World of MEPhI

December’ 16

DEAR PROFESSORS, LECTURERS, POSTGRADUATES, STUDENTS, AND EMPLOYEES OF MEPhI!

PLEASE ACCEPT MY SINCERE CONGRATULATIONS ON THE UPCOMING HOLIDAYS, NEW YEAR AND CHRISTMAS!

A YEAR, FULL OF RESPONSIBLE TASKS AND IMPORTANT RESULTS, IS COMING TO AN END. OUR WORK HAS BEEN REFLECTED IN NATIONAL AND WORLD RANKINGS, WHICH STRENGTHENED MEPHI’S POSITIONS IN RUSSIAN EDUCATIONAL SYSTEM, CONFIRMED WORTHY UNIVERSITY’S REPRESENTATION IN GLOBAL SCIENTIFIC-EDUCATIONAL COMMUNITY.

YOU ARE CAPABLE OF LARGE-SCALE PROJECTS OF HIGH IMPORTANCE. DAILY UNIVERSITY’S LIFE INCLUDES STRATEGIC SESSIONS AND MANY OTHER EVENTS, AIMED AT WORKING OUT THE MOST AMBITIOUS STRATEGY OF MEPHI DEVELOPMENT. WE HAVE STARTED THE DEVELOPMENT OF UNIVERSITY STRUCTURE ON THE BASIS OF STRATEGIC ACADEMIC UNITS, WHICH WILL REALIZE TRADITIONAL MEPHI ADVANTAGES WITH MAXIMUM EFFICIENCY AND PROVIDE NEW PROSPECTS OF DEVELOPMENT IN COORDINATION WITH WORLD CHALLENGES.

I WOULD LIKE TO THANK EVERYONE, WHO HAS WORKED SELFLESSLY TO MULTIPLY MEPHI ACHIEVEMENTS. LET 2017 BE EQUALLY RICH FOR CREATIVE IDEAS AND PROFESSIONAL SUCCESS. LET EACH OF YOU HAVE LOYAL FRIENDSHIP, SINCERE LOVE, AND LUCK. HEALTH AND WELL-BEING TO YOU AND YOUR FAMILIES!

HAPPY NEW YEAR, DEAR COLLEAGUES!

MEPHI RECTOR
M.N.STRIKHANOV

HAPPY NEW YEAR!

MEPHI IS THE FIRST AMONG ENGINEERING UNIVERSITIES OF COUNTRY

On December, 15 the project «Social Navigator» in cooperation with the Center for the study of the labor market has presented the results of the second «Ranking of demand for higher education institutions in the Russian Federation», which was based on the data from 82 subjects of the Russian Federation.

The main directions of evaluation of higher education institutions, considered in the ranking, remained as in the past year: employers' demand for trained specialists, commercialization of intellectual products, produced by the university, and academic relevance of the organization's scientific product.

MEPhI has become the leader among engineering institutions (technical universities). According to the ranking, the proportion of MEPhI graduates with job placement is 87%, and the share of funds from the commercialization of intellectual products is 32.2%, i-index of the citation of yees is 39%.

MEPhI is the only University that demonstrated growth in all three indicators.

RUSSIA TO CREATE ALLIANCE OF TRANSLATIONAL MEDICINE

The agreement about creation of the Alliance of Translational Medicine (ATM) was signed on December, 20 in MEPhI.

The main objective of the union is to accelerate the introduction of the most advanced achievements of modern fundamental science into practical health care. The alliance includes MEPhI, Lobachevsky State University of Nizhni Novgorod, National Research Tomsk State University and the Center for Strategic Research "North-West" Foundation.

"Despite very significant achievements of modern biomedical research, the degree of their results' implementation in everyday clinical practice is not sufficient," said MEPhI rector Mikhail Strikhanov. According to him, the task of translational medicine is to reduce and, ideally, eliminate the gap between cutting-edge scientific research and practical health care.

"We want the most advanced fundamental research and development to turn as soon as possible into new medical drugs and clinical technology, available to doctors and patients," he explained.

In order to achieve the stated objectives, the participants of the alliance suggested to join forces in accelerated drug development. It is planned, in particular, to develop and use an integrated database of biomarkers to create a patient monitoring system during first medicine tests, as well as computer models of data accumulation and analysis.

In addition, the Alliance intends to conduct scientific research, provide services in the field of applied research. Pharmaceutical, industrial companies and healthcare institutions will be able to address it as a developer of sensing technologies, new materials, technologies of data processing, technologies of nanoteranostics, and neurotechnologies. And research institutes can take it as a partner in basic research in the biomedical field.

It is also planned to create an integrated digital information platform for the collection and computer processing of medical research data as a part of the ATM. They will flock from universities and clinics partners of the alliance, and Alliance experts will design their processing models. This will allow quickly and accurately diagnose patients by their analyses and recommend them a personal treatment regimen.

The Alliance intends to participate in the implementation of the National Technology Initiative as a leading national network center. In addition, the ATM universities will open network graduate and postgraduate educational programs in new directions at the intersection of physics, chemistry, biology and medicine. This will allow train specialists who will be ready to use cutting-edge science achievements in medical practice.

EVOLUTION OF STARS IN THE LABORATORY.
MILLIONS OF YEARS IN NANOSECOND LASER PULSE

Employees of MEPhI and other leading research centers have conducted research in the field of laboratory astrophysics in the LULI Ecole Polytechnique, France.

Accretive processes in double star processes have been modelled with the help of combined impact on special targets of laser pulses of high-energy and strong outer magnetic field in laboratory conditions.

One of the experiment participants is the supervisor of the international laboratory "Radiation methods of diagnostics and radiation technologies with the usage of very energetic laser radiation" of the MEPhI Institute of laser and plasma technologies, Associate Professor of Laser Physics Department Sergey Pikuz told how evolution of astrophysical objects can be researched and whether magnetic field influences the development of plasma jet.

– Our partnership with employees of LULI laboratory is conducted mainly in laboratory astrophysics, i.e. in the modelling of hydro-dynamic phenomena in astrophysical objects with the help of laser plasma. For example, emissions from a polar region of a young star, shock waves, processes in the magnetosphere of stars, extended plasma jets, which in the astronomy are observed as a chain of bright crosses, consecutively following each other. The majority of these phenomena can be scaled to laboratory sizes and time scale and study in controlled conditions.

– Why is this experiment unique?

– Apart from combinations of two lasers it used an impulse magnet, which created magnetic field up to 20 Tl and influenced nanosecond plasma laser. We had to answer the question, how plasma jet, formed by a nanosecond laser, is evaluating under the spread of the vacuum in the presence of outer magnetic field, and how this field influences the process of this field' interaction with solid-state barrier. Another peculiarity was the target assembly, which was a layered target for a nanosecond laser several hundredths of a micron thick and a massive and flat plate from quartz or gallium-gadolinium-garnet. The laser with energy of hundreds of joules and a wide focal spot of about 0.5 mm irradiated a bulk target, what resulted in the formation of a plasma jet containing a mixture of tin ions and light elements, with quasi dispersal on its' back surface. A reverse shock wave was formed in the process of interaction between plasma flow and an obstacle. We followed the process of its development and formation, depending on the parameters of the experiment.

– How is it related to astrophysics?

– We have a system of couple stars. One is a substance donor, another one is an acceptor. That is, if we have more massive gravitationally powerful body, it begins to attract substance of the second star. So it's the flow of matter from one star to another. It looks like a plasma jet, which at some point begins to interact with the photosphere of the acceptor. As a result, the forward and reverse shock waves are formed in the photosphere in the process of accretion. The objective of the experiment was to determine how a shock wave appears near the obstacle, what is the compression ratio of a plasma substance, how external magnetic field effects the observed plasma hydrodynamics, and to determine how the observed in the experiment evolution corresponds to the results of numerical simulations and astronomical observations.

– Who participated in the experiment?

– This was a part of an international collaboration. The magnet was developed by German colleagues, the targets – by French and Japanese, theoretical calculations were made by Americans, French and Japanese.

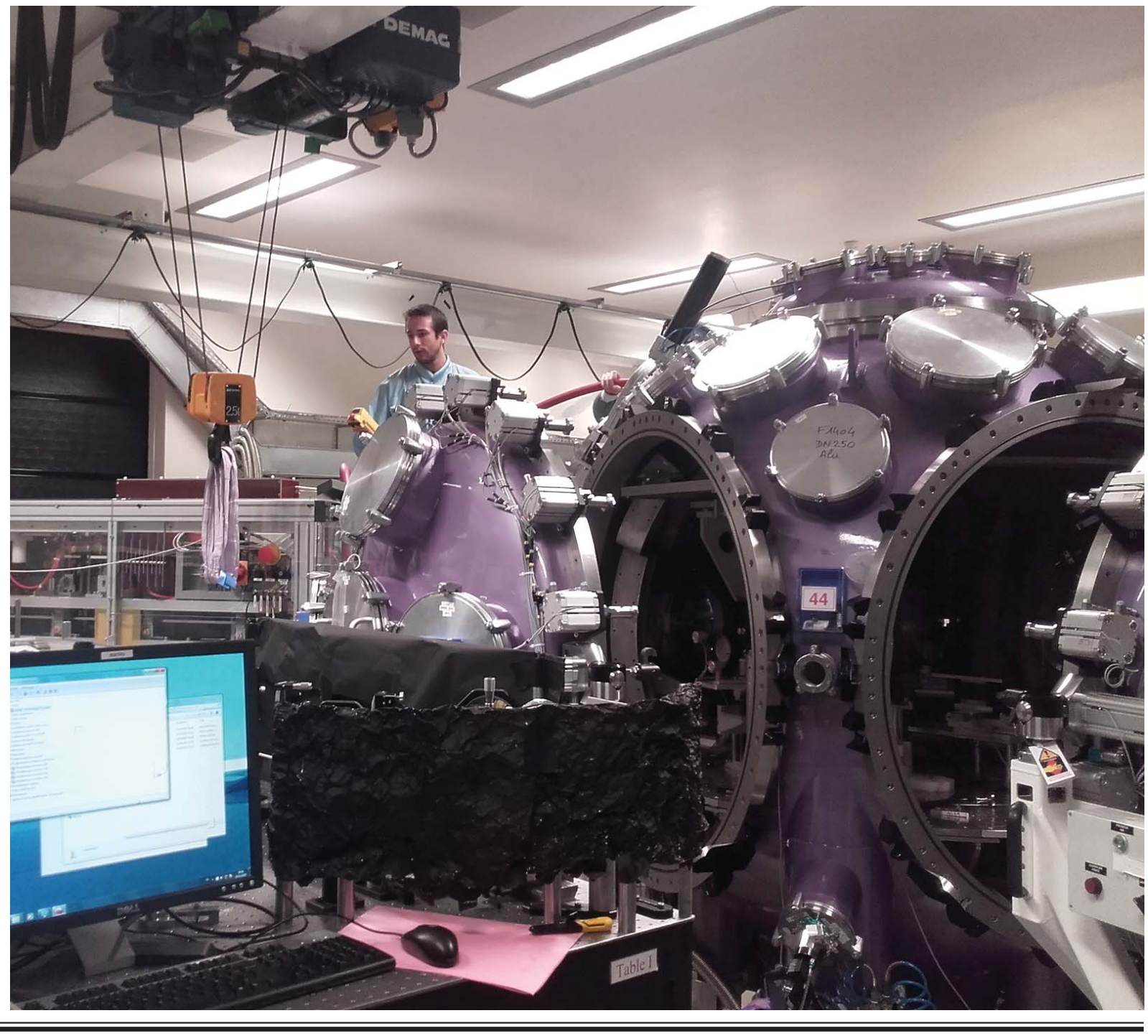
– What was the role of MEPhI participants?

– Traditionally, our role in such experiments is in radiation diagnostics: methods and approaches using ionizing radiation. It can be X-Ray flows or flows of ion beams, radiated by researched objects or a secondary source. In the particular experiment we were faced with the task to receive shadow radiographic images of a plasma jet with a good temporal resolution, for which the source of illumination was created by a short-pulse picosecond laser.

– What are the experiment results for now?

– Of course, it is early to speak about any final scientific conclusions. But we can say that in this experimental situation the magnetic field has very little influence on the development of the process. At least, there is a good flat expansion of the plasma, flat interaction with an obstacle and formation of shock waves in the incoming flow both in the presence and in the absence of a magnetic field.

The important point in this study is the validation and refinement of numerical codes of three-dimensional modeling of MHD processes in plasma, which are developed by a collaboration of the French Commissariat for atomic energy and the University of Chicago. And now these codes describe what we observed in the experiment with amazing accuracy.



NEWSPAPER “ENGINEER-PHYSICIST” IS LAUREATE OF CONTEST OF STUDENT PUBLICATIONS “CRYSTAL ARROW”

On November, 29 Moscow has hosted an awarding ceremony of the winners of the XIII All-Russian competition of student publications and young journalists “Crystal Arrow”.

The first place in the category “Best photo” was taken by Darya Zhuk, photographer of MEPhI newspaper “Engineer-physicist”!

The newspaper correspondent Victoria Drozdetskaia was awarded a special jury prize for active participation in the work of the publication.

According to official statistics, this year the competition was attended by students, PhDs and editors from 71 regions of Russia. The competition received 4,793 creative works and media from 411 higher education institutions in Russia.

This is not the first award received by the editorial staff. Over the past three years, the newspaper “Engineer-physicist” won in the following nominations:

“Best editor of student publication” – 2 place for the existence of the concept, design, headings, variety of genres and socially responsible position;

“Innovators among us” – 1st place for coverage of the scientific student activities;

“Best journalistic work” – 1st place for its topicality, the accuracy of facts and the accuracy of their presentation, originality, style, and authorial stance;

The “Engineer-physicist” was also awarded a special diploma of the Union of Russian journalists “For coverage of innovative activity of higher school”.

Congratulations to the newspaper “Engineer-physicist” on the deserved victory!

“SERVICE OF GOOD DEEDS” IN OMOFOROVO

On December, 17 team of the MEPhI Service of Good Deeds and the club VIRM have given happiness to pupils of a special boarding school in Omoforovo.

On this day a festive Christmas tree was decorated for children, and a number of different competitions and fun activities were organized. For example, MEPhI students held a workshop “Who a volunteer is”, staged fights with the guys from the Club of historical fencing VIRM, organized sweet treating. Of course, there were Father Frost and Snegurochka!

Omoforovo boarding school is one of the supervised institutions of the “Service of good deeds”. Students have been visiting this school for six years. For each visit they prepare an interesting and exciting program.