

Team total: five international grants on Polytech's account

Participation of SPbPU in international projects can be featured as a particular subject of pride. In the first half of 2017 Polytech has added up several resounding victories to its collection, and this is a great success.



Dmitry ARSENIYEV, Vice-Rector for International Relations commented: 'International project activity is an issue of a particular interest for the International Office which has been under peculiar focus for the recent years. One must have project-based competences, maintain contacts with an extensive network of partner universities, and perform monitoring of international funds and programs on a regular basis to successfully participate in fundraising on the international arena. It is equally important to analyze expert assessments and conclusions so that in the future, in close collaboration with SPbPU research, groups it could be possible to improve the quality of future projects and foster chances for success. Over the past three years, the number of applications for international project activities submitted by SPbPU has increased dramatically; the number of winning projects is also encouraging".

Together with partners from the Institute of Technology of Madras (IITM), within

the framework of the Russian Foundation for Basic Research competition, Polytech's team won with the project "Development and featuring of novel materials for capacitor-based storage devices ". The objective of the project is to create new dielectric materials for use in capacitor-based storage devices and identify fundamental microscopic mechanisms that produce impact on their significant properties to be used in practice at high temperatures. The main category of such materials is antiferroelectric crystals and ceramics, which store and release energy due to field-induced phase transitions between polar and nonpolar structures. In the course of the project, the most recent methods of synthesizing ceramics based on polymer precursors and the most informative methods for studying structure and microscopic processes based on X-ray scattering in single crystals will be used. The project will be implemented on the basis of the Department of Physical Electronics of the Institute of Physics, Nanotechnology and Telecommunications in 2017-2019 by the research team leader who is the head of the academic department, Professor Alexey PHILIMONOV.

Another successful bilateral application for the competition under the Federal Program 'Research and Development' was prepared by the Polytechnic University in cooperation with Indian colleagues from the Institute of Technology of Bombay (IITB). The competition is co-funded by the Ministry of Education and Science of Russia and the Ministry of Science and Technology of India. The project entitled 'Technologies and Toolset to Positively Control Manufacturing Sectors regarding Internet of Things' will be implemented in 2017-2019 by the team of researchers at the Higher School of Software Engineering of the Institute of Computer Science and Technology under the supervision of Prof. Vsievolod KOTLYAROV. The determinative trend for future goods and services manufacturing is the use of the Internet networks with network-centric command and control. Such an approach is undoubtedly promising provided that complex intellectual network-centric systems are highly reliable with efficient operation. At present, this problem is a fundamental one, therefore the study of the theory, development of technology and a prototype for a software package to provide a standard solution for creating reliable and efficient manufacturing sectors regarding the Internet of things is an issue of a particular concern of the research group's work within the framework of the grant.



The long-term cooperation between SPbPU and the Technical University of Hamburg (TUHH) has successfully gathered momentum. Ecology, biotechnology and Life Science have always been one of the key areas of Polytech partnership with German colleagues. For instance, the large joint scientific projects in the field of solid household waste processing performed in the course of the EU framework programs some years ago. In 2017, a new international project of SPbPU and TUHH 'Development and implementation of innovative bio-technologies to process microalgae *Chlorella sorokiniana* and duckweed *Lemna minor* (ABiRe)' gained financial support. SPbPU is represented by the Higher School of Biotechnology and Food Technologies. The head of the scientific group of researchers is Prof. Natalia POLITAYEVA, Deputy Director of the Higher School of Biotechnology and Food Technologies. The project is assumed for three years and requires a significant amount of theoretical and experimental research to be performed.

The team of the Graduate School of Industrial Management and Economics has won in the competition among projects under the Interreg Baltic Sea Region program which can be considered as the most significant achievement of Polytech. The international project AREA21 'Baltic Smart City Areas for the 21st Century' will be implemented by a representative European consortium, which brings together more than 30 major and associated partners - universities, municipal and regional organizations, industrial and technological companies from Germany, Finland, Sweden, Estonia, Russia, Denmark and Poland. The scientific team of the Polytechnic University to participate in the project is headed by prof. Valery

LEVENTSOV, director of the Graduate School of Industrial Management and Economics. The AREA 21 project is aimed at harmonizing approaches to improve energy efficiency of cities in the Baltic Sea region by developing and implementing new approaches and tools for cooperation and energy planning at the level of urban regions. The local and regional authorities of the nine Baltic Sea regions, including St. Petersburg, will work with residents, building owners and users, and energy companies to promote structural and behavioral changes at the city level for the benefit of energy efficiency.

And, finally, recently, the Polytechnic University has received an official confirmation that the application for a major international project within the framework of the South-East Finland – Russia Cross-Border Cooperation Program has been accepted. The application 'Energy-efficient systems based on renewable energy for Arctic conditions (EFREA)' was filed in a consortium with long-time SPbPU partners - Lappeenranta University of Technology and Research Institute of construction materials 'Prometheus'. The project aims to research and disseminate knowledge in the field of renewable energy production in the Arctic region and develop guidelines, recommendations and training materials on implementation of lightweight, non-volatile, reliable, environment- friendly and cost-effective structures with enough capacity to operate at extreme temperatures emerging in the Arctic and other isolated regions.

In the course of the project implementation, the team of researchers will carry out an assessment of the feasibility and applicability of the use of new high-strength materials and modern welding methods to create positive designs for production of renewable energy. SPbPU will be represented by a research group under the guidance of Prof. Sergey PARSHIN. And another part of the Polytech team is a research group, headed by Prof. Viktor ELISTRATOV, director of REC "Renewable Energy Technologies", will be engaged in calculations, modeling and development of a renewable energy system that will contribute to the safety and reliability of facilities, improve the energy transmission system and reduce the environmental impact in the Arctic region.

'Due to the example of this successful application we can see how important it is to efficiently coordinate and manage team project work at the stage of preliminary preparation. The project involved several research groups of the Polytechnic University, and the International Office had a key task to unite all the performers in one project and take into account the interests of each unit in achieving integrated global goals. It took us about a year to get this project ready. Several working meetings of the consortium and project sessions were required to arrange everything in a proper way. As a result, it was possible to achieve a balanced work plan, distribute the project road map among all partners, taking into account the competencies, experience and capabilities of each member. It is very encouraging to see that our work has been appreciated by the European experts,' - says Ekaterina BELYAEVSKAYA, the Head of the International Academic Cooperation Department, the coordinator of the project EFREA.

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