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Dear Reader,

May and June were significant for the Indo-Russian S&T ties. Ambassador of India to the Russian Federation, HE Mr PS Raghavan visited the Moscow Unit of Indo-Russian S&T Centre and had detailed discussions with Secretary, Department of Science and Technology or the Government of India on imparting greater stimulus to the ongoing endeavor on two-way transfer of technologies between India and Russia. The first joint calls for collaborative R&D proposals of the Department of Science and Technology and the Department of Biotechnology with the Russian Ministry of Education and Science (RMES) announced during this period received a very good response with about 100 R&D proposals having been submitted under these calls. An India - specific Forum on "Frontiers in Elementary Particle, Nuclear and Condensed Matter Physics" was organized at the Joint Institute of Nuclear Research (JINR), Dubna, Russia with support from the Embassy of India in Moscow, wherein 23 Indian scientists and over 60 researchers from JINR participated. Indian project teams of five collaborative projects visited Russia for implementation of joint research. A team of experts from International Advanced Research Center for Powder Metallurgy and New Materials (ARC-I), Hyderabad visited a Russian company to discuss partnership opportunity in the area of Lithium–Ion technologies. In all 37 visits from India to Russia were undertaken. Well understandably, this period did not witness any visit from Russia to India due to extreme hot climate in India.

During this period an agreement between Ministry of Education and Science and the Ministry of Internal Affairs of the Russian Federation was concluded to cooperate in the areas of education, science, technology and innovation activities as well as on safety and security of educational institutions. Russia launched a progamme to set up the world's most powerful laser facility by the year 2019. Russia, Belarus and the Ukraine have agreed to cooperate in research areas related to the Antarctic exploration and to share experience of organizing Antarctic expeditions and scientific research.

The current issue of the Newsletter covers highlights of various S&T related policies, programmes and developments in Russia by Russian scientists alone as well as through international cooperation including orbiting of a record-breaking 37 satellites by an Russian-Ukrainian joint rocket launcher – Dnepr, test trials of the Russian anti-aging eye drops in the USA; development of a multifunctional biometric bracelet with telecommunication module, a robotic patient for medical training and of robotic solution for physically impaired; news of a Russian supercomputer passing Turing Test for first time in the history, and the awards of Norwegian Academy to Russian Scientists.

The issue also gives glimpses of the latest R&D accomplishments including development of novel implants for facial bones, next-gen nanosilver fabric to protect inpatients against germs, low-cost coating for wide industrial applications, system for super hard coatings for enhanced wear-resistant machine industry parts, advanced cement to enhance security of oil and gas wells, next-gen spectroscopy device to measure greenhouse gases, infrared laser to detect illicit drugs and explosives, unique first aid device to assist emergency victims, advanced magnetic equipment for recovery of gold; and creation of a novel microchip for cost-effective reversible computing.

We hope that this Newsletter would facilitate greater information, cooperation and identification of potential Russian partners. We welcome your suggestions to improve the impact of the Newsletter for further strengthening Indo-Russian S&T cooperation and also your queries on Russian S&T developments.

Rama Swami Bansal

I. Bilateral / Multi-lateral Cooperation

a) Ambassador Raghavan visits Indo-Russian S&T Centre

To encourage and support two-way technology transfer activities between India and Russia, Ambassador of India to the Russian Federation, HE Mr PS Raghavan visited the Moscow Unit of Indo-Russian S&T Centre (IRSTC) on May 30, 2014. He was accompanied by Dr Ashish Sharma, Second Secretary (E&C) and Dr Rama Swami Bansal, Counsellor (S&T), Embassy of India in Moscow.

Welcoming the Ambassador, Dr Sergei Y Sukonkin, Director General of IRSTC Moscow Unit and Director of RAS Experimental Design Bureau of Oceanological Engineering (RAS-EDBOE) briefed on scientific and technological cooperation activities of IRSTC as well as of RAS-EDBOE with scientific organizations in India. Deputy Director General of IRSTC Moscow Unit, Ms Lyuidmila Kornaukhova reported on the current activities of the Centre and informed about their efforts to popularize the Centre in Russia including developing nodes for better outreach even in the remotely located regions of Russia. She mentioned the IRSTC Moscow Unit is acknowledged in Russia and is invited for participation in various national / regional / international forums that focus on developing research and technology partnerships with India. She shared the excitement of participants of such meetings for entering into Indian technology market. Discussion were held on Centre's joint plan for 2014 and its implementation, maximum possible information coverage on interested companies, enterprises and institutions, and on interactions between Delhi-NCR and Moscow Units for effective functioning of the Centre. Ambassador was briefed on the infrastructure of the Unit.

Ambassador expressed his satisfaction over setting up of the IRSTC, which was a Summit level decision, and committed to extend all support towards execution of its activities.

b) JINR holds India-specific Forum to Promote Scientific Networking

An India - specific Forum on "Frontiers in Elementary Particle, Nuclear and Condensed Matter Physics" was organized by Joint Institute of Nuclear Research (JINR), Dubna at the JINR during June 16-20, 2014 with support from the Embassy of India in Moscow. 23 Indian scientists and over 60 researchers from JINR participated in the Forum that aimed at strengthening existing linkages and establishing new networking with leading scientific research institutions of India and identifying potential focal areas and modes of cooperation to take the cooperation to the next level.

As part of the Forum three plenary sessions, wherein 19 review talks covering a wide spectrum of directions and the structure of fundamental research in India and JINR were delivered, and several thematic workshops / seminars were held in JINR laboratories that reviewed more specific investigations coupled with detailed excursions to their experimental facilities, wherein 57 talks were delivered by the leading scientists of JINR, BARC, TIFR, ISI, Kolkata, IACS, IISc, IMS Chennai, IoP Bhubaneswara, Inter University Accelerator

Centre and universities of Calcutta, Chitkara and Lucknow. Indian participants were acquainted with the structure as well as modus operandi of JINR.

The deliberation resulted in identification of mutually beneficial areas of cooperation, viz. a) Theoretical Physics, b) Nuclear Reactions and Spectroscopy, c) Neutrino Physics, d) Neutron applications, e) High Energy Physics and f) Information Technology. JINR and Indian institutions have facilities required for conducting joint research in these areas. Cooperation opportunities in applied areas including Radiation Biology and Nanotechnologies as well as in the area of education were also considered prospective. The participating Indian scientists had an interactive meeting with Deputy Chief of Mission, Mr Sandip Arya in the Embassy on Jun 18, 2014. Participants shared their high opinion about the expertise, technologies and facilities of JINR and recommended India's participation in the projects of JINR in addition to ongoing bilateral cooperation. They considered India's participation in JINR activities advantageous to India.

JINR is a large multidisciplinary international scientific research institute. It is equipped with a unique set of basic research facilities. JINR executes its research programmes based on international cooperation including 150 institutes and universities of the Russian Federation. Indo-Russian cooperation with JINR could facilitate linking Indian institutions involved in basic as well as applied research with the most relevant Russian research and academic institutions for establishing mutually beneficial cooperation between Indian and Russian scientists.

c) ARC-I explores Partnership in Li-ion Batteries with Liotech Ltd

A team of experts comprising Dr R Gopalan, Dr Raju Prakash and Mr D Sinivasa Rao from Advanced Research Centre for Powder Metallurgy and New Materials (ARC-I) visited Russia during Jun 2-5, 2014 to discuss potential cooperation with Liotech Ltd in the area of Lithium-ion battery for its application in electric transport and other potential sectors. Liotech, established in 2010 through RUSNANO with an aim to develop Li-Ion batteries (LIB) for energy efficiency, is the largest manufacturer of LIB in Russia.

The visit started with an introductory meeting held at LIOTECH office in Moscow on Jun 2 which was attended by Mr Ashish Sharma, Second Secretary of the Economic & Commercial Wing and Dr Rama Swami Bansal, Counsellor, Science and Technology of the Embassy of India. The team visited Liotech's battery production facility in Novosibirsk on Jun 3-4, 2014. Dr Rama Bansal accompanied the team. The concluding meeting with participation of Mr Ashish Sharma was held in the Moscow office on Jun 5, 2014 wherein the minutes of the meeting and an agreement on confidentiality and non-disclosure of confidential information were signed.

Meeting at the Liotech Factory in Novosibirsk

Inside battery operated Bus in Novosibirsk

Mr Alexey Surkov, General Director of LIOTECH briefed about their LIB manufacturing units and mentioned their areas of interest in India for battery applications in electric vehicles, grid energy storage systems and UPS systems. He quoted some examples of their successful endeavors in Russia for implementation of LIB in a small commercial vehicle (3 tons) by a Russian company and for UPS system in a hospital in St. Petersburg. The Indian team expressed their primary interest in Li-ion battery technology for electric vehicle applications and offered technical coordination help to connect with potential Indian companies for other applications.

The two sides agreed considering potential cooperation for a) transfer of Li-ion technology to ARC-I for electric vehicle applications, b) Grid storage energy system applications in India through IRSTC; c) Implementation of ARC-I - LIOTECH joint research projects on developing prototype batteries using ARC-I anode materials or for developing new electrode material and testing for Electric vehicle applications and d) Implementation of ARC-I - LIOTECH joint research projects through IRSTC on grid energy storage systems. It was agreed to formulate a MoU to detail the cooperation arrangement.

d) Exchange Visits

Indian Scientists to Russia

- Two scientists, namely Prof Javed Mohammad Iqbal and Prof Pravin Gupta, IIT Roorkee visited Moscow State University during Jun 1-10, 2014 under DST-RFBR Project P-1032.
- Two scientists, namely Prof Sagarika Mukhopadhyay, IIT Roorkee and Prof JR Kayal, Jadavpur University visited the Peoples Friendship University during Jun 1-11, 2014 under DST-RFBR Project P-156.
- Two scientists, namely Dr Virender Singh and Ms Toral Shah, IIT Bombay visited the Tomsk State University, Tomsk during Jun 5-26, 2014 under DST-RFBR Project P-97.
- Two scientists, namely Dr P Roy Chaudhuri and Dr Samit K Ray, Head of Nano S&T School, IIT Kharagpur visited the RAS kotelnikov Institute of Radio-engineering and Electronics, Moscow during Jun 22 - Jul 1, 2014 under DST-RFBR Project P-143.
- Two scientists, namely Dr Mulayam Singh Gaur and Mr Dayal Saran, Hindustan College of S&T, Mathura visited RAS - AN Bach Institute of Biochemistry, Moscow during Jun 18-30 2014 under DST-RFBR project P-125.
- Three experts, namely Dr R Gopalan, Dr Raju Prakash and Mr DS Rao, International Advanced Research Center for Powder Metallurgy and New Materials, Hyderabad visited Russia during June 2-5, 2014 to discuss cooperation related to Lithium–Ion technologies with Liotech Ltd.
- Dr Ramasubbu Sunder, Bangalore Integrated System Solutions (P) Ltd (BISS), Bangalore visited Russia for 10 days in June 2014 to participate in the International Forum of Technological Development - TECHNOPROM 2014 on "An era of technological change: A time for new victories (achievements)" held on Jun 5-6, 2014 in Novosibirsk.
- 23 Indian scientists from reputed Indian research institutions visited Russia to participate in the India-specific Forum on "Frontiers in Elementary Particle, Nuclear and Condensed Matter Physics" organized at JINR, Dubna during Jun 16-20, 2014.

II. S&T News of Russia

1. RMES and Ministry of Internal Affairs RF sign Cooperation Agreement

The Russian Ministry of Education and Science (RMES) and the Ministry of Internal Affairs of the Russian Federation have signed an agreement for cooperation in the areas of education, science, technology and innovation activities, safety and security of educational institutions, the provision of public services and management of state property in the field of education, anti-corruption, prevention of crimes and administrative offenses. Joint working groups are planned to be setup in many of these areas. The document was signed by Ministers Dmitry Livanov and Vladimir Kolokoltsev.

2. Russia launching World's Most Powerful Laser Facility by 2019

Russian scientists are developing the world's most powerful laser facility to conduct

fundamental research in dense high-temperature plasma. The laser, planned for launch in 2019 in the industrial park "Sarov" in Central Russia, is intended to become a collective research centre accessible to both Russian and foreign experts alike. The design of the installation has already been completed and its components are being produced. Building and assembling works are scheduled for 2015. The first stage of construction is planned to be accomplished in 2017 that would allow beginning of multiple fundamental research activities. Academician Vladimir Fortov, President of the Russian Academy of Sciences strongly supports this project calling it a breakthrough development.

The laser installation will have 192 channels and is expected to occupy the area of two football fields and have a height of a ten-storey building. The cost of the project is estimated at 45 bln Rub. The facility is expected to deliver a recording 2 MJ of energy to its target, while an analogue system in the US has a capacity of 1.8 MJ.

The Sarov town is the Russian center for nuclear research, which has developed a strong base for creating advanced laser technologies. It is located in the region famous for its research in physics. Several research institutes engaged in studying high energy density physics and extremely high pressures and temperatures are located there. The Sarov technopark hosts over 30 hi-tech resident companies. Its annual turnover in 2013 was 1.2 bln Rub.

3. Russian-Ukrainian Rocket launches a Cluster of 37 Satellites

On Jun 19, 2014 Dnepr rocket orbited a record-breaking 37 satellites from an underground silo at a space base near Yasny, Russia. The launch was performed by the Strategic Rocket Forces of the Russian Federation in accordance with the agreement with Kosmotras, a Moscow-based company with joint Russian-Ukrainian ownership that oversees the commercial exploitation of the Dnepr rocket.

The payload package – 37 active satellites of different shapes and sizes deployed for scientific research and commercial operation aboard Dnepr, was the most number of individual satellites ever launched on a single rocket. These satellites belonged to 17 countries including the USA, the UK, Spain, Japan, the Ukraine, Saudi Arabia, Canada and South Korea. Of these Deimos 2 and KazEOSat 2 owned by Spain and Kazakhstan, respectively, were the largest satellites. Most of the orbited payloads were designed to gather imagery for environmental and security purposes and carried Earth observing cameras.

The Dnepr rocket is a R-36M missile also known as SS-18 Satan. It was jointly developed by the space agencies of Russia and Ukraine. The design and control system were produced by Ukraine. The rocket was stationed all across the Soviet Union starting in 1966 outfitted with multiple warheads and independent re-entry vehicles. After the fall of the Soviet Union, a portion of the R-36 fleet was modified to become Space Launch Vehicles. Dnepr is one of the cheapest launch vehicles that are currently flying offering a payload capability of up to 4,500 Kg to Low Earth Orbit.

4. Belarus, Russia, Ukraine strengthening Joint Antarctic Research

The first science-to-practice conference dedicated to monitoring of the Antarctic environment and support for national expeditions was held at Naroch, Minsk Oblast, Belarus in May 2014 with participation of 60 scientists from 22 organizations in Russia, Belarus and Ukraine. The conference covered a vast variety of issues connected with the Antarctic exploration including construction of the Belarusian Antarctic station, utilization and preservation of biological resources of the

Antarctic and creation and development of legal framework of scientific work.

Russian, Belarusian and the Ukrainian scientists agreed to organize exchange of young and promising Antarctic researchers to strengthen joint cooperation in various research areas related to the Antarctic exploration and to use positive experience of the organization of Antarctic expeditions and scientific research. According to Aleksei Gaidashov, Deputy Head of the National Centre for Polar Research of the National Academy of Sciences of Belarus, such exchange of experience would facilitate progress of Russian, Belarusian and Ukrainian Antarctic research, and that further conferences would be held regularly once in two years.

5. Russian Anti-Aging Eye Drops under Tests in the USA

A team of medical nanotechnology specialists from Mitotech in cooperation with Lomonosov Moscow State University have developed a drug candidate to fight aging-related eye diseases. The eye drops contain Mitotech's proprietary mitochondrial antioxidant - SkQ1. The research has been led by Academician Vladimir Skulachev, Dean of MSU Faculty of Bioengineering and Bioinformatics and a prominent Russian scientist who is working on solutions to inhibit aging processes in the human body including what's known internationally as the "Skulachev ions."

Accordingly, the second phase of the clinical trials has been launched in the US ophthalmologic clinic which is due to complete by the end of this year. The medicine is being tested for safety and efficacy on American patients suffering from a cornea disorder caused by the dry eye syndrome, widespread in a hi-tech age. The drug has already passed a number of researches in independent American scientific organizations. Natalia Perekhvatova, Director General of Mitotech, believes the successful completion of these trials would allow introducing the Russian drug to the global medicine market.

6. Russian Supercomputer passes Turing Test for the First Time in History

First supercomputer to have passed the Turing Test simulated by a 13-year-old Ukrainian boy

On Jun 7, 2014 the British University of Reading organized a contest based on "Turing Test" to mark the 60th anniversary of Turing's death (Turing Test was devised in 1950 by computer science pioneer and Second World War codebreaker Alan Turing, who believed if a machine is indistinguishable from a human, then it is "thinking". Turing Test determines whether artificial intelligence has risen to the level of human intelligence.) For this five supercomputers, viz Cleverbot, Elbot, Goostman, JFred and Ultra Hal, were tested to see if they could befool people into believing they were humans during keyboard conversations. These supercomputers were presented with a series of unrestricted questions by a panel of 30 judges via a computer interface for a period of five minutes per chat. The test required 30% of human interrogators to be duped to pass.

Of these five supercomputers it was the Russian supercomputer, with a computer programme "Goostman" - simulation of a 13-year-old boy named "Eugene Goostman" from Ukraine that persuaded the judges 33% of the time that it was human. Goostman has thus become the first computer in the world to have passed the Turing test. While some experts claim that the Turing Test had already been passed, the event's organizer Kevin Warwick

stated that at the contest the Royal Society experiment went further – including the random nature of questions – and was independently verified.

This supercomputer is a joint effort of Russian developers Vladimir Veselov, Sergey Ulasen from St Petersburg and their Ukrainian colleague Eugene Demchenko. Earlier in 2012 the same programme had befooled 29% of the 25 human judges when winning a Turing test competition held at Bletchley Park, the World War II codebreaking centre. "Goostman" was also a runner-up in the Loebner Prize tests in 2001, 2005, and 2008. According to Veselov, it is a remarkable scientific achievement and they hope it boosts interest in artificial intelligence and chatbots. Now that Eugene has "beaten" the Turing Test, this team plans to develop it further: to make Eugene smarter and continue working on improving what the creators refer to as 'conversation logic'.

7. Robotic Patient for Medical Training developed

The robotic patient for mastering surgery skills

Kazan scientists have created a robotic patient to train doctors to conduct 50 types of medical surgeries. The robotic structure is equipped with all systems of life support to enable the doctors to monitor its pulse, blood pressure, pulmonary function, reaction to drugs, and take an ECG. Just like a human being, the robot moves from a state of consciousness into sleep when applied anesthesia. During the operation the robotic "organs" react to all processes of surgeon's interventions. The project was initiated by medical practitioners and graduates of the Faculty of Physics at the Kazan Federal University and implemented by the Russian company Eidos-Medicine along with their American partner Covidien. According to Lenar Valeev, General Director of Eidos, the system displays all life parameters that correspond to the real medical state of the patient, and simulates surgical complications with under variable anesthesia parameters. The invention is currently being tested in a US medical centre. Accordingly, the idea of creating an engineering centre of medical simulators on the grounds of the Skolkovo Innovation Centre is under discussion.

8. Multifunctional Biometric Bracelet with Telecommunication Module developed

Biometric bracelets for monitoring life parameters

Researchers of the Siberian State Medical University in partnership with the engineers of a Tomsk-based innovation company "Intek" have developed a multifunctional biometric bracelet called Obereg ("protector" in old Russian), which can automatically measure its user's pulse and temperature and alert relatives to his or her current physical status by SMS. The new system has a special telecommunication module built into the bracelet to collect and transmit data using mobile Internet channels. In case its user has fallen on the ground, has his or her blood pressure dangerously elevated or pulse changed, the bracelet sends out a message to both relatives and a local ambulance. The system also has a built-in GPS module, which can locate its user's whereabouts. All statistics on the state of health are sent to the Internet server where the user has a personal account.

The statistics could also be accessed on phone with the help of a special mobile phone application. The statistics can be used for making a diagnosis or analyzing the course of the disease. The bracelet also has a mobile phone function: it can be used to contact the call-centre or a relative in case of emergency.

The developers are currently working towards improving the bracelet and widening its range of measurable biological parameters.

9. Robotic Solution for Physically Impaired wins Skolkovo prize

Research team receiving the prize

The team of robotic specialists - professors and postgraduates of Lomonosov Moscow State University's Research Institute of Mechanics has designed and developed Russia's first "exoskeleton". It is an innovative software and hardware product designed to reinforce the human musculoskeletal system. The solution is primarily intended to help the physically challenged but it could also be an aid in search-and-rescue operations. Accordingly, two different modifications of exoskeleton for medical and rescue applications have been developed.

Search-and-rescue exoskeleton

Exoskeleton modification for medical purposes

The search-and-rescue modification was developed with support from the Russian Ministry of Emergency Situations and could be used for the elimination of the disasters during post-disasters phase, to debottleneck, for the purposes of fire-offices during fire-fighting operations even in the conditions of the oxygen shortage. The average speed of exoskeleton is expected to be about 7-11 km/h, at the same time it could carry additional load of upto 70 kg. The exoskeletons would be equipped with additional sensors and inbuilt transducers of global positioning system to help reach set destination on unknown territory.

The medical modification is designed to assist disabled people and it can be used for both physical and social rehabilitation of locomotor patients with musculoskeletal disorders. Such medical device can be used in physical therapy together with other means of medical treatment of patients with central paralyses, caused by cerebral apoplexy or spinal cord injury.

This research team of Moscow State University has formed a start-up company "ExoAtlet". According to Ekaterina Bereziy, CEO of ExoAtlet the company has already developed an operational exoskeleton prototype capable of lifting up to 200kg. This robotic solution named as "socially important and technologically advanced" won the first prize at the annual competition for young technology innovators held at Skolkovo Startup Village in June 2014. The first prize carrying $26,000 and special privileges to operate in Moscow, was the result of a tough competition with 21 contenders shortlisted from 750 national semifinalists.

10. Norwegian Academy awards Russian Scientists

On May 20, 2014 the Norwegian Academy of Science and Letters awarded the Abel Prize for 2014 to the outstanding Russian scientist, Academician Yakov Sinai of the Landau

Institute for Theoretical Physics, RAS "for his fundamental contributions to dynamical systems, ergodic theory, and mathematical physics". The Abel Prize, often called the Nobel prize in mathematics and carries a cash award of about $1 mln, is a prestigious international award which recognizes contributions of extraordinary depth and influence to the mathematical sciences.

Acad Yakov Sinai at the award ceremony

Academician Yakov Sinai is considered one of the most influential mathematicians of the twentieth century for achieving numerous groundbreaking results in the theory of dynamic systems, mathematical physics and in probability theory. Many mathematical results are named after him, including Kolmogorov–Sinai entropy, Sinai's billiards, Sinai's random walk, Sinai-Ruelle-Bowen measures, and Pirogov-Sinai theory. Academician Sinai is highly respected in Mathematics as well as Physics communities as the major architect of the most bridges connecting the world of deterministic (dynamic) systems with the world of probabilistic (stochastic) systems. According to the Abel committee, much of his research has become a standard toolbox for mathematical physicists.

Left to right: Drs Alan Guth, Andrei Linde, Alexey Starobinsky, pioneers in theory of cosmic inflation.

Another annual award by the Norwegian Academy of Science and Letters, namely the Kavli Prize, has been given to three more scientists, among them Academician Alexei Starobinsky of the Landau Institute for Theoretical Physics RAS. The team has been honoured a prize for astrophysics, namely their pioneering work on cosmic inflation. During the 1970s Academician Starobinsky studied particle creation in the early universe and from rotating black holes, work that led him to the theory of cosmological inflation. According to the theory, the universe rapidly expanded, or inflated, within a split second of the Big Bang. Later, along with colleagues, Starobinsky developed the theory of how quantum fluctuations in the early universe are blown up by inflation and provide the seeds of the large scale structure of the universe. The cosmic inflation theory is now one of the most accepted theories on the origins of the universe and has been adopted as a subject of study by theorists because of recent developments that have proven its accuracy. The winners share a prize of $1 mln for each field and receive a gold medal and a scroll.

III. R&D Developments in Russia

1. Novel Implants for Facial Bones developed

Specialists of the Tomsk Polytechnic University (TPU) jointly with researchers from the Tomsk Cancer Research Institute, SB RAS have developed biocompatible implants for craniofacial surgery to treat serious facial and scalp traumas and restore bone tissue of cancer-stricken patients.

Scientists have created experimental models of implants based on the carcass of a metal grid and a biodegradable polymer composition. As per Sergei Tverdohlebov, Head of the TPU scientific team, several polymers are mixed and then integrated together with a titanium mesh using special methods. The resulting grid is soft and flexible and can be molded and adjusted to the anatomical features of the skull. The grid can integrate with the bone and is able to recover a part of the bone tissue.

Moreover, the grid can prevent relapse of disease in oncology patients. Modification of polymer properties is widely considered extremely difficult due to its structure being highly resistant to external influence. Scientists are presently working towards improving the properties of both the metal grid and the polymer. The resultant material would be tested for biocompatibility, non-toxicity and cancer safety.

This project received funding to the tune of 45 mln rubles for three years from the Russian Ministry of Education and Science. There are no analogues of this development in Russia. This new material is expected to get cheaper than the one in offer from abroad.

2. Next Gen Nanosilver Fabric to Protect Inpatients against Germs developed

A Moscow based Central Research Institute of Textile Industry has designed a unique kind of fabric with silver ion nanoparticles. According to its Director, Ms Svetlana Lopandina, this fabric is designed for manufacturing various textile items for hospitals and other health care facilities, such as hospital curtains, bed linen and clothes for inpatients and medical staff. The silver ion nanoparticles inhibit germs' settlements on clothing or linen fibers, thus enhancing the asepsis in health care facilities. Nanosilver is expected to safeguard inpatients from harmful germs that inevitably infiltrate hospital wards, coming on visitors from outside, and pose an additional threat to inpatient with a weak immune system.

This advanced fabric has already attracted attention of medical experts. After certification procedures it can find wide application in hospitals across Russia.

3. Low-cost Coating for Wide Industrial Applications developed

A Siberian company FanNan, resident of Krasnoyarsk Regional Innovation and Technology Business Incubator (KRITBI), has created a new flexible transparent electricity-conducting coating that could be used for a variety of industrial applications including production of electrochromic glass with variable transparency, sensor displays, solar cells, transparent electrodes for organic light-emitting diodes, various optoelectronic devices and more. The technology is able to generate a elf-cellular structures that conducts electricity and evenly heats the surface. This novel Russian coating is inexpensive and has high technical specifications - mechanical plasticity along with a wide spectrum of light transmission; it is capable of becoming a new alternative to traditional coatings made from metal oxides.

According to Stanislav Khartov, CEO of FanNano, the cost of one square meter of the new mass-produced coating would be from 10 Rub ($0.4) while the most widespread tin oxide based solutions for electrically heated glass cost more than $17 per square meter, and indium oxide based ones are even more expensive.

The project has attracted investment of little over $350,000 from federal and regional funds and private investors. A pilot production focused on electrically heated glass for buildings and cars is planned to be launched later this year as a first stage towards industrial application of the material.

4. System for Super Hard Coatings for Enhanced Wear-Resistant Machine Industry Parts developed

A Tomsk-based company 'Microfusion' has reportedly developed a system to make super-hard coatings that would enhance wear resistance for parts in mechanical engineering. The system forms strengthening surface alloys on parts in mechanical engineering. The process completes in one vacuum cycle: nano-film is deposited over the desired part which is followed by liquid-phase mixing of underlayer with the nanocoating by using electron-beam mixing method. The upper layer with set

chemical properties gets fused into the underlayer forming single surface alloy.

Currently a regional factory in Tomsk is testing the new equipment to see if it beats the existing technology in use in the factory. Microfusion aims at commercializing their system that would find applications in sectors seeking strengthening solutions for machining tools such as automotive, heavy machinery, aircraft-building etc. The new technology is believed to help making contacting parts much more wear-proof thereby increasing lasting qualities of wearing pieces such as adhesions, buckets and details in gas engines in the automotive industry.

Microfusion is a joint start-up of Tomsk Scientific Centre ROSNANO and the Institute of High Current Electronics of SB, RAS. After years of research at the Institute an operational laboratory prototype has been made. The developers have obtained three Russian patents for the technology and are currently negotiating possible collaboration with a number of world's leading technology companies including South Korea's Hyundai. This development of Microfusion has won Skolkovo contest "Technostart 2014" with a cash prize of 5 mln Rub.

5. Advanced Cement to Enhance Security of Oil and Gas Wells developed

Specialists of the National Research Irkutsk State Technical University are developing a technology to protect oil wells using extra-strong and low-cost well cement produced using local industrial waste. The research team has added industrial waste in the form of carbide sludge and fluorine gypsum into portland cement. This technology involves mobile ways of producing the new material in areas of oil extraction and gas recovery.

This new cement is developed to protect collar and walls of the well from mechanical damage and landslides that may occur in the process of drilling, and for well's subsequent exploitation. The effectiveness of well exploitation depends most often on the quality of cement isolation, especially the strength of consolidated cement solution. According to project developers Evgeniy Levchenko and Vasiliy Vorobchuk, new cement isolates productive oil and gas layers from water-bearing deposits in the presence of multilayer deposits of oil. The presence of products of burnt carbide sludge in well cement reportedly accelerates the solidification of cement paste and thus speeds up the hardening process.

6. Next-Gen Spectroscopy Device to Measure Greenhouse Gases developed

IR spectro-radiometer to identify greenhouse gases and measure their distribution.

High resolution spectroscopy has found wide application in space research, astrophysics, climate studies, including spacecraft monitoring of greenhouse gases, environmental science and technology as a powerful analytical tool allowing for accurate measurements. Spectroscopic methods are particularly efficient in characterization of rarified gases where Doppler broadening of the IR rotational lines dominates. Tracing of carbon dioxide, methane and other gases in the atmosphere with further calculation of distribution of these gases in the atmosphere is of high importance for forecasting tendencies in ongoing global warming. However, forecasting and taking appropriate counter measures is halted by a lack of data on the distribution of greenhouse gases, since a great number of complex, cumbersome and

costly spectrometers are required to create a dense network of monitoring stations.

A scientific team of the Moscow Physical-Technical Institute has created the advanced heterodyne spectro-radiometer, which allows to characterize and measure with record high accuracy the distribution of various greenhouse gases in the atmosphere. The high resolution of the spectro-radiometer is significantly better than that of existing serial IR spectrometers of near IR-range and reportedly beats the new US analogue developed in the NASA's Goddard Space Flight Centre. Apart from a higher resolution, the compact and lightweight Russian device is less sensitive to environmental factors such as vibration, humidity and exposure to both low and high temperatures. The developers believe that high resolution spectroscopy may allow solar occultation observations of CO_2, CO, CH_4, H_2S, C2, H4 and other gases from spacecraft, airborne or ground-based platforms. This project has been supported by the grant from the Russian Ministry of Education and Science.

7. Infrared Laser to Detect Illicit Drugs and Explosives developed

Specialists of the Novosibirsk-based Siberian State Geodesic Academy (SSGA) have created an advanced technology that enables search for explosives, illicit drugs and other substances using laser emission. The methodology draws upon the properties of widespread infrared lasers, varying the frequency of laser emission and thereby making it possible to analyse gas composition of the surrounding atmosphere and trace specific substances there.

According to Valerik Airapetyan, SSGA's special devices and technology chair, in a conventional laser technology, a person sends out a signal and then receives it back. However, the intensity of a signal drastically increases when the signal is sent with a frequency that coincides with the internal frequency of the substance under study. For instance, if the object has to be studied for presence of explosives, the frequency of explosive substances can be used to send a laser beam to this object. If the return signal has the same frequency, it means there's an explosive in the object.

As per Airapetyan, the laser technology can have a wide range of applications. One could use it for search of illegal drugs and explosives at airports, analyze methane concentration in coal mines, monitor the environment, and make an express blood test for medical purposes. The laser can detect drugs from a distance of 10 - 100 meters; with methane it is much more sensitive (up to 10 km). The laser has already found application in Greece, where it is used to analyze environmental pollution levels. Presently SSGA team is refining its technology and is *looking for investors to set up joint commercial-scale production.*

8. Unique First Aid Device to Assist Emergency Victims developed

Mobile device to treat emergency victims

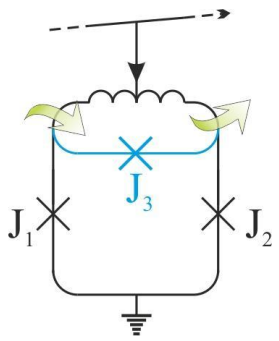
Under instructions of Russia's Federal Agency for Emergencies and Natural Disasters (EMERCOM) a team of researchers led by Professor Vladimir Syryamkin of Tomsk State University (TSU) in collaboration with a TSU spin-off company Diagnostika+ has developed a unique mobile device capable of screening the status of an emergency victim and recommending optimal first aid methodology. The instrument provides automatic assessment of thorax compression during cardiopulmonary resuscitation. The first aid "navigator" is fastened on a victim's neck, it

quickly screens victim's status and generates a course of action needed for victim's proper first aid. The system evaluates the efficacy of rehab operation as it goes on. If rescuer's actions are not enough or erroneous, the instrument would suggest ways of correcting them. In case the victim cannot be turned over, the instrument displays a warning message. The device can additionally pinpoint a range of parameters including heartbeat and breath, type of injury and if the damages can be mended.

The instrument is considered unique and would reportedly cost about 50% cheaper than similar existing equipment. The developers have obtained three Russian patents for the innovation. The instrument is expected to become a standard kit for EMERCOM units. In 2015 TSU plans to launch a joint venture manufacturing in the Tomsk special economic zone. Apart from EMERCOM, its target customers may include military surgeons and ambulance-based paramedics units.

9. Next-gen Microchip for Cost-Effective Reversible Computing created

In modern computers the process of calculating is irreversible, which leads to loss of some parts of information in the computing process, energy loss, heating of machine and the need to cool it. For this reason the power consumption of supercomputers poses a challenge.



BiSQUID microchip includes three Josephson contacts (J1, J2) and a ferromagnet (J3)

Specialists of the Skobeltsyn Research Institute of Nuclear Physics have found a solution. They have created a new superconductive reversible circuit for logical elements of supercomputer with zero electrical resistance. The circuit named bi-SQUID (Superconducting Quantum Interference Device) is capable of reducing the power consumption in supercomputers to 6 orders of magnitude and consists of three Josephson contacts with a ferromagnet for reversible computing and therefore, more accessible and cost-effective computer power. The microchip is planned to be put to lab tests in the second half of 2014.

10. Advanced Magnetic Equipment for Gold Recovery developed

A Russian company 'Itomak' has developed and modernized a next-gen magneto-liquid equipment for extracting fine gold. Specialists use special liquid with nanoparticles for recovering gold from non-magnetic impurities. When exposed to the magnet the liquid changes its density. For instance, the copper particle rise to the surface, while the gold particles sink down. For development of the unit with capability of extracting larger amount of gold the research team invited Physicists who participated in the static magnetic fields calculation that stabilized beams of the Large Hadron Collider in Switzerland.

According to Anatoly Lazaridi, Chief Technology Officer of Itomak, the scientists try to use domestic components to supply spare parts timely, when the unit is transferred to remote locations and some parts need maintenance or replacement. Experts of the company set up the equipment individually for each gold mine. Siberian concentrators and separators have been operating in more than 45 countries, from Alaska to South Africa and Latin America for twenty years.

IV Profile of R&D Institutes and Industry in Russia

1. AN Nesmeyanov Institute of Organoelement Compounds (INEOS) of Russian Academy of Sciences

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Website: http://www.ineos.ac.ru/en.html

AN Nesmeyanov Institute of Organoelement Compounds of Russian Academy of Sciences (INEOS RAS) was established in 1954. Its first director was a President of Academy of Sciences of the USSR Prof AN Nesmeyanov, a founder of the modern chemistry of organoelement compounds. He headed the Institute for 26 years. The present director of the Institute is Academician A.M. Muzafarov, a leading specialist in polymer chemistry. Under the guidance of these two outstanding experts INEOS RAS has developed into a worldwide-recognized research institution with profound expertise in organoelement and macromolecular compounds chemistry. INEOS RAS is a research centre with 38 laboratories and 18 research groups and 650 employees including 594 researchers.

INEOS RAS focuses on fundamental and applied research with concentration on prospective materials (including polymers, nanostructured materials, organoelement compounds Si, F, P, materials for medical applications). The basic directions of activity include:

- chemistry of organoelement compounds;
- chemistry and physics of high molecular weight compounds;
- biological active compounds;
- physical methods of investigations.

Subjects of scientific researches of institute cover topics such as Synthesis and structure, reactivity and properties investigation of organometallic and coordination compounds as well as organophosphorus, organofluorine and organoboron compounds; asymmetrical synthesis and catalysis in organoelement compounds chemistry; fullerenes – a base for the synthesis of new compounds and novel type materials; synthesis of biological active compounds of organic and ornganoelement compounds and biological active high molecular compounds; organoelement and metal containing polymers: synthesis, structure and properties investigations, application; functional and intellectual polymers and multi-component polymeric systems; catalytical and ecological safety processes of low molecular compounds and polymers formation; development and application of experimental and theoretical methods for investigation and analysis (X-ray analysis, optical spectroscopy, NMR, chromatography, mass-spectrometry, quantum chemistry, microanalysis, electron spin resonance, nuclear quadrupole resonance, X-ray photoelectron spectroscopy, paleography); theory and mathematical modeling of polymeric systems; metal-complex catalysis: activation of small molecules and inert molecules, new catalysts for polymerization and other processes. Alkanes as nontraditional raw material for the synthesis of organic compounds; development of new approaches to a nanoparticles formation in liquid and condensed medias; polymeric supramolecular structures and nano-composites.

INEOS provides R&D services, while paying special attention to coherence of fundamental studies and their practical implementation. The institute offers full spectrum of scheduled tasks, starting from completing scientific research studies, providing assistance with acquisition of patents and licenses, launching pilot production and advising on industrial introduction. INEOS has signed numerous contracts with many research institutions of Russian Academy of Sciences, universities, industrial centers and multinational companies in Russia and abroad. The institute maintains international relations with major world academies in Germany, England (University of

Glasgow), Belgium, Denmark (University of Kopenhagen), Israel (University of Haifa), USA (University Berkeley, California), France, Sweden and Japan (University of Kyoto). It also reserch linakes with India through Bhabha Atomic Research Centre, and Indian Institute of Science. The institute is very keen to strengthen its cooperation with India

2. D Mendeleyev University of Chemical Technology of Russia

Rector : Prof Vladimir A Kolesnikov
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Contacts: Tel: +7(499)978-87-33;
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Email: rector@muctr.ru ; zhukov@muctr.ru ;
Website: http://www.muctr.ru/

D Mendeleyev University of Chemical Technology of Russia (MUCTR) was founded in 1880 initially as an Industrial College to train chemical and mechanical engineers. It was named after the great Russian scientist Dmitri Mendeleev, the discoverer of the Periodic law. Since its inception and 134 years of existence with stable developments, the University had been going through a lot of trials alongside the Russian and the Soviet science and industry, including the turbulent period of World War II and the post-war reconstruction of the Russian economy. Its faculty and staff have enthusiastically dealt with the issues of nuclear energy applicatiions, cybernetics development and conservation of the environment. Presently D Mendeleyev University is among the leaders of Russia's technical universities and has the highest rating among Russia's chemical technology schools.

The University researchers continue their studies in the cutting-edge areas of the chemical science and achieve outstanding results in bringing solutions to the problems of fundamental science and applied research. The University uses innovative development strategy. It contributes towards all elements of development and implementation cycle starting from fundamental research to applied science and industrial production. This approach helps researchers identify promising research areas and supports them during the innovation cycle's initial as well as completion phases. More than 40 graduate departments and 20 domain-specific research laboratories of the Univeristy conduct fundamental and applied studies. The production base is comprised of two pilot production facilities, a pilot plant, a Technology Park, and a Centre for Technical Innovations. The University has completed over 240 research and development projects that are available for implementation.

Priority Research Areas are related to petrochemistry and oil refining, energy- and resource-saving technologies, varnishes and paints, filming materials, chemical and polymeric technology, new-generation inorganic materials, membrane technologies, sustained development issues, energy-saturated materials and composites, biotechnology, complex environmental studies, construction, finishing and decorative materials, materials and technologies for nuclear industry, composite and construction materials, inorganic substances and electrochemical technologies, electronic equipment materials, information systems and technologies, health care and medical materials, nanotechnologies and nanomaterials, safety in Production Processes and Facilities.

The University actively participates in international, academic and research programmes financed thorugh grants of various government and private foundations. Research programmes are developed in collaboration with partners from Germany, France, Japan, Italy, Spain, Netherlands, Switzerland, China, Chili, Latvia, Finland, Poland, Check Republic, Egypt, South Korea, Syria and Tunisia. MUCTR carries out major international conferences, symposia, and seminars under the auspices of UNESCO, IUPAC, and the Russian Chemical Society.

3. Federal State Unitary Enterprise 'Siberian Aeronautical Research Institute named after SA Chaplygin'

Director : Vladimir E Barsuk
Address : 630051, Novosibirsk, Polzunov Street 21
Contacts: Tel: +7(383)279-01-56;
Fax: +7(383)2278865/2278877;
Email: sibnia@sibnia.ru;
Website: http://sibnia.com/

SibNIA was established on Jul 9, 1946 on the ground of the Novosibirsk branch No 2 of the Central Aerohydrodynamic Institute (TsAGI). Its founder Sergey Chaplygin was one of the originators of the aerodynamics, Member of the USSR Academy of Sciences and the Honored Worker of Science. Over the years the Institute has grown into a large aeronautical centre with unique experimental capabilities, research laboratories and highly qualified personnel working in various aeronautics activities. An Aeronautical Test Centre was set up on the basis of SibNIA that had earned certification of the Aeronautic Register of the Interstate Aviation Committee and the State Standard of Russia. Institute's Quality Management System had received the Certificate of Conformance to the International Aerospace Standards ISO 9001 and AC 9100.

SibNIA is a multi-profile aeronautic centre with capability to solve practical tasks related to aircraft design and testing, as well as aircrafts' maintenance for their operation and overhaul-period renewal. SibNIA remains the largest research center of aviation science and the largest testing base for the Aeronautical and Aerospace Industry in the Eastern part of Russia. Institute's experimental capabilities make it possible to perform full-scale static, fatigue, and dynamic tests of aircrafts with the weight below 500 tons, aggregates and airframe components; aerodynamic researches on the aircraft layout design, finishing of the advanced aircrafts under design, as well as mass-produced aerotechnics, and flight tests of the mass-produced and tested aircrafts and aerotechnics.

Laboratories of this Institute have developed arrangements for several milestone aircrafts inlcuding An-2, A-57, Su-26, and Su-27, performed structural and fatigue tests of over two hundred types of aircrafts including Tu-144 - the supersonic airliner, Buran the aircraft-spacecraft, Tu-204, and Su-27 aircraft family. The laboratories also tested over two hundred of national aircrafts alighting gears.

Head of Research at the insitite is Prof Alexey Nikolaevich Seryeznov. Institute's broad range of activities cover:

- aircraft dynamics (researches of aircraft aerodynamic properties, improvement and upgrade of planes; research of unsteady aerodynamic properties of aircraft and frameworks including high angle of attack properties; study of the aircraft aerodynamic properties in contingency and emergency situations using modeling of the control failure; industrial aerodynamics researches).
- Static Strength (full scale airframes static and fatigue tests; numeric studies of airframe static and fatigue strength, and stability; design and experimental studies of dynamic and strength of the aircrafts alighting gears and other shock absorption systems; aircraft aeroelasticity studies).
- Flight Test (aircraft flight testing; testing of radio and lightning systems; works in regions of launch-vehicles detachable components falling during the spacecrafts launching; flight tests of aerophotographic systems).
- Scientific and Technical Support (scientific and technical support of aircraft creation, testing, operation, and repair; design of aircraft testing aids, airborne equipment testing, and aircraft operation safety inspections);

- Certification and Estimation (aircraft strength (including retained) and endurance valuation; execution of the ground-based, preflight and flight tests; discovering features of the aircraft and its systems, as well as pilotage characteristics; study and analysis of the engineering, design, operating, and other aircraft documentation).
- Designing (scientific and technical development of aircraft at the draft design stage; reproduction of design documentation for a full-scale product, an aggregate, or a component; development of accessories and equipment for aircraft repair, renovation, and production; ground equipment design).

In conditions of the personnel deficiency and intensive technological renovation, the Institute has been developing dynamically and remains the reliable partner for many aeronautical and aerospace research institutes and companies both in Russia and abroad. Russian partners include the central aerohydrodynamic institute (TSAGI), Sukhoi Company (JSC), PSC Tupolev, Irkut Corporation, BERIEV Aircraft Company and Russian Aircraft Corporation "MiG". The institutes has partners in China, US, Germany, Great Britain, France, Malasia and some others. SibNIA is very keen to develop linkages with Indian partners.

4. The Budker Institute of Nuclear Physics (BINP)

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Email: A.V.Vasiljev@inp.nsk.su

Budker Institute of Nuclear Physics (BINP) is one of the world-leading centers in a very important field of high-energy physics, controlled thermonuclear fusion and applied physics. In the majority of research fields the Institute is unique in Russia. BINP was founded by Gersh Itskovich Budker in 1959 and in 1961 the institute began building the first particle accelerator in the world - VEP-1, that collided two beams of particles. At present the Institute has about 30 research laboratories and sectors, including in its structure six united research laboratories, a theoretical department, two design departments, a computer system department, and two experimental productions. Budker Institute is a reliable partner in carrying out the joint physics research and projects, and has good reputation all around the world as a provider of high-tech scientific and industrial equipment. Over 120 BINP-produced powerful electrons are operated in technological lines in Russia, India, the Ukraine, Belorussia, Germany, Japan, China, the Republic of Korea and other countries. Moreover, about 50 BINP Low-Dose Digital X-ray installations for medical diagnostics are used in various medical organizations in Russia and France. The BINP is contributing toward the construction of CERN's Large Hadron Collider, providing equipment including beamline magnets. BINP actively collaborates with national laboratories and universities in India, China, USA, Germany, France, Italy, Japan, the Netherlands, Finland, Sweden, Korea.

The institute focuses its research effort on high-energy physics (particularly plasma physics) and particle physics. Main directions of BINP activities are as follows:

- Basic research (elementary-particle physics based on electron-positron colliders functioning and under construction; electro- and photonuclear physics using charged particle storage rings; plasma physics and controlled nuclear fusion based on open-confinement systems);
- Development of new unique facilities for the basic scientific research and for high-end technologies (facilities with colliding electron-positron beams having ultra-high luminosity (so-called e+e- factory); design and technologies of linear electron-

positron colliders; synchrotron radiation sources; powerful lasers based on high-energy electron beams (free electron lasers); intensive source of thermonuclear neutrons based on plasma "gas-dynamic" trap; design of high-powered electron accelerators and their application to various electron-ray technologies including ecological ones; development of new equipment for medical applications based on binp achievements in accelerator and detector physics);

- Participation in fulfillment of engagements provided by intergovernmental and interdepartmental agreements, treaties and other deeds about international scientific collaboration.

5. LLC "Vyatich-KM"

General Director: Vladimir I Valuev

Address : Moscow, 1st Dubrovskiy st 15/1

Contacts: Tel:+7(499)2591500, +7(916)8166161;

Email: vyatich-bio@yandex.ru

R&D enterprise LLC "Vyatich-KM" was founded in 1994. The company produces chemical as well as carries out R&D and production of pharmaceutical products. It is looking for an Indian partner to participate in a joint venture programme with a tentative name "Biotechnologies and microbiological fusion of biological products". The programme includes conditions with the following main points:

- starting up biotechnological factories (biofactories) with flexible computer-aided manufacturing;
- development and implementation of the known experimental and industrial operational procedures for production of biological products at the mentioned biofactories.

Some issues of the programme include production of the irreplaceable amino acids to substitute protein additives in eatables of plant origin and production of pharmaceuticals such as ergot alkaloids. Thew company is planning the start up of a pilot model of biofactory that woul;d precede work on joint venture. The company has assembly and input of biofactory permissions from monitoring authorities such as Sanitary and Epidemiological Service, nature conservation organisations).

V. Forthcoming Workshops and Conferences in Russia

1. 5th annual Forum on Innovative Drug Research and Development in Russia

Dates : Nov 18-19, 2014
Place : Moscow, Russia
Coordinator : Ms Victoria Iljash, Manager
Contacts : Tel: +44 20 7017 7444; Fax: +44 20 7017 7447;
Email: victoria@adamsmithconferences.com
Website: http://www.drug-research-russia.com

The international forum is devoted to deliberations on topics of strategic partnerships in R&D sector; current reforms in the sector; the potential of Russian science; creation and commercialization of new drugs. Participation of more than 250 pharma and biotech executives, professionals and experts involved in developing Russia's innovative drug market is expected.

2. Russian Forum for Industrial Biotechnology and Bio-based Economy "Graintek-2014"

Dates : Nov 19-20, 2014
Place : Moscow, Russia
Coordinator : Mr Ablaev Alexey
Contacts : Tel: 7(495)585 5139; Fax: 7(495)585 5449;
Email: info@graintek.org;
Website: http://www.graintek.org/

The Russian Forum Graintek is organized annually by the Russian Biofuels Association and would cover areas like grain processing, industrial biotechnology and bioeconomy with production of gluten, starches and its derivatives, including glucose and fructose syrups, bioplastics (PDO, succinic, lactic and other organic acids) and other value added fermentation products from starch (glucose). Topics for discussion include: implementation of "Comprehensive Programme for Biotechnology Development in Russia until 2020" and roadmap "Development of biotechnology and genetic engineering"; solving problems of agriculture through the deep processing of grain and sugar beets; production of low-cost glucose for competitive biotechnology in the global market; grain processing to the production of high value-added products - gluten, starch, bioproducts and food; high value added products of starch and glucose syrups: organic acids, chemicals and bioplastics; the market, production and use of gluten and modified starches; glucose and glucose-fructose syrups: market outlook, production and application; Sugar based bioproducts - the building blocks for the chemical industry; bioplastics and organic acids: succinic, ascorbic, citric, lactic, and others; biobutanol, other alcohols and hydrocarbons obtained by fermentation of sugar.

3. 2nd Moscow International Engineering Forum 'MIEF-2014'

Dates : Nov 25-27, 2014
Place : Moscow, Russia
Coordinator : Ms Ekaterina Sokolova
Contacts : Telfax: 8(499)6180565/618 3683/6183688;
Email: eng-forum@mirexpo.ru ; Website: http://www.mirexpo.ru/eng/exhibitions/engineering-forum.shtml ;

The Forum is dedicated to: designing and building of new industrial enterprises – greenfield; Modernization and reconstruction of existing industrial enterprises – brownfield; PLM technologies in engineering; 3D printing, scanning and prototyping; Instruments: sensors, tools for measure and control; Precision mechanics; Instrument-making: sensors, tools for measuring and control; Technologies for milling, granulating and powdering; Sale of used industrial equipment and industrial outlet; Industrial parks; Engineering Education; Special exposition of Turkish Manufacturers of Industrial Equipment.

4. X International Conference on System Identification and Control Problems SICPRO 2015

Dates : Jan 26-29, 2015
Place : Moscow, Russia
Coordinator : Dr Kirill Chernyshov
Contacts : Tel: 7(495)334-89-90; Fax: 7(495)334-89-90;
Email: noc@sicpro.org ; Website: http://www.sicpro.org/sicpro15/index.htm

The International conference would cover the following areas: development of the theory and methodology of identification, modeling, and control, mathematical problems of control, parameter and non-parametric identification, structure identification and expert analysis, problems of selection and data analysis, control systems with an identifier, identification in intelligent systems, identification in applied problems, simulation procedures and software for identification and modeling, cognitive issues of identification, verification and problems of software quality of complex systems, global network resources of support processes of identification, modeling, and control.

5. The Third International Conference on Digital Information, Networking, and Wireless Communications (DINWC2015)

Dates : Feb 03-05, 2015
Place : Moscow, Russia

Coordinator : Ms Pshehotskaya Ekaterina, General Chair
Contacts : Email: dinwc15@sdiwc.net ; Website:http://sdiwc.net/conferences/dinwc2015/

The conference focuses upon a broad range of the research topics, such as: mobile social networks; antenna systems and design; anti-cyberterrorism; biometrics technologies; channel modeling and propagation; cloud computing; coding for wireless systems; mobile, ad hoc and sensor network management; wireless traffic and routing; confidentiality protection; critical computing and storage; critical infrastructure management; digital communications; data compression; data management in mobile peer-to-peer networks; data stream processing in mobile/sensor networks; distributed and parallel applications; e-government; e-technology; embedded systems and software; forensics, recognition technologies and applications; IT human resources; IT infrastructure; IT strategies; mobile networking, mobility and nomadicity; resource allocation over wireless networks; multimedia computing; multiuser and multiple access schemes; national policies and standards; network security; optical wireless communications; wireless communications; wireless system architectures and applications.