

# PROCEEDINGS OF SPIE

## *XV International Symposium on* **Advanced Display Technologies**

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**Oleg N. Krokhin**  
*Chair*

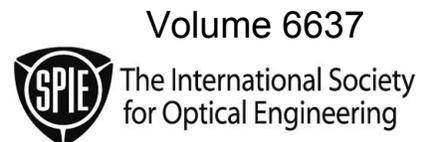
**Igor N. Kompanets**  
*Editor*

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Professor Igor N. Kompanets  
Chairs  
XV International Symposium on Advanced Display Technologies - ADT'06  
October 3–5, Lebedev Physical Institute, Moscow, Russia

c/o Dr. Edmund Akopov  
Executive Director  
SPIE Russia Chapter

Dear Sirs:

On behalf of the Officers and Board of Directors of SPIE, we are writing to express our congratulations to you as chairs of the International Symposium on Advanced Display Technologies, held in Moscow at the Lebedev Physical Institute of the Russian Academy of Sciences.

SPIE, working through its Russia Chapter, is pleased to serve again as a co-sponsor and publisher of the proceedings of this highly regarded meeting. Through these symposia and SPIE publications, the world technical community is made aware of advances in applications of ADT in Russia and across the world.

With these thoughts in mind, please accept our sincere best wishes for highly successful symposium in Moscow.

Sincerely,

Paul McManamon  
2006 SPIE President

Eugene G. Arthurs  
SPIE Executive Director

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.



## Introduction

I am glad to greet you at the XV International Symposium on Advanced Display Technologies, organized by the Russia, Belarus, and Ukraine Chapters of the Society for Information Display and the P.N. Lebedev Physical Institute of the Russian Academy of Sciences.

The Belarus SID Chapter first initiated a set of such scientific meetings in 1990. Then the Ukraine Chapter continued these meetings, and in 2000 Russia picked up the symposium. Since then, the annual symposium has rotated in turn - in Belarus, Ukraine, and Russia. The first symposium in Russia was held in Moscow, at the Russian Center of the International Science and Culture Cooperation. This forum is an excellent example of the successful international cooperation in the field of display devices, systems, and materials. It is also a vivid example of scientific and technological integration of developments and products in the territory of the Commonwealth of Independent States. In 2003 the symposium was held in the city of Korolev, known as the city of space science and rocket technology and the home of the International Space Mission Control Center with its super-large display. The meeting participants were able to visit this center as well as visit the Center of Astronauts Training in Zvezdny Gorodok (Star City) and the Museum of Space Ships in the Energiya (Energy) Corporation.

Now the symposium is being held in Moscow again, at the Lebedev Physics Institute of the Russian Academy of Sciences, and I would like to say a few words about our Institute. Lebedev Institute is the oldest of the first-class physics institutes of Russia. It was founded in Petersburg by Peter the Great in 1714 as the Cabinet of Curiosities. Physical investigations were actually started in 1724, when this Cabinet, called the Physics Cabinet, became the foundation of the Petersburg Academy of Sciences (later the USSR and Russia Academies of Sciences). Outstanding scientists of that time – D. Bernulli, L. Eiler, G. Rihman, E. Lenz, and B. Yacobi, were working in the Cabinet of Physics. In 1912 the Physics Cabinet was transformed into the Physical Laboratory, and then into the Physics-Mathematics Institute. In 1934 the Physical Department of that Institute was transformed into the Independent Physics Institute of the USSR Academy of Sciences (abbreviated as FIAN), and it was called the Lebedev Physics Institute in honor of the famous Russian scientist. In 1935 the Institute moved from Leningrad (Petersburg) into Moscow, and since 1951 is located at Leninsky.

There are currently about 2000 employees at Lebedev Institute; 900 of them are researchers including 16 members of the Russian Academy of Sciences, 185 Doctors of Sciences (Full Professors), and 430 PhDs working in several affiliations of FIAN (in Troitsk, Samara, Dolgoprudny, Dubna, Pushchino and others). The scientists of Lebedev Institute carry out basic research across many fields of physics: cosmic rays and nuclear physics, optics, laser and solid state physics, and

theoretical physics. The achievements of these scientists are well known over the world. Six of them are Nobel Prize winners in physics. They are I. Tamm (1958), F. Frank (1958), P. Cherenkov (1958), A. Prokhorov (1964), N. Basov (1964), V. Ginzburg (2003) and A. Sakharov (1975) – the inventor of the thermonuclear bomb who was the seventh Nobel Prize winner awarded for peace. You can see their portraits on the first floor of this building. Academician Vitaly Ginzburg's 90-year jubilee will be celebrated soon in this conference hall.

Lebedev Institute has old traditions and advances in research of display materials and developments, namely the electro- and cathode-luminescence materials, semiconductors, laser projection displays, and liquid crystals. Therefore, the Lebedev Institute is one of the organizers of all three conferences in Russia, and Academician Nikolay Basov, the Nobel Prize winner and former institute director, was the conference chair in 2000. Lebedev Institute will be one of organizers of the next ADT07 also. ADT07 will be joined to IDRC07 – SID Annual International Display Research Conference. Both conferences combined with the exhibition will form the forum "EuroDisplay 2007", which will be held in the building block of the Presidium of Russian Academy of Sciences, Moscow on September 17–20, 2007.

Now I return to ADT06. The organizing and program committees of the symposium in conjunction with SID Headquarters, Belarus and Ukraine SID Chapters, and Lebedev Institute administration, worked hard to prepare the rather extensive and interesting program and to provide conditions for successful work. About 130 specialists are participants of this symposium. They will discuss 57 papers, covering the research fulfilled in Russia (34 papers are presented), Belarus (12 papers), and Ukraine (eight papers), as well as the investigations performed in the United Kingdom, Japan, Hong Kong, China, Italy, Korea, Germany, and the United States. It is important that six papers were prepared by joint international teams.

The symposium is sponsored by the Society for Information Display (SID), the Society for Optical Engineering Russia Chapter, the Russian Foundation of Basic Research, the European Office of Aerospace Research and Development of the United States Air Force (EOARD USAF), and the Lebedev Physical Institute. We wish to thank all these organizations for their contribution to the success of the symposium.

In connection with this we thank personally Larry Weber, President of the SID, Jenny Needham, SID Data and Office Manager, and Jyrki Kimmel and Alexander Smirnov, the former and current Presidents of the SID European Committee, as well as Darrel Hopper, Principal Engineer from United States Air Force, and Edmond Akopov, Director of SPIE Russia Chapter, for the support of this international forum.

In addition, we are grateful for the support of the SID Journal "Information Display" and the Russian magazines "Electronic Components" and "Electronics (Science, Technology, and Business)".

Displays are an extremely important and quickly growing field of science and technology. They are everywhere, from TV and computers to sophisticated information and control systems. I wish that all the participants benefit from these useful discussions, fruitful work, and further advances in displays. I wish you also good health and prosperity.

**Oleg Krokhin**

