



Peter the Great St. Petersburg Polytechnic University and the Technical University of Madrid discussed an international student project marathon 2020

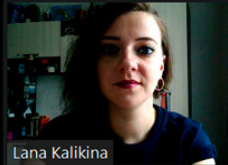
Online Student Project Marathon - is it possible? This was not only one issue discussed by the teams of SPbPU and the Technical University of Madrid (UMP, Spain) at a recent video conference. SPbPU representatives were Associate Professor of the Higher School of Physics, Materials and Technology (SPbPU Institute of Metallurgy, Mechanical Engineering and Transport) Ekaterina VASILIEVA and regional coordinator of cooperation with Ibero-American partners Svetlana KALIKINA. The Polytechnic of Madrid was represented by the Professor of the Mechanical Engineering Department, Director of Composites and Nanocomposites Lab Juan Manuel MUNOZ-GUIJOSA.

A little over a year has passed since the launch of the first international student project marathon. During this short time, it caused considerable interest from SPbPU foreign partners. The Technical University of Madrid is one of the potential participants in the following marathon, that SPbPU is planning to launch in cooperation with partners plans in the coming months. The only question is - what the format should be?

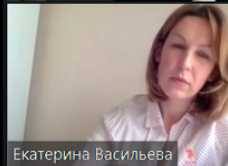


Composite machines and machine elements






Lana Kalikina



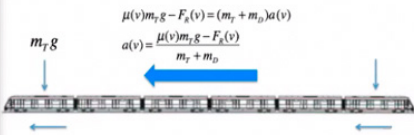
Екатерина Васильева




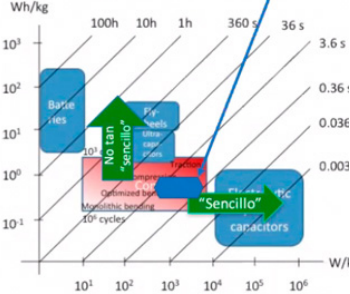
Juanma

Low weight, low volume, low cost train acceleration system ()(8)**

$$\mu(v)m_T g - F_x(v) = (m_T + m_D)a(v)$$

$$a(v) = \frac{\mu(v)m_T g - F_x(v)}{m_T + m_D}$$




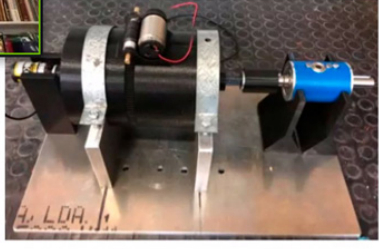


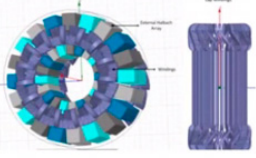
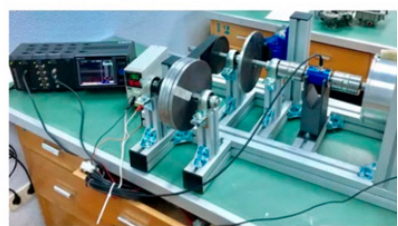
$F_{T,max}(v) = \mu(v)m_T g$
175kg compact springs at each wheel allow for the fulfillment of acceleration requisites up to 40 and 60 km/h, at similar cost and 50% weight with regard to alternative solutions



división de ingeniería de materiales

Estamos aquí

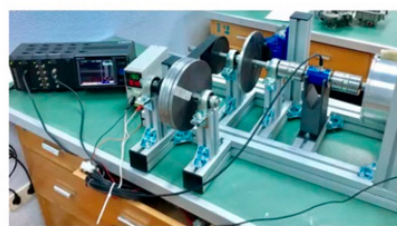
Variable stiffness joints for transport, robotics and machinery suspension ()**



ETH zürich Mechanical energy storage and power management



“The goal of an international marathon is to gain experience in international groups, the opportunity to work in foreign laboratories and research centers, as well as to use your experience in the industry. We have no problems switching to remote mode - the previous participants did a great job online. The problem is that for the checking tasks they met in person, talked with professors and supervisors, and conducted experiments. But the coronavirus pandemic made adjustments to this process, and in an extremely short time we need to coordinate the changes and make sure that they will not affect the value and information content of the marathon, ” Svetlana KALIKINA, one of the coordinators of the marathon, commented.

Professor Juan Manuel MUNOZ-GUIJOSA agreed with his Russian colleagues that today's realities require instant changes. The laboratory work of the Professor takes place in close contact with the industry. Industrial partners include Talgo, General Electrics, IBERDROLA, Respol. And since 2014, a graduate program has been launched at the UMP School of Industrial Engineering, based on the CDIO methodology, called INGENIA (from the Spanish verb “ingeniar” - the development of ingenious solutions). During the program, students carry out the full implementation of their product, including production and testing. Professor MUNOZ-GUIJOSA emphasized that the mechanism for implementing the CDIO course is similar to the mechanism of the Student Project Marathon.

“We are ready to participate in the International Student Project Marathon. I believe that with all the current changes, we will be able to start in the fall of 2020,” Professor MUNOZ-GUIJOSA underlined. He outlined the theme of the project: “Product Development”.

Associate Professor Ekaterina VASILIEVA expressed confidence that SPbPU and UMP will be able to build long-term cooperation in the field of metal-polymer and carbon nanocomposites and in the field of joint research, and in the process of training students in engineering, and also begin to work closely with the railway company Talgo. The representatives of this company [have already visited SPbPU](#), and they were interested in the research results of the Polytechnic University scientists. Ekaterina VASILIEVA also emphasized that the laboratories and specialists of the Polytechnic University have the necessary equipment and experience in the field of nanopowder synthesis methods, experimental creation of metal-polymer laminates and nanocomposite materials, and interaction with colleagues from the UMP Composites Laboratory and the Laboratory of Machines and Mechanisms will contribute to comprehensive experiments and calculations for vibration and mechanical stability, tribological and electrical properties. It will help evaluate the influence of the composition and structure of composite materials on transfer properties from nano to macro level, as well as find and expand the scope of a new generation of composites use in accordance with the requirements of European companies.

“I am sure that thanks to the Student Project Marathon, we will be able not only to engage students and graduate students of the Higher School of Physics, Materials and Technology, but also to increase the level of students research qualification work, motivation and interest in their topic,” Ekaterina VASILIEVA commented.

The parties agreed that in the current conditions it is extremely important not to waste time and work out the topics for joint projects, to establish new interaction in terms of information exchange and synergy of the available results. In the nearest future we will tell about the other foreign participants of the International Student Project Marathon - stay up-to-date!

Prepared by SPbPU International Office. Text: Olga DOROFEEVA

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