

## CIMTEC 2006 Presents Research on Ceramics and New Materials

www.cimteccongress.org

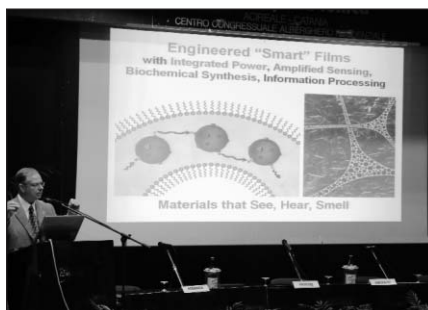
The 11th International Ceramics Congress and 4th Forum on New Materials (CIMTEC 2006), endorsed by the World Academy of Ceramics (WAC), the International Union of Materials Research Societies (IUMRS), and the International Ceramics Federation (ICF), was held in Acireale (Catania), Sicily, Italy, June 4–9, 2006. Pietro Vincenzini, chair of the Council of the WAC, chaired the congress with Robert Freer (president, ICF) and Robert Nemanich (immediate past president, IUMRS), who served as co-chairs of the Ceramics Congress and the Forum on New Materials, respectively. Vincenzini opened the congress with an outline of some aspects linked to current developments in the ceramics and new materials areas, pointing out that in few other sectors are research stimuli, potential market attractiveness, technology commercialization, and competitive positions more complex and more intertwined.

The opening plenary session, chaired by R.M. Spriggs (Alfred Univ.), included two keynote lectures, both devoted to the field of nanotechnology. Keynote speaker M.E. Welland (Univ. of Cambridge) addressed “Nanomaterials & Nanotechnology: Prospects and Pitfalls,” focusing on ethical issues and the potential environmental and human health consequences involved in the use of nanomaterials and nanotechnology. Keynote speaker C. Montemagno (Univ. of California, Los Angeles) followed with a lecture on “Molecular Engineering Biomimetic Materials and Systems.” Montemagno presented an approach to achieve a stable, hybrid, biotic/abiotic system for engineering functional materials that inherently process information and offer the premise for engineering materials that manifest higher-order functionality. A case in point was systems for engineered materials that incorporate coupled-protein functionality to enable energy transduction at the molecular scale.

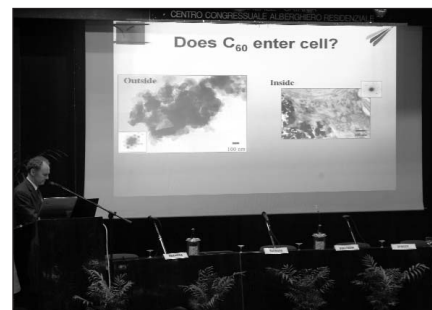
The program was mainly based on invited and selected lectures to discuss the most up-to-date research and development areas relevant to the different fields covered. The 11th International Ceramics Congress included 13 sections (61 sessions) that covered recent progress in relevant fields of ceramics science and technology, including the emerging area of nanomaterials, to which a special symposium was devoted. The 4th Forum on New Materials consisted of five parallel international conferences (Mass and Charge Transport in Inorganic Materials, Science and Engineering of Novel Super-



Presidential table at the opening plenary session of CIMTEC 2006 (from left to right): **Robert Nemanich** (chair, 4th Forum on New Materials), **Francois Baumard** (World Academy of Ceramics), **Pietro Vincenzini** (chair of the Council of the WAC and general chair of the CIMTEC conferences), **Richard Spriggs** (Alfred University and chair of the CIMTEC 2006 opening plenary session), **Robert Freer** (chair, 11th International Ceramics Congress), **Mark Welland** (keynote speaker), and **Carlo Montemagno** (keynote speaker).



**Mark Welland** (University of Cambridge) illustrates his keynote lecture on “Nanomaterials & Nanotechnology: Prospects and Pitfalls.”



**Carlo Montemagno** (University of California, Los Angeles) presents his keynote lecture on “Molecular Engineering Biomimetic Materials and Systems.”



Lunches for attendees took place on a terrace overlooking the sea.

conductors, Diamond and New Carbon Materials, Materials in Clinical Applications, and Advanced Inorganic Fibrous Composites for Structural Applications) and two special symposia (Spin Injection and Transport in Magnetoelectronics, and Biomedical Applications of Nanotechnologies). Altogether, more than 1100 attendees listened to about 740 oral pre-

sentations given in 15 parallel sessions and viewed about 280 posters. Online proceedings will be available from Trans Tech Publications, Switzerland.

The busy schedule of the event did not prevent an attractive social program that included a welcome reception; guided tours to the historical seaside city of Taormina and the craters of the active

volcano, Mt. Etna; and the closing concert, held in the Theater of Catania, in which a number of overtures from famous Italian operas were performed by the renowned Philharmonic Orchestra of the "Massimo Bellini" Theatre.

PIETRO VINCENZINI  
General Chair, CIMTEC Conferences

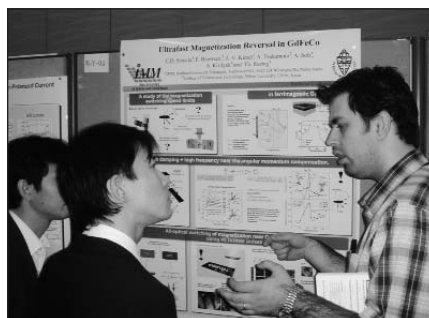
## 10th MORIS 2006 Workshop Lights up Future Recording Technology

[www.ecs.cst.nihon-u.ac.jp/moris2006ws/](http://www.ecs.cst.nihon-u.ac.jp/moris2006ws/)

The 10th international workshop on Thermal and Optical Magnetic Material and Devices (MORIS 2006), sponsored by the Magnetics Society of Japan, was held in Tomiura, Chiba, Japan, June 6–8, 2006.

Masahiko Kaneko of Sony Corp. was a general chair of the workshop. To open MORIS 2006, he gave a brief welcome and a history of the workshop. In his remarks, Kaneko said, "Thermomagnetic physics has progressed, as its use in the recording process for magneto-optical disks has spread toward application to HDDs and MRAMs [hard-disk drives and magnetic random-access memories]. In addition, magneto-optical effects have been actively studied for magnetophotonic crystals in new functional devices. In this workshop, invited presenters will be allotted enough time in their talks for comprehensive and informative discussions on their research fields."

In the MORIS 2006 workshop, research areas were related to thermal and optical aspects of magnetism. Five main topics were presented and discussed: heat-assisted magnetic recording (or hybrid



*Takuya Kamimura (left) of Fujitsu Laboratory Ltd. in Japan, and C.D. Stanciu (right) of Radboud University Nijmegen in the Netherlands, discuss ultrafast laser-induced magnetic switching. Kamimura and Stanciu each were honored with a best poster award at the MORIS 2006 workshop.*

recording), magneto-optics and MO recording, magnetophotonic crystals, fast magnetization reversal, and spintronics. Altogether, 114 attendees heard 22 invited speakers and viewed 54 posters.

Selected papers from the MORIS 2006 workshop are scheduled for publication as a special issue of the *Journal of the Magnetics Society of Japan (JMSJ)*.

J.A. Bain (Carnegie Mellon University) received one of the three best poster awards for his poster, "Side Track Erasure and Wide Magnetic Pole HAMR Write Heads." Bain suggested the optimal architecture for the head and medium of next-generation HDDs of Tbit/in.<sup>2</sup> and Tbit/s.

The busy workshop schedule included three local cultural events: a picnic lunch on a beach of the Pacific Ocean, a Japanese drum performance at a special dinner, and the construction of paper fans during lunch the last day.

The MORIS 2006 workshop, endorsed by the Materials Research Society, closed with the announcement of the plan for the next MORIS workshop in Pittsburgh, Pennsylvania, in October 2007.

KATSUJI NAKAGAWA  
Nihon University  
Chair, MORIS 2006 Workshop  
Steering Committee

## WoDiM Workshop Emphasizes High-κ Dielectrics

[www.imm.cnr.it/wodim\\_2006](http://www.imm.cnr.it/wodim_2006)

The 14th Workshop on Dielectrics in Microelectronics, WoDiM 2006, hosted by Consiglio Nazionale delle Ricerche (CNR), with the support of STMicroelectronics, Consorzio Catania Ricerche, the University of Catania, and the Catania Regional County, and endorsed by the Materials Research Society, was held in Santa Tecla (Catania), Italy, June 26–28, 2006. The meeting, organized by Salvatore Lombardo of the Istituto per la Microelettronica e Microsistemi (IMM) and an international committee, was attended by about 150 scientists from 21

countries and featured approximately 100 presentations focused on the theme of dielectrics in microelectronics.

Topics particularly discussed were in the field of high-κ dielectrics, with an emphasis on the understanding of the physical properties of the materials and on their integration in complementary metal oxide semiconductor processes, high-κ dielectrics for nonvolatile memories, ultrathin oxynitrides, novel memory concepts, insulators for back-end-of-the-line processes and novel substrates, and new applications.

Invited speakers covered essentially two main aspects: reliability issues such as trapping in high-κ dielectrics, negative bias temperature instability (NBTI), dielectric breakdown, and channel hot carrier damage. Invited speakers also addressed novel concepts such as phase change and nanocrystal memories, and dielectrics for Si photonics.

The next WoDiM workshop will be organized by IHP in Germany in 2008.

SALVATORE LOMBARDO  
CNR-IMM  
Organizer, WoDiM

## Particles 2006 Focuses on Particle-Based Advances in Medical Diagnostics and Drug Delivery

<http://nanoparticles.org/Particles2006/>

The conference Particles 2006, held in Orlando, Florida, May 13–16, 2006, brought together 480 participants from six continents, presenting more than 275 oral papers in six parallel tracks and 95 poster presentations in two evening poster receptions. The conference was produced by the Particles Conference of Rochester, N.Y., and was co-sponsored by the Division of Colloid and Surface Chemistry of the American Chemical Society, the European Association of Pharma Biotechnology, and the American Association of Pharmaceutical Scientists. The theme of the conference returned to that first produced in 2002, Medical/Biochemical Diagnostic, Pharmaceutical, and Drug Delivery Applications of Particle Technology. This interdisciplinary conference mixed presentations by research clinicians with presentations by biophysicists and materials scientists, and provided a venue for both academic and pharmaceutical venture scientists.

After the traditional Saturday evening opening mixer, the technical program commenced Sunday morning with a plenary lecture by Frank Szoka (Univ. of California, San Francisco, and a co-founder of Sequis Inc.) on "Targeted Bioresponsive Nanolipid Particles." Szoka illustrated the power of combining modern molecular biology methods with particle technology for delivering "cargo" to particular tissues

(typically cancer cells), the developmental processes encountered in bringing new drug delivery technology on line, and a stimulating view into the near future as further advances are achieved. The second plenary lecture, given on Monday morning, was delivered by Vince Rotello (Univ. of Massachusetts, Amherst) on "Nanoparticles: Scaffolds and Building Blocks." Rotello illustrated the divergent approaches available for diagnostic particle assembly, and focused on his own recent advances in using polymer functionalization to control nanoparticle condensation at designed interparticle spacings. These approaches should be of great use in general nanocomposite materials design. Heinrich Hofmann of EPFL Lausanne delivered the final plenary on "Superparamagnetic Particles for Diagnostics and Therapeutics." He concentrated on illustrating how to synthetically balance physical functionality to maximize delivery and minimize immunoresponses while maintaining colloidal stability *in vitro*. The use of superparamagnetic particles also facilitates the use of external magnetic fields to activate rates of transfection and cargo delivery, in addition to more classical diagnostic imaging applications.

The conference spanned a wide array of topics, and included full days on Particle Toxicology, Photodynamic and

EM Therapy, Supercritical Fluid Processing, and Inhalation & Aerosols, in addition to full tracks on Nanoparticles & Hydrogels and Diagnostics, with other symposia on Liposomes; Controlled Release; Particle Characterization; Suspensions; Emulsions; Vaccine Delivery; Cancer Targeting; Gene Delivery; and Micelles, Dendrimers, & Conjugates.

The spirit of start-up companies was pervasive at the conference. Joe DeSimone of both the University of North Carolina at Chapel Hill and North Carolina State University at Raleigh, and a highly reputed polymer chemist, presented a keynote lecture on the use of imprint lithography to manufacture highly value-added particles of uniform shape. The spinoff company marketing this technology, Liquidia, was an exhibitor at the conference. Vicki Colvin of Rice University and Vicki Stone of Napier University gave keynote lectures in respective sessions on their views of toxicology and its impact on particle and nanoparticle technology development.

It is planned to repeat this topic again in 2010.

JOHN TEXTER  
Eastern Michigan University  
General Chair, Particles 2006  
Organizing Committee