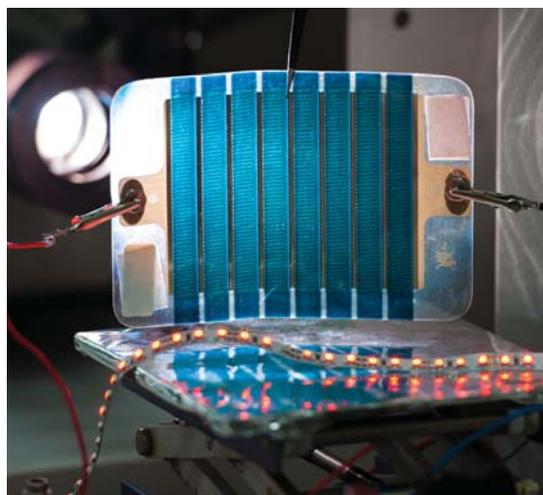


NUST MISIS SCIENCE NEWS DIGEST

April - June, 2016

THE FIRST FLEXIBLE RUSSIAN THIN-FILMED SOLAR CELL

A group of NUST MISIS scientists led by Professor Anvar Zakhidov has revealed a cutting edge development, creating a thin-filmed photoelectric cell based on hybrid metal-organic compounds called perovskites. These perovskites can convert solar energy radiation into electric energy with a performance coefficient of more than 15%, and with a planned rate of 20%. The main competitive advantage of perovskite, which brings photovoltaics to a new level, is the active layers of the solar cells that can be applied from liquid solutions on thin and flexible substrates. The commonly named "Roll-to-roll" technology allows the placement of solar batteries on any surface with curvatures. This new technology will influence portable electronics, the automotive industry, household appliances, "smart house" technologies, and in general transform the power supply of buildings.



NUST MISIS SCIENTISTS DEVELOP A NEW GENERATION OF SENSORS TO MONITOR NUCLEAR POWER PLANTS

A group of NUST MISIS scientists led by Sergey Gudoshnikov developed a new type of sensors that respond to mechanical pressure. A group of such sensors, when united in a measuring system, can provide a constant monitoring of nuclear power plants, pipelines and other industrial facilities. The sensors are capable of determining the applied mechanical stress (ranging between 1 to 1000 megapascals) as well as measuring the microwire's length changes (ranging between 0.0001 and 0.1 mm) depending on microwires' diameter. The EMERCOM of Russia is planning to apply it in 2017.





NUST MISIS SCIENTISTS REFUTE CLASSICAL THEORY OF CONSTITUTION OF EARTH

A group of scientists from NUST MISIS and École Polytechnique (Paris, France) headed by Professor Igor Abrikosov found a mistake in the calculations of their American colleagues. Their calculations completely refuted the classical theory of geomagnetism and the Earth's magnetic field's formation. American colleagues accepted the criticism and recalled their article from the Nature journal in April 2016. The recall and publication of refutation in the field of physics in the leading international scientific journal happened for the first time.



NUST MISIS STATIONARY BLADES TO REDUCE TOTAL AIRCRAFT WEIGHT

NUST MISIS scientists in conjunction with scientists from Ufa State Aviation Technical University (USATU) developed innovative stationary blades for aircraft engines. This is the first time that stationary blades have been cast from titanium aluminide alloys in Russia. These blades will be used in civil aviation to improve operational characteristics of engines, reduce total aircraft weight and lower fuel consumption.



HIDDEN STATE OF MATTER TO SPEED UP COMPUTER WORK BY 10 TIMES

An international group of scientists, including NUST MISIS's Professor Sergey Brazovskii, recently presented their research on altopstratus materials of tantalum disulfide, which shows that the material's opposition could be countered with a unique high speed revolution of an electrical conductor to an insulator and back. Ultrafast switching allows the use of the material in modern electronics as a nonvolatile element of memory for the new generation.



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