



# International Workshop on Scientific Challenges for New Functionalities in Glass

April 15 - 17, 2007

Key Bridge Marriott - Washington, DC

## Overview

The goal of the workshop was to identify and discuss broad scientific topics for future research which will lead to the development of glasses with new functionalities, and thereby, enable new commercial applications of glass. The Workshop brought together four groups of people:

- (a) the technology leaders of glass manufacturing companies,
- (b) the representatives of companies that use glass and other materials in advanced technologies to tell us their materials challenges, in general,
- (c) glass researchers from academia (and industry) who make discoveries related to glass but without any specific application in mind, and finally
- (d) the representatives of government agencies that deal with glass research.

In terms of deliverables, it was our goal to establish a list of well-defined scientific challenges for new functionality in glasses that, if achieved, would enable new and emerging technologies or products. With the input of industry leaders, two broad theme areas were selected for discussion:

- **Glasses for electronic application**
- **Nanostructured glasses.**

A total of 10 leading glass researchers and users who are well aware of the scientific challenges and/or technological demands of specific applications presented their assessment of specific topics, followed by discussions led by the top level R&D executives of five leading glass companies. This type of industry-university, hand-in-hand planning was effective in roadmapping the most relevant opportunities for advancing glass science, technology and education. Considering the leadership positions of the participants, we anticipate that this Workshop will influence future initiatives and priorities for research funding.

This was a limited-attendance event to maintain focus and to meet the deliverables. Each participant was expected to engage in break-out sessions, and to share his/her knowledge and opinions about the selected topics. A number of participants presented a poster, which highlighted recent scientific discoveries, or even ideas for new glass research directions, to bring to the attention of the group its potential relevance to the themes and goal of the workshop.





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## Presentations

### *Technical Session I*

#### **Trends for Glass in Electrical Components and Systems**

*Speaker: Mike Lanagan, Penn State University, USA*

#### **Transparent Amorphous Oxide Semiconductors and Their TFT Applications**

*Speaker: Hideo Hosono, Tokyo Institute of Technology, Japan*

#### **Solid-State Lithium Batteries Using Glass Electrolytes**

*Speaker: Mashiho Tatsumisago, Osaka Prefecture University, Japan*

#### **Special Lecture : NSF's Perspective on Industry-Academia Interactions**

*Right: Dr. Ardent Bement Jr., Director of NSF, discusses NSF's role in industry-academia research partnership, globalization programs, [Full transcript of remarks](#)>*



### *Technical Session II*

#### **Glasses for Microphotonics**

*Speaker: Ray DeCorby, University of Alberta, Canada*

#### **Glass and Glass-Ceramics for Wireless Communication**

*Speaker: Jau-Ho Jean, National Tsinghua University, Taiwan*

#### **Functional Glass Coatings**

*Speaker: George Sakoske, Ferro Corporation, USA*



*Dinner Speaker: Special Lecture  
Aer()Sculptures presented by [Ionnis  
MICHALOU\(di\)S](#) from Greece*





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## *Technical Session III*

Modification of Glass by FS Laser for Optical/Memory Applications

Speaker: [Kiyotaka Miura, Kyoto University, Japan](#)

Fabrication of Micro/Nano Structures in Glass by Lasers

Speaker: [Denise Krol, University of California-Davis, USA](#)

Chalcogenide Glass Memory: Applications and Issues

Speaker: Sean Jong Lee, [Intel, USA](#)

## *Evaluation and prioritization of the topics/scientific issues*

### **Industry Leaders' Panel :**

Mehran Arbab, Director, Glass R & D, PPG Industries Inc.

Herve Arribart, Scientific Director, Saint-Gobain, France

Klaus Bange, Executive Scientist, Schott, Germany

Setsuro Ito, Senior Fellow, Asahi Glass, Japan

David Morse, Vice President and Director Corporate Research Science & Technology, Corning, USA

Shigeru Yamamoto, Director and Senior Vice President, Nippon Electric Glass, Japan

