

News Release

Los Angeles County Museum of Art

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LACMALab presents *nano*: a Media Arts & Science Exhibition Making Nanoscience Visible, Tangible, and Experiential for Visitors of All Ages

December 14, 2003-September 6, 2004



nano is presented free to the public in
LACMA's Boone Children's Gallery

LOS ANGELES—*nano*, an exhibition that merges the arts and the atom by presenting the world of nanoscience through a participatory aesthetic experience, opens December 14 at the Los Angeles County Museum of Art. The exhibition, a collaboration between LACMALab and a UCLA team of nanoscience, media arts, and humanities experts, is free to the public and runs through September 6, 2004 in LACMA's Boone Children's Gallery. *nano* is presented as part of LACMA's NexGen youth membership program and is the fourth exhibition organized by LACMALab, the museum's experimental research and development unit, which initiates new models of presenting art and engaging audiences of all ages through artists' projects.

This groundbreaking project provides a greater understanding of how

art, science, culture, and technology influence each other. The exhibition addresses sophisticated subject matter that is especially relevant for the next generation. Modular, experiential spaces using embedded computing technologies engage all of the senses to provoke a broader understanding of nanoscience and its cultural ramifications. The various components of **nano** are designed to immerse the visitor in the radical shifts of scale and sensory modes that characterize nanoscience, which works on the scale of a billionth of a meter. Participants can feel what it is like to manipulate atoms one by one and experience nano-scale structures by engaging in art-making activities.

The project installations were conceived and designed by media artist Victoria Vesna (Department of Design | Media Arts, UCLA) with nanoscience pioneer James K. Gimzewski (Department of Chemistry, UCLA) and created together with a team of their graduate students. N. Katherine Hayles (Department of English, UCLA), also with graduate students, developed the text component within the gallery. In conjunction with the exhibition, Hayles is editing a collection of essays entitled ***NanoCulutre: Implications of the New Technoscience*** to be published in 2004 by Intellect Press. The exhibition's architecture was designed by Sharon Johnston, Mark Lee, and Anne Rosenberg of Johnston Marklee & Associates. **nano** also has a strong studio component, including a virtual reality drawing tool developed by Caltech. LACMALab's director, Robert Sain and its exhibition coordinator Kelly Carney, worked in conjunction with Carol Eliel, curator of Modern and Contemporary Art at LACMA to collaborate with the exhibition team on all aspects of **nano**.

Exhibition Overview

The exhibition begins in the lobby with a folded three-dimensional surface, which introduces visitors to the environment of **nano**. As visitors approach the gallery entrance, their pictures are taken by a swarm of small surveillance cameras. These photographs are used to form a large-scale, constantly flowing ribbon of images, a virtual "organism" that ultimately include a daily log of visitors to the exhibition.

The architecture of **nano** actively creates synergy with the exhibition's media installations and the visitors. Inside the 10,000 square-foot gallery, the folded architectural surfaces create flowing layers of enclosed and semi-enclosed spaces for the viewing of **nano**'s various components. These spaces transform the visitor's experience from an anthropomorphic scale to the nano scale.

One of the greatest advances in nanoscience was a paradigm shift in

understanding that access to and control of the nanoworld is possible through tactile-feeling sensors as opposed to lens-based viewing microscopes. In the Sense Space, visitors "feel" their way into and away from the Inner Cell with subtle changes in tactile elements and pulsed soundscapes. The sensory experience of these spaces and others are meant as a conceptual analogy to the scanning tunneling microscope (STM), a nanoscience tool that uses touch rather than sight as a means of understanding molecules on the nano scale.

In the central area of the exhibition, the visitors enter the large Inner Cell, where they interact with molecular forms through their hands and feet as well as through eyes and ears. This virtual and metaphoric cell-space provokes visitors to discover through physical engagement, to learn by feeling. With the use of nothing more than their shadows, visitors are able to manipulate and reshape large-scale projected images of a particular form of the carbon molecule, commonly known as a "buckyball." In the Inner Cell, visitors also encounter audience controlled robotic balls, or "atoms," that roam the space and project high-pitch sounds, emulating the physical actions of cells.

Nanoscience delves into the manipulation of life's building blocks. In the Atomic Manipulation area, visitors see a live, bird's-eye view of the Inner Cell space through a tabletop projection. There, they move, manipulate, and reorient individual "atoms" (the robotic balls in the Inner Cell) in actions that emulate the operations of the STM.

Two kaleidoscopes are embedded in the outer wall of the Inner Cell. Visitors view the kaleidoscopes' views of the Inner Cell and its participants, while hearing passages from science fiction narratives. These passages suggest to visitors the influence science fiction writers have had in the development of, and advances in, nanoscience. The fracturing of vision from multiple perspectives, combined with oral storytelling of science fiction prompts visitors to become immersed in the complex images or virus-like assemblages of imagery and action created by their fellow exhibition visitors.

To reinforce the understanding of the nano scale, the exhibition includes an installation connecting to the process of the recent creation of a [sand mandala](#) at LACMA, from a nano-scale view of a grain of sand to the completed eight-foot mandala (a cosmic diagram and ritualistic symbol of the universe, used in Buddhism and Hinduism). The method monks use to create sand images, particle by particle, bears resemblance to the purposeful arrangement of individual molecules in nanoscience.

Quantum mechanics is one of the least understood phenomena in science, for it focuses on shifting laws of action and reaction. Visitors can encounter *nano's* Quantum Tunnel, where images of their faces are

projected on two opposing walls. When a visitor in either of these spaces activates a camera, his or her image is captured and projected on the nearby wall. As a visitor travels through the connecting corridor to the opposite end, the two projected images are juxtaposed and become distorted. When another visitor passes through the corridor, the facial images are again disturbed and altered, fractured into particles and waves.

The popular LACMALab art studio elicits responses from visitors using open-ended materials and focused activities such as molecular model-making. In addition, visitors are invited to "draw" in space, using a cutting-edge computer design program and tool created by Steven Schkolne at Caltech that translates physical movements into virtual, 3-D images. The natural world and digital display merge in this exploration of crystallography, creating a shared space where viewers experience physical properties beyond traditional visual means.

Text passages are interwoven throughout the exhibition space in subtle but expansive ways that broaden the ideas and implications of the installations and the common understanding of nanoscience. Quotations from novelists, scientists, and other critical thinkers illustrate how nanoscience has been, and continues to be, imagined by the creative minds of so many authors and artists.

Participants

nano is a collaborative project involving more than 30 individuals from LACMA, UCLA's SINAPSE Group, and Johnston Marklee & Associates with an additional contribution by Caltech.

Installations by:

Victoria Vesna, noted media and net artist and chair of the UCLA Department of Design | Media Arts. She has exhibited internationally and lectures and publishes widely on how perceptions of identity shift in relation to technological and scientific innovation.

James K. Gimzewski, internationally known nanoscience pioneer, professor in the UCLA Department of Chemistry, and member of the California NanoSystems Institute at UCLA. He formerly led the IBM team that constructed the world's smallest abacus using molecules one atom high and is the recipient of numerous awards for his research.

Text component by:

N. Katherine Hayles, award-winning scholar, UCLA Associate Vice Chancellor for Research, John Charles Hillis Professor of Literature in the Department of English, and professor in the Department of Design | Media Arts. Her publications are widely influential in the fields of science, technology and literature, and electronic literature.

Architecture by:

Johnston Marklee & Associates, an award-winning architectural practice based in Los Angeles whose projects have been exhibited and published internationally. Principals Sharon Johnston and Mark Lee teach and conduct design research at a host of national and international schools of architecture and are on the faculty of the Department of Architecture and Urban Design at UCLA.

LACMA's participation under the direction of:

Robert Sain, director of LACMALab since 1999. Over the past four years, Sain commissioned 30 artists, 40 art students and three architecture firms to create experimental projects serving more than 250,000 visitors of all ages.

Carol S. Eliel, curator of Modern and Contemporary Art at LACMA. She joined the museum in 1984 and has organized numerous exhibitions, including *The Apocalyptic Landscapes of Ludwig Meidner* (1989), the award-winning *Annette Messenger* (1995), and *L'Esprit Nouveau: Purism in Paris, 1918-1925* (2001).

California Institute of Technology's (Caltech) participation includes:

Steven Schkolne, known for inventing physical ways to interact with 3-D digital data. He is currently writing his doctoral thesis on 3D computer interfaces.

Peter Schröder, professor of computer science and applied and computational mathematics at Caltech since 1995. He is recognized for his pioneering work in Digital Geometry Processing and has received numerous awards including a Packard Foundation Fellowship and the ACM/SIGGRAPH

Computer Graphics Achievement Award.

About LACMA

Established as an independent institution in 1965, the Los Angeles County Museum of Art has assembled a permanent collection that includes approximately 100,000 works of art spanning the history of art from ancient times to the present, making it the premier encyclopedic visual arts museum in the western United States. Located in the heart of one of the most culturally diverse cities in the world, the museum uses its collection and resources to provide a variety of educational, aesthetic, intellectual, and cultural experiences for the people who live in, work in, and visit Los Angeles. LACMA offers an outstanding schedule of special exhibitions, as well as lectures, classes, family activities, film programs and world-class musical events.

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Exhibition Credits

This exhibition was produced by LACMALab, a research and development unit of the Los Angeles County Museum of Art, and the University of California, Los Angeles. The exhibition was made possible in part by Union Bank of California, Bert Levy, the David Bermant Foundation, and Veeco Instruments. In-kind support was provided by IBM, Canon U.S.A., Inc., and Epson.

LACMALab is supported in part by the Caryl Mudd Sprague Endowment for the Education of Children.

UCLA units supporting this exhibition include the Department of Chemistry and Biochemistry, the Department of Design | Media Arts, Office of Research, Pico Lab, School of the Arts and Architecture, SINAPSE, and Technology Sandbox. Additional support was provided by UC Digital Arts Research Network and UC Discovery.

Exhibitions in the Boone Children's Gallery are made possible in part by the MaryLou and George Boone Children's Gallery Endowment Fund.

Boone Children's Gallery Hours: Monday, Tuesday, Thursday, and Friday, noon–5 pm; Saturday and Sunday 11 am–5 pm; closed

Wednesday. Call (323) 857-6000, or visit our web site at www.lacma.org.

Boone Children's Gallery Admission: Admission to *nano* in the Boone Children's Gallery is free.

General LACMA Admission: Adults \$9; students 18+ with ID and senior citizens 62+ \$5; children 17 and under are admitted free. Admission (except to specially ticketed exhibitions) is free the second Tuesday of every month, and evenings after 5 pm.

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