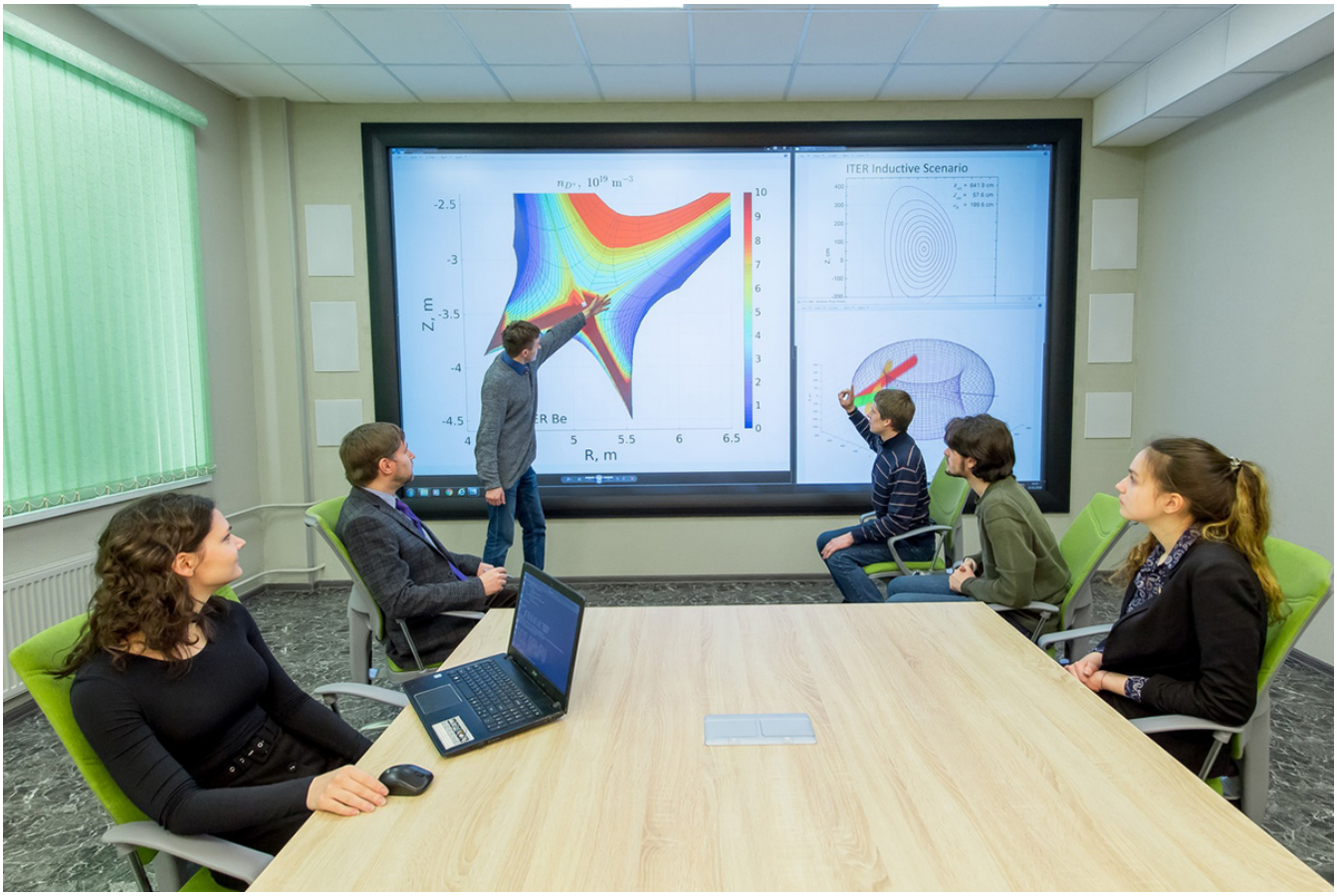
Advances and Applications in Plasma Physics - the first Nature conference in Russia

An international scientific conference entitled “Advances and Applications in Plasma Physics” guided by the world’s famous publisher Nature Research for the first time in Russia will take place during September 18-20, 2019. The main organizer is Peter the Great St Petersburg Polytechnic University in collaboration with editors of Nature Physics, Nature Communications and Nature Reviews Physics.

The meeting will bring together experts and young scientists from various plasma subfields, including nuclear fusion; low-temperature plasmas; astrophysical plasmas; laser-plasma interactions. In spite of tremendous progress over the past decades in understanding plasmas, there are many challenges that still confront plasma physicists, especially when it comes to the design and development of potential applications.

Presentations will be made by representatives of the International Atomic Energy Agency (IAEA), Rosatom, ITER, Space Research Institute of the Russian Academy of Sciences, etc.



Russia’s pioneering role in plasma research is indisputable: it was Igor Tamm and Andrei Sakharov who laid down the theoretical foundations for the tokamak, a device with magnetic plasma confinement. As member of ITER, Russia is currently participating in the construction of the tokamak-type International Thermonuclear Experimental Reactor in France.

In 2018 Professor Vladimir Rozhansky, Head of Laboratory of Controlled Thermonuclear Fusion at Peter the Great St. Petersburg Polytechnic University (SPbPU) became a member of the ITER Science and Technology Advisory Committee.

“Researchers at the Polytechnic University created a numerical code for modeling the parameters of near-wall plasma of tokamaks. The developed code was adopted as the main one at ITER in 2017, it is called SOLPS-ITER,” mentioned Professor Vladimir Rozhansky. This code is recommended for all researchers who are involved in controlled synthesis for modeling the near-wall plasma of tokamak.

A controlled thermonuclear reaction with the so-called positive output should be obtained on the ITER tokamak for the first time. This means that the energy released during the reaction is greater than or at least equal to the cost of heating the plasma in the reactor. It is necessary to reach the temperature of more than 100 million degrees! It is planned that the first plasma at ITER will be obtained by the end of 2025.

It is no wonder, according to Professor Rozhansky, that Nature has chosen the Polytechnic University as the venue for this conference. Polytechnic University’s researchers are renowned for their simulation studies on the tokamak reactor and for the diagnostics methods developed for ITER. Moreover, the university annually hosts a joint summer school on Plasma Physics and Controlled Fusion in collaboration with the School of Physical Sciences of SOKENDAI (the Graduate University for Advanced Studies, Hayama, Japan) and the National Institute for Fusion Science (Tokyo, Japan).

“By combining the world's leading achievements in plasma physics and controlled thermonuclear fusion, this conference entirely falls into the context of the actively discussed Russian national program on controlled thermonuclear fusion. The Russian ITER Domestic Agency is responsible for fulfilling our obligations in the framework of ITER international project, the most ambitious scientific and technical project of our time. And we are glad to have an opportunity to share our accomplishments, our experience with the international community at the conference at St. Petersburg Polytechnic University,” said Anatoly Krasilnikov, Director of the Institution “ITER Project Center”.

The conference aims to provide a platform for the exchange of recent results between plasma scientists working on different plasma-related research topics, to stimulate further breakthroughs in fundamental understanding and advances towards new applications in this fascinating field of research. The meeting will bring together experts and young scientists from various plasma subfields, including nuclear fusion, astrophysical plasmas, industrial plasmas, dusty plasmas and laser–plasma interactions. The conference will provide opportunities for discussions on key problems of controlled nuclear fusion and Russian thermonuclear program.

“We’re delighted to have SPbPU as our partner for our very first Nature Conference in Russia”, says Bart Verberck, Regional Executive Editor for Nature Research. *“We’ve seen many initiatives being launched to boost the already*

impressive scientific research activities in the country even more, some with involvement of Springer Nature, the publisher of the Nature Research portfolio. I'm particularly pleased that the topic of our first joint conference is plasma physics, given Russia's rich history and expertise on the topic. Judging by how the collaboration with SPbPU has been going so far, I'm convinced the conference will be a great success."

Venue:

Peter the Great St. Petersburg Polytechnic University, New Academic Building, Polytechnicheskaya str., 29

Organizers:

- Peter the Great St. Petersburg Polytechnic University
- Nature Physics
- Nature Reviews Physics
- Nature Communications
- Ioffe Institute

Website: http://aapp.spbstu.ru/

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