

**Program of Russia-USA Advanced Research Workshop**  
**“NANOSTRUCTURED SURFACES AND INTERFACES”**  
**State Technological University «Moscow Institute of Steel and Alloys»**  
*June 18-22, 2007*

The purpose of a Russia-USA advanced research workshop (ARW) is to contribute to the critical assessment of existing knowledge in the field of nanoscience and nanotechnology. The ARW is to identify most promising directions for future research in USA and Russia, and to promote close working relationships between USA scientists from Air Force Research Laboratory (AFRL) and leading academic and industrial organizations in Russia.

Nanoscience is concerned with materials and systems whose structure exhibit novel and significantly improved physical, chemical, mechanical and biological properties, which are not observed at macroscopic level. Since recent years, new nanomaterials (nanostructured thin films, nanodispersion strengthened coatings, carbon and non-carbon nanotubes, materials with nano and micron textured surfaces, quantum domain surfaces, etc.) have been obtained for a wide variety of applications in aerospace, medicine, mechanical engineering, etc. The progress in these fields is only possible by a controlled and well-directed optimization of the relevant film properties and requires joining the efforts of scientists from USA and Russia.

The ARW reviews the state-of-the-art on the nanostructured surfaces and interfaces with particular emphasizing on the following main topics:

- Adaptive nanocomposite coatings and nanostructured surfaces for tribological contacts
- Bio-engineered nanostructured surfaces and interfaces
- Multifunctional coatings for controlled surface optical characteristics
- Carbon and non-carbon nanotube modified surfaces
- Nanocomposite and nanostructured polymeric coatings
- Polymer nanoparticle modified surfaces and interfaces
- Plasma processing of nanostructured surfaces
- Modeling & computation of nanostructures

**WE WISH TO THANK THE FOLLOWING FOR THEIR CONTRIBUTION TO THE SUCCESS OF THIS CONFERENCE**



*Air Force Office of Scientific Research,  
United States Air Force Research Laboratory*  
<http://www.wpafb.af.mil/AFRL>



*European Office of Aerospace Research and Development*  
<http://www.london.af.mil>



*International Science and Technology Center*  
<http://www.istc.ru>



*State Technological University  
«Moscow Institute of Steel and Alloys»*  
<http://www.misis.ru>

**Chairman - Prof. Dmitry Shtansky**

**AFRL point of contacts for the workshop:**

Dr. A. Voevodin - AFRL/ML presentations

Dr. K. LaRochelle - EOARD

Dr. G. Schmitt - AFRL/ML international relationships

## Monday, June 18, 2007

8:30 Registration of participants  
 9:00 Greetings from Vice Rector for International Relations, Prof. Evgeny Levashov, MISA  
 9:10 Forewords: ARW Chairman, Prof. Dmitry Shtansky, MISA  
 AFRL/ML point of contact, Dr. Andrey Voevodin, AFRL

Time	Speaker	Title of presentation	Affiliation
<b>Chairman: Prof. D. Shtansky</b>			
9:20	A. Voevodin	Adaptive nanocomposite coatings and nanostructured surfaces for tribological contacts	Air Force Research Laboratory
9:50	E. Levashov	Nanoparticles strengthened surfaces in advanced tribological coatings and nanocomposite materials for their production	State Technological University «Moscow Institute of Steel and Alloys»
10:20	G. Kalinnikov	External magnetic field as a way to control surface hardness of depositing hard wear resistant nanostructured films	Institute of Problems of Chemical Physics of Russian Academy of Science
10:50	<i>Coffee break</i>		
11:10	S. Kaloshkin	Formation of Ti-Al intermetallic coatings by mechanical alloying technique	State Technological University «Moscow Institute of Steel and Alloys»
11:40	E. Pyatyshev	MEMS materials and technology solutions for aerospace	Saint-Petersburg State Polytechnic University
12:10	<b>Visiting of MISA Museum</b>		
13:00	<i>Lunch</i>		
<b>Chairman: Prof. E. Vinogradov</b>			
14:00	D. Shtansky	Multifunctional bioactive nanostructured films (MUBINAF) for load-bearing implants	State Technological University «Moscow Institute of Steel and Alloys»
14:30	O. Antonova	Biomimetic formation of nanostructured surfaces	Institute of Physical-Chemical Problems of Ceramic Materials of Russian Academy of Science
15:00	<i>Coffee break</i>		
15:20	J. Johnson	Enhanced surface optics using controlled nanoscale voids	Air Force Research Laboratory
15:50	V. Kononenko	Antireflective and diffractive diamond optics produced by laser patterning	General Physics Institute of Russian Academy of Science
16:20	A. Bolshakov	CVD synthesis of nano- and microcrystalline diamond films at superatmospheric pressures with laser plasmatron	General Physics Institute of Russian Academy of Science
18:00	<b>Welcome party</b> <i>for the invited speakers only</i>		

Tuesday, June 19, 2007

Time	Speaker	Title of presentation	Affiliation
<b>Chairman: Dr. V. Ralchenko</b>			
9:20	J. Baur	Nano-enabled and Adaptive Composite Structures	Air Force Research Laboratory
9:50	A. Useinov	New superhard and nanostructured carbon-based materials with special surface properties	Technological Institute for Superhard and Novel Carbon Materials, Troitsk
10:20	E. Zharikov	Carbon nanotube prepared by catalytic pyrolysis of liquid hydrocarbons	Mendeleev University of Chemical Technology
10:50	<i>Coffee break</i>		
11:10	E. Kramarenko	New generation of highly elastic magnetic materials	Moscow State University
11:40	V. Stolyarov	Severe electroplastic deformation of shape memory TiAl alloy	Mechanical Engineering Research Institute
12:10	A. Chernavina	The influence of surface condition on SME and TWSME parameters in Ti-Ni-based alloy	State Technological University «Moscow Institute of Steel and Alloys»
12:40	<b>Visiting of MISA Scientific Laboratories and Center of Corporate Benefit</b>		
13:30	<i>Lunch</i>		
<b>Chairman: Dr. J. Baur</b>			
14:30	J. Johnson	Molecular dynamics modeling of nanoscale structures and interfaces for dynamic adaptive coatings	Air Force Research Laboratory
15:00	A.K. Izgorodin	Nanocomposites based on capillary-porous fibrous structures	State Textile Academy, Ivanovo
15:30	G. Dzhardimalieva	Hafnium-containing polymers as precursors for obtaining thermal stable surface coatings	Institute of Problems of Chemical Physics of Russian Academy of Sciences
16:00	V.V. Teplyakov	Nanoporous polymer composite materials and their application for gas selective interfaces and membranes	Moscow State University
16:30	<i>Coffee break</i>		
<b>Chairman: Dr. J. Johnson</b>			
16:50	M. Durstock	Ordered structures for photovoltaic devices	Air Force Research Laboratory
17:20	A. Pomogailo	The formation of core-shell structures and interfaces in metallopolymer nanocomposites	Institute of Problems of Chemical Physics of Russian Academy of Sciences
17:50	A.V. Dunaev	Creation of nanocarbons with metal nanoparticles from GIC for different applications in catalysis	Moscow State University
18:20	O. Plaksin	Ultra-fast non-linear optical response of metal-nanocluster composites prepared by the method of dynamic ion mixing of polymers	Institute of Physics and Power Engineering

Wednesday, June 20, 2007

Time	Speaker	Title of presentation	Affiliation
<b>Chairman: Prof. E. Levashov</b>			
9:20	J. Jones	Plasma diagnostics of hybrid magnetron sputtering and pulsed laser deposition	Air Force Research Laboratory
9:50	A. Pogrebnjak	Formation of nanostructured coatings using combined plasma processing	Sumy Institute for Surface Modification, Ukraina
10:20	V. Ralchenko	Ultrananocrystalline diamond films: effect of nitrogen doping in microwave plasma on their structure and properties	General Physics Institute of Russian Academy of Science
10:50	<i>Coffee break</i>		
11:10	N. Gerasimenko	Ion beams for the formation of nanostructures on the surface of semiconductors	Moscow Institute of Electronic Technology
11:40	Ph. Kiryukhantsev-Korneev	Plasma based growth of hard nanostructured and multilayered films with low friction coefficient, enhanced thermal stability and corrosion resistance	State Technological University «Moscow Institute of Steel and Alloys»
12:10	V. Khmelevskaya	Radiation-induced nanoclusteric structures in metallic materials	Obninsk State Technical University of Nuclear Power Engineering
12:40	K. LaRoche	EOARD Research Support Programs	EOARD/AFOSR
13:00	G. Suh	ISTC Programs	ISTC Partner Project Manager EOARD
13:20	<i>Lunch</i>		
<b>Chairman: Dr. A. Voevodin</b>			
14:20	E. Vinogradov	Development of technology for nanostructures producing and their characterizations by optical spectroscopy methods in the Institute of Spectroscopy RAS	Institute of Spectroscopy of Russian Academy of Science, Moscow Region
14:50	E. Sheka	Odd-electrons in covalent chemistry, magnetism, and surface science of nanostructures	Peoples' Friendship University, Moscow
15:20	N. Lukasheva	Theory and calculations of nanostructures in stiff-chain polymers	Institute of Macromolecular Compounds of Russian Academy of Science, St. Petersburg
15:50	Yu. Baranov	loffe surface effects in mono- and polycrystals	Mechanical Engineering Research Institute
16:20	<b>Conclusion remarks, announcements</b>		
18:00	<b>Banquet</b> <i>for the invited speakers only</i>		