When Tod Machover’s Toy Symphony premieres in Berlin on February 24, 2002, it will introduce the world to a set of Music Toys and new hyperinstrument technology that will radically alter how children are introduced to musical expression and creativity. The culmination of a three-year effort by Machover and the Lab’s Opera of the Future group, which he directs, the Toy Symphony brings together children, world-class soloists, composers, and symphony orchestras from around the world, to redefine the relationship between professional musicians and young people.

Building on visionary technologies developed for Machover’s Brain Opera (now a permanent exhibit at the House of Music in Vienna, Austria), the specially designed Music Toys developed for the Toy Symphony enable children to engage directly in sophisticated listening, performing, and composing—activities normally accessible only after years of study. The toys also give children a unique opportunity to play alongside some of the world’s most accomplished musicians.

“One of the biggest surprises of the Brain Opera,” says Machover, “was that the people who understood it most quickly—and did the most with it—were the oldest and the youngest—grandparents and little kids. And it came to me that there are creative ways to better involve children in serious music; ways that don’t depend on language skills, but take advantage of kids’ emotions and physical energy.”

Diana Young and Tristan Jehan are creating the next-generation Hyperviolin. Young is developing new techniques for measuring “expressive” bows by embedding nanosensors directly into the bow. Jehan is developing software for analyzing the sound of the violin and wirelessly morphing it into another sound, creating a “cloud of electronic music” on the fly.

Egon Pasztor and Mary Farbood are the creators of HyperScore, software that converts visual information into music. Farbood is exploring how visual gestures are converted into melodies, phrases, and then an entire composition. Pasztor is developing a system for analyzing drawings and converting them into music.

For those who can’t wait until next year for a sampling of the Toy Symphony, Machover will premiere Sparkler with the American Composers Orchestra at Carnegie Hall in New York City on October 14.
Congratulations to Tod Machover, head of the Lab's Opera of the Future group, who was promoted to full professor.

Highly regarded for creating music that breaks traditional artistic and cultural boundaries, Machover's compositions offer a unique and innovative synthesis of acoustic and electronic sound. His works have been performed and commissioned by many of the world's most important performers and ensembles, and he has received many awards internationally, including the Chevalier de l'Ordre des Arts et des Lettres, one of France's highest cultural honors, and the first DigiGlobe Prize from the German government. He has composed five operas, including the celebrated Brain Opera, and is also the inventor of hyperinstruments, a technology that uses smart computers to augment musical expression for virtuosos, amateurs, and children.

This fall, Machover is composer-in-residence with the American Composers Orchestra at Carnegie Hall in New York, and will lead an international festival there in mid-October on the future of technology and the symphony orchestra. Machover's newest work for hyperorchestra, Sparkler, will premiere at Carnegie Hall as part of this event. In addition, Machover's most recent opera, Resurrection, will be produced by the Boston Lyric Opera in November; a CD of the work will be released in conjunction with this new production. In addition, final touches are currently being put on Machover's Toy Symphony project (see Toying with Serious Music in this issue), which will roll out in Europe in spring 2002, and travel to the United States and Asia in fall 2002.

Bruce Blumberg, who holds the Asahi Broadcasting Corporation Career Development Professorship of Media Arts and Sciences, has been promoted to associate professor.

Blumberg heads the Lab's Synthetic Characters group, which focuses on building systems that can learn the way animals learn, behave with the everyday common sense that animals display, and trigger the feelings of companionship that animals such as dogs evoke in us. The Lab's resident expert on dogs—both real and virtual—Blumberg and his group have developed several autonomous synthetic dogs, including Silas T. Dog and Duncan the Highland Terrier. Duncan is part of the group's sheepdog: trial by eire project, in which Duncan, with the user's help, attempts to herd a flock of autonomous (and willful) sheep. Most recently, Blumberg's group demonstrated alpha-wolf at the Emerging Technology venue of Siggraph 2001 in Los Angeles. This installation, featuring autonomous and semi-autonomous wolves with a multi-person interface in an expressive graphical setting, allows participants to interact socially with a pack of wolf pups and help them find their place in the social order of the pack. Duncan and other virtual characters created by the group have been widely demonstrated at conferences such as Siggraph, where Blumberg has also served as a lecturer on artificial life for graphics, animation and virtual reality, and intelligent, animated agents.

Blumberg came to the Lab from NeXT Inc., where he was one of the original employees. Prior to NeXT, he was the product manager for the original Apple LaserWriter. He received his doctorate from MIT, studying under Pattie Maes at the Media Lab. Previously he earned an MS from MIT's Sloan School of Management and a BA from Amherst College.
On Friday, November 9, faculty and research staff from the Media Lab will present a one-day special event, The Media Lab: Redesigning the Future, at Oribe Hall in Tokyo. The purpose of the event is to introduce sponsors and friends to the Lab’s current research agenda: what the Lab believes will define “being digital” in the twenty-first century.

The agenda will include remarks by Nicholas Negroponte, co-founder and chairman of the Lab; Walter Bender, executive director and head of the Lab’s Electronic Publishing group; and a number of other faculty members and research staff, including two new faculty members who joined the Lab this past summer, Cynthia Breazeal and Chris Csikszentmihalyi.

In conjunction with the seminar, the Media Lab’s current “Raw Materials” exhibit will be on display. The exhibit is a sampling of materials that serve as the building blocks of research, gathered by students at the Lab.

To learn more about the event, please send e-mail to: TokyoEvent2001@media.mit.edu

The Tangible Media group (TMG) has opened a year-long exhibit, Get in Touch, at the Ars Electronica Center’s Museum of the Future in Linz, Austria. The exhibit, which opened on September 1, features nine TMG research and design projects—both “classic” and new systems—that demonstrate how to “make bits tangible.”

This exhibit continues the center’s 20-year history of making new media arts and technologies accessible to visitors from Europe and around the world. By engaging the public with hands-on demonstrations, it lets people interact with digital information in new ways, challenging them to rethink notions of technology, communication, and public education.

For more on the Tangible Media group and the center visit http://tangible.media.mit.edu/ and http://www.aec.at/center2/index.html

Joseph Jacobson, head of the Lab’s Molecular Machines group, was one of eight scientists to receive a Discover magazine 2001 Award for Technological Innovation.

The awards, granted annually, recognize groundbreaking work of far-reaching impact with relevance to our daily lives. The winners were announced in the July issue of the magazine and honored at a gala ceremony in New York City.

Jacobson won in the Electronics category for Printed Inorganic Chips—Cheap, Really Cheap, Chips: integrated circuits that can be printed on a piece of plastic easily and inexpensively by a desktop computer.

In selecting Jacobson for the award, the judges cited the broad possibilities of this technology, from electronic paper to radio-frequency ID tags that could be printed on any item imaginable.

Sponsors may request more information about topics in FRAMES from Ellen Hoffman at hoffman@media.mit.edu, or by telephone 617-253-0640.

For information about the Media Lab, visit http://www.media.mit.edu

Photo: Webb Chappell
URING THIS PAST JULY, NRETHINKING LEARNING TO LEAD A PIONEERING DIGITAL NATIONS CONSORTIUM, WORKING THROUGH THE FUTURE OF LEARNING GROUP, THE MEDIA LAB'S ENVIRONMENTS FOR THE FOCUSED ON WORKSHOP. digitally augmented Mexico, was tional craft of Alebrije, a tradi-
This past July, the Media Lab’s Future of Learning group, working through the Digital Nations consortium, headed to Mexico City to lead a pioneering summer institute focused on rethinking learning environments for the twenty-first century.
For two weeks, 250 teachers and community activists from 13 countries, speaking 11 different languages—some of whom had never used a computer before—put the innovative concept of Learning Hubs into action.

Conceived by Research Scientist David Cavallo, who heads the Lab’s Future of Learning group, and Professor Seymour Papert, Learning Hubs is a pioneering approach to what learning could become in a digitally connected world. Initially, it is a group of very small entities—many from the world’s poorer and more remote locations—that form a global network focused on bringing about radical change in how we think about education.

Those participating in Learning Hubs share the belief that the need for significant change in learning has become more urgent with the spread of digital technology, and that the major kinds of changes needed have not—and will not—come as automatic consequences of placing computers in schools. Instead, serious intellectual effort will be needed to define new forms of learning. Serious efforts focused on social consciousness-raising will also be needed for the public to accept these changes.

“The essence of these hubs is not form, but function,” explains Cavallo. “The two primary requirements for each Learning Hub are first, to create at least one new ‘out of the box’ pilot for innovative learning, and second, to form a global network of local ‘learning activists’ to help develop, guide, and research successful models for learning.” Local Learning Hubs could help communities in numerous ways, serving as public access technology/learning centers, schools, centers for community development, incubators for small technology-based businesses, sites for professional development of educators, and centers for intellectual and political discussion.

The summer institute attracted participants whose backgrounds varied enormously: some with many years of experience, some with almost none. Some came with considerable technological experience, while others lacked even the most basic computer skills. “Rather than treating this diversity as a problem,” says Cavallo, “we viewed it as a strength, just as we advocate not segregating learners by age to enable a mixed environment.” And it worked. Using constructionist computer technologies, such as the Logo programming language for children, digital cameras, and simple robotics, participants came up with projects that ranged from computer-animated storytelling that incorporates local folklore, to a seismograph whose readouts were displayed on a roll of toilet paper.
What next?

Drawing on the success of the summer institute and working through the Lab's Digital Nations consortium, the Future of Learning group anticipates that participants will be creating Learning Hubs across the globe, beginning with existing sites in Mexico, Ireland, Costa Rica, the United States, Senegal and Brazil. Local projects will be leveraged to include larger efforts, with the aggregate of these local initiatives forming a global Learning Hub network.

For more on Learning Hubs visit http://learning.media.mit.edu/hub.html

The summer institute coincided with the second international forum of the Centro de Estudios Estrategicos de Cultura Digital, co-sponsored by the Instituto Tecnológico de Teléfonos de México (INTTELMEX) and Telmex, a corporate research partner of the Media Lab. The mission of the center is to bridge the digital divide, spreading technology across Mexico.