

# ASTC Dimensions

Bimonthly News Journal of the Association of Science-Technology Centers

May/June 2004

## GLOBAL POSITIONING:



### *Revisiting the Science Center Model*

**If We Could Start Again...**

**The Dana Centre:**

**Science for Adults Only**

**Agents of Change:**

**Reinventing the Ontario Science Centre**

**People to People:**

**Tying Science to Culture in South Africa**

**Who's Driving the Engine?**

**Finding Your Model for a Sustainable Future**

**The Darwin Centre:**

**Integrating Collections and Communication**

**Citizen Science:**

**Involving the Public in Research**

**Social Inclusion, Science, and the  
Quality of Life**



# Dimensions

Bimonthly News Journal of the Association of Science-Technology Centers

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## IN THIS ISSUE

May/June 2004

**Does our science center model need an overhaul? That was the question posed in the session of that title, led by ASTC president Pelle Persson and Buffalo Museum of Science president and CEO David Chesebrough, at the 2003 ASTC Annual Conference in St. Paul. The roundtable discussion attracted an overflow crowd—an indication that the topic resonates for many in the field. In preparation for a follow-up at ASTC 2004 in San Jose, this issue offers additional perspectives and some examples of ways that science centers are reexamining and repurposing their institutions for a new century.**

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*Cover:* In a changing world, what will it take for science centers to continue to make “a positive difference”? These young visitors to the Science Museum of Virginia suggest an answer: teamwork and tenacity. *Photo courtesy SMV*

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# If We Could Start Again...

By Emlyn Koster

The 1960s were an exciting time for science—and for science museums. Increasingly, the public was seeing science and technology as an engine for opportunity and challenge. At the 1962 Seattle World's Fair, the U.S. Science Pavilion was so popular that city officials voted to turn it into the Pacific Science Center.

In 1969, humanity entered a new phase in its relationship with nature as we took our first look back at Earth from the Moon. In that same year, the opening of the Exploratorium in San Francisco and the Ontario Science Centre in Toronto spurred the new “science center” movement.

Existing museums in a number of U.S. and Western European cities had already been introducing interactive experiences, and these new institutions were instantly successful. In place of artifacts and specimens, scholarly research, and conservation, they developed participatory exhibits and demonstrations and a strong focus on public education. ASTC was formed in 1973, but only after much fretting were science centers formally incorporated into the “museum” category.

The past three decades have seen a veritable explosion of our field. Science centers are now found on six continents, most abundantly in the United States. But all is far from well with our institutions. Increasingly, we find ourselves dwelling on disturbing issues: funding and sustainability, the balance between popularity and usefulness, our distinctive identity, the alarming state of science and technology literacy in society.

If we were to conduct a so-called SWOT analysis—a balance sheet of strengths and weaknesses, opportuni-

ties and threats—of the science center field, what would we say?

- *Science centers are popular.* Yet for many institutions attendance has been declining. In the United Kingdom, for example, several science centers that opened with Millennium Project funds have already closed or are struggling financially.

- *Science centers put enormous energy and resources into exhibits and programs.* Yet in the United States, where our abundance should produce the greatest impact, reports on the state of science education released by federal commissions commonly do not even acknowledge our existence.

- *Science and technology are new forces in the public's sense of culture.* In 1909, American museologist John Cotton Dana advised professionals to “learn what the community needs and fit the museum to those needs.” Yet only now are science centers starting to become truly relevant.

We must question whether these weaknesses and threats are, in retrospect, of our own making. Perhaps we have used the word “fun” too often in our marketing and branding. Perhaps we have been overly consumed with measures of internal performance rather than of external effectiveness. When we have asked the public and private sectors to support our capital campaigns, perhaps we have not positioned the value of our institutions—or our proposed expansions—to best advantage.

From time to time, it is instructive to step back and reflect on where and how one has traveled. If we could start our science centers over again, what would we do differently?

- In terms of *content*, would we rebalance our focus on education and entertainment? Would we reconsider

our overall costs and benefits? Would we demand more substantive value from giant screen and simulator experiences? Would we create systems to keep pace with new science and technology? Would we steer away from the “informal education” label?

- In our *community relations*, would we pay more attention to social and environmental issues? Would we establish the kind of relationships with schools that would lead them to regard us as indispensable to their needs? Would we responsibly place science and technology in a context of both opportunity and challenge? Would we strive to be seen more positively by society, by government, and by the scientific community?

- In our *partnerships*, what types of funding relationships—corporate, philanthropic and individual—would we regard as ideal? How would we relate to other cultural institutions? Yes, we have our own associations, but today many museums are copying our methods: How should we be working with them?

Of course, all of these questions, and more, have unique answers for different institutions in different cultural settings. But if we do not explore this territory, we will never come to grips with the common ground that surely does exist.

Any conclusions we can reach will be illuminating and beneficial to the well-being of a field that should be preoccupied, and successfully so, with the profound desire to make a positive difference in the world. ■

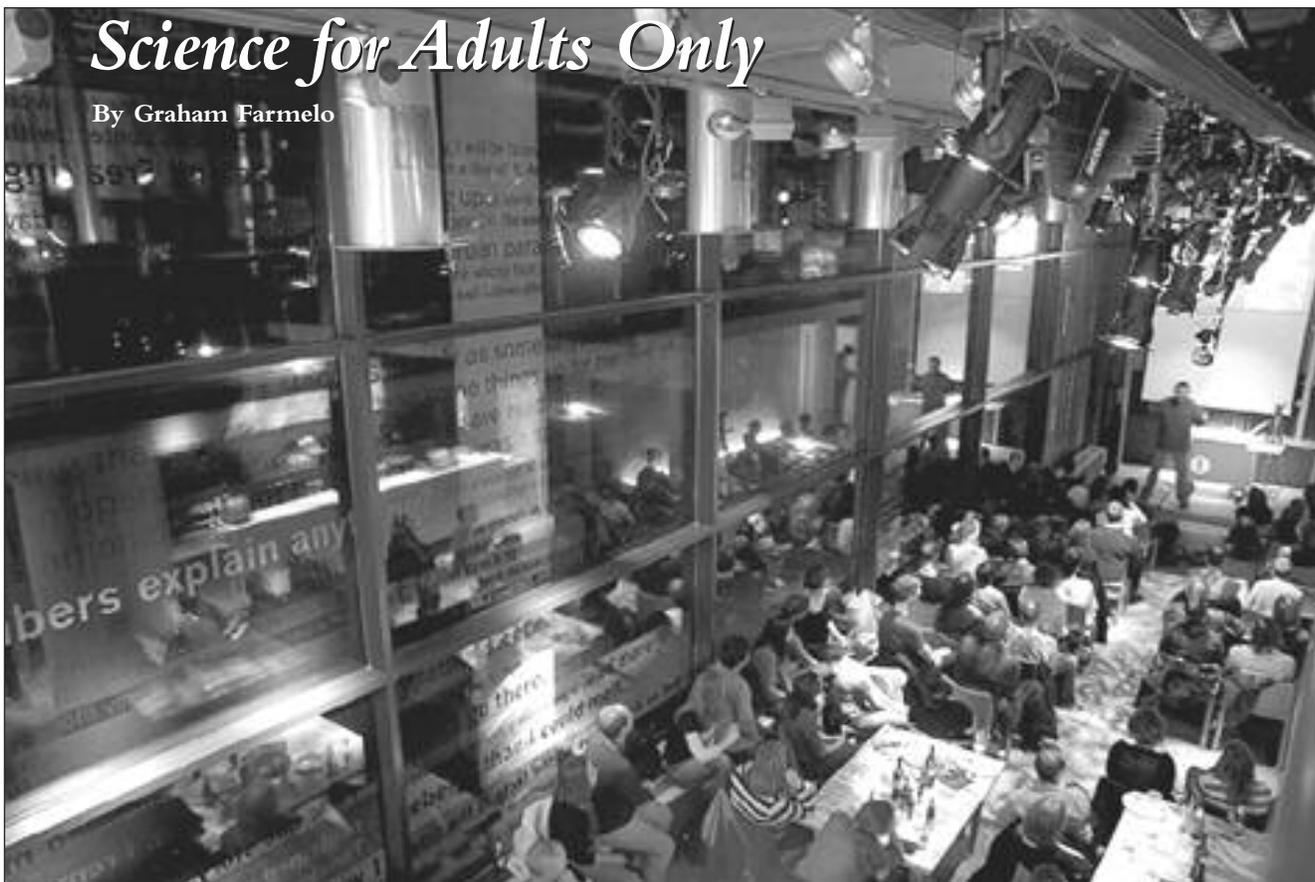
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*Emlyn Koster is president and CEO of Liberty Science Center, Jersey City, New Jersey. At the 4th Science Centre World Congress next April in Rio de Janeiro, Brazil, he will lead a roundtable discussion on the topic of this article.*

# The Dana Centre:

## *Science for Adults Only*

By Graham Farmelo



Photos courtesy Dana Centre/NMSI

By night, the cafe/bar at London's Dana Centre becomes a venue for performance, discussion, and relaxation.

In today's commercial leisure market, science centers are in danger of being invisible. This is true not only for the families we are seeking to reach, but also for many of the professional sectors with which we need to work closely.

Consider our standing within the scientific establishment. Although most scientists are familiar with collections-based science museums, few could tell you what a science center is. They simply have no connection with our institutions.

Likewise, we are often overlooked by cultural opinion formers. This has had important ramifications in the United Kingdom, where the science centers funded by the Millennium Project are having to fight hard for operational funding from the government. And it is a continual struggle to explain the value of our mis-

sion to potential corporate donors.

Must it be like this? I contend that it need not, and should not. Visitors to science centers should come away with an enhanced sense of science as a jewel of modern culture. They should recognize that Einstein was as much a creative genius as Beethoven. Like the members of Britain's Royal Society, whose motto is "Take nobody's word for it," they should understand that science is based on a culture of questioning, on never taking any one person's view as infallible truth. And they should emerge with a sense of the ethical, the moral, the political questions that science is generating in today's world.

### Trying a new tack

When we opened the Wellcome Wing at the Science Museum in London nearly four years ago (see

*ASTC Dimensions*, September/October 2000), we not only wanted to bring current science and technology into the museum in an interactive way; we also wanted to establish a clearer alignment and communication with the scientific community.

The Wellcome Wing's *Antenna* exhibition was conceived as a theater of current science, with rotating temporary exhibits on hot topics, real-time projection of science and technology information from the BBC's web site, and a demonstration area where museum staff and visiting scientists could present short talks on current research and take questions from visitors.

We envisioned these live interactions as true dialogue on a level playing field—not a case of "the people who know" addressing the

“benighted masses.” This notion of dialogue has proved very successful with our Science Museum audiences, which include primarily families and schools.

What we wanted to do next was to set up a place purely for adults, mainly in the 18–45 age range, where we could address issues that often cannot be treated in a family-focused environment, approaching them in ways that would not be suitable for children. We particularly wanted to reach groups of visitors who, frankly, would not normally be seen dead in a science museum or at what we might rather pompously call a “science engagement event.”

There were plenty of possibilities: university students, the people in the minority neighborhoods around West London, the tens of thousands of working people who do not visit the Science Museum. (We should never forget that most museums reach only a small fraction of their community.)

How could we draw these adult audiences in?

Informed by visitor research, we identified three elements for success. First, a program for adults would require its own place, one distinctly separate from the museum, a place where people would feel they could hang out. What could that be? A coffee bar? A broadcast studio? A nightclub? In the end, we chose all three.

Equally important was content. The science in our new center had to be edgy, controversial, a bit racy, and completely up to the minute. It had to connect with people’s lives. The Wellcome Trust gave us a \$250,000 grant to pilot content. Under the alluring title “Naked Science Debate,” we went out to pubs, theaters, and arts centers and presented 15 events we would never have dreamt of doing in the museum, on topics like abortion and euthanasia. Our emcees were people who had training in science but were also congenial to these

young adult audiences. Some of the events were failures; others—such as a pub quiz—were encouragingly successful. We have built on these learning experiences.

The final step was partnerships. We couldn’t handle every aspect of this project as a single agent, so we set about forming and growing partnerships with science researchers, with other U.K. science centers, and with cultural venues of various types, including those in the arts.

### Conversations around science

Thus was born the Dana Centre, the first separate adults-only center operated by an established science museum. We opened November 18, 2003, in the Wellcome Wolfson Building, a handsome, new seven-story structure that fronts the Wellcome Wing on one side and a South Kensington residential street on the other.

*Continued on page 7*



The Science Museum Design Studio worked with outside partners to design a sophisticated environment for the Dana Centre. Inspired by online blogs, the café’s Wall of Conversations, right, serves to filter light from an exterior courtyard, and the movable tables continue the playful combination of language, text, and typography.

Above: The center’s modest entrance on Queen’s Gate belies the lively activities within.



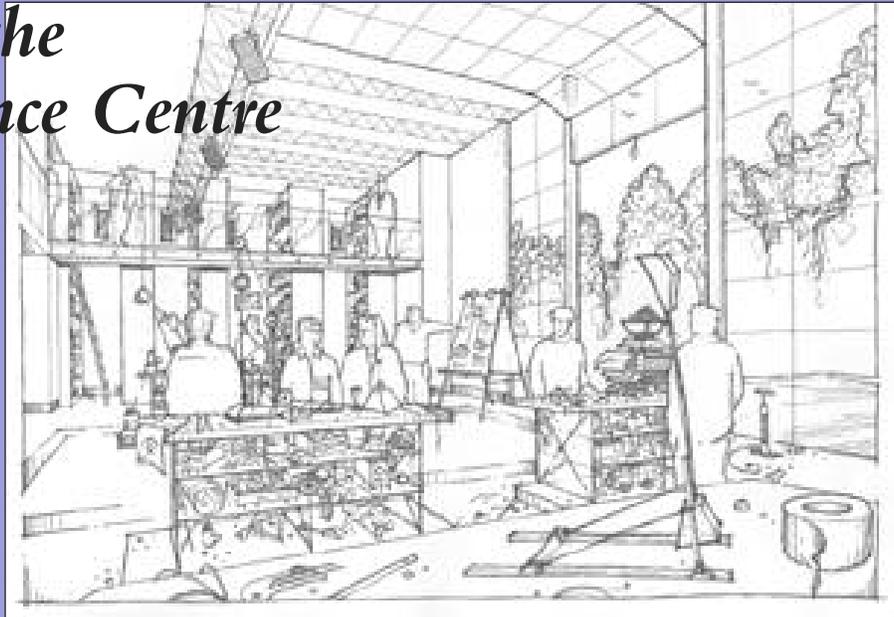
# Agents of Change:

## Reinventing the Ontario Science Centre

By Jennifer Martin

**In the Challenge Zone workshop, shown here in an artist's rendering, visitors will work to solve a "problem of the day" before time runs out.**

*Image courtesy Ontario Science Centre*



On the wall in the project team room at Toronto's Ontario Science Centre is a quote from Ralph Waldo Emerson: "Always do what you're afraid to do." It is a constant reminder that our team is doing something uncertain, something risky, and it will be several years before we're sure we're right.

After three decades, the science center—a pioneer, with San Francisco's Exploratorium, of the interactive, exhibits-based science museum—is revisiting its mission and methods. Branding research completed in early 2000 told us that, although our public regarded us highly as "authentic," a "place for excellence in science communication," and "a fun and educational place to visit," they also thought it was time for us to reinvent ourselves, to move into a new phase.

What would that look like? What if we abandoned our attachment to exhibits and "science learning outcomes" in favor of encouraging innovation, collaboration, creativity, and problem solving? What if we no

longer developed things *for* our visitors, but instead developed things *with* them? Could a focus on fostering the skills, attitudes, and behaviors needed for a new century provide a strong basis for institutional success? Could it justify a major new initiative, and the capital campaign to go with it? We took on the challenge of finding out.

The process began with a mutual understanding that, although the science center would continue to develop, design, and build interactive exhibits, we needed to diversify our strengths. We wanted to become not just a place, but a presence—a point of departure for confident and connected individuals who would then contribute, question, and collaborate in their worlds.

To accomplish that, we needed to find new ways to engage a very particular audience—teenagers and young adults—while retaining our current audience of families with younger children, and to offer that audience a chance to join us in the development of new experiences.

The result of our planning is the \$40 million initiative we call *Agents of Change*.

By 2006, the Ontario Science Centre will have completed 25,000 square feet of renewal, including seven new experience areas. These range from an expanded Great Hall, dedicated to inspiring our visitors when they first arrive, to the Challenge Zone, a workshop where teams will solve a "problem of the day" in a set time period with limited resources. We are also adding the Hot Zone, an area dedicated to current science, which will serve as an orientation and meeting hub for three major exhibition halls.

KidSpark, an 8,000-square-foot exhibition hall focused on children 8 years old and under, has already opened to great acclaim. Our three final areas—Citizen Science, Material World, and Media Studies—will allow participants to contribute to real science research, engage with real stuff, and create real expressions in art, computer science, fashion, technology, and music. If we are successful, the

entire *Agents of Change* project will continue to change and evolve.

To accomplish all of this, we have changed our development practices, taking our work out from behind the scenes and putting it on the exhibit floor. Guest audiences, from teenagers to corporate vice presidents, have participated in the design of the experience areas. Partners like DuPont Canada have brought real-world problems into the Challenge Zone to see what 15-year-olds can come up with. In turn, DuPont has challenged the science center to set up methods for documenting and assessing our innovation processes as we go.

To help very young children become scientists, we are working with TVO, the Ontario provincial educational television network, to develop a television and online program called "Sightings of Spring," in which 3- and 4-year-olds contribute data to climate models. At the other end of our audience spectrum, we are mentoring a group of teens new to Canada as they build their own local-broadcast radio station.

Of course, science content will always be central to the Ontario Science Centre's mandate. But we believe that to be viable in this century, science centers need to be more than places for science discovery.

Imagine what our world could be like if the power and passion of teenagers and young adults, as well as younger children, were supported by a platform of tools, skills, and, most importantly, collaborative guidance by mentors. Imagine those individuals becoming mentors to others. At the Ontario Science Centre, we are committed to creating just such a platform—a springboard of activities, partnerships, alliances, and programs that will foster Canada's young *Agents of Change*. ■

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*Jennifer Martin is director of visitor experience and lead planner for the Agents of Change project at the Ontario Science Centre, Toronto, Canada. For more information, visit [www.ontariosciencecentre.ca/about/aoc/why.asp](http://www.ontariosciencecentre.ca/about/aoc/why.asp).*

### *Continued from page 5*

The project is supported by four principal donors: the Wellcome Trust, the Wolfson Foundation, the Dana Foundation, and the Garfield Weston Foundation. The top four floors of the building house offices for the BA (British Association for the Advancement of Science), the European Dana Alliance for the Brain, and others. The lower floors are all about the excitement of science and technology—not in a musty, test-tube kind of way, but cool and sleek, with flowing screened images that combine classic typography with playful conversation.

What happens in the Dana Centre? That depends on the time of day. Drop in on a weekday morning for a cup of coffee and a chat (we're open Monday through Friday, 10 a.m. to 11 p.m.), and you may find people from *Antenna Science News* talking about the events of the day. In the studio, perhaps, a radio show is being taped or a scientist's talk is streaming out to a BBC or cable TV channel. Everything is relaxed and easy-going.

Nighttime is another story. That's when the young crowd arrives. One evening, the place may be a comedy venue; the next night, rap artists take over. We get mimes, poets, conspiracy theorists, and video jockeys. It's all built around science issues, but not in a patronizing way. One of our early events combined a performance by a professional contortionist with a discussion of the genetic inheritance that supports her talent. On another evening, we watched and discussed *Live from the Cardiac Classroom*, the pioneering program from the Liberty Science Center.

A popular recurring event is "Punk Science," a loud, anarchic, and comedic tour of contemporary science. From explosive demonstrations to adult humor, the Punk Scientists will show you science as you've never seen it before. Occasionally we bring in objects from the Science Museum, using the collections as a cultural feed, but adapting the content in such a way that people have a good time. Our approach to science has a high focus on entertainment. If our audi-

ence sees us as boring, then we have failed and we have to change.

To date, we have been lucky in our press coverage. By calling our enterprise "adults-only" and promising to tackle difficult issues in a funky way on a neutral platform, we have definitely aroused a lot of media attention. Dana Centre events are advertised in the hipper London listings, which you have to pay for, and we also put notices in magazines in the minority communities. What's encouraging is that when we talk to the right people, they do come. Many of our events are sold out well in advance.

That doesn't mean we aren't taking chances. Many people in the field, especially funders and governors of museums, have expressed doubts about the venture. We minimized the risk by hiring promoters, hosts, and planners who are experienced in working with our target audience. We test everything we do—through feedback, evaluation data, and public approbation at events—so we can build on our success and learn from our mistakes.

Money is also a challenge. Labor-intensive programs like ours are much more expensive than exhibitions, so we have to have considerable funding. Our supporters include government departments, academic societies, media organizations, and international science and technology companies.

Though we are having tremendous fun with all of this, mission is always at the heart of what we do. Our ultimate goal is for the events and deliberations in the Dana Centre to have a real influence on local and national research policy. To that end, we continue to develop content and work toward new partnerships at high levels. ■

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*Graham Farmelo, science research fellow at the Science Museum, London, directed the Dana Centre Project: [www.danacentre.org.uk](http://www.danacentre.org.uk). He is the editor of *It Must Be Beautiful: Great Equations of Modern Science* (Granta Books, 2002) and, with David Chittenden and Bruce Lewenstein, *Creating Connections: Museums and the Public Understanding of Current Research* (AltaMira Press, May 2004).*

# People to People: Tying Science to Culture in South Africa

By Jon Weinberg

Recent research has shown that science centers worldwide are reevaluating their positions. For the most part, the novelty of the science center as a fun-filled alternative to the traditional museum has worn thin. This applies as much to centers that benefit from state funding as it does to privately run institutions.

The model of science centers as entertaining, broad-based platforms for interactive mathematics, science, and technology learning is no longer a sufficient basis for operations. The bottom line has become how many visitors move through the turnstiles each day—a criterion that, in turn, undermines the notion of science centers as altruistic, education-based places of learning.

Borrowing enticements from the business marketing world may improve the situation somewhat, but in the end the integrity of science centers' mission statements and policies depends on how well those statements and policies reflect the environment and wishes of the targeted community or communities.

## Examining motives

It is not often that science centers look to museums for inspiring initiatives and examples, but in this case the exercise might be timely.

In the museum and science center worlds alike, many factors affect the decision to embark on policy changes.

In the case of certain museums, collection practices encased in colonial history, plus years of state funding and support, have militated against this process. But recently, we have seen more examples of museums that have adjusted and accommodated to the voice and needs of the community and the stakeholders of the museum's collection.

In some cases, circumstances surrounding a controversial museum exhibition have drawn the community into a decision-making process—a process that then played a part in influencing museum governance and policy decisions.

Examples include the Royal Ontario Museum's *Into the Heart of Africa* exhibition, the *Enola Gay* exhibit at the Smithsonian Institution's National Air and Space Museum, the SITES gallery's *Peoples' Voices* exhibition, and *Miscast—Negotiating the Presence of the Bushman*, an exhibition at the South African National Gallery. In each case, the museum had to reconsider its motives with regard to research and conceptual and consultative criteria.

Of course, not all science centers find themselves in this predicament, and conversely not all museums have done the right thing in terms of transformation.



Actors perform *Iklips, African Tales of the Moon and the Sun*, a play created at the MTN ScienCentre to celebrate the December 2002 solar eclipse.

Photos courtesy MTN ScienCentre

## Embracing a heritage

In general, science centers worldwide have been able to skirt some of these issues by focusing purely on science, math, technology, and related areas. But science centers in South Africa, by default, cannot ignore these issues. For very real sociopolitical and historical reasons, in our country cultural inclusivity is nonnegotiable.

Museums have led the way in this regard, with the IZIKO conglomerate of museums in Cape Town going through several transformative processes to become more representative of the communities they represent. It was therefore inevitable that this route should be pursued by South Africa's science centers.

Ironically, although our continent lags behind much of the rest of the world in science and math achievement, mathematics, science, and tech-

nology are deeply rooted in African heritage and culture. If our science centers are to survive, the reality of this rich history and experience must be acknowledged, applied, and made known to all South Africans.

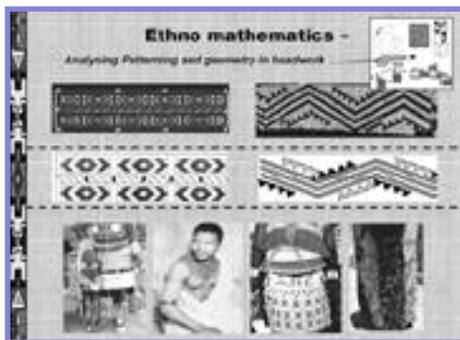
With these imperatives in mind, the MTN ScienCentre, in Cape Town, has been looking carefully at ways of making our activities more diverse and inclusive. Our interpretive staff already includes speakers of Xhosa, Afrikaans, and English, the three main languages of the Western Cape. And many of the existing exhibits and projects—including *Building Africa*, *African Games Spiral*, *Cycology*, *Mark Shuttleworth: First South African in Space*, *Inventions That Changed Your World*, and *Great South African Inventions*, as well as various theater productions written at the center—reflect African heritage and culture.

### Celebrating all systems of knowledge

Recently, the MTN ScienCentre applied to the National Research Foundation (NRF) to fund an exhibition on indigenous knowledge systems (IKS) in southern Africa. NRF has indicated its commitment to the project, which we call *Umntu Nguntu Ngabantu*, a Xhosa phrase that means “A person is a person through other people.”

In concept, the exhibition is a thematic mosaic that attempts to clarify, demystify, and create respect for the notion of indigenous knowledge. The concept and initial planning have been framed in consultation with NRF staff for a broad and diversified target audience, with a focus on South African youth.

Specialists in IKS from the universities of Maputo, Cape Town, Stellenbosch, and Witwatersrand are coordinating the research, in consultation with people in the various KhoiSan communities, rural dwellers in KwaZulu Natal, traditional healers



MTN ScienCentre's *Umntu Nguntu Ngabantu* exhibition, now in development, will use artifacts, contemporary works, and hands-on activities to link indigenous African knowledge systems with modern science, math, and technology.

from around South Africa, cultural workers, and others involved in the various fields of IKS. The design team includes designers and curators from the MTN ScienCentre and IZIKO museums; exhibits will be fabricated in Cape Town and project-managed by the MTN ScienCentre.

The content of *Umntu Nguntu Ngabantu* highlights such issues as

- the erosion of indigenous and traditional knowledge through colonial practices and apartheid legislation, as well as the notions of representation and misrepresentation;
- the different meanings of IKS and the new knowledge systems that are evolving out of interactivity and diversity in South Africa;
- collection practices in Africa and their influence in the creation of stereotypes; and
- ethnomathematics and the long rich history of math, science, and astrology in Africa.

Exhibition examples will be drawn from

- patterning in beadwork and basketware;
- African sand drawings;
- African healing: the importance of the ancestors, myths, and real practice;

- African religions;
- Art, music, and adornment;
- African games; and
- crossover knowledge (a term coined by planners to broadly describe a new knowledge system that arises from the confluence of a traditional system and a contemporary one).

We believe these attempts to include and share the diversity of indigenous practices and knowledge systems will serve to enhance the real understanding of science, math, and technology in a South African context. They will also have relevance for other developing nations, as well as for developed countries that are acknowledging their own “first nation” heritage.

The fact that modern South Africa has an underdeveloped “science culture” belies the country’s rich and embedded science and technological heritage. Perhaps it is only when this is acknowledged, shared, and understood that our science culture will improve. It is our hope that the MTN ScienCentre will play a small part in this renaissance. ■

*Jon Weinberg is exhibitions manager at the MTN ScienCentre, Cape Town, South Africa: [www.mtnsciencentre.org.za/](http://www.mtnsciencentre.org.za/).*

# Who's Driving the Engine?

## *Finding Your Model for the Sustainable Future*

By Thomas Krakauer

In my almost 30 years as a science museum CEO and now museum consultant, I have seen a lot of trends come and go—each proclaiming its critical importance in ensuring a sustainable future for our field and our individual institutions.

Early on, we were still doing battle over “hands-on.” That discussion eventually crystallized as the concept of “first-generation” to “fourth-generation” institutions—with first generation being the collections-oriented science museum, and fourth generation moving from mere interactivity toward becoming a true center of constructivist learning.

The field has seen, and continues to see, the creation of hundreds of new science centers, many reaching gigantic proportions. It has responded to calls for more “edutainment”—sometimes seeking to become more Disney-like than Disney itself. But we are still asking questions about paying the bills, still worrying about that sustainable future. The packed house at the ASTC 2003 session “Does Our Science Center Model Need an Overhaul?” attests to the level of interest in “new models” and the hope to be in on the creation of the magic bullet that will solve our economic problems.

I would like to recommend that we focus internally to find the new model that works best for each of us and our community. Many institutions have been coached by Roy Shafer to uncover their “Core Ideologies.” Core Ideology is a concept far stronger than Mission Statement, which describes future goals and stakeholder aspirations rather than the base from which we desire to grow.

Core Ideology reflects what we actually are, and how we need to invest to meet our long-term aspirations.

In his best-selling book *Good to Great*, business analyst Jim Collins created the “Hedgehog Concept.” In the wild, the little hedgehog survives predation, he says, because it does one thing very well and does not get sidetracked by competing strategies. Applying the idea to business, Collins singles out companies that have identified their “hedgehog” business strategy and invested to improve it.

The Hedgehog Concept can be summarized in three key questions: What is our organization *passionate* about? What can we be *best in the world* at? What drives our *economic engine*? A company becomes successful, Collins says, not when its people find the right external solution, but when they work hard to understand who they are and what they do best.

As nonprofit institutions, science centers and museums have more complex concerns and goals than commercial enterprises do (or we should have). Unlike corporations, we are held accountable for balancing margin with societal mission. But we can still usefully apply the Hedgehog Concept.

By taking time to identify where our *passions* lie and what our *centers of excellence* are, we are better positioned to make appropriate choices—whether those be to add more contemporary science, build stronger networks and collaborations, or enhance our connections to schools and after-school efforts.

It is in the area of *economic engine* that we most differ from the corporate world. The majority of science

centers charge admission, which meets part of the budget, but we also depend on governmental support, donations, and other unearned income to fund the rest. Our institutions thus have two economic engines, and the variables that impact each are quite different.

Earned income is largely a function of attendance, which in turn has been shown to be closely linked to facility size. (That is why expansion is so appealing.) Unearned income is more a function of building relationships that allow us to take advantage of assets like community size, wealth, and traditions of governmental support. It is a slower process, and harder to document.

In recent years, the field has focused on driving attendance and building the earned income side of our ledgers. But as our budgets have increased—whether through growth, or merely the passage of time—have we devoted the same kind of energy to our cultivation of unearned income? Any future dialogue about new models should give equal weight to this second “engine.”

In economics, as in other areas, it comes back to the need for intensive self-examination. Of course, it is important to keep up with the science center field, but our motivation in examining other models should be to better understand how to do those things that are consistent with our Core Ideology, not to imitate someone else’s “best practices.” If there is a magic bullet, I believe it lies in that. ■

*Thomas Krakauer is president emeritus of the Museum of Life and Science, Durham, North Carolina, and a consultant in the science museum field.*

# The Darwin Centre: Integrating Collections and Communication

By Neil Chalmers

The Natural History Museum in London, like several of the world's big natural history museums, is both a major visitor attraction and a scientific research institution. Yet, until recently, few of the 3 million people who visit our exhibitions each year would realize that, behind the scenes, some 300 museum scientists were caring for and researching collections of about 78 million animals, plants, rocks, minerals, and fossils. Bringing this "real science" into the open was one objective for the Darwin Centre, the new wing that the museum opened in October 2002.

Another objective had to do with public perception of the scientific enterprise. Since the mid-1990s, skepticism toward science has been on the rise in Britain; crises like the foot and mouth epidemic of 2001 and the discovery of "mad cow disease" have further fueled the mood of distrust. People not only needed a place to find authoritative information about hot topics of the day, such as global warming or the impact of genetically modified plants on the environment. They also needed a place where they could engage in dialogue with representatives from the scientific community and see science in action—experiencing it as a valuable and understandable activity carried out by real human beings, just like themselves.

Having taken visitors behind the scenes on rare occasions in the past, we knew that people become excited as they encounter the sheer scale of our collections for the first time. Those who have a chance to meet scientists in person, learning at first hand about researchers' efforts to combat deadly



Photos courtesy Natural History Museum

**Assistant curator Emma Sherlock, right, takes lab-coated visitors on a behind-the-scenes tour of the Natural History Museum's tankroom.**

diseases or understand and conserve the diversity of life on earth, become even more deeply engaged.

Ultimately, we envisioned three purposes for the building: to house our collections in the best possible conditions, to provide our scientific staff with first-class research facilities, and to make as much of this as possible open to all visitors.

## Windows on science

The first phase of the Darwin Centre sits immediately by the museum's main building, a structure well known for its exuberant Victorian architecture. As visitors enter the new wing, they clearly move into a different world.

The streamlined building is designed for environmental efficiency, with an air-filled cushioned roof and louvers that adjust to face the sun. In-

side, an atrium reaches up through eight floors, with the collections on one side and scientists' offices and laboratories on the other.

On the main level, floor-to-ceiling, fireproof windows allow one to see the collections and get an idea of their size. (Phase One houses some 22 million animals preserved in alcohol; Phase Two, planned to open in 2007, will contain the museum's fine insect and plant collections.) Touch screens, with text in 12 languages, allow visitors to discover more about where the collections come from, how they are looked after, and what they are used for.

Every half-hour, small parties of visitors are taken on tours through the collections. It is a somewhat chilly experience (the collections are kept at 13 degrees centigrade—57 degrees F—to reduce the fire risk), but a rewarding one. Encouraged by our guides, assis-



As *Darwin Live* participants look on, curator Mandy Holloway displays a "jenny haniver," a type of deliberately demonized animal specimen once sold to collectors as a curiosity. Inset, left: Louvers on the building's facade adjust to control entering sunlight.

tant curators chosen for their people skills and ability to inspire inquiry, each party engages in dialogue about what is on show, whether it be fish collected by Darwin during his voyage on the *Beagle* or a shark's head donated by Harrods, the upmarket retail store.

Access to objects is only one part of the Darwin Centre experience. The main visitor floor also has a performance area, where, once or twice a day, seven days a week, museum scientists bring out items from their collections and join in discussion with visitors.

The space, which looks a bit like a seminar room and a bit like a broadcasting studio, is definitely not a lecture hall. It can hold as many as 70 people, but visitors are free to come and go as they like. The aim of these *Darwin Live* sessions, as we call them, is to promote lively conversation about natural history and related topics of the day. The combination of expert scientist and his or her pet subject, replete with real objects from the collections, is unbeatable.

Many of our researchers and curators, even those who were somewhat cautious at first, have proved to be superb and enthusiastic performers. They are assisted in their presentations by an audiovisual team that can project even the tiniest specimens onto screens behind the speaker and link up by broadband and satellite to anywhere in the world. We have had live videoconferencing with the Exploratorium in San Francisco and with our field station in Belize, in Central America. The latter session, offered on

Halloween by the museum's expert on bats, featured bat colonies emerging from roosts in limestone caves.

Museum "hosts" are also present at *Darwin Live* to act as intermediaries between speakers and the audience. Several have a background in theater and performance and are adept at generating lively discussion. Hosts introduce the speaker, hand microphones around, feed in provocative questions when appropriate, and help the scientist in whatever way needed.

Sessions tend to last for half an hour, and all are recorded. The best are then edited and made available through web casts to a large audience worldwide. The topics covered are diverse: "Is London choking to death?" looked at how lichens can be used to monitor past and present levels of air pollution in Britain, while "Maggots," a session greeted with groans of disgust from parents and unrestrained glee in their children, showed the gruesome effects of flies that lay their eggs in people and cattle.

### Looking ahead

The Darwin Centre has undoubtedly been a success, but there are lessons to learn before we implement the second phase.

The guided, behind-the-scenes tours in Phase One are for small groups of people, who are at all times accompanied. This is both for the safety of the visitors, since the collections are potentially inflammable, and for the protection of the collections. For Phase Two, we want to design a system

whereby visitors can go through collections areas unaccompanied. This will allow several thousand people to make this journey every day, rather than the hundred or so at present. We also want to create a more ambitious formal educational program for the Darwin Centre, so that it can contribute more powerfully to education in schools.

Was the Darwin Centre a gamble? Possibly. Might it have been a failure? Almost certainly not. We had already proved the public appetite for direct engagement by having our scientists bring their collections out into the public galleries on special days and talk about them with passersby. So we were confident that there would be a lot of interest in our *Darwin Live* sessions.

We also involved staff in planning their own scientific facilities and in developing the style and content of their public sessions. There was resistance initially from some, enthusiasm from others, and a "let's wait and see" attitude from everyone else. It is fair to say that as time has gone by, the enthusiasm has grown hugely.

Would we recommend that other museums develop their own versions of the Darwin Centre? To the principle of bringing your collections and scientists out into the public arena, the answer is a resounding yes. Even if there are no collections to display, as is the case with many science centers, there is every reason to put scientists on show. A lot of science centers do this already, of course, by inviting scientists from nearby universities and research institutes to visit them and engage their visitors in dialogue.

But I would give an equally firm word of advice not to copy us exactly. The circumstances of different natural history museums and science centers are so varied that no single recipe can be applied to all of them. But to bring what is behind the scenes out into the open is enormously worthwhile. ■

*Sir Neil Chalmers is the director of the Natural History Museum, London. To learn more about the Darwin Centre, visit [www.nhm.ac.uk/darwincentre/](http://www.nhm.ac.uk/darwincentre/).*

# Citizen Science: *Involving the Public in Research*

By Rick Bonney and Melinda S. LaBranche

As educators at the Cornell Lab of Ornithology, we spend a lot of time trying to get people involved in the process of science. We do this by tricking them. It's not hard. When you ask folks if they're interested in doing science research, they are apt to say no; that sounds boring. But if you ask them if they would like to go outdoors, walk around, and watch birds—that is, if you offer them something they want to do, something that feels fun and is also meaningful—they say, “Sure.”

At the Lab, our work involves asking large-scale questions about birds and their habitats: How many animals of a particular species are in a particular location? Are populations increasing or decreasing? Are they affected by global warming or acid rain? Most researchers with projects this size hire graduate students to help them gather data. But about 15 years ago, we realized that we could expand our reach even more by involving the public in our studies.

Of course, lay persons have long taken an interest in bird watching. Most of what we have learned about birds in the past 200 or 300 years has come from what used to be called “amateurs.” That term seemed too casual for the project we had in mind. We wanted a name that would identify our public observers as part of the scientific endeavor—and even offer them a chance to become scientists themselves. We couldn't say “volunteer” because we planned to charge them a modest annual fee (\$15 U.S.) to cover the cost of materials, staff support, web design, and data analysis. We settled on “Citizen Science,” even adding the term to our mission statement.



**Eyes on the skies: Recruited for Urban Bird Studies through MOSI, in Tampa, Florida, a citizen scientist practices her new skills.** Photo courtesy Cornell Lab of Ornithology

Thanks largely to five separate grants from the National Science Foundation's Informal Science Education program, there are now 14 Citizen Science bird projects under way at thousands of sites around North America. A significant number of participants are now recruited through museums or through partnerships between museums and local community groups.

## An army of observers

One of the longest-running programs in Citizen Science is *Project FeederWatch*. Launched in 1987 as a joint project of the Lab and Canada's Long Point Bird Observatory, it is designed to help us measure changes in winter bird abundance and distribution in North America, to understand the movements of species, and

also to learn some things about what brings birds to feeders. About 17,000 people now participate in *FeederWatch* each year.

The concept is simple. We ask people to watch their bird feeders for two consecutive days every two weeks from November through April. It's not a full-time job; they can just glance out the window every few minutes and, following a protocol, count the numbers of each species that visit. Everyone who signs up receives a “research kit” containing a project rationale, instructions for setting up the observation area and collecting data, computer-scannable data forms, and a *Project FeederWatch* newsletter that provides detailed feedback on data analyses. Observers report their data online, and an editing program controls for errors. The result has been the best available database on the abundance and distribution of winter bird populations in North America.

What do we learn from a project like this? In terms of research, we leverage an enormous database to pinpoint species-specific trends. For example, through *FeederWatch* and a related effort, the House Finch Disease Survey, we have been able to track the progress of house finch conjunctivitis, a nonfatal but disabling disease that has caused a steady decline in the populations of house finches on the East Coast. We are now using the network to study the West Nile virus.

Citizen Science also has conservation implications. One of our projects, the Cerulean Warbler Atlas Project, allowed us to map all known distributions of this increasingly rare bird in eastern North America. Based on that,

we have been able to work with land management agencies to save some of these birds. In Tennessee alone, many thousands of acres of cerulean warbler habitat were bought and protected by the state in 2002.

### Tracking morphs, growing scientists

A program that lends itself to group participation, particularly for younger observers, is our NSF-funded Urban Bird Studies (UBS) program. Specifically designed for inner-city children, UBS consists of five projects: *Pigeon-Watch*, *Birds in the City*, *Crows Count*, *Gulls Galore*, and *Dove Detectives*.

The UBS audience is perhaps our most diverse. We have significant numbers of African-American and Hispanic participants, and all of the materials and web sites are bilingual in English and Spanish. Science centers participating in UBS projects include, in Florida, MOSI and the Museum of Science and History (Jacksonville); in Missouri, the Academy of Science of St. Louis; and, in California, the Reuben H. Fleet Science Center and the Natural History Museum of Los Angeles County.

The first UBS project, *PigeonWatch*, was launched in 1996 to answer some questions about this ubiquitous urban bird. Pigeons occur in a variety of different colors, or “morphs.” We know that these variations arose through selective breeding in captivity, but the reason why feral (wild)

birds retain the morphs is unknown.

We wanted to determine why there are so many colors of pigeons. Thousands of school-aged children, both in classrooms and in after-school and weekend clubs, actively record data and enter their results on the Internet. So far, we have learned that distribution of color morphs is not random, and that latitude may be one of the best predictors of the ratios of light to dark pigeons.

Participation in *PigeonWatch* is an excellent reflection of public understanding of science and research because the observers have no prior interest in birds. Evaluation shows that we are reaching new audiences and having demonstrable impacts on them.

It is gratifying to hear partners and leaders say things like “*PigeonWatch* encourages life skills for observation that can be extended well beyond bird watching; it has been enriching for both the partners and the children,” or, “In the end, many participants had become bird lovers—all had become science lovers, more observant of the world and nature around them.” Working with science centers also has allowed us to document parental involvement, since it is easy to get parents and kids to come to the museum together.

One evaluation activity we did for *PigeonWatch* was the “Draw-a-Scientist” test. This well-known instrument asks children to draw a representation of a scientist before and after they participate in a project. The drawings

are scored based on the number of stereotypical elements (labcoat, male figure, glasses, messy hair, and so on) that appear in the image. Low scores indicate stereotyping.

In one session, where we were able to compare pre- and post-project drawings of 29 participants, 19 increased their scores and only two had scores go down. In other

words, they got the message: “Scientists are people like me.”

When evaluating public understanding, it is important to remember that there is a leap from collecting data to being a scientist. At the Lab, we continually try to give our citizen scientists new information to help them understand the whole research experience. We have created materials for the Web; we have a middle school *Classroom FeederWatch* curriculum, and we just got funding from NSF to develop *Classroom BirdWatch*, a new curriculum that will allow students to report any birds they see, not just feeder birds.

It is rewarding to watch students progress in their scientific understanding from questions like “Why are cardinals red?” to “Do dark-eyed juncos visit in the morning or the afternoon?” Our annual publication, *Classroom Birdscope*, contains results from research done by children on questions of their own devising. For these students, such work is the ultimate in original inquiry.

Science centers and museums are ideally suited to host community-based citizen science projects. Studies of bird feeding, water quality, or local distributions of invasive plants are just a few possibilities. In addition to Citizen Science, educators with limited local resources can hook up with existing projects like Monarch Watch, the North American Amphibian Monitoring Program, and the National Weather Service Cooperative. We believe that science centers and museums have an even greater role to play in the future in demystifying and opening the process of science for their visitors. ■

*Rick Bonney is director of education and Melinda S. LaBranche is Urban Bird Studies project leader at the Cornell Lab of Ornithology, Ithaca, New York. For more on Citizen Science, visit <http://birds.cornell.edu/programs/citsci/>. For details on other projects, see the Society for Amateur Scientists at [www.sas.org](http://www.sas.org).*



**A film crew captures the action as MOSI families conduct investigations for *Dove Detectives*, one of five UBS projects.**

*Photo courtesy Cornell Lab of Ornithology*

# Social Inclusion, Science, and the Quality of Life

By Paulo Gadelha

In the mid-1950s, most of the houses in Bambuí (a village in the hinterlands of Brazil's Minas Gerais State) were infested with triatomine bugs. As a result, most of the population had Chagas disease. This parasitic infection, spread through insect feces, can, in its acute phase, cause fever, glandular swelling, and fatigue. But its long-term effects are even more alarming—over 10 to 20 years, Chagas disease can do irreversible damage to the human heart, esophagus, and large intestine.

Responding to the crisis, scientists from the Oswaldo Cruz Foundation (FIOCRUZ), a public health and research institute in Rio de Janeiro, decided not only to apply the usual disease-control measures, but also to get residents directly involved. They visited local schools and taught teachers and students how to identify the bugs. The pupils passed this information to their parents and neighbors. By the late 1950s, no new cases of Chagas disease were reported in the village.

The story of Bambuí is told in a traveling exhibition, *Chagas from Brazil*, developed by FIOCRUZ's public dissemination arm, the Museu da Vida (Museum of Life). The message is that science education, paired with community participation, can effectively change risky behaviors and combat pernicious health conditions.

FIOCRUZ and the museum have drawn on this spirit of collaboration to develop numerous health and education projects in Brazil's largest city. From the 70 *favelas* (slums) and 35 housing projects that surround its campus to the nearby middle-class neighborhoods, universities, and public school system, the foundation

expresses its social commitment through activities built around science, health, and technology. The theme of "life" also informs the three major thrusts of museum programs:

- life as a complex phenomenon, reflecting both research in specific sciences and the values of different cultural and ethnic groups;
- health as quality of life, replacing the earlier view of health as absence of disease; and
- human intervention in life, from earliest history to contemporary ethical issues.

The Museu da Vida employs interactive games, workshops, debates with scientists, theater, and video productions to help expand knowledge, encourage healthy living habits, and prevent risk factors. The museum provides multimedia support materials for schools and health centers on such topics as teenage sexuality and pregnancy, healthy eating, and preventive health. Touring exhibitions like *The Vaccine Revolt*, *Dengue*, and *Whale in Sight* spread information on health and the environment. Historical exhibits draw on our collections in science, technology, and public health.

The foundation's long commitment to social inclusion is seen in several projects. *FIOCRUZ for You*, a program created in 1998, consists of an annual open house held on the FIOCRUZ campus in conjunction with National Multi-Vaccination Day in June. Activities include cultural, artistic, and sports attractions; health information stands; social services; information on citizens' rights; and free health testing. In 2003 the event drew a crowd of 46,000, and nearly 6,000 children were vaccinated in one day.

The Young Talents project recruits low-income teenagers from local public schools and trains them as monitors for science museums and centers. Along with a strong focus on science and health, the project helps the young people learn to be responsible citizens and plan their future lives and careers.

In partnership with neighborhood associations, FIOCRUZ is a founder of the Manguinhos Cooperative, a center for educational and cultural activities that also serves as an instrument for creating local jobs. The cooperative's Open University has become an important factor in integration and reduction of social tensions.

A fourth social-inclusion initiative is Development with Local and Integrated Sustainability (DELIS). Within this broad-based project, which links public institutions, private companies, NGOs, and community associations in promoting improvements in quality of life and health, the Museu da Vida acts as a center for recreation as well as for science and health education.

All of these efforts are designed to provide our audiences—primarily children and young people—with the tools they need to form a critical awareness of themselves, others, and the world. By serving the development of techno-science and the responsible exercise of citizenship, the Museu da Vida shows its commitment to improving the quality of life and overcoming social inequality. ■

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*Paulo Gadelha is vice president of Fundação Oswaldo Cruz (FIOCRUZ), parent organization of the Museu da Vida, Rio de Janeiro, Brazil: [www.fiocruz.br](http://www.fiocruz.br). The museum will serve as host for the 4th Science Centre World Congress in April 2005.*

## Calendar

### MAY

- 3-5 Interactivity 2004.** Annual conference of the Association of Children's Museums. New Orleans, Louisiana. *Details:* [www.childrensmuseums.org](http://www.childrensmuseums.org)
- 6 Seventh Annual Space Day.** "Blazing Galactic Trails." Washington, D.C., and other U.S. locations. *Details:* [www.spaceday.org](http://www.spaceday.org)
- 6-10 2004 American Association of Museums Annual Meeting.** "Celebrating Innovation, Creating the Future." New Orleans, Louisiana. *Details:* [www.aam-us.org](http://www.aam-us.org)
- 18 International Museum Day.** "Museums and Intangible Heritage." Worldwide. *Details:* <http://icom.museum>
- 21 Math Momentum in Science Centers Workshop.** "Examining Data." Sponsored by TERC, ASTC, the Mid-Atlantic YouthALIVE! Regional Network, and the Virginia Marine Science Museum. Virginia Beach, Virginia. *Details:* Angela Wenger, [awenger@njaquarium.org](mailto:awenger@njaquarium.org), 856/365-3300

### JUNE

- 1-2 ASTC RAP Session.\*** "Science on the Move: Mobile Exhibit Projects (MEPs)." Technopolis, Mechelen, Belgium.
- 3-5 CASC 2004 Conference.** Canadian Association of Science Centres. Hosted by Odysseum, Edmonton, Alberta. *Details:* <http://canadiansciencecentres.ca/conferences.htm>

**3-6 8th International Conference on Public Communication of Science and Technology.** "Scientific Knowledge and Cultural Diversity." Barcelona, Spain. *Details:* [www.pcst2004.org/](http://www.pcst2004.org/)

**10-11 ASTC RAP Session.\*** "Exhibits and Expansion in the 21st Century." Liberty Science Center, Jersey City, New Jersey.

### AUGUST

**3-7 Visitor Studies Association Annual Conference.** Albuquerque, New Mexico. *Details:* [www.visitorstudies.org](http://www.visitorstudies.org)

### SEPTEMBER

**18-21 ASTC Annual Conference.** "Sustaining Innovation in an Era of Rapid Change." Hosted by the Tech Museum of Innovation, San Jose, California. *Details:* [www.astc.org/conference](http://www.astc.org/conference)

### OCTOBER

- 1-2 ASTC RAP Session.\*** "Successful Summer Camp Experiences." Rochester Museum & Science Center, Rochester, New York.
- 2-3 Strategies for Collaboration Workshop.** Montshire Museum of Science, Norwich, Vermont. *Details:* [www.montshire.org/teams](http://www.montshire.org/teams)
- 4-9 Theatre in Museums Workshop.** Science Museum of Minnesota, St. Paul. *Details:* Tessa Bridal, 651/221-4560

### NOVEMBER

**4-6 2004 ECSITE Annual Conference.** Barcelona, Spain. *Details:* <http://ecsite.ballou.be/new>

## See You in September

Are you ready for science and sunshine in California? The ASTC Annual Conference is scheduled September 18 to 21 in San Jose, and your conference host, the Tech Museum of Innovation (the Tech), is already working hard to ensure that your experience will be a memorable one.

The theme for ASTC 2004 is "Sustaining Innovation in an Era of Rapid Change." Where better to explore this theme than in Silicon Valley? In this legendary center of creativity, diversity, and world-changing ideas, technological innovation still thrives, despite the challenges of today's economy.

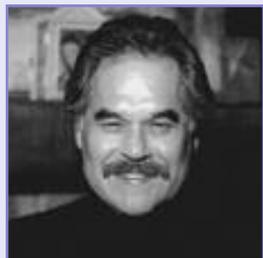
Together, we'll consider how we can advance our missions, operate in a climate of uncertainty, and understand and accommodate the needs of increasingly diverse audiences. More than 150 workshops, guest speakers, and concurrent sessions will afford an opportunity to pool our collective wisdom on these important issues.

Local talent will be on display in San Jose. This year's keynoters include Apple co-founder Steve Wozniak, now CEO of Wheels of Zeus (wOz), and playwright and film director Luis Valdez, often called the "father of Chicano theater." Among the featured guest speakers at the conference will be Stanford University psychologist Barbara Tversky; IDEO co-founder Bill Moggridge; cultural anthropologist Charles Darrah; SETI scientist and 2001 MacArthur Fellow Christopher Chyba; and American India Foundation president Lata Krishnan.

After-hours and pre- and post-conference events will highlight 20 ASTC-member institutions located within driving distance of the Tech. Because of the Rosh Hashanah holiday, workshops will be scheduled on the Tuesday and Wednesday after conference this year, instead of on the preceding Friday.

A special postconference open house at the Exploratorium in San

\* Information on ASTC RAP sessions is available at [www.astc.org/profdev/](http://www.astc.org/profdev/). For updated events listings, click on "Calendar" at [www.astc.org](http://www.astc.org).



Hosted by the Tech Museum of Innovation (above), the 2004 ASTC Annual Conference will feature two keynote speakers: Apple co-founder Steve Wozniak (top left), now CEO of Wheels of Zeus, and playwright and film director Luis Valdez. Photos courtesy the Tech Museum

Francisco is on the agenda for September 22. Additional options include the Monterey Bay Aquarium, Chabot Space & Science Center, NASA Ames Research Center, Intel Museum, Hiller Aviation Museum, San Francisco MoMA, Rosicrucian Museum, and Computer History Museum.

Programming at the Tech will include networking events, open houses, and a behind-the-scenes tour of the museum, IMAX Dome theater, and business office. The Children's Discovery Museum (CDM) of San Jose, another ASTC member, will also be actively involved in planning conference content.

Recently named the "safest big city in America," San Jose has a sunny climate just right for strolling. Cultural attractions include not only a half dozen local museums, but also the Mexican Heritage Plaza, a state-of-the-art cultural facility featuring a performing arts theater, art galleries, and beautiful gardens; Japantown, dating back to the late 1800s, when Japanese bachelors migrated to the Santa Clara Valley; and the SoFA (South First Area) District, a concentrated five-block downtown area that incorporates nightclubs, restaurants, art galleries, and theaters.

Within a day's drive of the city, you'll find the pleasures of San Francisco, the wine country of Sonoma and Napa counties, and the beautiful coastal towns of Carmel and Monterey. A celebration of fun, education, and exploration awaits you!

Early-bird registrations must be postmarked by July 30; the last date for mail-in registration is August 18. For more information, visit [www.astc.org/conference](http://www.astc.org/conference).

## TryScience Extends Its Reach

From Eric Marshall, director of TryScience.org, comes the following update:

"TryScience.org now serves parents better by hosting the online version of the *Family Guide to Science*, published by the Partnership for Science Literacy (PSL). A national initiative of the American Association for the Advancement of Science, PSL was designed to increase awareness—particularly among Latino/Hispanic, African American, and other minority communities—of the value of science literacy for all children.

"The main message of PSL is that 'Science Is Everywhere!' Sections in the *Family Guide* include Why Science Matters, Science in Schools,

and Get Involved.

"TryScience.org is also working to enhance its support of teachers. We have just concluded a national TryScience Teacher Contest that documented how teachers are incorporating science center activities from TryScience into their classrooms. Our new teacher section will also highlight professional development opportunities.

"Traffic to the site continues to increase. Since its launch, the number of visitors has increased threefold and the number of page views has increased sixfold (as more content is added). During the last quarter of 2003, TryScience.org measured 12 million hits, resulting from 264,000 visits. The average visitor looked at 6 page views and spent 4 minutes per visit. In all, TryScience now serves more than 1 million annual visitors in 178 countries, from Albania to Zimbabwe, with content in eight languages."

All ASTC member museums are represented on TryScience.org, a collaborative project of ASTC, IBM, and the New York Hall of Science. To recommend teacher professional development opportunities and possible PSL links, contact Eric Marshall, [emarshall@tryscience.net](mailto:emarshall@tryscience.net). ■

## Welcome to ASTC

### SCIENCE CENTER AND MUSEUM MEMBERS

- **Inland Northwest Science & Technology Center**, Spokane, Washington. Scheduled to open in 2006, this science center on the north bank of the Spokane River will anchor a regional technology complex for the region and provide a public gathering place along the waterfront.
- **Kern County Museum**, Bakersfield, California. Opened in 1945, this regional museum, which focuses on early California history, culture, and industry (particularly the Kern River oil field), also features a hands-on children's discovery center.
- **Museum of New Zealand Te Papa Tongarewa**, Wellington, New Zealand. Housed in two buildings, the national museum encompasses art, culture, history,

The following new members were approved by ASTC's Membership Committee in November 2003. Contact information is available in the Members section of the ASTC web site, [www.astc.org](http://www.astc.org).

natural history, and science, with an emphasis on native Maori traditions; four Discovery Centres bring the collections alive through activities for children and families.

- **Palouse Discovery Science Center**, Pullman, Washington. After several years as an outreach operation, this new science center, originally planned as part of an urban renewal project in nearby Moscow, Idaho, opened in October 2003 in space donated by a local engineering lab.

### SUSTAINING MEMBERS

- **Argyle Design Inc.**, Brooklyn, New York
- **Innovation Architects, LLC**, Fort Collins, Colorado
- **MICE/Kadoke**, Mississauga, Ontario, Canada

By Carolyn Sutterfield



Visitors to *What Is Addiction?* can see video interviews with young people in recovery. Photo courtesy Arizona Science Center

**DRUGS AND THE BRAIN**—In a leveraged arrangement, a resource developed by the **Arizona Science Center** (ASC), Phoenix, with support from the White House Office of National Drug Control Policy (ONDCP), will benefit museum visitors as far away as Charlotte, North Carolina, and Cleveland, Ohio.

While developing their ONDCP-sponsored permanent exhibition *What Is Addiction?*, which debuted in January 2003, the science center also built five small-scale copies. Like the original, the smaller version—featuring eight interactive components in two freestanding kiosks—explores the physical changes that occur in the brain when an addiction is present and the new technologies that make these changes visible. Video interviews with young addicts in recovery convey the social effects of drug use. The target audience is young teens and their families.

Last summer, ASTC institutions were invited to apply for a free copy of *What Is Addiction?* After peer review, the five sets were awarded to **Discovery Place**, Charlotte; **Great Lakes Science Center**, Cleveland; **Health World**, Barrington, Illinois; **Pacific Science Center**, Seattle, Washington; and **Science Spectrum**, Lubbock, Texas.

According to ASC vice president for exhibits and programs Deb Gilpin, all of the kiosks have now been safely delivered. “Visitors have begun using the exhibits,” Gilpin says, “and we are already getting posi-

tive feedback.” Official opening events, with participation by ONDCP staff, are planned at each site.

**Details:** Deb Gilpin, gilpin@azscience.org; [www.whitehousedrugpolicy.gov/news/press03/012203.html](http://www.whitehousedrugpolicy.gov/news/press03/012203.html)

**SCIENCE IN SEATTLE**—On February 12, more than 1,000 Seattle elementary school students had a chance to meet and mingle with practicing scientists, as the American Association for the Advancement of Science (AAAS) kicked off its annual meeting at the **Pacific Science Center**. The occasion was Public Science Day, an event sponsored annually by AAAS since 1989 to get youth excited about math, science, and engineering and show them some of the opportunities that await them in these fields.

Shirley Malcom, AAAS director of education and human resources, delivered the keynote address at the science center. Also on the program were researcher Jim West of Johns Hopkins University, whose 1960s work in charge storage and transport in polymers laid the foundation for today’s microphones, and three-time Emmy winner Max Gomez, health correspondent for WNBC, New York. After the speeches, the students explored the science center with volunteer guides from the University of Washington.

Another 2,000 local children participated in “Family Science Days” activities on February 14 and 15 in the AAAS Exhibit Hall. Content for this event was designed by Pacific Science Center and the Institute for Systems Biology.

**Details:** [www.aaas.org/news](http://www.aaas.org/news)

**ACHIEVEMENT IN THE AIR**—Continuing last year’s centennial homage to the Wright brothers, the **Virginia Air & Space Center**, in Hampton, Virginia, opened its new *Adventures in Flight* gallery on November 8. The \$6.4 million addition added more than 1 million cubic feet

to the Hampton Roads area facility, which is the visitor center for the NASA Langley Research Center and Langley Air Force Base.

*Adventures in Flight* is organized in six sections: Origins of Flight (the Wright brothers’ story), Golden Age (barnstormers and air circuses), Military Aviation (World War II era), Commercial Aviation, The Future of Flight, and Little Wings (a themed play area).

In addition to historic aircraft like the AirTran Airways DC-9, the N2S-3 Stearman naval trainer, and the F-18 HARV (High Alpha Research Vehicle), the interactive elements of the gallery include the Curtiss JN-4 “Jenny” Theater, and three flight simulators: a B-24 “Liberator” bomber, an F/A-22 “Raptor” fighter jet, and a Boeing 717 passenger jet.

More than 30 hands-on components, designed by museum staff and



The new *Adventures in Flight* exhibition features dozens of historic aircraft, as well as the latest technology from NASA.

Photo courtesy Virginia Air & Space Center

Krent-Paffet Associates, illustrate basic principles of flight, such as wing warping, lift, and propulsion, and allow visitors to test their aviation “skills.” Several interactive exhibits are located in the body of the DC-9, which also serves as a classroom for educational programs.

Established in 1917 as the nation’s first civil aeronautical laboratory, NASA Langley remains an important center of aerospace research and is an international leader in atmospheric studies. Langley Air Force Base is



Visitors to *Robots+Us* encounter Jeremiah, an avatar who appears to respond to their presence and actions. Photo courtesy SMM

home to the 1st Fighter Wing. Major donors for the *Adventures in Flight* project were NASA and the City of Hampton.

*Details:* [www.vasc.org](http://www.vasc.org)

**VOTERS RESPOND**—On March 2, the voters of Hamilton County, Ohio, registered their vote of confidence in the **Cincinnati Museum Center** (CMC) by passing the institution's 0.2-mill levy request, Issue 11, by a margin of nearly 2 to 1.

CMC had launched a massive campaign to win support for the initiative, undertaking economic and educational impact studies, setting up a dedicated web site, and conducting an e-mail campaign through ExactTarget.com.

As part of their "platform," CMC officials promised that levy proceeds—estimated at between \$3.6 and \$3.8 million a year—would be spent solely for preservation and maintenance of their historic home, the 1933 Union Terminal. Upkeep on the building already accounts for 20 percent of the institution's operating budget; a condition assessment estimated costs to meet ongoing needs at \$2 million a year over the next 10 years.

Levy funding will begin in 2005,

and plans are now under way for repair of several areas of the building.

"Issue 11's 64 percent approval rating clearly shows that this generous community believes in what we're doing," says CMC president and CEO Douglass W. McDonald. "We are humbled by the outpouring of support." The levy will not figure permanently in CMC's budget plans, however. Passage of the initiative means that fund-raising efforts can now be targeted at growing the center's endowment, McDonald says.

*Details:* [www.preservcincymuseum.org](http://www.preservcincymuseum.org)

**'BOT BUILDERS**—The twin Mars Rovers are just the latest in a long line of talented robots, both real and fictional, that have captured the public imagination. *Robots+Us*, a new traveling exhibition designed and built by the **Science Museum of Minnesota** (SMM), St. Paul, allows visitors to learn more about how today's robots differ from their literary forebears and discover how modern engineers are using real life as a basis for robot design.

Highlights of the 4,500-square-foot exhibition include

- Low Life Lab, a look at what designers have learned from simple life forms like ants and cockroaches
- Robot Arena, where visitors can test the capabilities of light-sensitive robots
- Leg Lab, where visitors can observe how changes to the legs of a walking robot affect its movement
- Build-Your-Own Jitterbug, an activity in which visitors create a dancing robot with common household materials
- Garden of Sensory Delights, a collection of robotic flowers that grow in response to body movement.

Funding for the project was provided by the National Science Foundation. After *Robots+Us* closes at SMM on August 29, the exhibition will tour science centers and museums in North America.

*Details:* [www.smm.org](http://www.smm.org); exhibition web site, [www.robotsandus.org](http://www.robotsandus.org) ■

## Grants & Awards

Jane's Trust, a new Boston-based charitable trust established to honor the late Jane Bancroft Cook, has awarded \$840,000 to the Environmental Exhibit Collaborative, a group of three New England science museums. The money will fund development of five 1,200-square-foot traveling exhibitions on key topics related to the New England environment. Partners in the four-year project include the **EcoTarium**, Worcester, Massachusetts; **ECHO at the Leahy Center** for Lake Champlain, Burlington, Vermont; and the Squam Lakes Natural Science Center, Holderness, New Hampshire. The **Montshire Museum of Science**, in Norwich, Vermont, will serve as advisor to the project.

GlaxoSmithKline has awarded the **Museum of Life and Science**, Durham, North Carolina, \$25,000 in support of the museum's *Science in a Suitcase*, an outreach program that features 200+ science kits, addressing 53 topics. The money will help offset expenses related to kit refurbishment and staffing.

The following ASTC members have received funding from the National Science Foundation Informal Science Education division for projects beginning in 2004:

- **California Science Center**, Los Angeles: \$2.2 million for *World of Ecology*, a 45,000-square-foot permanent exhibition, developed in partnership with the Santa Barbara Zoo, that fuses interactive science exhibits with immersive, live habitats.
- **Science Museum of Minnesota**, St. Paul: \$1.55 million for *Presenting Current Science and Research*, a museum-wide initiative to distribute exhibits and programs about new science and research among its core exhibits.
- **Denver Museum of Nature & Science**, Denver, Colorado: \$1.11 million for "Realm of the Black Hole," a high-definition television program for the PBS series *NOVA* and "Black Hole: The Other Side of Infinity," a 20-minute, full-motion program for planetarium theaters.
- **Hugh Moore Historical Park and Museum**, Easton, Pennsylvania: \$1.43 million to develop an integrated framework of exhibits at the National Canal Museum on the science and technology of canals and inland waterways.

**Timothy J. Gette**, previously chief operating officer of the Dallas Museum of Natural History, is the new executive director of the Virginia Museum of Natural History, in Martinsville. The museum, a division of Virginia's Department of Natural Resources, is scheduled to move into its new 89,000-square-foot home in Martinsville in 2006.



As of February 15, **Stephen Baumann** is the executive director of Kidspace Children's Museum, in Pasadena, California. A former vice president for education and programs at New Jersey's Liberty Science Center, Baumann replaces **Carol Scott**, who has relocated to South Carolina.



The new director of the Museum of Discovery, Little Rock, Arkansas, is **Nan Selz**. A former president and CEO of the St. Vincent Foundation, Selz replaces **Bill Bradshaw**, who left in July 2003 to become director of the Roper Mountain Science Center, Greenville, South Carolina.



**Raylene Decatur**, president and CEO of Colorado's Denver Museum

of Nature & Science, resigned her position effective March 31, citing a desire to spend more time with her two young daughters. Before joining the museum in 1995, Decatur held leadership positions at the Maryland Science Center, Baltimore, and the Academy of Natural Sciences, Philadelphia. Board member **Tom Swanson** is serving as acting DMNS president and CEO.



SciTrek, the Science and Technology Museum of Georgia, in Atlanta, announces the appointment of **Scott Coleman** as president and CEO. Coleman, a longtime executive in the computer industry, replaces **Lewis Massey**, who left the museum to become a partner in the lobbying firm Massey & Bowers LLC.



The Sciencenter, Ithaca, New York, announces two appointments: **Shannon McSurely**, previously a community educator for the Cornell Cooperative Extension of Tompkins County and co-manager of a local farmers market, is the museum's new education programs director, and **Jeff Pitcher**, a former science teacher with extensive experience in multi-

media design, joins the staff as director of technology workshops.



The Museum of Life and Science, Durham, North Carolina, announces the appointment of **Laura W. Smith** as director of programs. A former director of student development in the University of Houston's Department of Biology and Biochemistry, Smith most recently served on the board of the Durham Public School Scholarship Foundation.



We were saddened to learn that **Clare Intress**, executive director of the North Museum of Natural History and Science, Lancaster, Pennsylvania, died of cancer on February 13. She was 51. A former director of teacher education programs at the New Mexico Museum of Natural History, Clare served from 1999 to 2001 as an Informal Science Education program officer at the National Science Foundation. In that capacity, she helped ASTC members across the United States to develop proposals and implement their NSF-funded projects. **Rosemary Strickler** will serve as interim director of the museum until a replacement is found. ■



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