only once avoiding any undue mechanical and light exposure. Yet, occasional fragile stuck pages and ancient covers do not let open the book as scanning requires. Likewise, rubbed font and partial or complete loss of some pages make the task even more difficult. Despite all the difficulties, however, the librarians of 'The Rare Books and Manuscripts' department of the Gorky Research Library of SPbU strongly believe that the early printed and pre-Revolutionary editions need to be digitised to the greatest possible extent. As librarians hope, the enhanced technologies will make this process easier and faster in the course of time.

As Alexey Savelyev said, the library, owing to the digitisation hardware, can digitise several dozen editions per month to meet all the needs of the Library and its readers concerning electronic copying. The whole processing chain of digitising is equally time-consuming. 'My personal task is to provide bibliographic support for this process, including compiling lists of digitisation, selecting copies in the library, bibliographic description of titles, and so on',

#### IN BRIEF

##### THERE ARE TWO SCANNING MODES:

- Compulsory: copying pages as graphics, typically, raster images, by means of scanning or photographing followed by their processing and saving in one of the image file formats. This keeps the original book layout and eliminates errors. However, text fragment search and text fragment extraction for quoting, for example, become impossible.
- Optional: Optical Character Recognition (OCR) followed by saving the recognised text in one of the e-book formats, which enables full text search (F) across the book and massive e-book indexing. Yet, reproducing the original layout, images, diagrams, and formulas becomes more difficult, and recognition of errors is virtually inevitable. More recently, in particular with the advent of PDF and DjVu, a combined approach has become increasingly popular. The book text, in that case, is automatically recognised and put under the original raster images, which, therefore, makes it possible to combine the advantages of both modes.

WWW.LITPEDIA.RU

explained Alexey Savelyev. Besides, at the same time, they check the state of editions. If there appear to be ones that need 'treatment', this information is recorded, and later they are restored. Under the rules and regulation on coping with rare books and manuscripts, if the state of a rare edition is unsatisfactory or may worsen after digitising, scanning is not allowed.

In SPbU, it preserves the original layout, authentic font style and drawings. This eliminates text errors that may occur when using other methods of digitising books.

# Digitised, demesmerised: Book rarities becoming accessible

By **Svetlana Arkadyevna VORONKOVA**, deputy manager of the 'Library and Information' department catering for 'Medicine', 'Medical Technology', and 'Jurisprudence' of SPbU  
**Yekaterina Alexandrovna YATSUK**, head of the department of the Gorky Research Library catering for 'Jurisprudence'



'The Ostromir Gospel'. E-copy from the Presidential Library's collections. Original: Russian National Library

In 2010, the electronic reading room of the Boris Yeltsin Presidential Library opened in SPbU as the first project of its kind. Here, students can access the unique collections of documents, periodicals, and books, including those kept in the Gorky Research Library.

Information technology has integrated with all aspects of life in modern society, and libraries are no exception. Common practice worldwide is to complement traditional libraries with special electronic collections, or even comprehensive electronic libraries comprising e-copies of paper books. Such projects exist at the governmental level too, including 'The Digital library of the RSL', 'Docusera' of the Russian National Library, 'Gallica' of the National Library of France, electronic collections of the British Library, and so on. However, up until 2009, there had been no fully electronic national library. The first establishment like this appeared in Russia, and it was the Boris Yeltsin Presidential Library. Despite its digital environment, the Library has its quite tangible form, its 'home' in a historical building of Synod in St Petersburg. There is an electronic reading room equipped with computers providing full access to all collections. It also has a conference hall to hold scientific and training conferences, centres of digitising and storing digital data, and its own publishing and polygraphic facilities.

Today, the Presidential Library numbers about 370 thousand titles that a wide readership could hardly access earlier. About 122 thousand documents, which account for approximately 40 % of the entire stock, are available to the readers on the Library's site, while others can be accessed only in the electronic reading room. By the way, the Library has quite a few of them. Since 2010, it has been opening remote reading rooms in various establishments all over the world.

### THE FIRST OF ITS KIND

The first remote reading room opened only a year after the Presidential Library. At that time, it was a unique project for university students, postgraduates and teachers. The joint project of the University and the Presidential Library aimed, on the one hand, to provide the students with convenient access to information resources, and, on the other hand, to enlarge the stock of the Presidential Library taking into account students and teachers' research and study needs.

The electronic reading room of SPbU with access to the resources of the Presidential Library is located in Vasilyevsky Island, bld. 7, Line 22, where law students study. However, it welcomes all students who are interested in this electronic collection.

### UNIQUE COLLECTION

Indeed, the collection is unique. Its sources are two other national libraries of Russia, university

libraries, including SPbU Research Library, archives, and museums. The information resources of the Presidential Library comprise scientific and educational publications, maps, photo albums, video materials on the history, theory and practice of Russian statehood and Russian as the state language of the Russian Federation. The Presidential Library creates both thematic collections and collections dedicated to particular events and people. One of the recent projects is, for example, 'P.I. Tchaikovsky: The 175th anniversary'. It includes digital copies of the great composer's autographs, inscribed sheet music and photos, books and

articles about his life and work.

For the Year of Literature, the Library prepared 'Facts and images of the Russian history in the works by Russian writers'. This digital collection has more than 200 documents presenting the views of men of letters on the Russian history of the 16th – the early 20th centuries. In the centre of attention are the belles-lettres about the era of Ivan the Terrible and the Time of Troubles, the Patriotic War of 1812, and the sociopolitical situation in Russia in the 19th century.

Special collections of the Presidential Library are dedicated to the reforms of Alexander II: the Emancipation Reform of 1861, and the judicial reform of 1864. Of particular interest is a separate block of digital collections on the regions of Russia. The users interested in the history of St Petersburg can read the guides to memorable places and attractions, informational and visual materials, historical overviews of the city from its origin to the beginning of the

20th century. The materials selected, for example, in the Arkhangelsk Region present researches, statistical and archive documents that give an idea of the late 16th - the early 20th century administrative, socioeconomic, and ethnographic situation of the territory which is now part of the Arkhangelsk Region.

More than twenty collections concern the relations of Russia with other countries. Thus, users can find materials about Russia-China relations and cooperation, as well as editions and documents describing the socio-economic, administrative and demographic development of China. The great victory is commemorated in



The E-Reading Room at SPbU provides access to the collections of the Boris Yeltsin Presidential Library.

Library, including 'Governmental Authority' and 'Legal System'. These publications are mainly presented with Russian legal periodicals and series of 'Legal Gazette' (since 1860), 'Journal of the Ministry of Justice' (since 1859), 'Journal of Criminal and Civil Law', the Journal of the Law Society at Saint Petersburg Imperial University, and selection of newspapers like 'Saint Petersburg Senate Record', 'Law', 'Judicial Newspaper', 'Legal Newspaper'. The electronic copies of the journals and newspapers laid the foundations of the 'Legal Periodicals' section in the 'Legal system of Russia' collection and filled the collection of 'National Periodicals in the Presidential Library'.

Apart from the periodicals, a number of books have been digitised, including those written by the professors of Saint Petersburg Imperial University: Adolf Khristantovich Holmsten, rector of the University; Mikhail Gorchakov, protopriest, honored full professor of the University and corresponding member of Saint Petersburg Academy of Sciences; Pavel Isaevich Lublin, renowned expert in criminal proceedings, and others. The editions from the Scientific Library are easily identified with the mark 'Original kept in SPbU'.

Despite the large amount of information in the electronic environment, when it comes to publically available resources, high-quality scientific and educational resources are actually quite few. Undoubtedly, the Boris Yeltsin Presidential Library is one of these resources. Here everybody can find materials for the mind in science and education, and for the soul in broadening the horizons and raising the cultural level.

the collection which includes testimonies of combatants, archival documents, scientific publications, military operation maps, wartime newspapers, and a large number of documentaries and photos, including those made right at the front by the correspondents of the Telegraph Agency of the Soviet Union.

Among the publications accessed only from the computers in the electronic reading room there are 'Register Stamps in Ancient Rus of the 10th – 15th centuries. / V. L. Yanin' (1970), 'Atlas of Geographical Discoveries in Siberia and Northwestern America of the 17th and 18th centuries. / edited by A. V. Yefimov' (1964), 'The Diary of V. K. Kuchelbecker: materials on the history of Russian literary and social life of 10-40 of the 19th century' (1929), etc.

The collection of the Presidential Library mainly possesses the documents published before the first third of the 20th century. One of the eldest books in the library is 'The Ostromir Gospels' (1056 - 1057), the original being kept in the National Library of Russia. Novgorod posadnik Ostromir ordered to write this Gospel to deacon Gregory. The cooperation

of the Presidential Library with the Russian State Historical Archive and the State Archive of the Russian Federation developed into acquiring electronic copies of many archival documents, including the personal archives of Mikhail Speransky, Sergei Witte, Pyotr Stolypin and other prominent state and public figures of Russia.

The modern editions are primarily presented with dissertation abstracts on history, politology, sociology, philosophy, philology, jurisprudence, and economics. Besides, there are a number of textbooks on history, in particular.

### SPbU'S CONTRIBUTION

St Petersburg University also makes a great contribution to replenishment of the Presidential Library's collections. A number of the editions, mainly publications on law, kept in the Gorky Research Library were given to the Presidential Library for digitisation and later settled in its digital collections.

Since 2010 SPbU has given about 12,000 books and journals of the 19th - the beginning of the 20th centuries to be digitised. They have entered several collections of the Presidential

The electronic library of SPbU has digitised more than

1,100

volumes of pre-Revolutionary editions.

Digitisation of library collections started as far back as 2006.



# So Far, So Close

Just a couple of mouse clicks open access to the unique treasuries of global knowledge. It has been long since small wonder for the users of Gorky Research Library of St. Petersburg University.

**F**or some years now, rather than using the ever trusty Shanks's pony, we have been enjoying online access to electronic recourses, namely the University Library offers more

than 160 electronic resources to SPbU's employees, academic staff and students. Among the universities of our country, the University subscribes to the most comprehensive and highest quality electronic resources,

which can be compared to the best universities of the world. The electronic resources of the SPbU Research Library cover a wide range of subjects: from biology and medicine to art, from various information sources

(e.g. full-text books, journals, newspapers, dissertations, reports, etc.).

## WHERE TO BEGIN...

All information the user may require can be found in Library at <http://www.library.spbu.ru/>. The home page provides a single search interface for searching printed and electronic collections. To facilitate search across collections, there are various bookmarks. In Books, you can search the Library's electronic catalogue to get a printed edition in its stock. E-books searches for the electronic books available at SPbU (more than 155 thousand names). E-journals searches by electronic journals accessed by SPbU (more than 70 thousand names). Databases searches by the resources available for SPbU.

In Electronic Resources at <http://www.library.spbu.ru/er/>, there are links to the lists of the resources with various types of sources. In Help at <http://www.library.spbu.ru/help/>, Electronic Resources: How-To provides answers to a number of questions which may arise relating to search.

Since 1998 the preliminary search for printed books and journals has been available, even before visiting the Library, in Books and Journals where the electronic catalogue of the SPbU Research Library is allocated. Yet, bear in mind that the electronic catalogue includes the editions from 1995, but it is gradually expanding towards older editions. That is to say, if you have found the book in the electronic catalogue, it means it is definitely available in the Research Library. Conversely, its registry entry might not have been created yet. If so you have to search in the printed catalogue when physically in the Library. To this end, however, off campus access is also available – go to General Alphabet Catalogue at the site of the Library. This is a scanned service general alphabet catalogue dating from the time when the book collection of the University was firstly formed. Importantly, the scanned part of the catalogue comprises only editions in Russian.

## FACT

The Gorky Research Library of St. Petersburg State University numbers more than 6.9 million printed books and manuscripts and provides access to more than 100 thousand electronic resources, including academic journals, monographs, dissertations, thesis, reference books, etc.

The links leading to these sections are also duplicated on the homepage of the Library at the University's site. Another important link Catalogues of the Libraries is allocated in Electronic Resources. It gives access to the electronic catalogues of all the departments of the University's Library as well as to the catalogues of the largest Russian libraries and various librarian corporations.

## ...HOW TO FIND

All these recourses are open and free to all University students of all programmes and specialisations, irrespectively of their year of study. Electronic editions and catalogues can be accessed from any IP-address of the University network or if you are accessed to campus-wide Wi-Fi. Besides, the electronic resources have a world-wide reach from any computer around the globe 24/7. Login and password for individual access are given to all University's employees and students. For more information visit Help (<http://www.library.spbu.ru/help/>). Those who are registered as readers of the Research Library and issued a Full Electronic Library Card have their login as his/her surname and initials in Russian lower case of close print and the password as the bar code numbers on the face of the card. Yet, there is also another way how to log in – you can also use employee or student's single account created by the IT Service of SPbU. By the end of 2014, this option is supposed to have

substituted the Library Card. For detailed information on how to link to electronic resources from outside the University campus locations, visit <http://www.library.spbu.ru/help/ezpr.html>.

Materials of the electronic resources available at the SPbU Research Library can be downloaded and printed. Bear in mind, however, that the Library imposes strict regulations on downloading and printing (<http://www.library.spbu.ru/er/er.pdf>). In particular, it is usually not permitted to use files for any commercial purposes, copy an entire portion of publications and download large volumes of information by special software. In case of infringement, publishers may simply suspend SPbU's access to these resources.

**...AND WHAT TO SEE**

Among all the wealth of electronic services available through the library, the freshers should, first of all, pay their attention to some of them. For example, Databases features Browse by Subject, a list of resources by the main subjects created by the librarians on the initiative and with the help of the SPbU academic staff, that is primarily intended for students (<http://www.library.spbu.ru/er/eraz.html>). Thus, students can avoid long and tiring searching through all 160 electronic resources and confine their search to the lists of the resources recommended by academic staff for any given subject. Importantly, about 90% of the electronic resources access to which is given by the University Library are not available in Russian. Most of them are published in English and other, mainly European, languages. However, in Databases there is a link of Russian Electronic Resources ([http://cufts.library.spbu.ru/CRDB/SPBGU/browse/facets/name\\_regex/%5E\[%5Ea-z0-9\]](http://cufts.library.spbu.ru/CRDB/SPBGU/browse/facets/name_regex/%5E[%5Ea-z0-9])) with more than 10 electronic resources in Russian, including several electronic librarian systems, that are Russian platforms with textbooks in various branches of knowledge. In particular, these

are famous electronic librarian systems 'ibooks', 'Urait', 'Lan', and 'Studmedlib'. Primarily intended for students, these platforms are under continuous development to expand their digital collections.

Among the resources in English, there are a number of universal ones that can be of interest and use for students of absolutely different specialisations, as librarians of the SPbU Research Library said. For example, it is the Britannica, which is the most comprehensive and oldest universal encyclopedia in English and one of the most authoritative informational resources in the world. The electronic resources also include the Britannica Image Quest, a unique collection of more than 3 million high-quality images from the Britannica encyclopedia that can be used for presentation, report, coursework, or graduation thesis. Also, It has famous Oxford

atlas of human anatomy, which has more than 6,500 anatomical structures to be examined and studied in detail. Some years ago, this edition received the Queen's Award as the best 3D atlas of human anatomy in the world. In other words, SPbU is abundant in resources of that kind, not to mention unique publishing resources comprising academic journals and monographs of the world's leading publishers. Admittedly, even academic resources of this kind may be of interest to some of SPbU students from the very first day at the University.

**LET'S LEAF, LET'S CLICK**

Like most modern libraries of the world, SPbU Gorky Research Library regards printed stock and electronic resources as absolutely equal constituents. It may well be true that some never cross the threshold of the Library during



*The main book stock of the Library dates back to 1783, when Empress Catherine the Great gave 1,100 volumes from the collection of P.F. Zhukov, Russian bibliophile of XVIII century, to the first Russian Normal School.*

Language Dictionary Online, electronic English-Russian and Russian-English dictionaries that show definition of a word, example sentences, its idiom equivalents and translate it into other 11 languages. These resources can be logged on to from [http://cufts.library.spbu.ru/CRDB/SPBGU/browse/facets/resource\\_type/4](http://cufts.library.spbu.ru/CRDB/SPBGU/browse/facets/resource_type/4).

Of great interest to any students are resources on a particular field. For example, the subject index History has a link to History Online and History Study Center, a full-text complex resource for studying history that accumulates historical journals, reports, videos, and unique historical documents. Similarly, the section Biology features another high-quality recourse Primal Pictures, a detailed 3D

the years of study, rather use only the resources of remote access, as librarians say. Others, however, still recognize the full worth of the aura of library premises and unique smell of a printed book.

After all, the Library provides both printed editions and electronic resources which are also available right here in the specially-equipped rooms. The Library is equipped with computers, provides free Internet access and offer its visitors an opportunity to use their laptop or tablet (all reading rooms of the Library provides Wi-Fi service). Users happen to have absolutely different needs, and librarians take it in stride. Indeed, the task of the Library is to provide information in a way the user needs it and at convenient time and place.

# RUSSIAN AS A FOREIGN LANGUAGE PROGRAMMES

*St Petersburg University is one of the world's biggest centres providing teaching of Russian as a foreign language to international students.*

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Applicants are welcome **all year** round

Courses start every **Monday**

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- ✓ A diagnostic test at the end of each module.
- ✓ The course is designed for high school graduates, university and college students.
- ✓ It aims to improve the Russian language skills, develop confidence for everyday communication and expand knowledge of the Russian culture.
- ✓ This course is ideal for those looking to study at SPbU.

### RUSSIAN AS A FOREIGN LANGUAGE. SHORT TERM COURSE.

- ✓ The course lasts from 1 to 3 weeks.
- ✓ The course aims to help students enhance their Russian language proficiency, their listening and speaking skills.

### HOW TO APPLY

- 1** Fill in an application form online at [www.russian4foreigners.spbu.ru](http://www.russian4foreigners.spbu.ru)
- 2** Send a copy of your passport at [info@rlci.spbu.ru](mailto:info@rlci.spbu.ru)

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Fax: +7 (812) 327 79 88
- ✉ [info@rlci.spbu.ru](mailto:info@rlci.spbu.ru)
- @ [www.russian4foreigners.spbu.ru](http://www.russian4foreigners.spbu.ru)



## MAIN EDUCATIONAL POST-GRADUATE PROGRAMMES AT SPBU: FIELDS OF STUDY

- ➔ Physics and Mathematics
- ➔ Social Sciences
- ➔ Computer and Information Sciences
- ➔ Humanities
- ➔ Natural sciences, Medicine
- ➔ Art and Culture

## ➔ PROGRAMMES IN ENGLISH

Astronomy	Chemistry	Economics and Company Management
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### ACADEMIC STAFF

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25 resource centres	17 laboratories	6.8 mln of printed editions and manuscripts	More than 100 areas of expertise
Premises > 30,000 m <sup>2</sup>	9 research groups headed by the world's leading scientists and researchers		More than 2,000 expert reports and evaluations annually
Equipment and facilities > 6 bln roubles			2.4 mln of entries in the catalogue
Staff 293 engineers			

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