Why Staff Development Matters

- It’s All in Their Heads: Capturing and Building Intellectual Capital
- Growing Our Own: The Science Career Ladder
- Best People, Best Practices: A Development Strategy for Success
- Advancing Each Other: Lessons from the ASTC RAPs
- Outside the Box: Staff Redeployment as a Strategic Tool
In these challenging times, when some ASTC members are revising old strategic plans and others are formulating new ones, it’s important to remember the one great resource that all science centers—large or small, new or established—have in common: our people. The success of any plans we make depends on how well we nurture the skills, look for the potential, and engage the creative power of everyone who works in our institutions. In this issue, we look at how some science centers are doing just that.

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Cover: Staff-development programs like (top to bottom) Maloka’s Museum Guide School, Petrosains’ People Development Strategy, and ASTC RAPs at the Liberty Science Center and Denver Museum of Nature & Science build capacity for institutions and individuals alike. Photos courtesy, from top: Maloka, Petrosains, Liberty Science Center (Animal Collections in Science Centers), and DMNS (Community Partnerships)
Traditionally, the word "capital" has meant physical assets: cash in hand, buildings, copyrights, patents, the stock that a store has on its shelves. In the stock market, capital has long been how companies were evaluated. But when knowledge-based industries came along in the 1990s, a business could no longer be assessed on what it owned and held. It had to be judged on its potential, and that potential was based on a different kind of asset, one that became known as "intellectual capital."

Today, on the far side of the dot-com bubble, we can see that intellectual capital alone is not enough to guarantee value in the marketplace. But the concept remains useful—particularly in the science center field. We are in the learning business, and while we aren’t too concerned about stock market values, we are very much concerned about how to attract more visitors. Our success is built not just on knowledge, but on innovation and creativity—our own brand of intellectual capital. The bottom line is that an institution’s future depends on its staff creating new programs, new ideas, new ways of fulfilling its mission.

At the Ontario Science Centre (OSC), a 34-year-old organization run by the Ontario provincial government, we have been working on a new strategic plan for human resources that involves not only understanding and working to improve current practices and challenges, but also developing long-range planning processes that can build future intellectual capital.

**Transferring knowledge**

The tendency of OSC staff to think of their work not so much as a job as a calling means that the science center has always had a low attrition rate. (Currently, it’s running around 4 percent.) But it also means that a lot of our key employees, the ones with leadership roles not just in management but in design and fabrication and accounting, have been here for nearly three decades.

All of our staff, including our unionized workers, are government employees, and in Ontario the government retirement standard is 30 years. So these key staff members—the same ones who know every nut, bolt, pipe, table leg, and code in the place—are leaving, and it’s all in their heads. Very little has been put down on paper.

To give just one example, several years ago we lost two senior managers in the exhibit design department within six months. They didn’t leave in a huff, but they still left and took a gold mine of information with them. Our challenge is to capture that kind of knowledge before it is lost.

One technique we use is to identify likely successors in advance and put them in “acting” positions where they can understudy and be mentored by our longtime employees. In the hosting department, for example, we designated an acting senior host who would attend management meetings along with the hosting manager. In our exhibit operations, our acting manager took on corporate committee leadership that normally would have fallen to the manager. In my own department (operations and service management), I appointed an
understand to assume responsibilities in an ever-increasing way.

We also engage in knowledge transfer at the group level. For example, our science department runs a workshop on prototyping, in which experienced staff take inexperienced staff and walk them through the process. Our exhibit planners are working on a template for recording the exhibit design process, capturing key knowledge for future generations of OSC employees. We have brought in consultant services to document technical aspects of the building—identifying where cables are, upgrading drawings, and the like.

For newer science centers, the problem of conserving intellectual capital may not seem to be an immediate concern. But any institution can experience the sudden loss of a key employee. Putting a knowledge-transfer plan to work now will save much grief down the road.

**Fostering talent**

The complement to our knowledge-transfer strategy is training and development of current staff. OSC is very much a skills-based organization, but many of the skill sets that people employ in their positions here can be transferred. One of the things we pride ourselves on is finding ways to develop new employees and to broaden the experience base of existing staff.

Like many science centers, we bring in a lot of young people each year through our frontline hosting program. The Hosts department offers advancement based on increasing ability, and it also provides the science center with a rich pool of talent to draw on. For example, when I arrived in 1996, a young biologist named Rich Vieira was a senior host. Rich went on to serve as a coordinator in Public Programs, a programmer in Science, a representative for International Sales, and a senior scientist before eventually becoming project manager for Cirrus, one of our traveling exhibitions.

Typically with our development teams for programs and exhibits, and sometimes with facility projects, we try to bring in staff from across the organization to allow cross-pollination to occur. We also try to get junior staff involved in interesting corporate initiatives. In our International Sales projects, for example, we have opportunities for staff from within and outside the sales department to join a team and try new and different jobs.

In the past, such things have been done informally, at a manager’s discretion. What we are working on now is ways to formalize the process—and, in formalizing it, to start capturing the cost and the benefit.

**Looking ahead**

Long-lived organizations tend to go through periodic reinventions, and it’s my experience that staff want to be involved. They want their knowledge to be shared.

In 2001, the Ontario Science Centre’s Board and Lesley Lewis, our director general, introduced a new mission and vision. To communicate those changes to staff, about 16 managers each took two cross-organizational groups of 20 employees and talked about how people could help live the new mission and vision and bring them forth in their areas.

But we overlooked an important group. The smokers—the folks who gather outside each day to have their cigarettes and talk over business—came to management and said, “Why weren’t we asked for our opinion?” Good intellectual capital management means capturing all the knowledge that’s out there, not just the knowledge of the head scientists or managers.

We are also looking outside our walls to build intellectual capital. For example, we have a great group of volunteer engineers who help with our annual Engineers Week. We are thinking about asking them to expand their involvement by working with our Christmas holiday programs for students.

We are also interested in partnering and transferring knowledge with other science centers and informal science organizations. Yes, there’s a competition factor involved, but there’s also the opportunity to capture what you’ve learned and bring it back into your institution’s intellectual capital.

If I have a personal philosophy of management, it’s that I try to make my job redundant. I try to help the people who work for me to do their job so well that I am freed to go on to other things.

I am always thinking, “How can I do my job better, so they can do their job better?” That’s the essence of managing intellectual capital.

Lynn Rou, associate director of Operations and Service Management at the Ontario Science Centre, Toronto, Canada, is currently on health leave from that organization. This article is based on a presentation she gave at the 2001 ASTC Annual Conference in Phoenix.
Growing Our Own:

By Preeti Gupta

Finding, cultivating, and retaining talented staff is a challenge for any institution. In science centers, the workforce must embody a rare combination of science knowledge, teaching experience, creativity, flexibility, and general people skills. Diversity is important, too, as museums work harder to reach multiple audiences. At the New York Hall of Science, we’ve found a good way to ensure a supply of diverse, enthusiastic, knowledgeable, and committed workers: We grow our own.

The Science Career Ladder (SCL) program at the Hall of Science started in 1987 as a way to bridge the needs of two communities: the science center, which needed more help on the floor, and local high school and college students, who were looking for spending cash or money for textbooks. Yes, the teens could find work at the local fast-food place, but museum staff believed that some young people were ready for a new kind of opportunity, one that would reward them both monetarily and scholastically.

For the Hall of Science, because staff made an effort to hire young people from various ethnic and socio-economic backgrounds, the SCL program meant not only acquiring much-needed “Explainers,” but also guaranteeing diversity in the institution’s workforce. For the teens, it meant a chance to earn money in an exciting and challenging environment while developing new personal and professional skills. The ultimate vision was that Explainers, as they gained experience, would work their way up the “ladder” to increasingly responsible positions in the science center.

Rung by rung

SCL quickly became a signature program at the museum. Each year, the Hall of Science employs about 100 Explainers, paying them hourly stipends of $6.50 to $9.25. Funding comes from a combination of federal and state government sources and private foundations.

The museum’s visitors come from many different communities, and Explainers, who range in age from 15 to 29, are selected to reflect this diversity. Collectively, the Explainer pool speaks 13 languages and represents 20 countries. Sixty-five percent are female, and 35 percent are high school students. All attend a weekly on-site training session, also paid, that covers exhibit interpretation techniques, science content, and visitor services skills.

The first “rung” of the Science Center Ladder is an after-school program for 14-year-olds. At this stage, students are introduced to the museum and its resources through interactive science workshops, and they become familiar with the museum and its staff, including older Explainers. Subsequent rungs lead from Explainer to Program Explainer to Senior Explainer, and participants can also move into other leadership positions at the Hall of Science while they are full- or part-time students. After graduating from college, a strong SCL participant might be invited to work full-time at the science center.

Promotions and pay incentives are built into the process to encourage students to work hard, develop good science skills, and demonstrate leadership qualities. Mandatory seminars, peer mentoring, and optional field trips to other informal institutions and scientific organizations are key strategies employed for students’ personal and professional development. The program also introduces Explainers to career options in both science and education.

Although SCL participants are not required to commit to a career in
Staff Training at Maloka

By Elizabeth Hoyos

Providing staff development is a top priority at Colombia’s Maloka science center. To promote the highest level of professionalism among staff, and to provide training that supports their immediate and long-term success, the Maloka Corporation has implemented three plans:

(1) Museum Guide School (Escuela de Guías)

For this grow-your-own program, we select and recruit university students from different fields and offer them training in areas like visitor services, security, and administration. Topics covered include informal education tools, an introduction to interactive centers, and (for non-science majors) some basic principles of science.

Museum Guide School students spend time working in our outreach program, Maloka Viajera, which takes science activities to different cities in Colombia. If we can find sponsors and donations to cover the cost, we may send them to visit science centers abroad or to do residencies in similar organizations at the national level. Student guides also help us evaluate public understanding of science and the impact of our organization.

After graduation, the best students may be offered an opportunity to join the staff, forming what we call our “replacement generation.”

(2) Diploma in Science and Technology Popularization from the National Autonomus University of Mexico (UNAM)

In May 2003, Maloka signed an agreement with the Dirección General de Divulgación de la Ciencia (Center for Science Communication) at UNAM to develop a continuing education program for our staff. The three-month program will be taught on a semi-residential basis. Six instructors will come from Mexico City to Bogota to teach classes on-site at the science center; the rest of the course material will be offered online. Maloka will cover the costs of transporting and accommodating the instructors.

In this way we can offer our entire staff the opportunity to receive a professional certificate in science communication.

(3) Cooperative Exchanges

Finally, Maloka occasionally collaborates with sister institutions in other countries (such as La Cité des Sciences et de l’Industrie, in Paris), exchanging staff members for residency programs.

Science or science communication, 65 percent of Explainers (according to a study conducted in 2001 by the Institute for Learning Innovation) go on to earn college degrees in science and/or education. Of that group, many go into medicine, engineering, or teaching.

Interestingly, Explainers often choose to continue working in museums or related informal institutions, a field they would never have considered had it not been for their experience with us. Each year, graduating Explainers ask about positions at the Hall of Science or other museums in New York City, and, depending on availability, we do try to hire Instructors from the Explainer pool.

Shaping the future

To see the long-term effect of the SCL program at the science center, you have only to look at our education department. Staff here deliver science programs to schools and teachers, interpret exhibits and conduct demonstrations, oversee day-to-day management of group orientation, and manage the multimedia resource center. Among the 18 educators and managers who work in the department, either part-time or full-time, 14 are former Explainers.

To give just three examples, Carlos “Charlie” Silva, who started in the SCL program when he was a college student, now oversees the Explainer program, directing a leadership team composed of five former Explainers. In 2000 Charlie was selected as one of the first ASTC Conference Fellows, and he continues to participate with ASTC as an Alumni Fellow and conference presenter. Indira Ramper-saud, a member of our very first Explainer group, moved up through the SCL to supervisory positions. Since starting her family, she works part-time as a Science Instructor. And the director of the education department (and author of this article) got her start in the Explainer program.

Former Explainer or not, each member of the department has a supporting role in the Science Career Ladder. Whether training Explainers, mentoring them as they assist with student programs, or teaching them how to fill out a time sheet, staff members are intimately involved in all activities related to Explainers.

Converting home-grown staff to full-time employees has many benefits. Already well versed in the culture of the museum, former Explainers require less training time. They understand the organization’s mission, philosophies, collections, and history. If they eventually become supervisors, they are better prepared and more effective for having held the positions of those they supervise.

At the Hall of Science, the retention rate for Instructors who have served as Explainers is greater than that for staff hired through other means. On average, Instructors who are not former Explainers stay about two years; those who have been Explainers tend to stay much longer.

The Science Career Ladder has been going strong for 16 years. As the Hall of Science expands to include 55,000 square feet of new space, it continues to add new exhibitions, more programs, and new amenities. These are tough budgetary times, and the SCL also faces challenges. But it is a strength of the program to remain flexible—not only providing strong staff development for Explainers and related staff, but also, most importantly, focusing on the science center’s mission: “To bring the excitement and understanding of science and technology to children, families, teachers, and others by galvanizing their curiosity and offering creative participatory ways to learn.”

Preeti Gupta, director of education at the New-York Hall of Science, Queens, joined the Science Career Ladder program while still in high school. After graduating from Columbia, she was hired full-time as a Science Instructor. Eight years later, she oversees museum education and is heading development of the Harcourt Teacher Leadership Center, due to open in 2004.
Best People, Best Practices: 
A Development Strategy for Success

By Geoffrey Snowdon and Harison Yusoff

Jean Kaur and her coworkers were able to learn so much so quickly is a tribute to the Petrosains’ People Development Strategy (PDS).

Initially, the PDS approach meant intensive training for core staff, in which team leaders were exposed to industry practices, locally and globally, through familiarization visits. Next came organization-wide trainings—both formal, structured classes, run by team leaders, and informal sharing sessions, with staff learning from mentors, peers, and even visitors. The goal was for everyone to develop credible knowledge, especially science knowledge, of every exhibit in every area of the science center. There was an added emphasis on being able to link exhibits to the science and technology of petroleum.

Today’s PDS system continues to demand sustained motivation and creativity. Energy and inspiration are kept high, so that visitors continuously see, feel, and experience the Petrosains “brand” as they explore and discover the “oohs and ah-ha’s” for themselves.

Each day begins with Morning Roll Call, a brief yet dynamic forum where staff is made aware of significant happenings for the day, and people also exchange inspirational thoughts and words of wisdom. Roll Call is followed by a 5- to 10-minute “Explore Session,” a knowledge-building exercise conducted as much as possible in facilitation mode (for practice with peers) within the relevant exhibit. Staff and volunteers then head to their stations for the day.

Fostering personal growth

Under PDS, individual staff development follows a sequence. All frontline
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A STC Dimensions goal is to draw visitors into a more extended discussion. After mini-shows come full-fledged “science shows.” Most science centers offer some form of these standard 10- to 15-minute shows, but Petrosains adds the extra touch of costumes and drama effects to break down communication barriers. Sometimes we use music and dance as well, and for the very young we have puppet shows, role playing, and hands-on interactive workshops. All of this offers an opportunity for Facilitators to extend their science and communication skills.

An important part of staff development is learning to help others learn. Out on the floor, Facilitators are expected to be active mentors to the nearly 200 volunteers—mostly undergraduate and graduate students—who work in the science center. Not all have studied science, and this places a demand on Facilitators to be constantly reviewing their own knowledge and sharpening their ability to develop others.

Effective training for volunteers is important to the institution as a whole, not just to visitors on the floor. Some volunteers go on to become full-time staff members, while others make significant and lasting contributions to the science center before they leave to pursue new careers.

Looking to the future

Jean Kaur has come a long way since her desk job days. “Of course, it was tough initially,” she recalls, “but Petrosains is the ideal place for working and learning. It’s like going back to school and getting paid for learning.” Today, Jean has no qualms about striking up conversations with visitors. She enjoys showing off her busking talents, discussing exhibits, or doing science shows, extending typical Malaysian hospitality all the way. Last March she presented a science show at the ASPAC Conference in Kuala Lumpur. And her proudest moment at Petrosains came when the Prime Minister of Malaysia visited the science center and paused several minutes to watch her conduct a demonstration for students.

Tengku Nasariah, general manager and CEO of Petrosains, sees staff development as integral to the success of the organization. “Four years down the road, we have come a long way, but we are still learning and growing,” Nasariah says. “Petrosains is a work in progress. Our leaders have a key role to play in preparing and equipping staff to manage and thrive in an ever-changing industry.”

The People Development Strategy at Petrosains continues to challenge and extend science center staff. In August 2002, we opened our first internally designed exhibition, the 3,000-square-foot DinoTrek. To accompany four animatronic dinosaurs from Japan, our in-house Exhibit Design team developed an “authentic” Cretaceous diorama, plus caricatures, puzzles, and games for young children and their families.

PDS has also supported the evolution of proactive leadership among staff as we strive to bring science to all of the Malaysian people, including those in remote areas.

Best practices grow from the best people, and “developing people”—though not always an easy task—is a priority at Petrosains.

Geoffrey Snowdon is associate director of Petrosains, Kuala Lumpur, Malaysia. Harrison Yusoff is head of Petronas Twin Towers visit operations. Both are members of the Petrosains Leadership Team. The science discovery center’s web site is www.petrosains.com.
Advancing Each Other: Lessons from the ASTC RAPs

By Carolyn Sutterfield and Sally Middlebrooks

In October 2000, ASTC’s Professional Development Committee initiated a new form of learning opportunity for the field—the single-topic Roundtables for Advancing the Professions (RAPs). Conceived by Committee co-chair Emlyn Koster as two- or three-day, in-depth workshops hosted by individual science centers, the RAPs were designed to address a perceived need for learning opportunities that would be shorter, more focused, more affordable, and closer to home than the ASTC Conference.

Since April 2001, when the program was launched, 17 RAPs have been held at 15 science centers and museums. Approximately 250 registrants representing 96 organizations, plus some 80 staff members from hosting museums, have participated. At this writing (late July), two RAPs remain for 2003.

With more than two years of experience under our belts, it’s time to take an overall look at the RAPs. Participants have been nearly unanimous in giving the workshops high marks for the networking opportunities they offer—one of the program’s chief goals. In what other ways are people benefiting from this form of learning opportunity? What are the challenges and rewards for the hosting science centers? How can RAPs be made even better? A review of participant evaluations and feedback from organizers provides some answers and directions for the future.

Secrets of successful RAPs

All RAPs follow the same procedural guidelines—participants pay for their own travel, lodging, and off-site meals, and host sites charge a modest fee (the recommendation is $50 for members and $100 for nonmembers) to cover direct expenses. Content and logistics are determined by the host. A typical schedule includes an arrival day, with museum tours and an evening social gathering, plus one or two days of planned sessions.

Each RAP is aimed at a particular job function or group of job functions. For example, exhibits and education professionals were targeted in the August 2001 “Outdoor Science Parks” at SciTech Hands-On Museum, while education, outreach, and development staff were the audience for the April 2002 “Selling Outreach Programs to Corporate Sponsors” at COSI Columbus.

Typical RAP activities include staff presentations, participant sharing, talks by outside experts, hands-on activities, behind-the-scenes tours, and social occasions.

At the North Carolina Museum of Life and Science, organizers Chad Hallyburton and Shantel Landavazo fielded a museum team of 12 for their February 2003 “Youth Programs: Creating a Sustainable Future for Your Institutions,” which was aimed at both youth program and development personnel. Staff from the administration, finance, and animal departments joined representatives from education, youth programs, and development to lead sessions, participate in focused discussions, and attend social functions. Says Hallyburton, “Having the president and two vice presidents there really helped to validate the workshop.”

In “Strategies for Renewing Science Center Experiences,” hosted by Exploration Place in August 2001, CEO Al DeSena ensured lively participant sharing by asking the senior-level managers who registered to consider four key questions in advance and prepare short presentations. DeSena credits the strategy with creating “a good balance of input” for the workshop. “Participants took their ‘homework’ seriously,” he says. “It helped to focus our discussion, as well as assure that all participants had an opportunity for sharing experience and ideas.”

Betty Faber, organizer of Liberty Science Center’s March 2003 “Animal Collections at Science Centers,” made good use of outside speakers. Liberty’s program included a USDA official who handles permitting and a representative from New Jersey’s Raptor Trust. Of the latter, Faber says, “He has been taking care of birds for 20 years. His views are not necessarily our views, but we wanted that diversity of opinion.” Faber also invited staff from the Newark Museum to give a presentation on animal husbandry.
Seven Tips for a Successful RAP

Here, in their own words, are suggestions from participants that can help move a RAP from “good” to “great”:

- Provide specified time to visit exhibits, meet with staff, look around behind the scenes.
- Try to incorporate more than one job area; people don’t work in a vacuum.
- Balance presentations with group discussions and sharing of experiences.
- Set rules for discussions to make them more beneficial to all.
- Make presentations by participants a requirement, or at least more aggressively encourage them.
- Have handouts at all workshops.
- Schedule a wrap-up, where we list what we’ve learned and how we might use it.

Rating the RAPs

One meaning of the word “rap” is an opportunity for free exchange of ideas and experiences. From the start, evaluation has been part of the RAPs program. Hosts are encouraged to schedule time for this at the end of the workshop, and participant response has been good (around 90 percent). The evaluations not only provide valuable immediate feedback for hosting science centers, but also help to shape ASTC’s advice to future hosts.

As mentioned earlier, networking tops the list of positive outcomes. In their evaluations, respondents almost universally express gratitude to their hosts and enthusiasm for the chance to network with colleagues. (More than 95 percent have checked “Outstanding” for this goal.) In addition, some attendees single out as “most valuable” a telling moment in a workshop:

- “The chance to hear from project participants—children, parents, teachers! This was unique and very powerful.”
- “The frank discussion of failures as well as successes.”
- “Hearing from the actual researchers.”

Participants also offer their appreciation for techniques and tools they can use at home. As one respondent put it, “[Now] I have information with which I can hit the ground running.” Examples of “most valuable” tools include:

- “Good ideas for team building”
- “Nuts and bolts section, almost impossible to duplicate at a conference”
- “Articles, a great source of information”
- “Project grants-planning information.”

RAP evaluations sometimes note that managing the flow of discussion is a challenge. Some express frustration with speakers who talk too long or conversations that wander from the topic at hand. But participants also offer many constructive suggestions (see “Seven Tips for a Successful RAP,” above).

The host’s viewpoint

Although there is no formal evaluation instrument for science centers that host RAPs, many organizers have shared their joys and frustrations with ASTC through e-mails, letters, and telephone conversations. From these sources emerges a picture of RAPs as a challenging but rewarding staff-development tool for host sites as well as for registrants.

Marketing—As specified in the RAPs plan, ASTC actively markets scheduled workshops, individually and as a group, through the ASTC Annual Conference program, ASTC’s web site, ASTC Dimensions, the INFORMS newsletter, and the ISEN-ASTC-L listserv. Announcements are sent via e-mail to individuals listed in ASTC’s database and to regional museum associations that have listservs and/or newsletters. Hosts also receive address labels for ASTC-member institutions in their region, which they can duplicate for multiple mailings.

Despite these efforts, response is sometimes low. When only six people had signed up a week before “Family Science in Museums,” a 2001 workshop at the New Mexico Museum of Natural History and Science, organizer Maddie Ziegler got on the phone and filled her roster. Says Ziegler, “No matter how much marketing is done, personal calls will make the difference.”

An intimate workshop may not be a bad thing, however; even the smallest RAP so far (five participants) garnered positive evaluations.

Logistics—With average revenues running between $750 and $1,000, RAPs generally cover direct expenses for food and supplies but not the cost of staff salaries. Workshops are time-intensive, both before and during the event, and management must understand the effort involved and commit to the level of funding and staffing necessary to provide a quality RAP.

Says Mary Lou McGiff, one of two organizers of “Science Discovery Rooms That Work,” a June 2003 RAP at the Sciencenter, “If I had it to do over, I would recruit more help from staff and volunteers. I spent time setting up tables and A/V equipment when I should have been participating in sessions.”

Staff development—Registrants are not the only ones to benefit from networking at RAPs; host-site employees—even those not directly involved in planning the workshop—also gain from the chance to meet staff from other museums. “[Exploration Place] staff did not organize the RAP, but they were equal participants in the discussion and social gatherings,” says DeSena. “This was a great way for them to get to know their colleagues and learn about other institutions.”

Hosting a RAP can also spark institutional collaborations. Nipun Patel, organizer of Liberty Science Center’s September 2002 “Changing Technological Trends,” reported after his workshop that “we are meeting with the New York Hall of Science in a few days to exchange experiences.” And two months after the “Youth Programs” RAP in North Carolina, regional attendees got together on their own to stage a follow-up session.

Challenges and rewards—Most organizers admit that the process is demanding, and sometimes you have to cut corners. Says Faber, “It was
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tiring, but not so much in the planning and presenting. It was more like the way you feel when you give a party, and you want it to work. It’s the angst that’s tiring.” Anita Sohus, who ran the Jet Propulsion Lab’s April 2003 “NASA Earth Science Enterprise” workshop, regretted running short of time and resources: “With only two days, and no facilitator except me, we never got to ‘what you could do with this info now that you have it.’”

But when it all comes together, it can be exhilarating. “Highlights for me [included] the “ah-ha” moments that folks shared when they heard something…they’ll definitely use to address a challenge in their own program,” says Mary McIntosh, co-organizer of the November 2002 “Camp-Ins” RAP at Boston’s Museum of Science. “We could easily have spent another day.” Adds Faber, “After the RAP, the LSC team all went out to dinner together, and we invited the participants. We wanted to continue that feeling of inclusion.”

Going forward

Of course, it is disappointing when a RAP has to be cancelled. One frustrated organizer spoke for many when she wrote, “We really pursued this…and were prepared to go the distance. It is unfortunate that folks are too strapped to do the things that might make for increased revenues in the long run.”

We can’t know exactly why people choose not to come to a RAP. Certainly, museum staffs are busy, and budgets are tight everywhere. But two things stand out that might make a RAP more attractive.

The first is that successful workshops tend to offer content for multiple audiences. All of the RAPs that filled were aimed at educators, but most also included at least one additional job function, and one—Liberty’s “Technological Trends”—targeted five staff “professions.”

The second is that people are looking for “take-home” information. “Our topic was good because it was pragmatic,” says Betty Faber. “People who take care of animals really need to know the facts.” For those unsure of a topic’s appeal, she suggests, “Try prototyping the idea at the ASTC Annual Conference. It’s not the same amount of labor, and you can test the response.”

In a field known for its generosity of spirit and can-do attitude, the ASTC RAPs represent a unique opportunity to enrich both those who host and those who attend. Experience shows that the program has strong potential; it’s up to science centers to take up the challenge and find the rewards.

Carolyn Sutterfield is the editor at ASTC, and Sally Middlebrooks is director of education projects and coordinator of the ASTC RAPs. Host applications are still being accepted for 2004. To learn more about past and future workshops, or to propose a RAP, go to www.astc.org/profdev/raps.htm.
Five senior staff are jammed into a small room near the president’s office at the Museum of Science, Boston. Our goal is to create a presentation slide for an upcoming trustees meeting. The diagram must illustrate a dramatic reorganization plan for museum staff—conveying both a new way of linking working groups and a fundamental shift in underlying assumptions.

“No more black and white boxes in neat rows,” someone says. The chart that emerges includes multicolored, circular “clusters,” “semi-permeable membranes,” and five encompassing “orbits.” Gone are three whole divisions—Exhibits, Programs, Visitor Services—that had been around for at least 30 years. In their place are two new entities—Research, Development & Production and Visitor Experience & Outreach—clustered in a new kind of relationship that appears repeatedly throughout the plan.

Ioannis (Yannis) Miaoulis, new president and director of the Museum of Science and catalyst of the plan in question, grins when he sees the chart. “Great!” he says. “This really shows we’ve been thinking outside the box.”

Why a radical reorganization?

At the time of that meeting last May, it had been barely four months since the former dean of the engineering school at Tufts University arrived to head up our 173-year-old Boston landmark.

We might have expected someone from the academic world to be out of touch with the audiences that science centers serve. But Yannis had already demonstrated an ability to popularize science and reach underserved populations. At Tufts, he had built engineering courses around people’s interests, such as music and cooking, and under his leadership, the engineering school had increased its enrollment of women students by 26 percent and nearly tripled the number of female faculty.

Yannis was also familiar with younger audiences, having played a key role in championing the incorporation of engineering in the Massachusetts Science and Technology Curriculum Frameworks for grades K-12. This achievement closely matched one goal of a strategic plan developed at the end of former museum president David Ellis’s 12-year tenure, which called for raising our level of technology education to the level of science education.

Our new president saw science centers as perfectly positioned to help facilitate a nationwide expansion of technology literacy. Everyone expected him to move quickly on this initiative. But no one expected him to propose a reorganization that would turn an established institution on its head. Was this a case of a new man putting his mark on the museum, or was it a key strategy for success in challenging times? The answer to both questions was, and is, “yes.”

Yannis acknowledged up front that he didn’t know much about running museums—and that he had an experienced and talented staff who did. But as he began to ask different people about what was working well in the institution and what wasn’t, he realized that not everyone was in the best position to contribute their talents. A reorganization, he thought, especially one that created new combinations of people and was
flexible, could help staff find their best place within the museum.

There were other strategic issues at work, too. Demographic trends in the Boston metropolitan area show that the potential family audience is not growing but flat. The recent opening of three new IMAX theaters has changed the competitive environment. A struggling economy and new social realities after 9/11 have made it clear that we must reinvent ourselves.

Clusters, ellipses, and orbits

The reinvention process began when Yannis asked senior management what they thought about combining the Exhibits and Programs divisions and creating a special group to lead Strategic Projects. Over a period of weeks, staff and trustees contributed their reactions and suggestions, and the model evolved a little each day. Yannis would find missed opportunities under our old structure and ask, “What if we got rid of that barrier?” By the time we announced the new staffing strategy, it didn’t look anything like the one he had originally proposed. Though driven by the president, the final plan was crafted mostly by the senior management team, with input from many others.

The new strategy has two key goals: (1) to create within our organization the ability to explore new directions, while maintaining a high-quality experience for visitors, and (2) to reduce our dependency on admissions-related income. To implement those goals, it abandons the museum’s previous nine separate staff divisions in favor of four “clusters” that combine entire former groups in new ways.

- Marketing and Advancement (a new term for “Development” that is increasingly popular) links people who will now work together more closely on how the Museum of Science is viewed by others.

- The Human Resources and Finance & Building Operations groups now collaborate to coordinate staff, volunteers, interns, money, and physical space.

- Staff in Research, Development & Production (RD&P) focus on projects that will advance the strategic plan in the future, while people in Visitor Experience & Outreach (VXO) work to ensure that today’s visitor is having a great experience. RD&P primarily addresses exhibit and program development, initiatives to support formal education, and educational research; this group is project-based and funded almost entirely from grants, gifts, restricted endowment income, and other project-based sources. VXO staff focus on the quality of education programs and the amenities so important to enjoying a visit, as well as a variety of programs through which we reach out to the community.

- Information Systems & Resources combines elements from several former divisions to provide support for operations, the museum’s web site, exhibit maintenance, and the library (now a more broadly defined “media center”).

In addition to the four clusters, we have added two new top-level components, shown on the chart as ellipses:

- The Strategic Projects Group comprises strategists and matchmakers who are able to communicate the museum’s vision in a compelling way. Some are dedicated solely to this task, and some have other positions within the organization. All work closely with RD&P and other museum groups, while also developing partnerships with outside organizations that share common goals.

- Trustee & Overseer Relations is directly linked to the president’s office, rather than being housed in Advancesment, in recognition that time and talent are important contributions provided by trustees and overseers.

Though an organizational chart can’t depict all of the relationships and interdependencies within an organization, this one shows five that seem particularly important. They take the form of themed “orbits”—Families, Adults, Students, Educators, Technology—that cut across the entire museum.

Four of these are audience-based: Their goals include strengthening our relationship with schools, directly serving students and educators, building our adult audience, and continuing to serve and enhance the family experience. The fifth, as mentioned before, is our commitment to raising technology education in the museum to the level that science already enjoys. For each orbit, there is a “champion,” a senior manager within the organization who takes on the additional responsibility of museum-wide advocacy for that orbit.

What’s next?

Many reorganizations are driven solely by the need to reduce costs: to do more with less, to be more efficient. But this one is aimed at maximizing the effectiveness and impact of people. It is, in essence, a staff-development plan, creating opportunities for people to play new roles within the museum.

Yannis’ vision spurred the change; senior staff played a key role in shaping the vision; and now people at all levels are implementing that vision.

How is the transition proceeding? For such a dramatic reorganization, the staff’s attitude has been surprisingly upbeat. The fact that the reorganization did not produce any layoffs or pay cuts removed a level of fear. It helped, too, that the strong sense of mission underlying the reorganization was apparent to all. When Yannis presented the final plan at an all-staff meeting, the occasion concluded with general applause and a toast to our future.

As this article goes to press (August 2003), we are continuing to work out the details. For the Museum of Science, this is only the beginning of an exciting journey.

Larry Bell is senior vice president for Research, Design & Production at the Museum of Science, Boston, Massachusetts; www.mos.org. Gail Jennes, the museum’s Institutional Communications officer, assisted in the preparation of this article.
Learning to Speak “School”:
A Part-Time Program for Museum Educators

By Bronwyn Bevan

As a field, we have been making a powerful case for the ways that science centers can help strengthen K-12 science education. We provide unique inquiry learning environments, we offer content expertise, we design curriculum adjuncts, and we lead teacher professional development.

But as educators working directly with schools and teachers, we often find ourselves in a place where another language is spoken, and a strikingly different culture holds sway. Without a clear sense of how formal and informal systems of education both differ and connect, we sometimes reach for traditional classroom tools and language in an attempt to communicate with, and be understood by, the school system.

One result is the common sight of students walking around the museum floor clutching worksheets, like so many tourists navigating a busy foreign marketplace with their noses in guidebooks.

Where is the Berlitz course for informal educators traveling into formal education territories?

The Center for Informal Learning and Schools (CILS), a research and professional development partnership between San Francisco’s Exploratorium, the University of California at Santa Cruz, and King’s College London.

At the doctoral and postdoctoral levels, CILS offers full-time programs that support the bridging and alliance of the formal and informal education systems. But for current museum staff, the CILS Informal Learning Certificate Program for Museum Educators (ILC) provides a way to explore these same topics on a part-time basis.

Spread over two years, the ILC program comprises both focused sessions and networking opportunities designed to provide knowledge of, and experience with, thinking, research, and practices from the formal system of education. It begins with a six-day Inquiry Institute at the Exploratorium in October; continues during the following year with a two-day SchoolSense Institute at NSTA, a five-day summer Bay Area Institute, and a half-day meeting at the fall ASTC Annual Conference; and concludes with a three-day Learning Theory workshop in the spring of the third year.

ILC participants build understanding of the language and practice of formal education—and how these relate to informal education—in four key areas:

• Standards-based reforms, the driver of all public school education reform and practice today.
• Current research and learning theory, particularly the part that relates to informal learning environments.
• What teachers know and how teachers learn, and how these translate to classroom practice.
• The nature of scientific inquiry, and how science centers can support its adoption into classroom settings.

In October 2002, 29 educators from 15 informal science institutions became the first cohort of the ILC program. Another 35, from 20 institutions, are slated to start this fall. Among the first group, Aly Evans, Museum Director of the Space Museum of Chicago, created her new CILS certificate program.

Looking for a refresher course? A change of direction? A chance to acquire new skills? The Informal Learning Certificate at CILS is just one example of part-time programs available to working museum staff. Here some others:

Bank Street Graduate School of Education:
www.bankstreet.edu/gs/leadershipinmuseumed.html
The Leadership in Museum Education program offers a part-time master’s degree in Science in Education (40 credits), to be completed at the New York City campus over two years, in monthly weekend sessions from September through May and for one full week in June.

Birkbeck College, University of London, U.K.:
www.bbk.ac.uk/study/fce/scisociety/scicommd.html
Offers a diploma in Science Communication in a two-year program, with classes on weekends at and summer school.

MLI: Museum Leadership Institute: www.getty.edu/about/leader
Formerly the Museum Management Institute, this intensive, three-week summer workshop sponsored by the Getty Leadership Institute, is aimed at directors and/or senior staff in positions to influence policy and effect change. The 2004 MLI will meet July 10-30 in Los Angeles. Applications are due January 6.

Museum Management Program, University of Colorado: (303) 473-9150
This three-day June short course for museum directors and other senior administrators, run by museums expert Victor Danilov, is held in Boulder, Colorado.

Smithsonian In-Career Museum Training and Education Opportunities Clearinghouse: http://museumstudies.si.edu/listings.htm
An online calendar of workshops, conferences, and events covering a variety of professional development topics. Recent listings included “CEOs and Governance,” “Leadership Through Diversity,” “Mutual Concerns of Air and Space Museums,” and “Secrets of Institutional Planning.”

University of Bath, U.K.: www.bath.ac.uk/psychology/about/ssc.cfm
The diploma in Science, Culture, and Communication requires 60 hours (12 credits) on a part-time modular basis.

University of Victoria, British Columbia: www.uvcsc.uvic.ca/crmhp
The Museum Leadership Development Program, conducted over nine months by the Division of Continuing Education’s Cultural Resource Management Program, consists of four courses held in three six-day immersion sessions (June, October, and March), with online interaction between sessions. Leads to a Certificate in Public Administration with a Museum Leadership Specialization.

Learning on the Job

—A sampler of part-time opportunities, compiled by Carolyn Sutterfield
director of education at the Reuben H. Fleet Science Center, in San Diego, California, applied because she wanted to fine-tune her communication with the formal education community. “I wanted to be sure [teachers] were aware of the learning opportunities we can offer them,” says Evans. “I am discovering that our best chance for impacting student learning depends on true dialogue, with each side translating its needs and objectives effectively to the other.”

The Bay Area Institute is a particularly useful forum for ILC participants because it gives them a chance to try out their new skills with other CILS students. These include doctoral candidates in science education (some of whom also have worked in science centers) and developmental psychology; Science Fellows who are pursuing graduate degrees in the natural sciences; and Postdoctoral Fellows, from various disciplines, who are doing research in informal science institutions. Together with the CILS faculty, each group brings unique strengths and questions to the meeting, and, as at any gathering of different communities, the ability to translate and use a common language is key to connecting and moving ahead.

The science center field needs more “bilingual” educators—professionals who can speak the school language and design school programs that build on the strengths of informal education. As the research agenda around informal/formal alliances translates into practice and policy, Informal Learning Certificate holders can expect to have more influence on their institutions’ school partnerships—and on the ways teachers build science centers into school curriculum.

**Bronwyn Bevan is director of the Center for Informal Learning and Schools, San Francisco, California. CILS is funded by the National Science Foundation, The Noyce Foundation, and NEC Corporation of America. For more information, visit www.exploratorium.edu/cils.**

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### Calendar

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Host with the Most

The ASTC Annual Conference is famous for its extended learning and networking opportunities, but this year there’s a bonus—the chance to explore and learn at one of the premier science centers in the United States.

The Science Museum of Minnesota (SMM), host of the conference, has made its world-class facility a centerpiece of ASTC 2003. In addition to three Friday night receptions and Saturday’s “Learn to Have Fun, Minnesota-Style!” party, no fewer than 18 workshops and sessions are scheduled at the 3-year-old, nearly 370,000-square-foot St. Paul facility between November 5 and the close of conference on November 11.

Preconference SMM workshops include exhibit developer Chris Burda’s 2½-day “Exhibit Graffiti: Interpreting the Urban Landscape,” in which participants, beginning on Wednesday, November 5, will work with local partners to develop and prototype wayside exhibits in St. Paul’s waterfront district. Two one-day workshops, “The Science of Not Sleeping” and “Carpentry for Kids,” will be held at the museum on Friday.

Extended workshops scheduled at SMM during the Saturday–Tuesday program include sessions on biology experiment benches, digital spirographs, programming on the human genome, playful invention with digital technology, and brain/body learning, as well as an exhibits project-tracking tour and a seminar linking Gregory Cajete’s book Native Science with the Montana State University exhibition Native Waters, on view at the museum. Many of these programs have limited enrollment, so be sure to indicate your first three choices on the conference registration form.

Monday’s Open House will, of course, be a chance to explore behind the scenes, as SMM staff welcome delegates to galleries and theaters for an afternoon of exhibits, demonstrations, performances, and giant-screen films.

But the museum has also looked outside its walls to include the larger Twin Cities community. Delegates arriving on Friday will find a series of “St. Paul Welcomes You!” receptions, hosted by SMM staff, staged in downtown locations, and Monday’s special evening events will highlight local entertainment and culture.

In addition, SMM’s Science Book & Toy Drive will provide a legacy for the city, as delegates donate new items from their science center shops for distribution to local children in need and to the St. Paul Public Library. Don’t forget to bring your new, unwrapped toy or science book!

Advance registration for the 2003 ASTC Annual Conference closes on October 8; the ASTC Housing Bureau’s hotel reservation service closes on October 10. For more information, and for downloadable registration and hotel reservation forms, go to www.astc.org/conference.

Petrosains Hosts ASPAC 2003

Geoffrey Snowdon, outgoing secretary of ASPAC, sends this report of the 2003 ASPAC Conference, hosted by Petrosains, in Kuala Lumpur, Malaysia:

More than 150 participants from the ASPAC region (representing New Zealand, Australia, Singapore, Indonesia, Thailand, the Philippines, China, Japan, Brunei and Taiwan) joined 75 international guests from as far away as Finland, the United Kingdom, Qatar, and the United States, at the fourth ASPAC Conference, held March 3-5.

“Keynoter Dennis Bartels, president of TERC Inc., Cambridge, Massachusetts, set the scene with a thought-provoking case for science centers as ‘transformal’ learning institutions. Science centers and museums, Bartels said, stand as fantastic boundaries spanning institutions—between scientists (and the scientific enterprise) and the lay public; between schools and the learning people do outside of school; and between the individual and the question he or she is trying to understand in the moment. Media, content, and the Web are integral, he said, and technology is vital ‘connective tissue’ for the individual traveling among these institutions.

“After Monday’s plenary day, which featured contributions from many delegates, the science center came alive for an evening party, as guests enjoyed live music and performances by Petrosains staff.

“Tuesday was for workshops. Each of the Petrosains departments led one, and almost every international visitor and many locals had a chance to give input. Networking opportunities, ideas, and gains were plentiful and appreciated. Putat Sains Negara hosted the final morning session, at which staff launched their ‘Release of Butterflies to Nature’ campaign.

“At the close of the conference,
outgoing ASPAC president Chew Tuan Chiong, CEO of the Singapore Science Centre, handed over the president’s role to Chee Kuen Yip, director of the Hong Kong Science Museum.”

For more on Petrosains, see “Best People, Best Practices,” page 7.

Online Program to Open Soon

ASTC’s online learning program will open to the field by the end of the year, thanks to the support of the Institute of Museum and Library Services and testing by participants from more than a dozen institutions.

The program aims to offer year-round professional development opportunities at limited cost and without the need for travel. Objectives include increasing participants’ familiarity with problem-solving tools and methods; raising awareness of and access to resources; and developing a supportive community for ongoing professional development.

Opportunities developed so far include a self-paced introduction to the science center field, called “Science Center Basics,” and moderated workshops on visitor surveys and accessible print materials.

Help with the testing has come from moderators and participants at nine ASTC museums, including the Museum of Science (Boston), Pacific Science Center, Arizona Science Center, St. Louis Science Center, New Jersey State Aquarium, Fairchild Tropical Garden, Whitaker Center for Science and the Arts, Bell Museum of Natural History, and the National Health Museum. (Our thanks go also to the Oakland Museum, MIT Media Lab, Randi Korn Associates and Selinda Associates.) Candace Julyan, developer of the online program Seasonal Investigations, is serving as evaluator, and ASTC member Ideum is designing the site and the registration system.

In coming months, ASTC will be working with new partners to develop additional content. For more information, contact Wendy Pollock, wpollock@astc.org.

The following new and updated memberships were approved by ASTC’s Membership Committee in May 2003. Contact information is available in the Members section of the ASTC web site, www.astc.org.

GOVERNING MEMBERS
- Rochester Museum & Science Center, Rochester, New York
- Science Alive! The New Zealand Science Centre, Christchurch, New Zealand

SCIENCE CENTER AND MUSEUM MEMBERS
- Everest Science Centre Nepal (ESCN), Sitagunj, Biratnagar, Nepal. Scheduled to open in January 2004 on 40 acres near Nepal’s largest industrial city, ESCN is the first science center established in the Himalayan kingdom.
- Museo de Ciencia y Tecnología SEMILLA, Chihuahua, Chihuahua, Mexico. After hosting a number of traveling exhibitions in temporary quarters, the state-operated museum will open its 48,000-square-foot permanent facility this December.
- Museo Interactivo EPM (Empresas Públicas de Medellín), Medellín, Colombia. Managed by the local public utility company, the museum features exhibits on water, energy, telecommunications, and local geography.
- West Liberty State College SMART-Center, Wheeling, West Virginia, U.S.A. The college-sponsored Science, Mathematics, And Research Technology education center, which has been offering school outreach programs and summer sessions for students and teachers since the late 1990s, will open its new 5,000-square-foot Exhibit Hall in January 2004.

SUSTAINING MEMBERS
- Ansel Associates Inc., Richmond, California
- Blair Inc., Springfield, Virginia
- Taylor Studios Inc., Rantoul, Illinois
- XhibitNet, Portland, Maine.

For more ideas on staff development, watch for these sessions in St. Paul this November:
- Career Paths for Museum Educators and Designers
- Shared Vision: an Indispensable Tool for Energizing and Aligning Your Work Unit
- Peer Clusters: An Innovative Approach to Evaluating Programs
- Your Responsibility in Creating an Inclusive Working Environment
- A COSI Model of Floor Programming: Year Two Progress Report
- Exceeding Visitor Service Expectations: Learning from Industry Pros
- Professional Development: Building Cultural Competency for Recruitment and Retention
- Diversity! Haven’t We Already Done This?
- Developing a Vision for the Visitor Experience
- Integrating Marketing and Product Development
- Sibling Rivalry: Exhibit Design and Program Development.
BENEATH THE BIG NICKEL—In the early 1900s, Sudbury, Ontario, was the center of a booming Canadian nickel-mining industry. The legacy of that era, and the larger impact that geological forces continue to make on communities around the world, are the focus of Dynamic Earth, a $15.3 million (Canadian) earth sciences center that opened at Sudbury’s Science North on May 10.

Built on the site of the former Big Nickel Mine (a 30-foot replica of Canada’s 1951 coin of the same name dominates the grounds), the 18,000-square-foot, self-contained attraction sits between the city of Sudbury and the Inco mining company’s modern Copper Cliff smelting and refining complex.

Inco has sponsored the exhibition’s most spectacular experience, a seven-story drop in a glass elevator into the underground Inco Chasm. Here, projected on native rock walls, visitors can see a multimedia presentation on the ways geology has shaped culture in places like the Andes, Japan, Hawaii, and Tibet. Once underground, they can don hard hats for a tour in which retired miners and science center staff members, costumed as miners of different eras, describe techniques and equipment from the history of mining.

Sixty exhibits, divided between two aboveground galleries, offer plenty of hands-on experiences. Visitors can create an earthquake, relive the meteor strike that formed the Sudbury Basin, dig with kidsized equipment in the three-level Explora Mine, manipulate a remote-controlled rockbreaker from the Mining Command Centre, and examine minerals in the interactive Rockhounds lab.

In the Nickel City Stories object theater, “Louie” the barber tells tales of Sudbury’s history. A Miners’ Playground and interpretive trails extend the experience outdoors, and the Dynamic Earth web site provides additional information for visitors and school groups (and will soon feature online activities).

Besides Inco, funders for the project include the Northern Ontario Heritage Fund Corporation; the City of Greater Sudbury; Heritage Canada’s Cultural Spaces Program; FedNor; and Human Resources Development Canada (HRDC).

Details: Mia Boiridy, director, boiridy@scienceonorth.ca; web site http://dynamicearth.ca

HOMO LUDUS—A new traveling exhibition created by La Cité des Sciences et de l’Industrie, Paris, invites families to learn more about themselves through play.

In a custom-designed Games Room, visitors to Jeux sur Je (Games of Me) find exhibits based on board games popular in Europe, such as Taboo, Brainway, Jungle Speed, Confusion, and Amnesia. The focus is not on the history and aesthetics of such games, however, but rather the skills and abilities needed for success in playing them.

Jeux sur Je was designed by La Cité staff in collaboration with human resources specialists, play researchers, professional trainers, and game designers. Starting with two basic concepts—that a game represents life in society, and that human activity is governed by rules—designers looked at how players interact and confront each other and thereby develop attitudes and behavior similar to those of daily life. The result is contests in which the visitor-player is the hero.

The 15 interactive exhibits are grouped in five areas, according to the skills they require:

- Communication and Interaction: transmission, sharing, and listening
- Strategy and Tactics: analyzing a situation and deciding on a course of action
- Creativity and Innovation: improvising solutions and associating ideas
- Teamwork: defining a common strategy, coordinating efforts, taking risks together
- Reaction and Crisis Management: Responding quickly and appropriately under stress.

A few of the games have been modified slightly from the originals, and elements like cards, boards, and timers have been made larger. Mediators are present in the room to answer questions and to resolve arguments, should any arise.

After it closes in Paris in January 2004, Jeux sur Je will go on tour.

Details: For information and online activities, visit www.cite-sciences.fr/francais/ala_cite/expo/tempo/jeu.

A MATERIALS WORLD—Nitinol, aerogel, magneto-rheological fluid... Stranger than fiction are the ingredients of Strange Matter, a new traveling exhibition developed by the Ontario Science Centre, Toronto, Canada, that explores the bizarre world of modern, high-tech materials.

Ten “experience pods” and a demonstration theater make up the 5,000-square-foot exhibition, in which seemingly everyday items like plate glass, metal strips, crystals, and foam behave in extraordinary ways. Visitors can swish gloved hands through a viscous liquid and then turn it solid at the touch of a button; restore twisted “memory metal” to its original shape with a blast of hot air; and do their best to shatter a glass panel with a swinging bowling ball.
Other exhibits examine the real-time growth of crystals, the unpredictable behavior of amorphous metals, and possible uses for aerogel, the lightest material ever made.

The Materials Evolution area provides science background and places these innovations in context, while an overview video introduces visitors to some of the scientists behind the scenes. For younger children, the Touch Table offers a variety of experiences involving texture, color, and other properties of materials.

Strange Matter was commissioned by the Materials Research Society, a not-for-profit scientific association numbering 12,500 scientists from industry, government, academic, and research laboratories around the world. The society promotes interdisciplinary, goal-oriented research on materials of technological importance. Funding for the exhibition was provided by the National Science Foundation, Alcan, Down, Ford Motor Company, and the 3M Foundation.

After closing in Toronto on January 4, the exhibition, along with a smaller 1,500- to 2,000-square-foot version, will go on tour.

Details: www.StrangeMatterExhibit.com

Ferrofluid, a suspension of iron particles in an oil-based solution, “dances” in response to a magnet’s attraction. Photo courtesy Ontario Science Centre

Grants & Awards

The following U.S. ASTC members have received National Science Foundation grants for projects starting in 2003:

- **Chabot Space and Science Center**, Oakland, California: $2.64 million for Dragon Skies: Astronomy of Imperial China, a traveling exhibition of Chinese astronomical artifacts and related interpretive materials.

- **Franklin Institute Science Museum**, Philadelphia, Pennsylvania: $1.22 million for The Franklin Air Show, a 5,000-square-foot permanent exhibition that explores the science and technology of aviation and aeronautics.

- **Huntington Botanical Gardens**, San Marino, California: $1.75 million to support the design and installation of exhibits in the Rose Hills Foundation Conservatory for Botanical Science, including Discovery Stations for families with children aged 9 to 12.

- **Miami Museum of Science**, Florida, and **Science Museum of Minnesota**, St. Paul: $2.18 million for Amazon Voyage: Vicious Fishes and Other Riches, a 5,000-square-foot, bilingual traveling exhibition highlighting the rich diversity of the Amazon River ecosystems and addressing ways that personal choices can affect environmental outcomes.

- **MOSI**, Tampa, Florida: $1.58 million to develop Disasterville (working title), a 9,000-square-foot exhibition on the effects of floods, tornadoes, hurricanes, lightning, hail, wildfires, earthquakes, and volcanoes. Partnering with the science center in the project is the Institute for Business & Home Safety, now headquartered on MOSI’s campus.

- **New York Hall of Science**, Queens: $1.39 million for Connections, a 3,500-square-foot exhibition and related resources that will introduce visitors to the technology of networks.

- **Oregon Museum of Science and Industry**, Portland: $1.4 million for Outdoors Indoors, a 2,500-square-foot, bilingual exhibition for children aged 3–8 and their families. Two versions of the exhibition, which replicates a woodland environment, will be developed—one to be installed at OMSI and one to travel.

The GE Foundation has awarded $400,000 to Kentucky’s **Louisville Science Center** to support Inquire! Investigate! IMAGINE!, a three-year science education program for elementary and middle school students in the Jefferson County Public Schools.

The **Museum of Discovery**, Little Rock, Arkansas, has received two planning grants from the Donald W. Reynolds Foundation, Las Vegas, Nevada. A $380,217 award will support research into the possibility of linking existing state museums to establish a Children’s Discovery Center Network. A second grant, totaling $196,750, will fund planning for expansion of the museum's current facility.
ASTC welcomes four new staff members: Jacqueline Lowery, senior manager in Partnerships for Learning, was formerly with Caliber Associates, where she managed research and evaluation projects for federal agencies. Dawn Tullis, assistant manager for Meetings and Conferences, joins us from Advanstar Communications, where she was conference coordinator. Rakeb Suraphel has replaced her brother Samuel as Information Services coordinator, and Velma Graves has joined us part-time in accounting.

Pacific Science Center, Seattle, Washington, has announced the appointment of R. Bryce Seidl as executive director. He replaces George Moynihan, who headed the museum for 23 years. Seidl, a former mayor of Vancouver, Washington, and timber industry executive, was most recently interim director of the Pilchuck Glass School, near Seattle.

The new director of Questacon, the National Science and Technology Centre, in Canberra, Australia, is Graham Durant. Previously associate director of Scotland’s Glasgow Science Centre, Durant was instrumental in creating that institution’s inaugural exhibitions. He also received a U.K. Millennium Fellowship in 1998. Durant replaces Annie Ghisalberti, who left Questacon in August 2002.

After eight years at the Smithsonian Institution’s Lemelson Center for the Study of Invention and Innovation, Michael W. Judd has left to become executive director of the Discovery Museums, Acton, Massachusetts. He replaces Deborah Gilpin, who recently accepted a position as vice president of exhibits and programs at the Arizona Science Center, Phoenix. While in Washington, Judd helped to produce the award-winning Invention at Play exhibition now being toured by ASTC.

The Brooklyn Children’s Museum, Brooklyn, New York, announces the appointment of Gregory Zuroski as vice president of development and marketing. Zuroski, a former director of development for the Friends School on Long Island, will coordinate the third and final phase of a major fund-raising and expansion effort that began in the museum’s centennial year, 1999.

Oakland, California’s Chabot Space & Science Center has a new executive director. Alexandra “Alex” Barnett was previously business development director at the National Space Centre, Leicester, U.K. She is also the author of Black Holes and Other Space Oddities. Barnett replaces Mike Reynolds, who has assumed the presidency of the Chabot Foundation.

Jeff Liverman, a former exhibit developer and director of outreach education at the Science Museum of Virginia, Richmond, is the new executive director of that institution’s western Virginia affiliate, the Danville Science Center. He replaces Ginny Laubinger, the museum’s founding director, who retired in July.

Two staff members at Sci-Port Discovery Center, Shreveport, Louisiana, have recently received promotions: M. Al-Najjar is now senior vice president, and Jennifer Tuxen is director of exhibits and programs.