Program

Functional Glasses:

Properties and Applications for Energy and Information

January 6 – 11, 2013
Siracusa, Sicily, Italy

Conference Chair:

Himanshu Jain
Lehigh University

Conference Co - Chairs:

Carlo G. Pantano
The Pennsylvania State University

David L. Morse
Corning Incorporated

Klaus Bange
MK Consulting, GmbH

Setsuro Ito
Tokyo Institute of Technology

Engineering Conferences International
32 Broadway, Suite 314 - New York, NY 10004, USA
Phone: 1 - 212 - 514 - 6760, Fax: 1 - 212 - 514 - 6030
www.engconfintl.org – info@engconfintl.org

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www.lehigh.edu/imi

Grand Hotel Minareto

Via del Faro Massolivieri, 26 96100 Siracusa (Italy)

Tel. +39 0931.721222 - Fax +39 0931.721555

Engineering Conferences International (ECI) is a not-for-profit global engineering conferences program, originally established in 1962, that provides opportunities for the exploration of problems and issues of concern to engineers and scientists from many disciplines.

Sunday, January 6, 2013

17:30 – 19:00	Conference Check-in / Registration (Hotel Lobby)
19:00 – 19:30	Welcome Drink (Terrace overlooking the beach)
19:30 – 21:00	Dinner

NOTES

- Please do not smoke at any conference functions.
- Turn your mobile telephones to vibrate or off during technical sessions.
- All technical sessions will be in Archimedes Hall. Poster sessions will be in Archimedes and the foyer.
- All meals will be in the Nesos Restaurant.
- Be sure to check your contact information on the Participant List in this program and make any corrections to your name/contact information online. A corrected copy will be sent to all participants after the conference.

Monday, January 7, 2013

07.00 - 07:45	Breakfast
07:45 - 08:00	**Opening Remarks: *Himanshu Jain, Chair***
	Applications of Glass in Energy Technology
08:00 - 09:15	Session 1: ***Lighting*** **Integrated glass substrates for OLED lighting,** **Mehran Arbab**, PPG Industries, USA *(~45 mins)* ***Discussion*** *led by* ***Klaus Bange****, MK Consulting, GmbH, Germany (~30 mins)*
09:15 - 10:30	Session 2: ***Photovoltaics*** **Photovoltaic industry & role of glass for reducing the cost of solar energy** **Sener Oktik**, Sisecam, Turkey *(~45 mins)* ***Discussion*** *led by* ***Driss Lamine****, Saint Gobain, France (~30 mins)*
10:30 - 11:00	Coffee break
11:00 - 12:15	Session 3*:* ***Coatings*** **Alterations of glass surfaces & functional coatings for energy conversion systems** **Joachim Deubener**, Clausthal University of Technology, Germany *(~45 mins)* ***Discussion*** *led by* ***Roland Langfeld****, Schott AG, Germany (~30 mins)*
12:15 - 13:30	Lunch
	Application of Glass in Information Technology
13:30 - 14:45	Session 4: ***Roll - to - Roll Thin Glass*** **Ultra-slim flexible glass for electronic applications** **Sean Garner**, Corning, USA *(~45 mins)* ***Discussion*** *led by* ***Richard Brow****, Missouri University of Science & Technology, USA (~30 mins)*
14:45 - 16:00	Session 5: ***Fiber for Telecommunication*** **Microstructured optical fibers: Opportunities and challenges** **Philip Russell**, Max Planck Institute, Germany *(~45 mins)* ***Discussion*** *led by* ***Younes Messaddeq****, Laval University, Canada (~30 mins)*
16:00 - 16:30	Coffee break
16:30 - 17:45	Session 6: ***Transparent Conductive Materials*** **A general introduction for the use and needs of TCMs in glass industry** **Driss Lamine**, Saint Gobain, France (~45 mins) ***Discussion*** *led by* ***Claes-Goran Granqvist****, Uppsala Univ., Sweden (~30 mins)*
18:00 - 20:00	**Poster Session** All posters will be kept on display throughout the conference. Participants will then be free to view/discuss posters at their convenience as well.
20:00 - 21:30	Dinner

Tuesday, January 8, 2013

07:00 - 08:00 Breakfast

Glass Properties for Energy Applications I

08:00 - 09:15 Session 7: ***Optical Properties***
Coated glass for energy efficient buildings: Spectral selectivity, angular dependence and time variability
Claes-Goran Granqvist, Uppsala University, Sweden *(~45 mins)*
Discussion *led by* ***Philip Russell****, Max Planck Institute, Germany(~30 mins)*

09:15 - 10:30 *Session 8:* ***Ion Transport***
Ion transport across grain boundaries in fast lithium ion conducting glass ceramics
Bernhard Roling, University of Marburg, Germany *(~45 mins)*
Discussion *led by* ***Steve Martin****, Iowa State University, USA (~30mins)*

10:30 - 11:00 Coffee break - ***Sign up for Wednesday's excursion to Siracusa***

11:00 - 12:15 *Session 9:* ***Dielectric Properties***
Dielectric properties of glasses and glass ceramics and examples for applications
Martin Letz, Schott AG, Germany (~45 mins)
Discussion *led by* ***Minoru Tomozawa****, Rensselaer Polytechnic Institute, USA (~30 mins)*

12:15 - 13:30 Lunch

Glass Properties for Energy Applications II

13:30 - 14:45 Session 10: ***Fundamentals of Strength***
Fundamentals of indentation cracking in glass: A measure of strength?
Satoshi Yoshida, University of Shiga Prefecture, Japan *(~45 mins)*
Discussion *led by René Gy, Saint Gobain Research, France (~30 mins)*

14:45 - 16:00 Session 11*:* ***Chemical Strengthening***
Sharp contact damage in ion-exchanged cover glass
Tim Gross, Corning, USA *(~45 mins)*
Discussion *led by* ***Tayyab Suratwala****, Lawrence Livermore National Lab, USA (~30 mins)*

16:00 - 16:30 Coffee break

16:30 - 17:45 Session 12*:* ***Mechanochemistry***
Surface chemistry of glass – interfacial water and mechanochemical properties
Seong Kim, Pennsylvania State University, USA *(~45 mins)*
Discussion *led by* ***Takashi Murata****, Nippon Electric Glass (NEG), Japan (~30 mins)*

Tuesday, January 8, 2013 (continued)

Energy Storage Technologies

17:45 - 19:00 Session 13: ***Glass Seals***

Sealing glasses for electrochemical devices
Richard Brow, Missouri University of Science and Technology, USA *(~45 mins)*
Discussion *led by* ***Joachim Deubener****, Clausthal Univ. Germany (~30 mins)*

19:30 - 21:15 Dinner and special presentation,
Unlimited Glass – A Mirror of Our World's Trends
Marc van den Neste, Asahi Glass - Europe, Belgium

Wednesday, January 9, 2013

07:00 - 08:00 Breakfast

Energy Storage Technologies (continued)

08:00 - 09:15 Session 14: ***Glass for Energy Storage***
Glass for energy storage: advancing the energy density and safety of batteries
Steve Martin, Iowa State University, USA **(~45 mins)**
***Discussion led by Monia Montorsi**, University of Modena, Italy (~30 mins)*

09:15 - 10:30 Session 15: ***Li battery - Electrodes***
Glass - ceramics for the innovative secondary batteries
Tsuyoshi Honma, University of Nagaoka, Japan *(~45 mins)*
***Discussion** led by **Lisa Klein**, Rutgers University, USA (~30 mins)*

10:30 - 11:00 Coffee break

11:00 - 12:15 Session 16*:* ***Proton Conductors***
Proton behavior at glass/water interfaces: implications on reactions and proton transport
Steve Garofalini, Rutgers University, USA (~45 mins)
***Discussion** led by **Jincheng Du,** University of North Texas, USA (~30 mins)*

12:15 - 13:30 Session 17: ***Nonlinear Optical Glass***
Glass and glass - ceramic for nonlinear optics: fundamentals and applications
Thierry Cardinal, University of Bordeaux, France *(~45 mins)*
***Discussion** led by **Mario Affatigato**, Coe College, USA (~30 mins)*

13:30 Lunch followed by *Optional Excursion to Siracusa / Free Time*

Dinner on your own

Excursion Itinerary

14:30	*Buses depart for optional excursion to **Siracusa***
15:00	*Arrival at the archeological park of the **Neapolis** where we can see the monolithic Greek Theatre (its cavea is one of the largest ever built by the ancient Greeks and still in use today for classical representations), the sacrificial Altar of Hieron II, the Ear of Dionysius (an artificial limestone quarry named by the painter Caravaggio) and the Roman Amphitheatre.*
16:30	*Continue on to the island of **Ortigia** to see the temple of Apollo, the oldest Doric style temple built in Sicily, The tour ends at the fresh water spring of Aretusa where the papyrus still grows abundantly.*
18.00	*Coffee stop in the scenic Piazza Duomo of Ortigia*
	Leisure time, dinner on your own
21:00	*Transfer back to the hotel*

Thursday, January 10, 2013

07:00 - 08:00 Breakfast

Glass Properties for Information Applications I

08:00 - 09:15 Session 18: ***Nanophotonics***
Microfiber/Nanofiber photonics
Limin Tong, Zhejiang University, China *(~45 mins)*
Discussion *led by* ***Octavio Cintora****, Saint Gobain, France (~30 mins)*

09:15 - 10:30 Session 19: ***fs Laser - Glass Interactions***
Micro-modification of glass by femtosecond laser - fundamentals and applications
Jianrong Qiu, South China University of Technology, China *(~45 mins)*
Discussion *led by* ***Denise Krol****, University of California - Davis, USA (~30 mins)*

10:30 - 11:00 Coffee break

Glass Properties for Information Applications II

11:00 - 12:15 Session 20: ***Information Storage***
Understanding the electrical switching behavior of chalcogenide glasses for phase change memory applications
Asokan Sundarrajan, India Institute of Science, India *(~45 mins)*
Discussion *led by* ***Yong Gyu Choi****, Korea Aerospace, Korea (~30 mins)*

12:15 - 13:30 Session 21: ***Processing - performance of Integrated Optic Structures***
Photosensitivity of optical materials for photonics and integrated optics,
Raman Kashyap*,* University of Montreal, Canada *(~45 mins)*
Discussion *led by* ***Denise Krol****, University of California - Davis, USA (~30 mins)*

13:30 - 14:45 Lunch

14:45 - 16:00 Session 22: ***Fiber Lasers***
Towards the development of advanced optical fibers
Younes Messaddeq, University of Laval, Canada *(~45 mins)*
Discussion *led by* ***Jianrong Qiu****, South China University of Technology, China (~30 mins)*

Glass Processing and Fabrication

16:00 - 17:15 Session 23: ***Glass Melting***
Making glass better
Roland Langfeld, Schott AG, Germany (~45 mins)
Discussion *led by* ***Setsuro Ito****, Tokyo Institute of Technology, Japan (~30 mins)*

17:15 - 17:45 Coffee break

17:45 - 19:00 Session 24: ***Glass Surface Damage***
Surface interactions on glass optics during fabrication, post - processing & laser operation
Tayyab Suratwala, Lawrence Livermore National Lab, USA*, (~45 mins)*
Discussion *led by* ***Raman Kashyap****, University Montreal, Canada (~30 mins)*

Thursday, January 10, 2013 (continued)

19:30 - 20:00	Cocktail reception
20:00 - 22:30	**Conference Banquet and Dinner Talk** **Path to the realization of 'A Day Made of Glass'** **M.K. Badrinarayana**, Corning, USA

Friday, January 11, 2013

7:00 - 8:00	Breakfast
	Glass Processing and Fabrication (continued)
8:00 - 9:15	Session 25: ***Optical Elements Fabrication*** **Production of chalcogenide glass optics: motivation, current status and future development** **Xianghua Zhang**, University of Rennes, France *(~45 mins)* ***Discussion*** *led by* ***Akihiko Sakamoto****, Nippon Electric Glass (NEG), Japan (~30 mins)*
9:15 - 10:30	Session 26**:** ***Large Area Device Fabrication*** **High refractive index glass for OLED lighting** **Takashi Murata**, Nippon Electric Glass (NEG), Japan (~45 mins) ***Discussion*** *led by* ***Sener Oktik****, Sisecam, Turkey (~30 mins)*
10:30 - 11:00	Coffee break
11:00 - 12:30	**PANEL DISCUSSION and Conference Conclusion** **Panelists will include leaders of glass industry**
12:30	Lunch and departures

Poster List

1. ***Formation of residual compressive stress on a glass surface through surface stress relaxation: a new mechanical strengthening mechanism***
   Minoru Tomozawa, Rensselaer Polytechnic Institute, USA

2. ***Hybrid melting gels in electronic packaging***
   Lisa C. Klein, Rutgers University, USA

3. ***Alkali free boroaluminosilicate glasses for high energy and high temperature power electronic capacitors***
   Priyanka Dash, The Pennsylvania State University, USA

4. ***Solution-processed amorphous chalcogenide electrolyte for lithium-ion batterys***
   Yong Gyu Choi, Korea Aerospace University, Korea

5. ***Controlling temperature dependence of lifetime of trivalent dy ions doped in GE-AS-S glass via very small compositional adjustments***
   Yong Gyu Choi, Korea Aerospace University, Korea

6. ***Effects of irradiation on structure and properties of zinc-aluminophosphate glasses***
   Charmayne E. Smith, Missouri University of Science and Technology, USA

7. ***In situ surface relief recoding in light sensitive chalcogenide glasses***
   Sandor Kokenyesi, University of Debrecen, Hungary

8. ***Hybrid plasmonic structures incorporating glass microfibers and AG nanowires***
   Xin Guo, Zhejiang University, China

9. ***Application of ion transport in chalcogenide glasses for radiation sensing***
   Mahesh Ailavajhala, Boise State University, USA

10. ***Effect of salt bath composition on chemical tempering of sodium-containing silicate glass***
    Vincenzo M. Sglavo, University of Trento, Italy

11. ***Field assisted viscous flow accompanied by electrical conductivity and photoemission in a sodium aluminosilicate glass***
    Umberto Scipioni, University of Trento, Italy

12. ***Compositional design for borate glass as a matrix for active components***
    Kathryn L. Goetschius, Missouri Universtiy of Science and Technology, USA

13. ***Analysing the microstructure of glasses by cutting-edge transmission electron microscopy***
    Thomas Höche, Fraunhofer IWM, Germany

14. ***Laser crystallization of fresnoite thin films on sapphire wafers***
    Thomas Höche, Fraunhofer IWM, Germany

15. ***Fabrication of conductive glass nanocomposites through percolation of conductive nanoparticles***
Timothy L. Pruyn, Georgia Institute of Technology, USA

16. ***Electrical and structural properties of vanado-phosphate glasses***
Monia Montorsi, University of Modena and Reggio Emilia, Italy

17. ***Rare earth doped oxyfluoride glass-ceramic nanocomposites for oled***
Manuela Reben, AGH -University of Science and Technology, Poland

18. ***Nanostructured thin layers on glass obtained by silkscreen technique***
Joanna Zontek-Wilkowska, AGH -University of Science and Technology, Poland

19. ***The effects of the mixed glass former effect on ion conductivity in MGF solid state electrolytes***
Deborah Watson, Iowa State University, USA

20. ***New advances and current challenges in femtosecond laser-induced crystallization for 3D precision patterning of nonlinear optic structures inside glass***
Adam Stone, Lehigh University, USA

21. ***Simulation of phosphate glasses for nuclear waste applications***
Benjamin Bell, Imperial College London, United Kingdom

22. ***Study of AL2O3 coating by atomic layer deposition (ALD) on soda-lime-silicate glass***
Yusuke Arai, Asahi Glass Co., Ltd., Japan

23. ***The effect of zinc oxide addition on the durability and alkali clustering in nuclear waste glasses***
Thorsten R. Stechert, Imperial College London, United Kingdom

24. ***Effect of electrical field and defects on lithium ion diffusion in lithium silicate glasses and lithium lanthanum titanate solid electrolytes***
Jincheng Du, University of North Texas, USA

25. ***Reuse of copper slag as selective absorption glass-ceramic glazes for mw energy applications***
Cristina Siligardi, University of Modena and Reggio Emilia, Italy

26. ***Percolative electrically-conductive CMAS-TiO2-Pd glass-ceramics***
Himanshu Jain, Lehigh University, USA

27. ***Fabrication and optical properties of gold-glass nanocomposites***
Himanshu Jain, Lehigh University, USA

28. ***The mechanical strength increase of glass containers using nanotechnology***
Krzysztof Czarnacki, Pol-Am-Pack S.A., Poland