

## A man is known by the company he keeps

We continue the series of publications about the strategic partners of the Polytechnic University. As you remember 13 world leading universities are among the best friends of Polytech. We do benchmarking according to their performance, exchange experience, conduct joint research and invite students and teachers to strengthen cultural and scientific communication.



Graz University of Technology (German: Technische Universität Graz; TU Graz) became a strategic partner of Polytech in 2013. However, joint projects, academic exchanges and scientific research (R&D) started much earlier. To some extent TU Graz and SPbPU were at the forefront of establishing collaboration between Russian and Austrian higher education. This article is to provide you with more details about the history of cooperation between Polytech and TU Graz, common technical language and implemented projects, about passion for science and love for speed.

### **SCIENCE. PASSION. TECHNOLOGY**

This is slogan of TU Graz. The slogan is explained by the fact that students and

university staff are united by a passion for sciences and technology. Strong relations between fundamental and applied sciences make TU Graz the leading university in Austria for cooperation with business and industry.



University was founded by Archduke Johann in 1811 in the city of Graz - capital of the federal state Styria. Graz is considered to be a real student city, since a fifth of its population are students. Core areas of studies in TU Graz are mechanical engineering, electrical and power engineering, biotechnology and civil engineering. The university focuses on research-oriented Master's and PhD programs, which are very much in demand internationally.

Notable alumni can also tell a lot about the university: TU Graz was an alma mater for the world-famous scientist Nikola TESLA, Nobel laureate in chemistry Richard Zsigmondy, one of the founders of soil mechanics Karl von TERZAGHI and many others. Now the university is among the ten best universities in Europe. International cooperation is one of the key activities of the university, since serious research requires talented scientists, ambitious ideas and numerous infrastructure, human and financial resources. The university underlines that innovation needs cooperation.

### **The first to establish collaboration**

Graz University of Technology was the first Austrian university to sign a contract with a Soviet higher educational institution - the Polytechnic University, called the

Kalinin Politechnical Institute at that time. The contract was signed in 1985 and joint projects in the field of electrical engineering and information technologies started at that point. In the laboratories of TU Graz, the representatives of the Electro-Mechanical Faculty (now the Institute of Energy and Transport Systems) together with their Austrian counterparts conducted research on the calculation of electrical and electronic devices. As well scientists of the Faculty of Technical Cybernetics (now the Institute of Computer Science and Technology) were engaged in the development of measuring instruments. Over time, the sphere of joint collaboration has expanded from power engineering and informational technology to civil engineering, mechanics, material sciences, etc.



To raise educational and scientific links to a significantly new level, in September 2012 the Polytechnic University signed a framework agreement on cooperation with TU Graz. Then the Rector of the Austrian university Harald KAINZ underlined the following: "We speak the same language - technical language. Therefore, we can develop joint research and implement joint educational programs."

One year later, in September 2013, delegation from SPbPU headed by the Rector, Academician of the Russian Academy of Sciences, Andrey Rudskoy visited Graz. During the visit an agreement on Strategic Partnership was signed. According to SPbPU Rector: "This document is aimed at developing academic, scientific and cultural cooperation between our universities," Andrey Rudskoy as well stressed the need for organizing and holding scientific seminars and conferences, publishing

articles in scientific journals, and enhancing academic mobility.

### **From something on mind to something in kind**

Signing of a framework agreement on cooperation, as well as a Strategic Partnership agreement, has boosted the launch of new large-scale projects. So, it was decided to establish a Research Center for technological design and transmission (R&D Center) between SPbPU, TU Graz, JSC Zvezda and AVL List GmbH - the world's largest company for design of power plants, cars and tractors, and test equipment. The agreement was signed in Smolny in the presence of the Governor of St. Petersburg, Georgiy POLTAVCHENKO.



The priority areas of the Center are the following: students and young professionals training, applied research, as well as commercialization and transfer of scientific discoveries for manufacturing. The Director for CIS programmes of AVL List GmbH Joseph MAYER commented the inauguration of the Centre: "All the innovative directions necessary cannot be covered by the forces of one company; this is why cooperation with universities is especially important. This would allow getting well-educated staff. At the same time all the technologies developed at the universities can be applicable to various fields - from internal combustion engines to electric cars. "



A number of scientific seminars have been held on these topics; moreover, research in the field of laser and welding technologies had become a joint interest. SPbPU specialists took part in conferences on welding processes modeling at research complexes Gleeble. Also they took part in the 10th International Seminar "Numerical Analysis of Weldability " that was held at TU Graz.

### **Visits exchange**

Establishment of effective collaboration is impossible without knowing partner universities infrastructure and personal links with scientists and researchers. It is necessary to get into university's scientific and cultural environment. In this regard, on a regular basis, representatives of TU Graz visit SPbPU, and vice versa.



In 2014 SPbPU delegation headed by the Vice-Rector for International Relations, Dmitry ARSENYEV visited Graz University of Technology. In the framework of the visit partners discussed internationalization of both universities, including academic mobility, joint master degree programs, joint scientific research etc. Rector of TU Graz Harald KAINZ called this interaction "science without borders" and emphasized the importance of strongly developed relations between SPbPU scientists and researchers from TU Graz that may contribute to joint research projects, students' mobility and new educational programs launch.

The next year delegation headed by Rector Harald KAIN arrived to St. Petersburg to participate in the seminar "Effective development of strategic partnership between SPbPU and TU Graz". Within the framework of the round table, colleagues discussed students' mobility, joint double degree programs, joint research projects and joint summer and winter schools. For example, the Director of the Institute of Experimental Physics TU Graz Wolfgang Ernst is a visiting professor within the Summer Polytechnic Schools in the field of "Space Technologies".



In 2016, delegations of the Institute of Physics, Nanotechnology and Telecommunications and students of the Institute of Computer Science and Technology visited the laboratories of TU Graz. As a result of the visit, representatives of the Institute of Physics, Nanotechnology and Telecommunications decided to conduct joint research with the Laboratory of Electronic Microscopy and Nanoanalysis. Professors of TU Graz expressed their interest in the work of the department "Quantum Electronics" in the field of nanoparticles in polydisperse solutions and diagnostics of surface structures by optical methods. Meanwhile Master's Degree students of the Institute of Computer Science and Technology discussed with Austrian students technologies of the "smart" house and visited the laboratories of TU Graz. "It was very interesting! We've tested virtual reality glasses, an intuitive maintenance system for coffee machine and studied how to use the Latin alphabet with the help of tactile associations," - shared her emotions Aigul Batyrova, student of the Institute of Computer Science and Technology.



Not so long ago, during this summer, representatives of the international department of TU Graz Barbara BEOTTGER and Birgit BAUSHTTEDTER, as well as Professor Wolfgang ERNST visited laboratories of the Institute of Computer Science and Technology. SPbPU students presented their ideas and projects in modeling, robototronics, facial recognition system, etc. And at the Institute of Physics and Technology, Professor Wolfgang ERNST and his Russian colleagues discussed the issues of joint cooperation, and gave special consideration to two areas: researches of different materials and fractions; and also spectroscopy.

### **Speed racing and encores**

Cooperation between our universities is not limited by strict rules of academic higher education. There is always place for youth projects and cultural initiatives. Yevgeny ZAKHLEBAYEV, Deputy Director of Polytech NCM, visited TU Graz when he was fifth-year student of the Institute of Energy and Transport Systems. During the visit he discussed with students of TU Graz design of a racing car and participation in youth competitions "Formula Student". Austrian students have a great experience in this field – racing team in TU Graz has existed already for over 10 years.





One year later Polytech NCM team designed the first in the North-West student racing car of the "Formula Student" series, which was later considered to be one of the best in Russia. The team of Polytech proudly presented racing car to the Rector Harald KAINZ. He even got into the car and appreciated its technical conditions. Now the members of Polytech NCM met a new challenge: in the framework of the "Polytech Solar" project students create solar energy car.



It's not a secret that Austria is a home for many famous composers, whose names are familiar to us since our childhood - Mozart, Schubert, Liszt, Strauss etc. And it was Austria that for the first time held the World Choir Games under the patronage of the President of the country. Traditions of choir singing are strong at the Polytechnic University, therefore, at the stage of signing the cooperation agreement, one of the points of joint activity was to conduct tours and organize performances by the performance teams of both universities. In 2014, the youth choir "Polyhymnia" and the student team of folk instruments gave a concert at TU Graz. Performance of polytechnics caused a storm of applause. For those who did not have enough space in the hall, "Polygymnia" sang an encore on the main staircase and in the foyer of the University. The White Hall of SPbPU, in turn, hosted the University Orchestra of Graz. The performance was attended by the Vice-Governor of Graz Martin SCHRÖCK, as well as representatives of the Government and the Legislative Assembly of St. Petersburg.



## **This is not the end**

2019 will be the year of Russian-Austrian youth exchanges. In this regard, within the Forum of the European Association for International Education (EAIE), which was held in Seville in September this year, representatives of the international offices of SPbPU and TU Graz discussed the opportunity to hold joint International Youth Forum.

"We have a lot of projects and ideas, and we will actively bring them to life," SPbPU Rector Andrey I. Rudskoy, underlined at the meeting with Harald KAINZ.

"International cooperation, especially with our strategic partner, allows us to expand and transfer the latest achievements not only of our researchers but as well of world science, and this is a priority condition for the high quality of education."

Дата публикации: 2017.10.16

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