On Becoming An Inclusive Science Center

Beyond Tokenism: Why Diversity Matters in Science Centers

As Happy as Can Be: Fostering Inclusiveness at Explora

Haven’t We Done That? Measuring Staff Diversity in Science Centers

Native Waters: Integrating Scientific and Cultural Ways of Knowing

Action for Equity and Diversity: Things You Could Start Tomorrow

Diversity Dialogues: Lessons of the ASTC Conference Fellowship Program
IN THIS ISSUE

If our institutions are to grow and thrive, science centers and museums must engage new audiences and learn to meet the complex educational needs of our increasingly diverse communities. We cannot do that if we do not ourselves reflect that diversity. In May 2000, ASTC’s board of directors set itself an ambitious task: to “aggressively pursue equity and diversity” as a strategic objective for the entire organization. In October 2001, ASTC adopted the Equity and Diversity Initiative. Three years later, how much closer are we to our objective? In this issue, we offer some reports from the field.

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Cover: Encountering ‘someone like me’ on the science center floor sends a powerful message of inclusiveness, but staffing is just one element of a diverse institution. Photos courtesy (clockwise from top right) Discovery Place, North Carolina Museum of Natural Sciences, Carnegie Science Center, Petrosains, Explora, Arizona Science Center.

ASTC Dimensions (ISSN 1528-820X) is published six times a year by the Association of Science-Technology Centers Incorporated, 1025 Vermont Avenue NW, Suite 500, Washington, DC 20005-6310, U.S.A. Copyright ©2004 the Association of Science-Technology Centers Incorporated. All rights reserved. ASTC Dimensions is printed on 45 percent recycled paper with environmentally friendly inks.

ASTC Dimensions is intended to keep member institutions apprised of trends, practices, perspectives, and news of significance to the science center field. Readers are encouraged to submit news items and ideas for articles. Contact Carolyn Sutterfield, editor, 202/783-7200 x130; e-mail csutterfield@astc.org. For editorial guidelines, visit www.astc.org.

ASTC-member institutions receive five free copies of each issue as a benefit of membership. Individual and bulk subscriptions are also available. For employees of ASTC-member institutions, the individual rate is U.S. $35; $45 outside the United States. For all others, the price is $50; $60 outside the United States. Send name, address, name of institution, and payment in U.S. dollars to ASTC, 1025 Vermont Avenue NW, Suite 500, Washington, DC 20005-6310, U.S.A., Attn: ASTC Dimensions. For more information or to place a credit-card order, contact publications assistant Shirley Gaines, 202/783-7200 x140; e-mail pubs@astc.org. ALTERNATIVE FORMATS AVAILABLE ON REQUEST.
Beyond Tokenism: Why Diversity Matters in Science Centers

By Barbara Ando and Jeff Rudolph

Three years have passed since ASTC’s Equity and Diversity Initiative for the field was announced. The Board of Directors’ Equity and Diversity (E&D) Committee spent many months shaping the plan that was adopted in October 2001. Its arrival sparked enthusiasm in some, cynicism in others, and apathy in more than a few.

Nevertheless, the work has continued. The effort is perhaps largely driven by those whose science centers and communities are immediately affected by significant changes in local demographics or global migrations. It may also reflect a perceived need for creative renewal of efforts to engage local communities historically underserved by science centers.

No matter what the motivation for being proactive, there is growing realization in the field that offering “event-based diversity” (one or two programs a year for targeted populations) or building more accessible restrooms is not enough. Such tokenism is unlikely to yield new audiences who make the science center an ongoing part of their lives. Inclusion requires far more knowledge and effort on our part.

If the results of visible external successes—in staff recruitment, perhaps, or audience development—are to be lasting, we have much internal work to do. In the January/February 2002 issue of ASTC Dimensions, diversity expert (and Cherokee storyteller) Eric Jolly, now president of the Science Museum of Minnesota, asked readers to consider four key questions: “Who informs your work? Who sets the policy? Who does the work? Who benefits from the work?” These are critical operational questions, relating directly to the sustainability of present and future diversity, that must be explored honestly when assessing the degree of inclusion present in an organization.

We have no way of calculating how many ASTC members have seriously reflected on these four questions. Neither do we know how many science centers have found the ASTC-produced video and accompanying discussion/planning guide, Eric Jolly on Sustainable Diversity in Science Centers, helpful in their diversity work.

There are many more things we do not yet know about the paths ASTC members are taking to achieve their diversity-related goals. But three years into the initiative, it seemed appropriate to revisit the topic and find out how some in the field have been addressing inclusion in their institutions.

In this issue of ASTC Dimensions, Paul Tatter describes how his recently opened Explora is implementing its commitment to welcoming children and families from varied cultures and reflecting in its staff the diversity of its audiences. Bonnie Sachatello-Sawyer and Teresa Cohn write of the challenge of working across cultures to create Native Waters, a meaningful informal educational experience built around the concept of responsible water management. Colleagues from several science centers and museums share successful diversity strategies that could be adapted to other museums’ needs. And ASTC’s DeAnna Beane offers some lessons from the Conference Fellowship Program about how we can support museum professionals of color—people who “do the work,” often against the odds, with a passion for seeing the communities they represent fully included as visitors, members, staff, advisors, and board members.

The E&D Committee extends its thanks to all ASTC members who have reported demographic data, described their benchmarks, identified their challenges, shared something that has worked well for them, or supported the Equity and Diversity Initiative goals in other ways.

This work is ongoing and is often comprised of small, but highly intentional steps or strategies. Some of these steps are described in this issue, and we actively seek more to share with the field. If your institution is on the path to becoming an inclusive science center, let others know what has worked for you. On page 21, you will find a “Call for Promising Practices in Equity and Diversity,” which details how you can submit a program idea or strategy for inclusion in ASTC’s online Equity and Diversity resource pages.

Barbara Ando, associate director for public programs at the University of California’s Lawrence Hall of Science, Berkeley, is co-chair—with Gail Becker, executive director of the Louisville Science Center and an ASTC past president—of ASTC’s Equity and Diversity Committee. Jeff Rudolph is president and CEO of the California Science Center, Los Angeles; a past president of ASTC; and chair of the board of the American Association of Museums.
I like the museum because it makes me happy. As happy as can be.”

This message on a comment card left by a young visitor to Explora is a message about accessibility and inclusiveness. It’s a message about the role of a place in somebody’s life. So are these: “¡Divertido! ¡Muy inteligente!” “Remarkable! A great experience for 7-year-olds or 70-year-olds.” “Me gustó todas las cosas.” “This weekend we came Saturday and Sunday. Yea for Albuquerque!” “Dude, this is a so cool place.” “This museum is awesome. I love it! I want to live here.”

Explora, in Albuquerque, New Mexico, is work in progress—its very newness makes it atypical—and so it doesn’t have advice to offer, only experiences to share. We keep trying to focus on the experience of the whole place; on the interplay among exhibits, environment, programs, stuff, staff, and visitors of all kinds, and passing beyond the walls to the interplay of all these things with the community and its diverse population, personal histories, special interests, schools, neighborhoods, government, organizations, and businesses. Whew! How do museums embrace all of this?

We constantly slide back and forth between attention to the whole and attention to the detail. We try to remember that the whole and the detail are connected. Since this is a process, the whole is always editing the parts and the parts in turn are making up the whole.

People—visitors, staff, board, supporters—and their learning experiences are the heart of Explora, not the exhibits, programs, building, or the business, which are just the context for the people and what they are doing. In 2001, Explora’s board made a commitment to people and diversity with a policy resolution that includes the following: “Explora’s exhibits and programming will be welcoming and responsive to children and families from all of New Mexico’s varied cultures.... Explora is committed to the goal that its staff reflects the diversity and demographics of New Mexico’s population.... Explora will seek to develop the skills and abilities of its staff members so they may assume greater levels of responsibility, either at Explora or elsewhere....”

Our current staff is 67 people. Ninety-three percent were hired from
local communities; 44 percent are conversationally bilingual (English plus languages ranging from American Sign Language to Kerese, Navajo, and Spanish); 40 percent are Hispanic, Native American, African American, or Asian; 37 percent are male; 30 percent are over 50. We search for new employees through referrals from staff, board, and community friends, and by word of mouth, phone calls to people who know people, ads in local English and Spanish papers, and notices to some social service organizations.

Among our criteria for hiring are the usual skills and experience. Given these, employment is offered to people whose personal qualities indicate they will participate in and contribute to the growth of our shared and diverse institutional culture. If an applicant pool does not provide such qualities, we have learned to wait and try again. Probably the most important management activities at Explora are tirelessly advocating a vision for our developing institutional culture, hiring thoughtful, creative, generous, cooperative, and happy people to inhabit that culture, and facilitating its transactions with the community.

Defined by what we do

Explora has had its share of diversity and inclusiveness studies, committees, and focus groups. These all are good at identifying myriad issues, but they can’t make things happen. Our staff does that. But where to start? Rather than waiting for clarity, we decided to just start somewhere and then make adjustments as we go along—understanding that this is a long-term, organization-wide process.

Explora’s diverse board, and especially its board executive committee, serves as an ongoing forum for ideas. Board members represent a wide range of ages and are 40 percent female and 33 percent Hispanic/Latino, Native American, or Asian.

What matters is what people do here: what visitors do, what staff members do, what board members do. What they do defines the place.

Explora is driven by an evolving, experimental pedagogy and by its mission: “creating opportunities for inspirational discovery and the joy of lifelong learning through interactive experiences in science, technology, and art.” The environment shapes the behaviors of people within it, both employees and visitors, and those behaviors in turn become aspects of the environment. What matters is the overall effect of place, of small experiences accumulating into the outcome of an experience of the whole.

A common quality of the comments quoted at the beginning of this article is that they are expressions of whole, personal responses to accumulated experiences of a whole place. They communicate global feelings, from people diverse in age, culture, gender, interest, and ability, about the residues of time spent in an immersive environment.

We are not sure why such a broad cross-section of our community visits Explora. According to the most recent U.S. Census, New Mexico is 45 percent White (not of Hispanic/Latino origin); 42 percent Hispanic or Latino; 10 percent Native American; 2 percent African American; and 1 percent Asian. Our visitors reflect these proportions. Their comments are so diverse that it is difficult to identify any primary factor drawing them here. Most likely it is not because of any particular thing, but rather because of a collective whole, within which different people are drawn to different things. In attracting visitors, inclusiveness is more important than marketing.

Inclusiveness at Explora begins with attention to the most basic aspects of voluntary human learning: the proclivities and heuristic capacities of the human body (all people learn with their bodies); the analogs from past experiences that people bring into their present experience, and how these can be accommodated within our exhibits and programs; an ease and intimacy of conversation; a sense of participation, ownership, inclusion, and respect; physical and emotional comfort; personal control of materials, space, attention, and activity. Inclusiveness starts with these conditions because they are shared by almost all people.

Pursued together, these conditions create a comfortable and familiar-feeling environment for people of diverse backgrounds and personal histories. A visitor commented, “There’s a home environment quality about it. There’s an element of intimacy. It’s not institutional in feeling.” Homelike comfort is inclusive.

A person who works downtown often spends lunchtime at Explora because she likes the atmosphere. Every day we see families in our two picnic areas. Explora takes pride in appearance, cleanliness, and workmanship; in aesthetics, colors, textures, and materials; and in hospitality,
Sixty percent of Explora’s staff works directly with visitors, and every staff member spends time on the floor each month.

Sixty percent of Explora’s staff works directly with visitors, and every staff member spends time on the floor each month.

much the way people take pride in the care of their homes and in their hospitality. Almost everyone intuitively understands this analog.

**Including basic human needs**

The following descriptions may seem out of place in an article about inclusiveness, but we believe they are essential elements of how inclusiveness works here.

As, over time, the inclusiveness of science centers is becoming more than programmatic enhancement, it is because the most basic conditions for human learning are being manifested in the details that shape people’s experiences. A few easy chairs really may matter to diversity and inclusiveness. At least they matter to the grandma who needs to rest, and to the infant who needs to nurse, and to the person sitting with you—or on your lap.

Among Explora’s exhibits, irregular mazes of mobile walls and small tables create personal spaces that support focus and attention, semiprivate, and conversation. They distribute visitors evenly across the floor space, limiting crowding and displacement. They dampen sound and movement, lowering the volume and pace of activity. The floor and passage configurations meet ADA requirements, though some are tight as we strive for intimate spaces that are not frustratingly difficult for wheelchairs. There is seating everywhere, mostly stools but also those easy chairs in nooks and crannies, promoting thought and lingering.

The mazes seem to encourage attitudes of exploration and curiosity. (“No maze has ever been like Explora, with a new adventure at every node. It was interesting for my young grandchildren as well as for me, a physicist/engineer.”) We strive to include multiple options for engagement and lines of inquiry, and to place exhibit components accessible to different ages and backgrounds in close proximity, so that all members of a family may stay together, yet satisfy their own interests. Many exhibits are fragile, with hundreds of loose parts, providing respect for, and trust in, our visitors.

The scale of most exhibits is small, fitting on tabletops. Parts are hand-sized and made for handling. Hands provide both a means and the proof of learning through the things they do. Not even brains can do this. We see in ordinary hands the magnificent, marvelous hands that for millennia have built civilizations; that have painted caves and canvases, made music and monuments, tools and technology. Provisions for free hands are important for inclusiveness because they make control and decisions personal. We try to make exhibits with transactive qualities, such that both they and their users are changed even in small and unexpected ways by their encounter, and there is evidence of that activity for the next users.

Signage among exhibits is more personal than instructional. It is short and phrased in chunks of meaning. Sometimes it resembles free verse. It offers clues, questions, support for inquiry, bits of strange but relevant information. It has humor. It is bilingual. Along with personal control of activity, intimate spaces, loose parts, and a staff that asks “What do you think?” the signage tries to communicate that here the invitation is for experience that is yours and created by you, rather than for knowledge that is mine and provided for you.

On the exhibit floor or in programs, one sees our community and the community sees itself. Visitors hear their home languages being used. There is Spanish on the walls. Visitors meet staff members who are as diverse as they are. Explora’s exhibits are intended to have a large staff presence. Sixty percent of Explora’s staff works directly with visitors, and their main goal is to engage visitors in conversation about their experiences. One hundred percent of the staff, including executive director and custodians, spends at least four hours a month helping visitors among exhibits or in programs. This personal contact raises sensitivity and awareness and provides a continual feedback loop in both directions.

Through their activity, staff members create an inclusive institutional culture, an interpersonal working environment that shares qualities with the learning environment they try to create with visitors. They incorporate their diverse backgrounds into collective efforts at understanding learning. They experiment with exhibits and programs and with how they converse with visitors.

Unlike the transmission of established past practices and knowledge, which creates hierarchies between knowers and learners, experimentalism is inclusive because it makes peers of everyone. Outcomes are not predetermined, and everyone can contribute to them.

Recently, exhibit developers began a book group to discuss what John Dewey’s *Experience and Education* might contribute to our next step. This led to the entire staff, from the controller to the marketing manager, reading and discussing the book. At all-staff meetings we sing and spend some time discussing what is important to us, what are our values, and what is our reason for being.

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Paul Tatter is executive director of Explora, Albuquerque, New Mexico; for more details, visit www.explora.mus.nm.us/.
Haven't We Done That?

Measuring Staff Diversity in Science Centers

By Vivian Jenkins Nelsen

In his book *Diversity Metrics*, consultant Calvin Ball II suggests the following requirements for successful assessment:

- A perceived need for the information
- Organizational willingness to deal with positive and negative data
- Buy-in from the top and commitment from persons in the dominant culture
- Allocation of necessary resources
- Readiness to act on data, once gathered.

According to Ball, if measurement is done well and in a timely fashion, and if results are communicated broadly and acted on, the outcome will be a high-performance, high-trust environment. In such an organization, diversity is not a special project but the way business is done. All employees are considered for promotion. Conflicts are effectively resolved, resources outnumber problems, and the employee turnover rate is low.

**How to measure**

Both quantitative measures (capable of being expressed in numerical terms) and qualitative measures (relating to, or based on, the character of something, as opposed to its size or quantity) have their place. Each type has its strengths and weaknesses, and often both approaches can often be used to measure the same thing in different ways. (For ideas on which tool to use when, see “Matching the Tool to the Job,” page 9.)

Quantitative measures can help a science center to assess its affirmative action numbers (we employ so many Asians, so many African Americans, and so on), while qualitative measures can help institutional leaders to fully understand the character of those employees’ work experiences. For example, an organization that boasts a large number of persons of color in the workforce might congratulate itself on having achieved diversity, but if there is still subtle discrimination at play, quantitative measures alone won’t capture it. A real-life case that comes to mind is that of an African American science center employee who had multiple sclerosis; she found her experience as a person with an unpredictable disease more unpleasant than any occasional incidents sparked by race.

Quantitative measures are useful for gathering aggregate or summative data—for example, statistics showing compliance with the Equal Employment Opportunity/Affirmative Action (EEO/AA) (continued on page 9)
The ASTC Equity and Diversity Initiative:
2004 Implementation Status Summary

In October 2001, the ASTC Board of Directors approved a new plan developed by its appointed Equity and Diversity Committee. The plan, which formed the basis for the E&D initiative launched at the 2001 ASTC Annual Conference, was based on a two-part vision: (1) that ASTC would become a model of excellence in equity and diversity, and (2) that ASTC members would be recognized by their communities as truly inclusive institutions. The following summary addresses achievements to date (October 2004) in each of the plan’s five major areas of focus.

Leadership Support
Objective: Provide ASTC’s board and directors of member institutions with information, strategies, and tools to enable them to lead this initiative and monitor its progress.
• A two-day workshop on diversity was held for ASTC Board members in November 2001 in Richmond, Virginia.
• Conference sessions on diversity issues have been offered for CEOs each year since 2000.
• In 2002 ASTC produced a video on sustainable diversity, featuring Eric Jolly and including a discussion guide/planning manual.
• A “Call for Promising Practices in Equity and Diversity” has been developed (see page 21). Reviewed and edited submissions will be posted on the ASTC web site.

Assessment
Objective: Create a system for collecting baseline data and monitoring changes in the status of diversity in the science center field.
• The 2001 Workforce Survey, sent to 342 U.S. ASTC members in the United States, collected baseline data on race/ethnicity and gender of boards, volunteers, and staff (broken out by job categories); number of board members and full-time employees with disabilities; and accommodations for employees with disabilities. Based on the 121 members responding, ASTC was able to report the following:
  1. Among the total science center workforce, from unskilled laborers to executives/managers, the race/ethnicity breakdown reported in the Equal Employment Opportunity Commission (EEOC) categories was 74.4% White; 14.1% Black; 7.1% Hispanic; 2.6% Asian/Pacific Islander; 0.6% Native American/Alaska Native; and 1.2% Other.
  2. Among CEOs/executive directors, the breakdown was 95.5% White; 1.8% Black; 0.9% Hispanic; 0.9% Asian/Pacific Islander; 0.0% Native American/Alaska Native, and 0.9% Other.
  3. Among board members, the percentages were 85.3% White; 9.6% Black; 2.9% Hispanic; 1.5% Asian/Pacific Islander; 0.4% Native American/Alaska Native, and 0.4% Other.
Respondents were asked to rank equity and diversity priorities at their institutions. Of those completing this section, 53.6% picked “recruit/hire diverse staff” as their first or second choice, and 32.3% chose “increase board diversity.”

Communication
Objective: Develop vehicles to present the case for this initiative to multiple audiences to gain buy-in from ASTC members, to disseminate information, to publicize professional development resources, and to disseminate best practices of members.
• Copies of the Equity and Diversity Initiative case statement and plan were distributed during the 2001 Meet and Greet Breakfast and have been made available at subsequent conferences.
  • The January/February 2002 issue of ASTC Dimensions focused on the Equity and Diversity Initiative; articles described work already underway at several member institutions.

Professional Development
Objective: Create and use multiple vehicles to move science center employees from awareness of the need for diversity to knowledge and action.
• The number of ASTC Annual Conference sessions addressing equity and diversity issues increased from 3 in 1999 to 10 in 2004. Presenters who can deepen the cultural competency of conference participants are sought annually. Between 2000 and 2003, ASTC’s National Science Foundation–funded Accessible Practices project conducted 16 workshops for exhibit designers, visitor services staff, and facilities managers and created an online resource area (www.astc.org/resource/access/).
  • From 2000 to 2004, Promoting Dialogues on Diversity: The ASTC Conference Fellowship Program (see article, page 15) has enabled 77 museum professionals of color to participate in the discussions, panels, and activities at ASTC conferences.
  • Equity is a component of professional development workshops and technical assistance for Math Momentum in Science Centers, ASTC’s National Science Foundation–funded collaborative project with TERC. For several of the project’s 13 alpha science centers, addressing local equity issues has become part of the planning of a new math program or exhibit.
  • An Equity and Diversity Toolkit, containing annotated information on easily accessible resources supporting ASTC members’ efforts to build fully inclusive institutions, is being compiled for future posting in the Resource Center on ASTC’s web site. The core topics mirror the “Call for Promising Practices” categories.

Career Pipeline/Recruitment
Objective: Develop and implement short-term and long-term strategies to meet the field’s current and future workforce needs, as well as introduce cohorts of precollege youth to careers in science education and science centers.
• The Conference Fellowship Program has been designed to address a variety of issues, including the feelings of cultural and professional isolation that can make retention of professionals of color a challenge for science centers.
  • Today’s Youth/Tomorrow’s Educators, a corporate-funded program that builds on the infrastructure and institutional capacity of ASTC’s 10-year YouthALIVE! Initiative, was launched in July 2003 at six pilot sites: the Science Museum of Minnesota, St. Louis Science Center, New Jersey State Aquarium, Museum of Science (Boston), Chabot Space & Science Center, and Utah Museum of Natural History. The process of integrating academic expectations, college preparation awareness, and career development into youth programs has now begun at nine sites. ASTC will publish effective implementation strategies in a youth programs handbook.
  • Resources on recruitment and retention will be included in the online Equity and Diversity Toolkit described above.
requirements of U.S. labor laws. This type of research is done with computer “runs,” and information can be computed very quickly. But quantitative measures can meet with resistance when used to gather attitudes about diversity, and evidence indicates that there may be a “lie factor” when respondents are asked about their attitudes toward race. Another major issue in quantitative work is researcher bias: Are the researcher’s questions the right ones? Is there inherent bias in the way questions are asked?

Qualitative measures, such as interviews or focus groups, tend to be more “person friendly.” They have the added benefit of gathering a great deal of data while giving full voice to the person who is speaking. Oral cultures often find such conversational methods a good fit. In recent years, qualitative research has become more accepted as a valid way to gather information. Participants usually like the opportunity to give their views in focus groups and interviews. It is, however, more difficult to sort through this open-ended data.

Who should measure?

The individual or individuals charged with coordinating and implementing diversity research may vary from organization to organization. If possible, research should be done by outside, non-biased investigators so that fear is minimized, data is trustworthy, and issues of confidentiality are reduced. Whoever is in charge needs to be skilled in measurement, understand diversity, and have experience in nonprofits.

When an organization cannot afford outside help, there are ways to minimize bias and ensure trust and confidentiality. One approach is to invite a group of employees to brainstorm ideas for things to measure without judging the suggestions. A variation on this is the Nominal Group technique proposed by business consultant Edward Hubbard in his book Measuring Diversity Results.

Quantitative Measurement

- Demographic representation. What is the ethnic, racial, and cultural composition of your community?
- EEO/AA reports.** How does the composition of your institution’s workforce compare to your regional demographics?
- Pay equity. Are different groups getting equal pay for equal work?
- Promotions. Who gets promoted?
- Recruiting. What are the costs of finding diverse employees?
- Retention. Who stays? Who is leaving and why?
- Training costs. Are you getting the results you need?

Quantitative Measurement

- Focus groups and interviews
- Self-assessment
- Suggestion boxes
- Best practices and benchmarking
- Assessment of climate, morale, and culture
- Diversity goals
- Training
- Frequency of performance evaluations and severity of discipline
- Effectiveness of programs
- Reputation as a good diversity employer
- Customer satisfaction, from both internal and external feedback
- Team effectiveness
- Conflict management


** For details of EEO/AA laws, click on “Affirmative Action” at www.dol.gov/dol/topic/hiring.

In Hubbard’s approach, a small group of employees (no more than 12) meets to collect suggestions of things to measure. They choose one person to be a recorder and keep track of the process. Each idea is summed up in a word or short phrase and written down on a Post-It note, which is placed on a flip chart or wall.

The next step is to sort the notes into similar categories, clarifying the suggestions, and eliminating duplications. Finally, the group decides how many things they can reasonably measure and votes to arrange those suggestions in rank order.

When to measure

Certain metrics are best done on a regular schedule. “Climate,” for example—the extent to which all employees feel included and valued in the work environment—needs to be assessed annually, since a lot can happen to change organizational dynamics in a year. It can be very helpful to repeat certain surveys or focus groups on this issue. Individual performance reviews, including diversity measures, are best done at least twice a year. These are recommended practices, although timetables may vary in different organizations.

Once your science center commits to gathering and using information to improve its diversity work, you will find that not only are there improvements for all workers, both paid and volunteer, but your organization will also be perceived as an employer of choice for diverse communities in your area.

References


Vivian Jenkins Nelson is principal of the INTER-RACE Institute, a diversity consultancy based in St. Paul, Minnesota. A trustee of the Science Museum of Minnesota and long-time supporter of the science center field, she is currently working on an Equity and Diversity Toolkit to be posted later this year in the Resource Center on ASTC’s web site at www.astc.org. This article is adapted from her introduction to the Assessment area of the Toolkit.
Native Waters: Integrating Scientific and Cultural Ways of Knowing

By Bonnie Sachatello-Sawyer and Teresa Cohn

In our history, science and culture were inseparable.... Native culture, theology, and values are based on the land where we live and the natural systems that surround us. That includes the sciences. It is imperative to teach science and culture together.

—Jolene Catron, Laguna, Navajo, and a 2002 youth camp organizer

Based at Montana State University—Bozeman (MSU), Native Waters is a comprehensive, four-year, informal science education program that works closely with community education leaders from 28 Native American tribes in the Missouri River Basin to teach scientific and cultural perspectives about the watershed to youth and adults. Funding for the project has been provided by the National Science Foundation (NSF), the M.J. Murdock Charitable Trust, the Bush Foundation, and the Bureau of Reclamation.

The project team, which is divided equally between Native and non-Native informal educators, has attempted to bring together Native voices with new perspectives, and Western science with traditional ways, to address complex environmental issues. Since launching the project in 2000, the team has developed

• A 30-minute film, A Dream for Water, produced by the Piegan Institute and the Center for Indigenous Media at the University of Washington.

• Watershed tours serving more than 250 adults living in Missouri River Basin tribal communities.

• Three Visions for Sustainable Tribal Communities conferences at MSU, attended by 1,000 adults and youth.

Gathering students to learn in an outdoor setting is a conscious and important part of the Native Waters Young Leaders Camps.

• Young Leaders Camps on seven reservations, serving more than 800 tribal youth.

• Two copies of a portable, 500-square-foot exhibition, Native Waters: Sharing the Source, built by the Science Museum of Minnesota. Currently touring Missouri River Basin reservations and nearby communities, the exhibition has reached more than 120,000 children and adults to date.

Throughout the project, the MSU-based staff has built strong ties with adult and youth leaders in tribal communities. Have we been successful with all components? The jury is still out. But for the summer camps and the exhibition, both of which were evaluated by researchers from Randi Korn & Associates, in Alexandria, Virginia, we can offer some lessons learned and some promising practices for the future.

The youth leadership camps

Native Waters collaborates with Missouri River Basin tribal members to plan and implement seven summer youth camps. Held on different reservations, the weeklong sessions are designed to provide leadership training for American Indian students in grades 9–12, increasing their knowledge of water and tribal water issues, linking them with further training opportunities, and sharing higher education options through bridging programs.

Those eligible to apply are young people living on or near tribal communities in the Missouri River Basin. A local committee typically selects about 20 students for each camp.

There is no one set program for all camps. Interested tribal members meet with Native Waters staff over a period of six to nine months to plan and or-
ganize events. Content is determined collectively by the planning committees; Native Waters’ role is to help identify the work that needs to be done to implement the camps and to develop a schedule and a series of planning agendas. During the camp sessions, project staff serve as facilitators and resource providers but not as coordinators and instructors.

Gathering students to learn in an outdoor setting is a conscious and important part of the program, serving to underscore the cultural and scientific interrelationships of water, land, plants, humans, animals, earth, and sky. A typical day at camp begins with a prayer offered by a tribal member. After breakfast come loosely structured games; science presentations on basic topics, such as the storage and management of water, riparian dynamics, and water quality and quantity; and cultural activities that include storytelling with elders, music, art, ceremonies, and the sharing of beliefs and values. In the afternoons, tribal water resource specialists often lead workshops on local water challenges.

In the three years that the program has been offered, more than 800 youths from the Blackfeet, Northern Arapaho, Eastern Shoshone, Mandan, Hidatsa, Arikara, Northern Cheyenne, Crow, Chippewa, Cree, Gros Ventre, and Assiniboine tribes have participated. Many campers say they enjoy learning about the way water affects their reservation. They report feeling that their opinions count, that everyone can talk and share. They say the camp helps them feel connected to their community.

“A lot of people don’t really know about water on our reservation, so it was good to let the kids know so they can share it with other people,” one participant commented in the evaluation interviews. “I’m really interested in water now,” said another. “When there are meetings about water on the reservation, I go and listen. I read articles about water that people put in the newspapers or magazines or on the Internet.”

The traveling exhibition

The exhibit development process for Native Waters: Sharing the Source began in 2000 with a series of more than 100 interviews. The Native and non-Native design team talked with tribal elders, resource specialists, educators, and cultural specialists to find out what tribal community members believed their young people needed to know about water. The responses included cultural beliefs and practices, water science, language preservation, water law, water rights, water quality, sources of contamination, environmental justice issues, and water history.

The exhibition that emerged from this collaborative process centers on a recreated Great Spring. Fourteen panels of quotes from tribal members and elders about the scientific and cultural aspects of water encircle four interactive water-science exhibits, a small film theater, and an audio unit that plays messages about water by youth and adults. Text, audio, and film combine to communicate respect for water and the positive, empowering changes that water stewardship brings.

The two copies of the exhibition are traveling among the tribal communities of the Missouri River Basin through August 2005. The exhibitions are set up in schools, tribal colleges, and community centers. Native and non-Native project staff travel with them and teach watershed science and education programs on-site.

In the summative evaluation, nearly two-thirds of visitors interviewed said that the hands-on exhibits, activities, and supplemental games were the most successful aspect of the exhibition, especially for children: “The kids really seemed to enjoy it. They did a really good job not only of cycling quite a few kids through the exhibit, but also of providing some supplemental sort of water-related activities.”

One-quarter of respondents said the greatest success was that the exhibition brought the community out to a central location: “We had a really, really good turnout because we had so many people involved with the camps. And then the video that they did is local, and I think that gives a sense of pride to our community.”

Several interviewees said the Native American focus gave the exhibition cultural relevance. “I don’t really mean to be biased ... but [the most successful part was] the spiritual part of what water is, and water is the giver of life. And if we didn’t have water, there wouldn’t be much life.” When asked to name the exhibition’s least successful aspect, most respondents had no comment. A few said they wished the exhibition could have stayed in their community for a longer period.
**RESOURCES FOR INCLUSION: AN INTERNATIONAL SAMPLER**

**Books and Articles**

**Related Organizations**
- **AAM Committee for Diversity in Museums**
  www.aam-us.org/initiatives/diversity/
  Useful tools on the web site of this newest AAM Standing Professional Committee include a fact sheet on developing a diversity plan and links to web-based resources including policies, programs, reports, and bibliographies.
- **Centres for Social Change: Museums, Galleries, and Archives for All**
  www.culture.gov.uk
  Click on “museums & galleries,” then “publications,” to access this 2000 policy document from the U.K.’s Department for Culture, Media and Sport, which requires publicly funded museums, galleries, and archives to “identify the people who are socially excluded and their distribution, engage them, and establish their needs.”
- **Continuous Cultures, Ongoing Responsibilities (CCOR)**
  www.museumsaustralia.org.au
  Adopted by Museums Australia in 2003, CCOR is an update of a 1993 policy document that outlines policies not only for the care of culturally sensitive objects, but also for the inclusion of Indigenous representatives at all levels of museum work.
- **Delivering Inclusion in Science Communication (DISC)**
  www.the-ba.net/scicomm
  This joint project of the BA (British Association) and the African-Caribbean Network for Science & Technology is aimed at helping ethnic minority groups and the U.K. science communication community work together to achieve greater participation in science. Web site will include promising practices and a database of related organizations.
- **Society for Human Resource Management (SHRM)**
  www.shrm.org/diversity
  SHRM is an international organization based in Alexandria, Virginia. Among the resources in this section of its web site is a “Workplace Diversity Toolkit” with advice on making the business case for diversity, launching an initiative, selecting a consultant, measuring results, and more.
- **U.S. Census 2000**
  Enter a state name under “Data Highlights” and hit “Go” to access demographic information for U.S. cities and regions.

* Cited by Bonnie Sachatello-Sawyer and Teresa Cohn

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**Conclusion**

Our world needs resource managers who are aware of global scientific concerns, sensitive to local concerns, and engaged physically, spiritually and emotionally with their physical and social surroundings. It is our responsibility to create educational systems that do not fail our youth, systems in which our youth do not fail.

As plant ecologist and Potowatomi tribal member Robin Kimmerer writes in a recent issue of *Bioscience,* “A number of very capable students tell the story of abandoning their science education, and a potential place in the scientific community, because of the perception that science prohibits the expression of personal connection to nature. At a time when our ecosystems are threatened by imbalance between humans and nature, we cannot afford to discourage such students from membership in the scientific community.”

In *Native Waters,* we have learned that working to create meaningful informal education experiences across cultures demands an approach based on mutual respect and trust, one that validates and honors cultural and inherited knowledge in the same manner as scientific knowledge, and that supports the social norms and individual needs of community members.

Successful cooperative youth education programs in tribal communities require a substantial investment in time and relationship-building. In effective programs, local needs are addressed and elders teach side-by-side with other educators. Participants are aware of cultural, educational, and professional backgrounds and biases. Through learning to respect each other’s disciplines, worldviews, and differences, students can find the benefits of what Native educator Gregory Cajete calls “healing the split” (*pingeh beh* in the Tewa language) between modern and traditional ways of knowing about the world.

Bonnie Sachatello-Sawyer is director and Teresa Cohn is assistant director of the *Native Waters* project at Montana State University–Bozeman; www.nativewaters.org.
As important as it is to develop a comprehensive plan for institutional equity and diversity, sometimes it’s useful to have something more modest you can do to kick-start the process. Here are some approaches, ranging from easy and immediate to more challenging and long-term, that colleagues are using successfully to put a personal face on inclusion.

Expand beyond ‘José’ and ‘Maria’
To make our education materials more inclusive of our community, staff at the Lawrence Hall of Science use the telephone book as a source of representative names. For example, “Nguyen” (pronounced “win”) is a first or last name found frequently in the Bay Area’s Vietnamese community, while “Fatima,” a female first name, can represent a girl from a Central American, Asian, or Middle Eastern background. For oral presentations, the common English surname “Shaw” sounds very similar to the Indian name “Shah.”—Elizabeth K. Stage, Director, Lawrence Hall of Science, Berkeley, California

Tap an underutilized source
Diversity is a hallmark of the paid Explainer program at the New York Hall of Science (see ASTC Dimensions, September/October 2003), which recruits bright, hard-working, dedicated students—not necessarily those who have high grades in science or experience with public speaking. Recently, the program has been attracting more applicants with disabilities, and we find that we can accommodate this group with little alteration in our training.

One Explainer who uses a wheelchair receives and participates in full Explainer training. To ensure her safety, she carries a walkie-talkie in the galleries, but otherwise she has been able to conduct most demonstrations. She has also served as an advisor on physical access issues.

Students with learning disabilities are offered flexibility in the order and rate at which they are expected to master tasks and given the opportunity to start in just one or two areas. This makes the process of learning to interpret the Hall’s many exhibits less stressful. Staff and peers also provide support in finding alternative ways to learn the science here.

Students who are deaf are paired during training with staff members who know sign language, but eventually they graduate to conducting signed demonstrations on their own. We have no way of knowing how many of our visitors have limited or no hearing, but enough people have gravitated to these presentations to warrant increased marketing of our programs to the hearing-impaired community.—Preeti Gupta, Director of Education, New York Hall of Science, Queens

Draw on community expertise
At the New Detroit Science Center, our Pi Society Science Docent Program brings together young children who visit the exhibit floors with volunteer experts from the science, engineering, and technology fields.

Of the program’s 92 certified docents, some come from local corporations, such as DuPont; others hold appointments at institutions of higher learning, such as Wayne State University; and still others have their own professional practices. At the science center, they currently serve in galleries devoted to matter and energy, waves and vibrations, motion, life science, and traveling exhibitions.

Not only does the Pi Society boast a broad range of expertise—from physicists, engineers, and computer scientists to biologists, medical doctors, and educators—but it is also highly diverse. Membership is 44% female and 56% male. Ages range from 21 to 71. The ethnic/racial breakdown is 51% Caucasian, 24% African American, 15% Middle Eastern, 5% Asian, and 5% Other.

Participation in the program has become a popular way for Detroit’s professional community to leverage its knowledge, share its passion for science, and inspire tomorrow’s science and engineering leaders.—Michelle Sposito, Manager, Pi Society Docents, The New Detroit Science Center, Detroit, Michigan
Partner with a resource agency
Many ASTC members are in need of teacher aides for growing summer camp programs but can’t afford to pay for the help. At the Reuben H. Fleet Science Center, the solution came through an ongoing partnership with San Diego’s Indian Human Resource Center (IHRC).

IHRC exists to offer support to Indian families in a part of California where the metropolitan area population is 1 percent Native American, and several large reservations are located nearby. The agency encourages permanent solutions for self-sufficiency, and providing meaningful work for high school students is a primary goal.

Our agreement with IHRC is that the agency will pay four to five Native American students each summer to work in the Fleet’s camps. Our staff interview, hire, and train the teenagers, who learn customer service skills and basic clerical duties in addition to helping museum educators ensure smooth running of the camps. Many of the teens leave with an impressive resume and a list of good references, and a few have been hired as permanent workers at the Fleet.—Lynne Kennedy, Deputy Executive Director, Education and Exhibits, Reuben H. Fleet Science Center, San Diego, California

Provide cross-cultural training
Questacon, Australia’s National Science and Technology Centre, has developed a successful outreach program that serves Australia’s remote Indigenous communities.

A key component in preparing outreach staff is structured, cross-cultural training. This training is developed and delivered by representatives of Indigenous communities who are themselves experienced in training non-Indigenous educators. We identify potential trainers through a network of museum educators and through teachers and liaisons in the regions, looking for suitable people who are willing to spend time discussing with us—at Questacon or at outside locations—the cultural protocols of particular communities.

Sessions usually cover the notion of “culture” in general (how we identify what our own culture is, plus interactions between cultures), as well as the diversity of Australian Indigenous cultures, insights into the social structure of some cultures, and a somewhat confronting look at the changes that have occurred in Indigenous cultures since European contact began.

Participants report that the training—together with their experience in the communities—contributes to significant change in their perception of other cultures in general and of Indigenous cultures in particular.—Allen Rooney, Manager, Indigenous Outreach Programs, Questacon, Canberra, ACT, Australia

Build a representative team
At Sci-Port Discovery Center, one way we address critical community education needs is through our board of directors. In our annual nominating process, we identify which of several major areas each member best represents, and then recruit candidates who round out the strengths we need for broad community involvement. In addition to gender and ethnicity, we look for success in fund-raising; leadership abilities; general community contacts; effective reach and experience in ethnic, church, government, or donor relations; membership in the science or education communities; business/finance acumen; experience in inspiring youth; and public advocacy of Sci-Port’s mission and programs.

In choosing staff, we follow a similar process. Monthly personnel reports help us see how closely our staff profile compares to the demographics of our region. We use a network of community contacts to circulate job openings and to recruit diverse candidates for jobs ranging from interacting with the public to making decisions about the direction of the organization. Our common purpose is a high-quality, high-impact visitor experience.—Andre Peek, President and CEO, Sci-Port Discovery Center, Shreveport, Louisiana.

Develop tomorrow’s staff today
A community-oriented program at the Carnegie Science Center, Science in Your Neighborhood (SIYN), recruits high school students from underserved communities to serve as science presenters and mentors for elementary age audiences. The program not only serves these students as a gateway into the workforce, but also helps to enrich the diversity of the science center staff.

Students who have successfully completed SIYN have gone on to join CSC’s volunteer program and/or become members of part-time staff in other areas. A few exceptional SIYN graduates have come back from college to work full-time for the youth program.—John Radzilowicz, Director of Visitor Experience, Carnegie Science Center, Pittsburgh, Pennsylvania
Diversity Dialogues:

Lessons of the ASTC Conference Fellowship Program

By DeAnna Banks Beane

Any discussion of Promoting Dialogues in Diversity: The ASTC Conference Fellowship Program must begin with YouthAlive! (YA!). Youth Achievement through Learning, Involvement, Volunteering, and Employment—to give it its full name—was the 1990s initiative established by ASTC and the Wallace-Reader’s Digest Fund to provide support and professional development for U.S. science centers committed to engaging adolescents from underserved communities.

During the years (1991–1999) when YA! was actively funding a national network of youth programs, staff from participating museums were required to meet twice a year. The majority of attendees at these meetings were Caucasian, but a significant number, like the populations YA! served, were African American, Latino, Native American, or members of other groups that are typically underrepresented in museums.

Early on, several soul-searching discussions led network members to conclude that cultural diversity issues were central to the work they were doing as a community of learners determined to embrace new colleagues and new youth audiences. Subsequent discussions, trainings, training materials, and approaches to diversity work developed for YA! formed the groundwork for the Conference Fellows program, which has maintained the network’s commitment to honest and productive dialogue that strives to avoid blaming, shaming, and attacking one another.

As the YA! grant period concluded, ASTC approached the Wallace-Reader’s Digest Fund with a final request. Could the remaining initiative funds be used to provide fellowships for museum professionals of color to attend the ASTC Annual Conference? Permission was granted, with the understanding that one of the outcomes would be “increased support for building museum environments that welcome and nurture underserved adolescents and their communities.”

Thus was born the ASTC Conference Fellowship program, which convened its first cohort in October 2000. Although the program is no longer funded by Wallace-Reader’s Digest, the criterion of advocacy for youth and communities still applies. In science centers, just the presence of the friendly African American educator or the welcoming Hispanic visitor services manager says to children, “Here’s someone like you.” And it also says, “You could work here, too,” a message vital to the overall Career Pipeline component of ASTC’s Equity and Diversity Initiative.

The fellowship experience

The 67 ASTC Conference Fellows from 38 North American institutions who have participated over the past five years are themselves a diverse group, demographically and in their

ON BEING A FELLOW: Mark Thorne

In 1985, as a junior in high school, I volunteered with a friend for two days at the Capital Children’s Museum. A few months later, when I signed up for a local youth employment program, I requested the museum as my work site. I have been there ever since.

Despite my years of service, it was not until I became an ASTC Conference Fellow in 2001 that I decided it was possible for me to have a career in the museum field. Before that, I had worked at the museum purely because of my love for children and its mission.

Being a Fellow gave me new confidence right away in the skills and talents I bring to my job. I am fortunate that the administration at my museum is committed to encouraging diversity among staff and visitors. Shortly after I returned from the conference in Phoenix, I was promoted from manager of guest services to director of the department. In this role, I supervised a staff of 10 and oversaw an increase in earned revenue. I also began mentoring other minority employees at the museum.

Recently, I received another promotion, to director of outreach. Because the museum, now the National Children’s Museum, is closed pending relocation, I will be managing all public programs through outreach until we reopen in 2008.

The support I received as a Conference Fellow was tremendous, and the network of alumni is an ongoing resource. Keeping in touch with other Fellows has increased my comfort level at the ASTC conference and led to more contacts in the field. Last year I was a panelist in the conference session “Reflections on the Journey: Leadership Skills for Discussions on Diversity.” My next move is to pursue a master’s degree or Ph.D. in an area that will assist me in reaching my career goal: an executive position in a science center, children’s museum, or museum association.

2001 ASTC Conference Fellow Mark Thorne is director of outreach at the National Children’s Museum, Washington, D.C.
job responsibilities (see Tables 1 and 2). Some have been relative newcomers to the field; others have had years of experience. In addition to an interest in youth, criteria for eligibility include identity as a person of color in a “mid-level management” position, a willingness to assist the science center in creating a more inclusive environment, and commitment to professional growth in this field. Applications are sent to North American museum directors in mid-spring, and the selection is made by panel review in June.

The work of being a Fellow begins well before participants convene at the ASTC Conference and continues as long as each individual chooses. Some come to conference once, get what they need, and go off to pursue their goals independently. Others stay in touch with each other and with ASTC staff throughout the year. Of the 67, 18 have returned as Alumni Fellows to support their colleagues, continue their own professional growth, and serve as session presenters.

Advance assignments are demanding and multifaceted. For 2004, Fellows were asked to complete a survey on their challenges as managers; read selected articles; reflect on the possible impact of racism or other barriers on their personal/professional lives and their institutions; interview their supervisors to learn what they expected their Fellow to get from the experience; identify their short- and long-term goals; and consider how the vision of the ASTC Equity and Diversity Initiative (see page 8) applies to their vision for their science center.

Once on-site, Fellows participate in a postconference debriefing and planning workshop, they analyze the best sessions they attended, identify topics they feel were not sufficiently covered, and netw orking during orientation and “get acquainted” activities that facilitate sharing of problems and solutions. Experienced senior administrators, usually volunteers from ASTC’s Equity and Diversity Committee, lead sessions designed to address the Fellows’ professional needs. For 2004, “faculty” for these on-site activities—which we are now calling the Conference Fellows Academy—included Witte Museum CEO Mimi Quintanilla; NSF/ISE program director Julie Johnson; and Science Museum of Minnesota president Eric Jolly.

Fellows also attend plenary events, keynote addresses, and concurrent sessions that relate to their job duties, challenges facing their institutions, or equity and diversity issues. As a program fund-raiser, they host a dance party for conference attendees. And in a postconference debriefing and planning workshop, they analyze the best sessions they attended, identify topics they feel were not sufficiently covered, and next steps to ensure ongoing support.

### Table 1: Demographics of ASTC Conference Fellows 2000–2004*

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<th>Year</th>
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<th>Hispanic/ Latino</th>
<th>Asian American</th>
<th>Native American</th>
<th>Iranian/ Asian</th>
<th>Haitian</th>
<th>Hawaiian American</th>
<th>Mexican</th>
<th>Other</th>
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Notes:
* Data represent first-time recipients, not Fellowship alumni.
** The 2004 totals include, for the first time, three Fellows sponsored by their own science centers, not through Fellowship funds.

### ON BEING A FELLOW: Valerie Rodriguez Oguss

As a first-time ASTC Conference Fellow last year, I set personal and professional goals that included being more vocal with my opinions and gaining more experience in grant writing and budgeting. I have had the opportunity to pursue these goals in the past year through presenting a parent workshop at a nursery school conference and assisting our development department in writing several grants.

When I returned from the conference in St. Paul, my supervisor and mentor of more than five years said I was “a new woman.” He began to include me in senior-level meetings and to seek my opinion on matters pertaining to the museum’s December 2004 reopening. I was recently put in charge of managing Kidspace’s on-site programs.

Being a Fellow has given me a better sense of what it is to be a spokesperson for my institution, as well as a role model for the Latino children of our community and a resource for the parents and teachers we serve. The most important lesson I learned as a Fellow is that I am a museum professional who happens to be a person of color, not a person of color who happens to be a museum professional.

As a 2004 Conference Alumni Fellow, I co-led a session entitled “Perspectives of Latino/Hispanic Communities and Science Centers,” which explored strategies for engaging Latino/Hispanic communities. I was encouraged to see that our audience was ethnically diverse and included museum professionals from upper and middle management. Not having to preach to the choir was a welcome change!

My long-term goal is to help my institution establish a task force or formal committee that will address equity and diversity issues at Kidspace Children’s Museum and develop a plan of action. With the support of our executive director, my supervisor and I have already begun to establish relationships with key stakeholders in the diverse communities we serve.

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2003 ASTC Conference Fellow Valerie Rodriguez Oguss is education programs manager at Kidspace Children’s Museum, Pasadena, California.
and begin working as teams on proposals for the next conference.  
During the Academy, the Fellows are continually urged to excel in their current jobs, contribute to their science centers’ growth, and be prepared when opportunities for promotion arise. One session is devoted to writing a five-year career plan. Though they will not go home from this one experience and transform their institutions, they can go back feeling secure about who they are. They can find their voices and engage colleagues in what Eric Jolly has called “positive education.” They have the tools to promote dialogues on diversity.

The director’s viewpoint

Every application for an ASTC Conference Fellowship requires a personal commitment from a museum director. That the CEOs of more than 50 North American institutions have signed on to support their applicants’ professional growth speaks volumes. This year three directors reached into their own budgets to ensure a valued staff member’s attendance—a trend ASTC hopes will continue.

Bill Booth, president of Ohio’s COSI Toledo and an ASTC board member, sent his third Fellow to the conference this year. “[The first two] both had tremendously positive experiences,” he says. “The program allowed them to see that everyone faces challenges and that they have a peer network to support them as they overcome these hurdles and help shape their organization’s philosophy and actions.” Since their ASTC experience, Booth says, both have taken on more responsibility, coaching other COSI Team members, organizing museum-wide projects, and starting new community collaborations. “I value that tremendously,” he says.

Another ASTC board member, CEO Andrée Peek of Louisiana’s Sci-Port Discovery Center, also sent a third Fellow to San Jose. She, too, sees the program as a crucial development tool. “Our first Fellow, the director of exhibit galleries, returned energized and enthusiastic about increasing the presence of African American scientists and interests in our programs and exhibits,” says Peek. “More important, she returned with the confidence to lead us in making it happen.”

Sci-Port’s second Fellow, the membership manager, came back with more ways to grow the science center’s resources and garner support from all segments of our community, Peek says. “He has not only secured many four-figure gifts and kept our membership retention rate high; he has also become a role model and advisor to all of us on

| Table 2: Job Areas of ASTC Conference Fellows 2000–2004* |

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<tr>
<th></th>
<th>Museum Education</th>
<th>Visitor Services</th>
<th>Outreach/Community Svc</th>
<th>Youth Programs</th>
<th>Exhibits</th>
<th>Marketing/PR/HR/Admin./Volunteer Svcs.</th>
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Notes:
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ON BEING A FELLOW: Elgin Cleckley

Why did I want to be a Fellow? The answer is similar to the reason why I, a U.S. citizen, choose to live in Toronto. This is one of the most multicultural, multilingual cities in the world, and appreciation of the “mosaic society” that surrounds us forms an integral part in everything we do at the Ontario Science Centre.

The science center’s commitment to diversification often entails getting advice or opinions from all levels of staff, as well as testing concepts with visitors. As an American, with my own point of view on race and culture, I find it compelling to consider how identity and the concepts of science are presented in Canada. I enjoy studying social dynamics, seeing how different cultures “produce.” Being a Fellow has allowed me to continue the discussion with colleagues who have similar positions and issues.

Another goal was to broaden my horizons within the science center field. Having come to the field three years ago from a career in architecture firms, I wanted to explore the opportunities and challenges that may arise in the ASTC community. The fellowship has given me a sounding board I can contact when needed.

Noticing and analyzing larger patterns of thought has led me to see similarities between the fellowship program and Ontario’s Agents of Change project. The mandate of our project is direct: “To spark creativity, inspiration, innovation and change, by joining participants and partners with the science center to create unexpected, unbelievably cool experiences, relationships, networks, environments and enterprises, so that people generate new ways of seeing and thinking about themselves and the world.”

Replace “the science center” with “the ASTC conference,” and you have an engine that can influence the way science-technology centers are run. I strongly believe that every ASTC conference has the power to create the “mosaic” society, with all of the pieces making a whole and with Fellows acting as agents of change within the science center community.

2002 ASTC Conference Fellow Elgin Cleckley is design coordinator for the Agents of Change project at the Ontario Science Centre, Toronto, Ontario, Canada.
how to make new contacts and achieve growth with our current ones.” She has equally high hopes for her visitor services manager, a 2004 Fellow.

The bigger picture

As rewarding and energizing as it is, the Conference Fellows program occupies only one week out of a Fellow’s professional life. Equally important is his or her continuing commitment to active participation in the field—as a session presenter, mentor to new Fellows, and member of the ASTC Conference Fellows Network.

Likewise, Equity and Diversity Committee members, ASTC staff, and the many supporters of the program continue to seek ways to challenge Fellows, respond to their needs, and utilize their talents. This intention is reflected in the adoption of the “Academy” concept during this year’s conference.

The high visibility and apparent successes of the Conference Fellows are a source of pride, but they also present a danger—the danger of tokenism. Tokenism is the tendency to rely on one special individual, group, or program to address an important systemic issue, thereby absolving members of the larger body from the systemic policies and actions needed for sustainable change.

While ASTC, largely because of the Fellows, is recognized by some as a leader in the effort to create more inclusive informal science and cultural institutions, we must remember that this program is a relatively small part of the field’s diversity work. As one component in ASTC’s Equity and Diversity Plan, the evolving Conference Fellowship Program must be supported by other effective practices. To be successful in our quest for full inclusion, we all have much more work to do.

DeAnna Banks Beane, former project director for YouthAlive!, currently directs ASTC’s Partnerships for Learning. With Jacquelyn Lowery, assistant director of Partnerships for Learning, she coordinates the ASTC Conference Fellowship Program.

Silicon, Science, and Sunshine

By Carolyn Sutterfield

Do you know the way to San Jose? asks the old song. Luckily, we did. With hurricane Ivan bearing down on the U.S. Gulf Coast and the entire eastern seaboard on alert, ASTC staff were only too happy to evacuate to sunny central California and join our colleagues at the 2004 ASTC Annual Conference, hosted ably by The Tech Museum of Innovation.

This year’s September 18–21 gathering set a five-year attendance record, attracting more than 1,800 registrants from 29 countries. In over 140 workshops and sessions—not to mention The Tech’s “Scintillating San Jose!” party and Monday Open House, the Conference Fellowship Dance Party, and a number of excellent off-site tours—hosts, presenters, and conference attendees congregated, debated, collaborated, and gyrated to their hearts’ content.

Program highlights

The 2004 keynote speakers brought new perspectives from their fields. On Saturday, Apple Computer co-founder and Silicon Valley icon Steve Wozniak addressed the conference theme, “Sustaining Innovation in an Era of Rapid Change.” In a welcoming chat with longtime friend and local journalist Michael Malone, “The Woz” shared stories of growing up in the Santa Clara Valley’s community of electronics engineers and the evolution of his own inventive spirit. Speaking of the importance of informal science institutions, Wozniak said, “Field trips in elementary school are things you remember for life. We want our kids to grow up innovative, but they can’t explore in school. They need to think about what’s possible.”

On Sunday, actor, playwright, and director Luis Valdez, son of a farm-worker and founder, during the 1969 Delano Grape Strike, of the Chicano theatrical troupe El Teatro Campesino,
Calendar

NOVEMBER


DECEMBER


THROUGHOUT 2005


FEBRUARY 2005

3  Math Momentum Workshop: “Data and Measurement.” Hosted by the New England Aquarium, Boston. Details: Rebekah Stendahl, rstendahl@neaq.org

17–20  ASTC RAP Session.* “Successful Science Shows.” Hosted by Technopolis, Mechelen, Belgium. World, Milwaukee, Wisconsin

20–26  National Engineers Week (U.S.), Cochaired by ASME and BP p.l.c. Details: www.eeweek.org

26–Mar. 6  National Engineering Week (Canada) Details: www.new-sng.com

APRIL

10–15  Science Centre World Congress 2005. Hosted by the Fundação Oswaldo Cruz and the Museu da Vida, Rio de Janeiro, Brazil. Details: www.museudavida.fiocruz.br.4swc/

MAY


JUNE

8  Math Momentum Workshop: Topic TBA. Hosted by the St. Louis Science Center, St. Louis, Missouri. Details: Gloria White, gwhite@slsc.org

10–12  ECSITE Annual Conference. Hosted by Heureka, the Finnish Science Centre, Vantaa, Finland. Details: http://ecsite.ballou.be/new

OCTOBER


* Details of ASTC RAP sessions are available at www.astc.org/profdev/. For updated events listings, click on “Calendar” at www.astc.org.
Ostrenko, MOSI. The new Member-at-Large is Andrée Peek, Sci-Port Discovery Center. She replaces Bill Booth, who was reelected as a general director. New board members include Chew Tuan Chiong, Singapore Science Centre; Eric Jolly, Science Museum of Minnesota; and Bryce Seidl, Pacific Science Center.

Completing their terms as directors were Doug King, St. Louis Science Center; Sheila Grinell, Arizona Science Center; and Colin Johnson, Techniquest. (For a full list of directors and committee chairs, visit www.astc.org/about/governance.htm.) ASTC is grateful for the leadership and generous service of all board members, past and present.

Our first McGrath Fellow
Friends of the late ASTC executive director and 1995 ASTC Fellow Lee Kimche McGrath were delighted to welcome the first recipient of the Lee Kimche McGrath Worldwide Fellowship to this year’s conference.

May M. Pagsinohin is deputy director of the Philippine Foundation for Science and Technology, parent organization of the Philippine Science Centrum museum in Manila. In addition to assisting her director, Leticia Moran-Zerda, in planning, implementing, and evaluating programs and activities at the museum, Ms. Pagsinohin has primary responsibility for overseeing Traveling Science Centrum, a mobile, interactive-learning component that promotes hands-on science in different regions of the country. Since its inception, the outreach program has served close to 2 million visitors.

The endowment for the ASTC McGrath Worldwide Fellowship was established by Lee McGrath with a $25,000 donation shortly before her death in 2002. Her hope was to “increase international members’ participation in ASTC activities.” Since then, ASTC has matched the original contribution, and a number of science center directors have pledged or contributed additional funds. The income from the endowment is used to cover registration and a travel stipend for an individual from an ASTC-member institution outside the United States to attend the ASTC Annual Conference.

Those wishing to make a donation in support of future ASTC McGrath Fellows can contact executive director Bonnie VanDorn, bvandorn@astc.org.

‘Dialogues’ draws 23
Ten new and 13 alumni ASTC Conference Fellows were on hand for the fifth year of “Promoting Dialogues on Diversity: the Conference Fellowship Program.” Not only does this program bring new voices and perspectives to conference discussions; it also directly addresses the attrition issues faced by ASTC members that are committed to achieving and sustaining a culturally diverse professional staff. Beginning with the 2005 conference, the program will be known as the ASTC Conference Fellows Academy. For more information, see “Diversity Dialogues: Lessons of the Conference Fellowship Program,” page 15.

The ASTC Conference Fellows for 2004 included
- Manca Denise Carter, Science Education Curator, Louisiana Art and Science Museum, Baton Rouge
- Lesley Cornathan, Group Marketing and Promotions Supervisor, COSI Toledo, Toledo, Ohio
- Jennifer Corea, Explainer Supervisor, New York Hall of Science, Queens
- Siinya Dulaney, Community Science Coordinator, St. Louis Science Center, St. Louis, Missouri
- Damon Gibbs, Senior C.A.U.S.E. Program Mentor, New Jersey Academy for Aquatic Sciences, Camden, New Jersey
- Renee Pecot, Store Manager, Whitaker Center for Science and the Arts, Harrisburg, Pennsylvania
- Marion Smith, Visitor Services Manager, Sci-Port Discovery Center, Shreveport, Louisiana
- Walter Stoddard, Researcher/Programmer, Engineering and Technology, Ontario Science Centre, Toronto, Ontario, Canada
- Galyne Walter, YouthWorks Program Director, Lied Discovery Children’s Museum, Las Vegas, Nevada
- Madeleine Zeigler, Grants and Education Development Specialist, New Mexico Museum of Natural History and Science, Albuquerque, New Mexico.

Also participating in San Jose were Alumni Fellows Betsy Beredo (COSI Toledo), Elgin Cleckley (Ontario Science Centre), Cheronda Frazier (New Jersey Academy for Aquatic Sciences), Juliet Gray-Moliere (Brooklyn Children’s Museum), Regina Hall (Cincinnati Museum Center), Monika McCoy (Buffalo Museum of Science), Lynell Moore (New Detroit Science Center), Valerie Oguss (Kidspace Children’s Museum), Charles Silva (Apple Computer, formerly of New York Hall of Science), Marcos Stafne (New York Hall of Science), Joanne Tashiro (The Exploratorium), Mark Thorne (Capital
On display
The two-day ASTC Exhibit Hall seemed particularly bountiful, with 180 booths representing 147 companies and organizations. Once again, conference attendees enjoyed an extended opportunity to meet with vendors and network with friends during the Sunday evening Dinner Buffet.

New this year in the ASTC Resource Area was a guest appearance program featuring moderators of upcoming workshops on ASTC Connect, the association’s professional development web site (www.astc.org/connect), and authors/editors of new books available through ASTC Publications.

Participants included
- Elisa Israel, moderator of “Making Sense of Visitor Comments: How to Code Open-Ended Data.”
- Mary Dussault, moderator of “Understanding Visitors’ Ideas: Cosmic Conversations.”
- Kathy McLean, moderator of “Creating Exhibition Case Studies” and co-editor of Are We There Yet? Conversations about Best Practices in Science Exhibition Development.
- Andrea Bandelli, moderator of “Critiquing Your Web Site.”
- Paul Orselli, editor of Cheapbook 3, the latest ASTC “Compendium of Inexpensive Exhibit Ideas.”
- Sue Allen, author of Finding Significance, the report of a multi-year Exploratorium research project.
- Sheila Grinell, author/editor of A Place for Learning Science: Starting a Science Center and Keeping It Running.

Our thanks to these talented folks, and to Cheapbook contributors Harry White, William Katzman, and Claire Pillsbury, who joined Paul in a lively demonstration of favorite affordable exhibits.

ASTC Exhibition Services and Publications were joined in the Resource Area by TryScience director Eric Marshall, who showed off the latest additions to the internationally acclaimed science center web site, a project of ASTC, IBM (sponsor also of this year’s popular Internet Café), and the New York Hall of Science. Also present was Judy Draucker of the Richmond Convention and Visitors Bureau, who cheerfully alerted passersby to the pleasures awaiting them when ASTC travels to Virginia next year.

Hail and farewell
Indeed, it won’t be long before we meet again in Richmond for the 2005 ASTC Annual Conference, hosted October 15–18 by the Science Museum of Virginia.

The theme for next year is “Partnerships for Excellence.” You will find a downloadable proposal form online at www.astc.org/conference. Talk to your colleagues, capture in writing those great ideas you had in San Jose, and send your completed proposals to conference@astc.org (e-mail) or 202/783-7207 (fax). The deadline is December 17.

We close this report with a hearty thank you to our nearly 30 ASTC 2004 sponsors, including special kudos to IBM, Intel, and HP (Silver Partners); Advanced Micro Devices, J & J Grfx, Natural History, the San Jose Mercury News, Sodexho, and SurveyWorks (Emerald Partners); and Ideum, Panasonic, and the Smithsonian’s Lemelson Center for the Study of Invention and Innovation (Turquoise Sponsors).

And to Peter Giles, Susan Wageman, Craig Baker, Greg Brown, and the many hard-working staff members and volunteers at The Tech Museum of Innovation, what can we say? It was amazing, exciting, challenging, innovative, rapid, and sustaining.

Muchas gracias, San Jose!
LINKS TO LEARNING—Science took to the fairways this summer as two ASTC-member museums opened themed outdoor mini-golf courses.

At the Sciencenter, Ithaca, New York, staff members and volunteers designed and constructed Galaxy Golf, an 18-hole course where each hole features a science- or math-related “hazard.” Construction costs were largely funded by a $25,000 grant from the Tompkins County Strategic Planning Board. Players maneuver their way through challenges like the Pendulum Pass, the DNA Helix, and Planet Putt, helped by signs that explain the concepts involved.

Sciencenter exhibits developer Tom Prendergast says Galaxy Golf has attracted strong visitor interest despite soft marketing efforts this first year. “One of [our] motivations was to reach demographics that normally don’t visit the Sciencenter, specifically teens,” he says, noting that results have exceeded expectations. The $4 course fee (separate from general admission) goes toward maintenance and improvements. Galaxy Golf, which remained open through Labor Day 2004, will continue to evolve, with new holes added in future summers.

At the Science Museum of Minnesota (SMM), St. Paul, the nine-hole, 30,000-square-foot Earthscapes Mini-Golf course is just one feature of a larger, new outdoor exhibit gallery, Big Back Yard. Located behind the museum, along the Mississippi River, the golf course is designed to demonstrate the way water moves from “source to sink,” mountains to ocean, shaping the landscape along the way. At Hole No. 2, Erosional Landscapes, for example, small channels erode into fewer, larger channels until they combine into one big river. The complex system results in a different path to the hole for each player.

Besides its golf course, Big Back Yard includes large-scale interactive exhibits like a 17,000-square-foot prairie maze featuring plants native to Minnesota’s prairies, a Panning for Gems activity, and the zero-emissions Science House, which creates electricity from sunlight to heat, cool, and power itself. Major support for the project was provided by the National Center for Earth-Surface Dynamics, a National Science Foundation–supported Minneapolis research facility administered by the University of Minnesota. Access to most of Big Back Yard is covered by SMM’s admission fee, but there is an additional $4.50 fee for adults ($3 for children) for a round of mini-golf.

RESEARCH CENTER TAKES FLIGHT—Butterflies filled the air on August 14 at the opening of the McGuire Center for Lepidoptera and Biodiversity at the University of Florida’s Florida Museum of Natural History, in Gainesville. The new center—which gathers under one roof the more than 4 million specimens of the university’s butterfly and moth collections, an archive second only in size to that at London’s Natural History Museum—also includes a 39,000-square-foot research area where university and Florida State Department of Agriculture scientists can work together in state-of-the-art laboratories emphasizing molecular genetics and physiology.

Public education is a focal point at the McGuire Center, where both collections and laboratory space are visible to visitors. The Wall of Wings, three stories high and over 200 feet long, contains more than 13,000 scanned images and actual specimens of Lepidoptera, as well as information panels on moth and butterfly biology and video footage of species in different parts of the world. A wall map, World of Wings, features stories of how Lepidoptera contribute to biological research worldwide.

Perhaps most appealing to visitors is the opportunity to walk among the center’s living collections in the Butterfly Rainforest. This 6,400-square-foot, screen-enclosed living exhibit houses up to 65 different species, with a continuous population of several hundred native and exotic butterflies and moths living amid subtropical trees and plants.

The new center was made possible by a $7.2 million grant from the William W. McGuire and Nadine M. McGuire Family Foundation and a $4.2 million grant from the state of Florida. Dr. William McGuire, a Lepidoptera enthusiast who has made notable discoveries in the field, donated his collection of more than 30,000 specimens. Exhibits were designed by Ralph Appelbaum Associates, Inc. and constructed by SPARKS Exhibits & Environments. Rainforest landscaping is by Environmental Designs.

Details: Paul Ramey, director of marketing and public relations, pramey@ufl.edu
IN SEARCH OF HEALTH—Science education and theme-park style merge in BodyQuest, a new permanent exhibition at the Adventure Science Center, Nashville, Tennessee. Opening in two phases, the exhibition weaves together the topics of body systems, healthy choices, and careers in healthcare. Phase I, the 3,500-square-foot section that debuted in July, has three major sections.

- Body Battles, an interactive “dark ride,” where visitors can participate in a laser gun battle between the human body and the illnesses that attack it.
- The Wind Pipe, a giant walk-through model of the throat, trachea, and lungs that includes sound effects and the feeling of “breath” against one’s skin. Hands-on activities here encourage healthy habits.
- The Amazing Aging Machine, a face-altering photo booth that shows visitors how factors such as smoking affect the aging process.

Phase II, scheduled to open next summer and complete the 10,000-square-foot exhibition, will focus on the skeletal, nervous, and circulatory systems.

BodyQuest is funded primarily by a $1 million grant from Nashville’s Memorial Foundation. Designed by Bruce D. Robinson Museum Design and constructed by Design Craftsmen, the exhibition includes interactive technology and animatronics by the Sally Corporation.

Details: Jeri Hasselbring, director of education, jhasselbring@adventuresci.com; www.adventuresci.com

A BRIDGE TO LEARNING—What do Athens, Greece, and Redding, California, have in common? Both are home to elegant projects by world-class architect Santiago Calatrava.

Recently tapped to “improve and harmonize” the existing Olympics Sports Complex in Athens (millions admired his arching beams and welcoming plazas), the Spanish designer and engineer enjoys small challenges, too. On July 4, his Sundial Bridge, the first free-standing Calatrava bridge in the United States, opened at Turtle Bay Exploration Park, in downtown Redding. The new footbridge, named for its 217-foot-tall anchoring pylon, connects campuses of the park on opposite shores of the Sacramento River. Major funding for the $23 million project was provided by Redding’s McConnell Foundation.

Translucent decking made of glass and granite provides for optimal viewing of the water below. To spare the river’s salmon-spawning habitat, the cable-stayed bridge has no supports in the river. At each end of the bridge are plazas for public use, the northern one stretching down to the river’s edge.

How did Calatrava, creator of the internationally acclaimed Museu de les Ciencies in his native Valencia, come to design a project in north-central California? It just took a phone call, says McConnell Foundation vice president John Mancasola. When Mancasola telephoned Calatrava’s studio in Zurich, the artist himself answered the phone. After several visits to Redding, he agreed to take the commission.

A June 27 Los Angeles Times article quotes Calatrava on the role of the bridge as a tool of public learning. “If a bridge tells you a story, and you can remain for a while there ... and try to see how the bridge works,” the architect said, “it’s possible to develop an educational aspect around it.”

To coincide with the opening, the museum created a temporary exhibition, The Sundial Bridge Project, which will remain open through January 16, 2005.

Details: Lori Salles, manager of exhibits, lsalles@turtlebay.org

Turtle Bay visitors enjoy the July 4 grand opening of the Sundial Bridge. Photo by Michael Burke Photography

Grants & Awards

Through its Philadelphia Cultural Leadership Program, the Pew Charitable Trusts has awarded general operating support (GOS) grants to the Franklin Institute ($810,000 over three years) and the Zoological Society of Philadelphia’s Philadelphia Zoo ($743,000 over three years).

The Science and Society Directorate of the European Commission’s Scientific Advice and Governance Unit has awarded $400,000 (330,000 Euros) to a consortium of science centers for DeCiDe—Deliberative Citizens’ Debates in Science Centres and Museums, an 18-month program to develop and host debates on contemporary life sciences across Europe. Partners include ECSITE, At-Bristol (whose director, John Durant, will serve as consortium leader), La Cité des Sciences et de l’Industrie; Heureka, the Finnish Science Centre; and IDIS–Citta della Scienza. Consultant Andrea Bandelli will manage the project.

The following ASTC members have received funding from the National Science Foundation’s Informal Science Education (ISE) program for projects beginning in 2004:

- Miami Museum of Science, Miami, Florida: $376,871 for After-School Program Exploring Science (APEX), a program to develop and implement a training model for enhancing the capacity of community-based after-school programs to provide science-learning opportunities for children 5-10. Partners include the Miami-Dade Public Schools, Florida International University, Miami-Dade College, YMCA, YWCA, and Family Christian Association of America.
- The Children’s Museum of Houston, Houston, Texas: $261,505 for Everyone Counts—¡Todo el mundo cuenta!, a 1,500-square-foot bilingual traveling exhibition based on the museum’s “Magnificent Math Moments” activities.
- The Exploratorium, San Francisco, California: $382,781 for Attention, Emotion, and Judgment: How Do Minds Figure Out What to Do?, an exhibition devoted to the mental activities involved in processing human perceptions and enabling action.
- The Pittsburgh Children’s Museum, Pittsburgh, Pennsylvania: $184,645 for How People Make Things, a traveling exhibition created in collaboration with Family Communications, that will use segments on factories from the Mr. Rogers’ Neighborhood television series to engage children in the processes by which familiar objects are manufactured.
- Woods Hole Oceanographic Institution, Woods Hole, Massachusetts: $74,988 for Virtual Stowaway, a web site that will allow visitors to explore a research vessel engaged in studying the biology of gelatinous zooplankton.

AFTER THE STORY...
The Museum of Life and Science, Durham, North Carolina, announces two senior staff appointments: Julie Ketner Rigby, who directed the First Flight Centennial Foundation’s $5 million 1999–2004 campaign, as vice president for external relations, and Beth Balmuth Raffeld, most recently associate vice president and dean for development of Harvard University’s Faculty of Arts and Sciences, as senior vice president for advancement.

The new executive director of Michigan’s Ann Arbor Hands-On Museum is Mel Drumm. Formerly president of the Detroit Science Center, Drumm succeeds James Frenza, who stepped down as president and CEO in January 2004.

Turtle Bay Exploration Park, Redding, California announces the appointment of John C. Peterson as president and CEO. A former president of the Massachusetts Horticultural Society, Peterson will oversee the park’s museum, wildlife exhibits, educational programming, and a new arboretum and botanical garden, opening in 2005. The park has had two interim directors since Judy LaLuche retired in June 2003.

Alana S. Kulesa, museum educator at the Children’s Museum of Pittsburgh, Pennsylvania, is one of 23 U.S. educators to be named a JCPenney Afterschool Ambassador for the 2004–2005 school year. The ambassadors will communicate with policy makers, build community awareness for afterschool programs, and organize major events for the October nationwide Lights On Afterschool! rally.

David Brose, former president and CEO of the Schiele Museum of Natural History, Gastonia, North Carolina, is the new director of the Cranbrook Institute of Science, Bloomfield Hills, Michigan. Brose replaces board member and acting director Keith Kleckner.

Dean Briere, formerly vice president for education, programs, and guest services at the Museum of Life and Science, Durham, North Carolina, has accepted a new position as vice president of discovery experiences at Discovery Place, Charlotte.

The Sciencenter, Ithaca, New York, announces two appointments: Marie Hedrick, formerly with Cornell University, is the new manager of public relations, and Lara Kimber, formerly with Wells College, is the director of advancement.

Greg Andorfer, executive director of the Maryland Science Center (MSC), in Baltimore, resigned his position effective September 2. Andorfer will continue to serve as a consultant to the museum, and MSC trustee Van Reiner has taken over as acting executive director.

ASTC welcomes two new staff members and announces a promotion. Christine Ruffo, a Brown University museum studies graduate who most recently worked in visitor services at the Supreme Court of the United States, is the new researcher/writer in ASTC’s Research and Publications department. Harry Korkoya, a recent graduate of Strayer University’s accounting program in Washington, D.C., joins us as senior accountant. Former senior accountant Wendy Margolis has been promoted to chief financial officer.