On STAGE with Science

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When engineering, science and art converge

?Disciplinary boundaries are far more arbitrary than people tend to believe,? said Turk, who lauds what he sees as a pervasive interdisciplinary culture throughout UCSB. ?We think there?s a lot to be gained by breaking down or transcending boundaries.?

The Professional Artists Lab and the California NanoSystems Institute at the University of California, Santa Barbara announce the fourth STAGE International Script Competition, open to plays about science and technology.

The winner will receive a $10,000 prize, along with opportunities for developing and promoting the winning script.

Stage endeavors to:

- cultivate appreciation and collaboration between the two cultures of science and art
- catalyze the development of art that depicts the technological age in which we live
- promote understanding of the sciences in the public arena
- foster new and imaginative voices and methods of storytelling
- accomplish all of the above within an international community

All entries must be postmarked on or before December 15, 2009
boundaries It’s a word that crops up often in conversation with Professor Matthew Turk, chair of the Media Arts and Technology (MAT) Program at UCSB. For some people the word may suggest constraints, restrictions, and limits. For Turk, however, boundaries are something to be pushed, extended, blurred, and even erased.

Within the academic world, the arts and the sciences were long considered distinct, if not mutually exclusive, disciplines. Now, however, the MAT program at UCSB is proving that when artists, engineers, and scientists work together, the results can be truly astonishing.

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Such collaboration, for example, may enable scientists to visualize things that are too small to see, helping them to better understand their science or engineering; at the same time artists are digging below the surface of science, sometimes using little more than raw data to create new visual, audio and performance works.

Nancy Kawalek, a studio professor in film and media studies and the MAT program, agrees. “What’s very interesting to me is that our lives and technology intersect every second of the day but that’s not reflected in the theater as much as I would like to see,” she said.

A trained actor and director from New York with 25 years stage, film and television experience, Kawalek is the founder and director of the Professional Artists Lab which brings professionals from around the world to share their creative and performance talents at UCSB.

Kawalek is especially interested in using multi-media in the theater to help tell a great story rather than just adding special effects. “That requires artists, scientists and engineers to talk to each other,” she said. “And that raises some exciting possibilities.”

The same MAT theme of entwining the arts and science has given rise to STAGE -- Scientists, Technologists, and Artists Generating Exploration--which has just held its third annual playwriting contest.
The cast of 2006 STAGE Script Competition winner Splitting Infinity (from left to right): Kathryn Ish, Sage Parker, Michael Cassidy, Sharon Lawrence, Saul Rubinek, Angela Goethals, and Peter Smith.

STAGE, which operates under the umbrella of the Professional Artists Lab and the California NanoSystems Institute (CNSI), offers a $10,000 prize for the best script which must prominently feature issues relating to science and technology. ?It?s about creating theater that?s relevant,? Kawalek said.

Based on the ?extraordinarily positive response? to the script competition, Kawalek has introduced the STAGE Project, an international collaboration to create and develop original multi-media theater pieces prominently featuring science and technology.

This fall a group of professional actors and multi-media artists, along with some MAT graduate students, will gather at UCSB to begin working on one such piece called ?The Brain Project?.

The seeds of MAT were sown when music professor JoAnn Kuchera-Morin, who has been building media systems and studios for more than two decades, launched the Center for Research in Electronic Art Technology (CREATE) at UCSB in 1984.

She worked with MAT colleagues Professor Curtis Roads and Stephen Pope to build and develop the facility in the mid-?90s, and was MAT?s first chair. Today CREATE is still knitting together such diverse talents as computer engineering and composition.

The Center provides students, researchers, media artists and professional composers with a creative environment in which to work; CREATE also acts as a laboratory for the development of software and hardware tools for media-based composition.

The value of such collaboration is not lost on Turk, a computer scientist who came from Microsoft to join the faculty at UCSB in 2000.

He senses a gradual movement towards more programs like MAT as other universities fall into step with the digital rhythm humming beneath the surface of modern life. George Legrady, professor of media arts, said there are eight such graduate programs in the U.S.
MAT, spread across at least three campus buildings, is mainly based in CNSI where a chunk of the second floor is devoted to lab space and faculty offices. The graduate program, started in 1999, has about 35 students working towards Master of Science, Master of Arts and PhD degrees.

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Turk believes MAT helps boost visibility and name recognition for UCSB and sets the university apart. In time he sees the program pushing forward research in ways not happening at other universities which will be another bonus for UCSB.

He also thinks the program helps attract quality students and faculty who might otherwise look elsewhere. As for the benefits beyond the campus, Turk believes they are huge and getting bigger all the time.

Faculty positions for PhDs are opening up not just in this country but also in Europe and Japan, while gaming companies and the entertainment industry in general is hungry for the sorts of skills taught within MAT.

DreamWorks, Pixar and other movie makers are looking for engineers with "aesthetic senses" and artists with "technical competence," Turk said; similarly, Internet companies like Google and Microsoft value the broad background provided by the MAT program.

This same sentiment was expressed in a recent New York Times story which quoted author Daniel Pink ("A Whole New Mind: Why Right-Brainers Will Rule the Future") saying that the MFA (Master of Fine Arts) has become "the new MBA."

A remarkable physical manifestation of MAT's rolling back boundaries is the Allosphere, described by Turk as the "crown jewel" of Media Arts and Technology. As chief scientist of digital media for the University of California in the early 2000s, Kuchera-Morin created, designed, and implemented the Allosphere Research Laboratory.

Six months after its initial reading at UCSB, The Phenom, a Professional Artists Lab project, went on to have a final developmental workshop at the Minneapolis Playwrights' Center. Here, seen at the close of the workshop, are the exhausted but very happy participants. From left to right: Producing Artistic Director of the Minneapolis Playwrights' Center, Dr. Polly Carl; playwright Barbara Lebow; dramaturge Liz Engelman; and Lab Director Nancy Kawalek.
This three-story, 10-meter-diameter sphere, built inside an anechoic cube on the second floor of CNSI, is a deep black space destined to be saturated with speakers and projectors to create what Turk calls a “very, very rich immersive environment.”

Though there’s still more hardware, software and computing infrastructure to come, the Allosphere is already wowing visitors who walk out onto a narrow metal bridge in the heart of the sphere for a unique spatial experience.

Right now that walk can turn into a 3-D journey through a brain—the scanned brain of MAT visual artist Professor Markos Novak. Ultimately, the goal is to create a multi-user interactive facility which would, for example, simulate the ability to reach out, grab molecules and move them around.

That research has already started, said Kuchera-Morin, director of the Allosphere, with the work of Professor Christopher Van DeWalle and the Solid State Lighting and Energy Center making it possible to “fly through atoms.”

The Allosphere is unique. “It’s the only place in the world doing this,” said Kuchera-Morin. “It’s not virtual reality? we’re effecting a true human experience of immersion in visual and auditory manifestations of information, with resolution limited only by eyes and ears.”

The facility will be used to help visualize the most minute structures or processes, detect patterns in information that scientists may not otherwise find, and turn data into art.

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Turk also sees the promise of commercial applications for Allosphere technology in a range of computing devices, from large displays to cell phones, and thinks the interaction-rich possibilities could appeal in the world of entertainment and gaming.

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“We can do a lot better,” says the director of the Four Eyes Lab where students from computer science and MAT focus on imaging, interaction, and innovative interfaces (the “four I’s”).
When it comes to the visual and spatial arts, Turk said MAT students are very technically competent and much more advanced technically than in typical art departments.

He singles out one of Legrady’s projects as an example of the type of artwork or installation art that “couldn’t have happened without MAT.”

Making Visible the Invisible at the Seattle public library, typifies Legrady’s work in the field of interactive installations in which data is given artistic representation—in this case the constant flow of data generated every time someone checks out a book, DVD, CD or other item.

The installation runs in real time on six large screens behind the information desk. Legrady has used statistical and algorithmic software to create a visual representation of the data captured by the Dewey cataloging system and other information such as book titles and check-out times.

Projects like this require expertise both in the arts and in engineering. “MAT attracts students who are eager to work in this way and provides such collaboration opportunities,” Legrady said. “For instance, Rama Hoetzlein, an MAT Ph.D., contributed innovative engineering to the Seattle project.”

Legrady said besides creating an experience for viewers, part of the idea is “to integrate the audience.” That goal has also inspired other of his works which have appeared across the U.S. as well as in Europe, Canada, Taipei and Japan.

One of his installations called Blink, an animated wall of eyes continually opening and closing, was shown last year at the Santa Barbara Museum of Art. His latest project, “We Are Stardust?,” based upon the journey and observations of the Spitzer Space Telescope, opens October 10 at the Art Center College of Design, in Pasadena.

George Legrady’s “Dynamic Modulations” is a visual artwork of continuously changing electronic images. Video cameras inside and above each tank record activities at 30 frames per second. The images are then digitized and mathematically processed, filtered, and stored. Based on the calculated information, animations are then generated and displayed on the large LCD screens.

Artwork like this seeks to bring form and human scale to a piece of science which,
because of its size, scope and the amount of data being generated, is difficult for many to fully comprehend.

However, when talk turns to mixing engineers and scientists with artists and musicians, it’s easy to assume who’s contributing the creative juices. But beware those stereotypes, says Nancy Kawalek.

“Scientists are as creative as artists,” said Kawalek. While the two groups have plenty of differences, “scientists I know are unbelievably creative.”

In some senses, the blurring of the lines between arts and science does little more than reflect the reality of today’s fast-moving, fast-changing, high-tech world. “Technology is constantly morphing,” Kuchera-Morin said.

**Relevant links:**

Scientists, Technologists and Artists Generating Exploration (STAGE)
[link](cnsi.ucsb.edu/stage)

Media Arts and Technology Graduate Program
[link](mat.ucsb.edu)

The Allosphere at CNSI
[link](mat.ucsb.edu/allosphere)

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