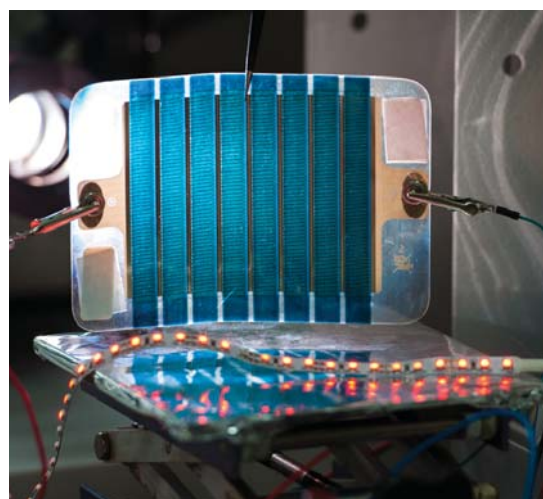


## NUST MISIS SCIENCE NEWS DIGEST

March - May, 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.



<http://en.misis.ru/university/news/science/2016-04/4008/>

### NUST MISIS: CUTTING EDGE CANCER DIAGNOSIS TECHNIQUE TO BEGIN TRIALS IN 2018

The NUST MISIS science team, led by Dr. Alexander Majouga, head of the NUST MISIS Biomedical Nanomaterials Laboratory, is started clinical trials of a new Russian nanoagent on the basis of magnetite of early disease detection through MRI technology. The launch of clinical trials is planned for 2018. The magnetite nanoagent itself, in contrast to tracers and other existing alternatives, is not toxic and is much cheaper than current options. The developed technology allows the release of drugs into specific tumor cells. The nanoagent is able to identify a brain tumor during the first stage, and can subsequently be used for the cardiac implants of other cancer types as well.

<http://en.misis.ru/university/news/science/2016-03/3919/>





## 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 leading international scientific journal happened for the first time.

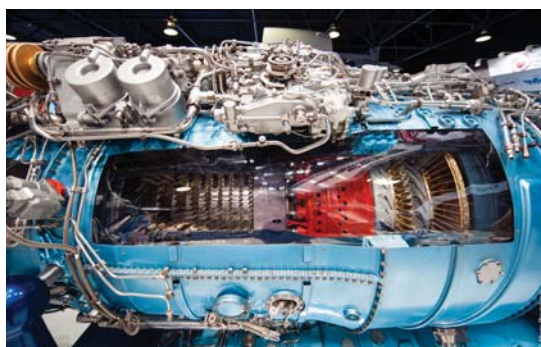
<http://en.misis.ru/university/news/science/2016-05/4070/>



## 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.

<http://en.misis.ru/university/news/science/2016-04/3992/>



## NEW «NUCLEAR BATTERY» CONCEPT WITH A LIFE SERVICE OF OVER 50 YEARS

NUST MISIS scientists have developed a new technology for making "nuclear batteries" with nickel-63 isotopes with a long service life of over 50 years. The battery can provide continuous output power of 10-100 nanoWatt/cm<sup>3</sup> which is sufficient to supply cardiac implants. In 2016 the market volume of active medical implants amounted 24,8 billion dollars. Such battery is expected to be used in various sectors – from cardiac implants to space vehicles for deep space research.

<http://en.misis.ru/university/news/science/2016-03/3905/>



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