

International Students Project Marathon was "put to the test" by the coronavirus pandemic

During the coronavirus pandemic, the [International Students Project Marathon](#) opened up a new perspective. In addition to its original goal - to unite science, education, and project activities - another one was added: to create opportunities for virtual mobility, which in 2020 and 2021 remains almost the only way to acquire new competencies and international experience. One of the brightest examples of productive international cooperation within the marathon is SPbPU's interaction with Spanish universities - Technical University of Madrid (UPM) and the University of Cadiz. For almost a year, Russian-Spanish teams have been working together on projects in materials science and humanities.



Teams from SPbPU and Technical University of Madrid are working on two projects. The team from UPM is researching and developing a multiscale model of the metal-polymer composite, which in the future will help to reproduce both the behavior of the material and the interaction of its components during operation in static and dynamic mode. Students and postgraduate students have already analyzed and limited the scope of application of existing models, selected software, and developed a preliminary version of the model, both for the final

composite with different numbers of metal and polymer layers and the inter-structural interaction within it at the micro- and nano level. Optimization of parameters, verification, and improvement of the obtained result are yet to come.

“Composite materials are now becoming increasingly important in many fields. This topic attracted us from the very beginning - thanks to the fact that participants from two universities are working on the project, we have perfect opportunities. The use of simulation makes it possible to predict the behavior of composite materials with different structures and compositions, reducing the time and cost of experimental research. This has significant advantages for the industrial sector,” said Professor Juan Manuel Muñoz GUIJOSA, the project supervisor from the UPM.

A team from SPbPU is experimentally developing the composition and structure of composite metal-polymer sandwich panels. These materials consist of alternating layers of aluminum and polymer. Such sandwich panels containing thermoplastic elastomers as a polymer interlayer can be recycled without destroying them. Structures made of them are strong and weigh much less than made of metal materials.

“The problem of weight reduction with preservation of mechanical strength is especially actual for modern cars, airplanes, ships, trains,” notes Ekaterina VASILYEVA, the project supervisor from SPbPU side, *“but the key aspect of metal-polymer composites application, besides weight, is the mechanism of their destruction. The cracks in the composites spread not deep into the material but run along the metal-polymer interface that allows keeping the general integrity of the construction. It is fundamentally essential since the main cause of the destruction of structural materials are fatigue cracks due to the constant vibration and impact loads, which occur during the movement of trains and cars and are transmitted to the body of those.”*

As of today, the team of Technical University of Madrid is modeling the variants of the composite structure to achieve the required properties, using the experimental data developed by the SPbPU scientists for calculation. The project team has ahead of it the continuation of the work on creating solutions for composites that will effectively dampen vibrations of different nature with minimal damage during the long-term operation.

Teams from Polytechnic University and the University of Cadiz are working on projects that focus on linguistic and cultural aspects. For example, one of the teams is studying the development of socio-cultural competence in teaching Russian as a foreign language. *“Since learning a language implies immersion in the culture of the people to whom that very language belongs, in the system of their worldview and values, the study and development of socio-cultural competence are very important. We believe that our research will allow us to develop a system of tasks and exercises that can be used in Russian language lessons with foreign students. This way, students interested in learning Russian will also be able to know more about the culture and social aspects of life in Russia,”* says Elena Tokareva, SPbPU project coordinator, an assistant at Higher School of Engineering

Pedagogy, Psychology and Applied Linguistics. Participants have already analyzed existing research on the topic of the project and identified types of exercises and assignments. *"We took into account such factors as the age of students, their sphere of interest, level of language proficiency, and the degree of study of lexical and grammatical material. For example, texts of youth magazines are most suitable for work at the 'advanced' level of training, and acquaintance with the literature, which reflects the character of Russian heroes and problems within a person, will be relevant at the initial stage of training,"* said Elena TOKAREVA. Soon, the project participants plan to test the developed tools and evaluate the results.

Another project of SPbPU and the University of Cadiz has a broad title: *"Russian-Spanish Translation: Technique and Error Analysis."* As part of the project, participants are engaged in translating journalistic articles and compiling a database of completed translations. *"Since we are non-native speakers, and Spanish is our second foreign language, of course, our translations are not perfect for a native speaker's ear, which provides grounds for research,"* says Ekaterina SHOSTAK, senior lecturer at the Institute of Humanities, SPbPU project supervisor, *"In this project, we want to identify what mistakes beginner translators make most often, how to evaluate the quality of student translations, what recommendations can be given for translating journalistic articles into Spanish. These are the main aspects we are trying to address in our research. Currently, the translation bank is in the review process at the University of Cadiz. In the future, the participants plan to analyze errors, collect statistics and draw conclusions not only in the form of a joint scientific article but also in the format of practical recommendations for the translation of similar texts from Russian into Spanish."*

"We can say that the Students Project Marathon has been 'put to the test' by the coronavirus pandemic. We received strong support from our foreign colleagues and partners - universities in Spain, Austria, Brazil, and other countries. The past year has shown that the marathon can adapt to almost any format of interaction without losing effectiveness," commented Lana KALIKINA, coordinator of the Students Project Marathon.

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