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“The essential difference between emotion and reason is that emotion leads to action while reason leads to conclusions.”

— Donald B. Calne
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Cover: Photographer Diana Hay snorkels with humpback whales. This photograph became part of a QUEST TV story (science.kqed.org/quest/video/your-photos-on-quest-bryant-austin). Photo by Bryant Austin/Marine Mammal Conservation through the Arts
A Place for Learning Science: Starting a Science Center and Keeping It Running
Sheila Grinell

A Place for Learning Science presents the essentials of science center planning and management—from understanding the audience and defining the mission, to making the transition from start-up to operating support, to planning for change.

The book includes nine “Voices from the Field” (sidebars reflecting the experiences of museum practitioners) and seven “Viewpoints” (longer articles offering perspectives on informal science education, marketing, board management, and more).

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To submit ideas for features or departments, contact Emily Schuster, (202) 783-7200 x130, eschuster@astc.org. Email letters to the editor to dimensions@astc.org (subject line: Inbox) or mail them to ASTC at the above address, Attn: Dimensions Inbox. Include your name, title, and institution. We reserve the right to edit letters for publication.
No Bad Questions

“There are no bad questions, only bad answers.” Implicit in this well-worn expression is the purity of inquiry, the virtue of asking, and the excitement of self-initiated discovery.

The adage comes to mind as I reflect on an interesting workshop on inquiry-based learning (IBL) that convened just prior to the start of the American Association for the Advancement of Science (AAAS) Annual Meeting, held in February in Vancouver, Canada. My thanks to AAAS and to Science World British Columbia, TELUS World of Science (our ASTC-member science center in Vancouver) for organizing and hosting this workshop.

The workshop afforded me the opportunity to present some highlights of the science center field and the work of our association. Yet I was struck, more broadly, by the distressing commentary by workshop participants about the near absence of IBL in the classroom today; rather, that there is a perceived disposition within the formal education community against learning that is both student centered and teacher guided.

Although this is not new information, it is no small matter for science centers on several levels. Clearly, we exemplify the principles of IBL, and we point to these principles to defend our impact in the education realm—giving knowledge meaningful real-world connections, transferring concepts to applications, encouraging the use of critical thinking skills, and creating a sense of personal commitment to learning. Moreover, we pride ourselves on offering teachers a wide range of training and support programs to help them employ IBL techniques in their classrooms. Stating the obvious, then, we do not win the case for the valuable role that science centers and museums play in education unless we help to counter those who still harbor some skepticism about IBL’s fundamental value.

Anthony (Bud) Rock (brock@astc.org) is ASTC’s CEO. Visit www.astc.org/blog/category/ceo to read more from the CEO editorials.
The March/April 2012 issue of Dimensions is beautiful! I’ve had a strong interest in the interrelationships among the arts, and the way science has inspired art, since graduate school, so this is a really absorbing issue for me.

Susan Zimecki, director, marketing and community affairs, Carnegie Science Center, Pittsburgh

I was gratified to see the From the CEO opinion piece from Bud Rock in the March/April 2012 issue of Dimensions, regarding the need for inspirational possibilities and the role science centers can play in shaping them. This is precisely my aspiration for our SpaceTime project. Scheduled to open in late 2014, this outdoor experience will explore the intersection of science and science fiction in three eras (1930–40s, 1950s–60s, and today). Each era struggled with potential apocalypse, yet presented a parallel vision of the future that offered promise and hope. In that spirit, SpaceTime will display a vision of the future rooted both in scientific fact and science fiction–inspired possibilities. I again want to commend Bud and ASTC for recognizing the power of possibility in the lives of our children.

We’re with you!

Alexander Zwissler, executive director/CEO, Chabot Space & Science Center, Oakland, California

I was glad to see in the Notes from ASTC department in the March/April 2012 issue of Dimensions that student subscribers to Dimensions now also receive a subscription to ASTC’s INFORMER enewsletter. I congratulate and thank you for INFORMER. It is one of only two or three online industry newsletters that I open because it always contains something of interest/importance to me.

Cheryl D. McCallum, director of education, Children’s Museum of Houston, Texas

CORRECTION:
The cover photo for the March/April 2012 issue of Dimensions should have been credited to Michael Hart. The large image on page 38 should have been credited to Mark Finkenstaedt. In addition, in the article beginning on page 38, the correct size of Tony Orrico’s artwork is 20 x 20 feet, or 400 square feet (37 square meters). We regret these errors.
NEW ADVENTURES AT EDVENTURE

At EdVenture Children’s Museum in Columbia, South Carolina, children can learn how to take care of their pets in one gallery and how to keep their own bodies healthy in another. The two new permanent exhibitions opened within a week of each other last November after two years of planning. They are the first in a series of new exhibitions that emphasize career exploration, critical thinking, and problem solving.

In Wags & Whiskers, a 270-square-foot (25-square-meter) exhibition that opened on November 5, children step into a pet clinic. They can use grooming tools, explore a stuffed pet’s anatomy and physiology, diagnose ailments, and decide on appropriate treatments. Funding was provided by the Animal Mission, South Carolina Association of Veterinarians, American Veterinary Medical Foundation, and Toni M. and Sam Elkins.

Body Detectives, a 1,900-square-foot (175-square-meter) exhibition for 8- to 12-year-olds, opened on November 12. Children can use 3D modeling software to find out how their bodies work, look through microscopes at healthy and diseased cells, and simulate skills needed by doctors and scientists. A Body Detectives Lab invites visitors to investigate the relationship between lifestyle and chronic heart disease, and a Body Investigations Lab offers facilitated laboratory activities related to the human body and health. Funding for Body Detectives was provided by a Science Education Partnership Award from the U.S. National Institutes of Health, Richland County, City of Columbia, the Fullerton Foundation, Colonial Life, the Zvejnieks Foundation of South Carolina, and Haynsworth, Sinkler Boyd, P.A.

The total cost for the two exhibitions was approximately $800,000. Within the first four months of their opening, attendance increased by 10%.

—Sharon Barry

Details: Kristy Barnes, marketing communications manager, kbarnes@edventure.org, www.edventure.org
LOCAL PERSPECTIVES

At the Natural History Museum of Utah’s new home in the foothills of the Rocky Mountains, overlooking Salt Lake City, visitors to the Sky gallery can step onto an outdoor terrace to experience directly the weather and atmosphere. Other unique perspectives on the local environment are woven throughout the museum, which opened on November 19 after about 10 years of planning. It includes 41,300 square feet (3,840 square meters) of exhibition and education space.

The museum’s centerpiece, a three-story-high gathering space called the Canyon, features a wall with more than 500 treasures from the museum’s collection. Ten interdisciplinary galleries support the museum’s mission to illuminate the natural world and the place of humans within it, focusing on Utah. In addition to the Sky gallery, exhibitions include Native Voices, Life, Land, First Peoples, Gems and Minerals, Great Salt Lake, Past Worlds, and Utah Futures. Our Backyard is a discovery environment for young visitors. Three learning labs provide space for school and public programming.

The museum is located in the University of Utah’s new Rio Tinto Center, a 163,000-square-foot (15,140-square-meter) building inspired by Utah’s natural landscape. Clad in 42,000 square feet (3,900 square meters) of copper mined in Utah, the building comprises stepped terraces that blend into the environment and incorporates green elements throughout.

Funding for the $102.5 million center came from the federal government, the Utah State Legislature, a bond supported by Salt Lake City voters, and monies from individuals, corporations, and foundations. Kennecott Utah Copper/Rio Tinto provided a naming-level donation. —S.B.

Details: Patti Carpenter, director of public relations, pcarpenter@nhmu.utah.edu, nhmu.utah.edu

Left: An active ant colony is one of the displays in the Life gallery at the Natural History Museum of Utah. Photo by Stuart Ruckman/NHMU. Above: The Natural History Museum of Utah at the Rio Tinto Center is situated on the Bonneville Shoreline Trail, one of the major launching points for recreation enthusiasts in Salt Lake City. Photo by Stuart Ruckman/NHMU.
A NEW HOME FOR THE WORKS

For 16 years, the science and engineering discovery center known as the Works operated in temporary homes in and around Minnesota’s Twin Cities. Its audience grew steadily. By 2010, attendance had jumped to 41,366—more than twice that of the previous year. To accommodate its growing visitorship, the Works purchased a building in downtown Bloomington, Minnesota, and reopened there on November 12, 2011.

The 45,000-square-foot (4,180-square-meter) facility is four times larger than the previous one, can accommodate 150,000 visitors a year, and has enabled the Works to triple its hours of operation. In less than three months after reopening, the museum served 24,300 visitors.

Designed for children ages 5 to 12 and their families, exhibits at the Works highlight how things work and inspire interest in engineering and innovation. Visitors can build a race car, lift weights with a pulley, play a harp with “strings” made of laser light, or zip up a 6-foot (2-meter) zipper to see how wedges work. The new facility includes a Design Lab with rotating activities that introduce families to the engineering design process.

Rebecca Schatz, founder of the Works, explains, “When a child builds a project at the Works, she learns more than the science behind it, she learns that she, too, can make a motor, a polymer, a skyscraper, a solar car. That child learns that she can make a difference.”

The expansion is being financed by a $3 million capital campaign that includes contributions from corporations, foundations, and individuals. The lead funder is 3M. –S.R.

Details: Jill Measells, CEO, Jill@theworks.org, www.theworks.org

The First Peoples gallery features a re-creation of Median Village, an archaeological site in central Utah. Photo by Tom Smart/NHMU

A summer camper shows off the battery-powered, motorized jitterbug that he designed and built. Photo courtesy the Works
NOYCE FELLOWS ANNOUNCED

The Noyce Foundation, in collaboration with ASTC and the U.S. Institute of Museum and Library Services (IMLS), announced the participants in a fifth round of sponsored Noyce Leadership Institute (NLI) Fellowships, with the aim of increasing the public impact of science centers, museums, and related institutions. Fellows gain knowledge, tools, and professional networks that strengthen their capacity to lead effectively and advance innovation in their institutions, communities, and the field.

The Fellowship program provides an action-learning framework via face-to-face sessions, executive coaching, peer learning, audio conferencing, and other strategies.

The 18 2012–13 Noyce Fellows and their Strategic Initiative Sponsors are listed below. (ASTC-member institutions are indicated in bold.)

- **Accokeek Foundation, Maryland**
  Fellow: Lisa Hayes, president & CEO
  Sponsors: Wilton C. Corkern, senior advisor, and Mark Alexander Wright, board member

- **American Museum of Natural History, New York City**
  Fellow: Lauri Halderman, senior director, exhibition interpretation
  Co-Sponsors: David Harvey, senior vice president for exhibition, and Lisa J. Gugenheim, senior vice president, institutional advancement, strategic planning, and education

- **Boston Children’s Museum, Massachusetts**
  Fellow: Tim Porter, project director, education
  Sponsor: Leslie Swartz, senior vice president of research and program planning

- **Copernicus Science Center, Warsaw, Poland**
  Fellow: Irena Cieślińska, deputy director
  Sponsor: Robert Firmhofer, CEO

- **Lawrence Hall of Science, University of California, Berkeley**
  Fellow: Gretchen Walker, public science center interim director
  Sponsor: Elizabeth Stage, director

- **Madison Children’s Museum, Wisconsin**
  Fellow: Brenda Baker, director of exhibits
  Sponsor: Ruth Shelly, executive director

- **Marian Koshland Science Museum of the National Academy of Sciences, Washington, D.C.**
  Fellow: Erika Shugart, deputy director
  Sponsor: Patrice Legro, director

- **Museum of Science and Industry, Chicago**
  Fellow: Patricia Ward, director, science and technology
  Sponsor: Kurt Haunfelner, vice president, exhibits and collections

- **Museum of Science, Boston**
  Fellow: Christine Reich, director of research and evaluation
  Co-Sponsors: Wayne Bouchard, chief operating officer, and Britton O’Brien, vice president, human resources

- **National Museum of Emerging Science and Innovation, Miraikan, Tokyo, Japan**
  Fellow: Yasushi Ikebe, principal investigator of science communication
  Sponsor: Mamoru Mohri, CEO

- **Natural History Museum, London**
  Fellow: Ian Jenkinson, museum manager
  Co-Sponsors: Ailsa Barry, head of interactive media, and Andy Polaszek, keeper of entomology

- **Naturalis Biodiversity Center, Leiden, the Netherlands**
  Fellow: Paul Voogt, director, public programs
  Sponsor: Edwin van Huis, CEO

- **New York Hall of Science, Queens**
  Fellow: David Kanter, director, SciPlay, Center for Play, Science, and Technology Learning
  Sponsor: Margaret Honey, president & CEO

- **Science Museum of Minnesota, St. Paul**
  Fellow: Bob Breck, director of marketing and membership
  Sponsor: Paul Martin, senior vice president of science learning

- **Science Museum Oklahoma, Oklahoma City**
  Fellow: Sherry Marshall, director of the Oklahoma Museum Network
  Sponsor: Don Otto, CEO

- **Thanksgiving Point Institute, Lehi, Utah**
  Fellow: Blake Wigdahl, vice president, design and programming
  Sponsor: Mike Washburn, president and CEO

- **Franklin Institute Science Museum, Philadelphia**
  Fellow: Dale McCready, director, gender and family learning programs
  Sponsor: Frederic Bentley, vice president, science and innovation

- **Universeum, Gothenburg, Sweden**
  Fellow: Carina Halvord, deputy managing director and head of development
  Sponsor: Lars Rehnman, CEO

The Noyce Foundation and its partners are proud to announce a sixth NLI Fellowship in 2013–14. Senior-level leaders interested in learning more about the application process should visit www.noycefdn.org.
NEW GOVERNING MEMBERS APPROVED

The ASTC Board approved **MIDE, Museo Interactivo de Economía**, in Mexico City as a new Governing Member in October 2011. The museum presents topics such as economics, financial literacy, natural science, and how society and economic processes interact with nature in a context of sustainable development. MIDE opened in 2006 in a restored 18th-century convent, and won a Roy L. Shafer Leading Edge Award for Visitor Experience in 2007. The museum has 27,000 square feet (2,510 square meters) of interior exhibition space and a budget of USD 2.5 million.

CAISE NEWS: NSF ISE PROGRAM PI MEETING

The Center for Advancement of Informal Science Education (CAISE) thanks the ASTC community for its participation in and support for the 2012 National Science Foundation (NSF) Informal Science Education (ISE) Program Principal Investigator (PI) Meeting, held March 14–16 in Washington, D.C. With fresh input from that gathering, CAISE is in the planning stages for a new phase of initiatives for Years 6–8 of the project. The center intends to continue to enhance and integrate infrastructure for sharing informal science, technology, engineering, and math (STEM) learning resources; expand capacity in the ISE evaluation community; and connect to research scientists who seek to (or already) communicate their work through science center and museum exhibits, out-of-school time and citizen science programs, broadcast media and film, cyberlearning projects and games, and other informal channels.

COMMUNITIES OF PRACTICE NEWS

Communities of Practice (CoPs) are special interest groups, initiated and led by science center professionals who wish to interact regularly with peers to share their concerns, passions, and best practices. The ASTC professional development team provides dedicated staff support to each CoP, as well as online resources. Here is some recent news from a few of the CoPs.

Currently, the Advocates for Diversity CoP is starting a resource library for diversity and inclusion materials. Resources include a growing collection of science center and museum diversity statement and policy templates, a listing of museum-related scholarships and fellowships, and audience-specific materials (including materials related to universal design, cultural groups, and lesbian, gay, bisexual, and transgender audiences). This CoP also features an active discussion forum for members to share challenges and successes.

In addition, the ASTC Membership Managers LinkedIn Group hosted a conference call for membership managers in late January. Topics of discussion included members-only events, member versus nonmember spending, and membership discounts.

Finally, the Public Engagement with Science CoP recently hosted its first discussion forum. Membership in ASTC CoPs is open to any ISE professional. Learn more about all ASTC CoPs and how to join and start new communities at www.astc.org/profdev/communities/index.htm.

From left to right: Donna DiBartolomeo of the Harvard Graduate School of Education, Barinetta Scott of Soundvision Productions, Steve Curwood of the World Media Foundation, and John Falk of Oregon State University greet one another at the 2012 NSF ISE Program PI Meeting. Photo courtesy Risdon Photography

At MIDE, visitors gather around an interactive to explore the indirect impact of various products and services on the planet. Photo by Carlos Somonte
The following new members were approved by the ASTC Board in October 2011. Contact information is available in the About ASTC section of the ASTC website, www.astc.org.

SCIENCE CENTER AND MUSEUM MEMBERS

- **Children’s Museum**, Tucson, Arizona. Starting out as a one-room museum in 1986, this museum moved into the historic Carnegie Library in downtown Tucson in 1991. It serves more than 100,000 visitors annually, with its 12 permanent interactive exhibitions.

- **Children’s Science Center**, Herndon, Virginia. This center’s leadership will initiate its capital campaign (approximately USD 17.5 million) after securing a building site. The group hopes to open its 40,000-square-foot (3,720-square-meter) facility in 2014 or 2015. Its Museum Without Walls program serves over 7,000 visitors annually.

- **Discovery Space of Central Pennsylvania**, State College. With 4,000 square feet (370 square meters) of interactive exhibits, Discovery Space was designed to spark curiosity and imagination as children learn about the world. The museum celebrated its grand opening on October 22, 2011.

- **Maria Mitchell Association**, Nantucket, Massachusetts. The association operates two observatories, a natural science museum, and an aquarium, and preserves the historic birthplace of Maria Mitchell, the first female professional astronomer in the United States. The aquarium and museum will move to a new site, to be opened by 2016.

- **Placer Nature Center**, Auburn, California. Founded in 1991, the nature center has connected over 180,000 children and adults with the outdoors where they learn science through hands-on activities, enjoy nature, experience teamwork, and develop curiosity and wonder about their environment.

- **Rockville Science Center**, Rockville, Maryland. This center’s long-term vision is to develop a vibrant facility that offers an educational forum for all ages to explore the wonders of science. The group hosts robotics competitions, geology walks, and Science Cafés.

SUSTAINING MEMBERS

- **AECOM**, Los Angeles. This company combines its experience in museum master planning, expansions, attendance projections, impact studies, and more to provide a wide range of services for museums and cultural attractions.

- **American Museum Professionals**, Silver Spring, Maryland. This company offers an extensive range of services that include design, conveyance, and installation of artworks and exhibitions.

- **Entech Creative Industries Corporation**, Orlando, Florida. Entech is a multifaceted company that develops and creates brand destinations for the amusement and theme park, entertainment, retail, and museum industries.


- **Exhibits Development Group**, St. Paul, Minnesota. This company is dedicated to the development, production, marketing, and distribution of traveling museum exhibitions, cultural projects, and corporate collections.


Children learn about aquatic life cycles and ecological balance at Placer Nature Center. Photo by Megan Krekorian
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Do you think science centers and museums should advocate for particular positions on political or controversial issues?

We should all be advocates for fact-based decision-making. But when we educate the public on subjects where there is not consensus within the scientific community—e.g., because of lack of data, as is the case with many current energy issues (hydraulic fracturing, wind, etc.)—it is inappropriate to advocate one position over another. However, informal science education providers are uniquely qualified to be the rational place for the public to hear the facts available, to facilitate civil discourse about the ramifications of the options based on the available data, and to increase understanding of what information is still needed. We can be advocates for science, not policy. It is important to keep in mind that science tells us how the world works; it does not tell us what society should do.

Carlyn S. Buckler, senior education associate, Paleontological Research Institution and its Museum of the Earth, Ithaca, New York

It is incumbent on science centers and museums to voice their stance on tough issues. To remain mum on controversial topics is irresponsible. Even more, it’s a hypocritical digression from the very nature of free thinking we so ardently engender our visitors to undertake throughout their lives.

Christopher Wirkkala, placement manager, NRG! Exhibits, Kirkland, Washington

On one side, no one wants to be preached at when they’re digesting the evidence. Conversely, some issues seem so important and the evidence is so clear that you’re a fool to hold your tongue. Generally, it’s best to err on the side of evidence and allow for human judgment to take its course.

Charlie Carlson, senior scientist, Exploratorium, San Francisco

▲ There are more ways in which a science center can be seen to be advocating a position than by just saying it outright. For example, the International Centre for Life leases space to a stem cell research lab, and however much we may hold debates on the ethics of stem cell research, by doing this we are clearly implicit supporters of the research.

Ian Simmons, science communication director, International Centre for Life, Newcastle upon Tyne, England, United Kingdom

From our Facebook page:

I think the real question is whether we should do so deliberately rather than passively, or by default.

Alexander Zwissler, executive director/CEO, Chabot Space & Science Center, Oakland, California

Visit www.astc.org/blog/category(astc-dimensions/viewpoints for an extended discussion of this question.

The above statements represent the opinions of the individual contributors and not necessarily the views of their institutions or of ASTC.

Tell us: Should exhibitions be the central focus of what science centers and museums do?

Email dimensions@astc.org (subject line: Viewpoints), or post on our Facebook page (www.facebook.com/ScienceCenters). Include your name, title, and institution. Responses may be printed in a future issue or on our website. We reserve the right to edit responses for publication.
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In February, after a four-month national search, McWane Science Center in Birmingham, Alabama, named Tom Angelillo as its next president and CEO. He succeeds Tim Ritchie, who held the position for seven years before becoming president of the Tech Museum in San Jose, California, in October. Angelillo spent 15 years as president and CEO of Southern Progress, the Birmingham-based publisher of Southern Living and Cooking Light magazines, before retiring in 2008. One of his first priorities at McWane Science Center will be to oversee the opening of the Birmingham Children’s Museum in the center’s facility. The opening is slated for May or June of next year.

On December 16, 2011, Tracey Kuehl retired as director of the Family Museum in Bettendorf, Iowa, a position she had held since 1994. Prior to that, she was director of Bettendorf’s Children’s Museum beginning in 1991. Major achievements during Kuehl’s tenure include the consolidation of the former Children’s Museum and Center for the Cultural Arts to create the Family Museum, construction of the Family Museum facility, completion of the outdoor learning environment Faye’s Field, and accreditation by the American Association of Museums.

After 16 years as president/CEO of SciWorks in Winston-Salem, North Carolina, Bev Sanford will retire from her position at the end of June. A nationwide search for her replacement is underway. During her tenure at SciWorks, Sanford spearheaded two capital campaigns that added two new exhibitions (FoodWorks and Science Lab) and renovated five exhibit galleries. She also oversaw the development of the new Outdoor Science Park at SciWorks. Before joining SciWorks, Sanford was vice president of programs and education at Discovery Place in Charlotte, North Carolina. She has also served on ASTC’s conference program planning committee and equity and diversity committee, and was involved with ASTC’s YouthALIVE! (Youth Achievement through Learning, Involvement, Volunteering, and Employment) initiative.

Cristián Samper has announced that he will step down as director of the National Museum of Natural History (NMNH), Smithsonian Institution, Washington, D.C., in July, to become president and CEO of the Wildlife Conservation Society, headquartered at the Bronx Zoo in New York City. He will succeed retiring president and CEO Steven Sanderson. Samper became director of NMNH in 2003 and took a 15-month leave in 2007 and 2008 to serve as acting secretary of the Smithsonian. Among other accomplishments at NMNH, Samper oversaw renovations of major exhibitions including the Behring Family Hall of Mammals (2003), the Butterfly Pavilion (2007), the Sant Ocean Hall (2008), and the David H. Koch Hall of Human Origins (2010). Before joining NMNH, he was deputy director and staff scientist at the Smithsonian Tropical Research Institute in Panama from 2001 to 2003.

On February 16, Tiiu Sild, director of Science Centre AHHAA in Tartu, Estonia, died after a long illness. She was 53 years old. Trained as a specialist in molecular biology and molecular diagnostics, Sild led Science Centre AHHAA since its founding in 1997. She worked to steadily enhance the center’s reputation and build worldwide recognition of Estonian science and research. In 2011, she was honored with the Lifetime Achievement Award for Science Popularization from the Estonian Ministry of Education and Research.

in memoriam

On February 16, Tiiu Sild, director of Science Centre AHHAA in Tartu, Estonia, died after a long illness. She was 53 years old. Trained as a specialist in molecular biology and molecular diagnostics, Sild led Science Centre AHHAA since its founding in 1997. She worked to steadily enhance the center’s reputation and build worldwide recognition of Estonian science and research. In 2011, she was honored with the Lifetime Achievement Award for Science Popularization from the Estonian Ministry of Education and Research.
what we learned

Qualities of Excellent Science Center CEOs

By Alan J. Friedman

Over my nearly 40 years in the science center field, I’ve seen and worked with many excellent CEOs. I’ve found that essentially all of the most effective leaders possess the characteristics described below. I have also known a great many less effective CEOs, and in each case they were, in my opinion, lacking in several of these traits and skills.

1. Ability to articulate, with passion and detail, the vision and mission of the organization. This cannot be faked. Donors, government officials, staff, and patrons usually have well-developed detectors for insincerity and shallow claims. For a CEO to be effective, he/she must be capable of taking the existing vision and mission statements and then finding his/her own means of convincing all stakeholders to share the same enthusiasm and belief in those core principles. The vision and mission will change with time, and the CEO needs to be sensitive to opportunities and needs for change. Clarity of the current core values must be maintained at all times. A CEO will encounter many challenges and opportunities, each of which will exercise his/her judgment and persuasive powers on an almost daily basis.

2. People skills for dealing with all the major stakeholders. A CEO by himself/herself can do very, very little. It is essential for the CEO to bring the board along, as well as follow the board’s direction, while avoiding the two deadly extremes of micromanagement and disengagement. A similar set of challenges lies in keeping the staff excited and productive, as budgets, popularity, and external threats rise and fall. Donors and government officials are an additional set of stakeholders, and the CEO needs to be able to understand as well as they do their particular needs and constraints. Among the key people skills required are the abilities to delegate authority, to hire and retain excellent senior staff, and to deal with personal issues among those staff. Simultaneously, the CEO must accept total responsibility for the institution.

3. Enthusiasm for science, technology, engineering, and math (STEM), and the ability to communicate that enthusiasm. Whatever the specific vision and mission of a given science center, STEM disciplines and principles are going to be central. I’ve known many excellent CEOs who did not have strong STEM backgrounds, but who learned quickly and were then able to articulate STEM values as well or even better than most Ph.D. practitioners. So while a degree in science, especially a Ph.D., is undoubtedly a benefit, it is not an absolute requirement if the CEO’s skill set includes being a rapid and continuous learner, who can translate his/her STEM learning into a persuasive passion for the fields.

4. A combination of technical skills, such as fundraising, marketing, public relations, financial management, and partnership building. The CEO will be called upon to demonstrate all of these skills at some point, but no one
skill should be a make-or-break qualification. Other senior staff should be able to share their expertise in these areas, and staff can be supplemented with expertise from the board or consultants as needed. For example, the requirement that the CEO handle emergencies, embarrassments, and disasters comes up from time to time.

Few CEOs have had extensive training or practice in what to do and what not to do in these events. But if the CEO’s support network is strong, the needed knowledge and skills can be quickly acquired by a fast learner. This takes us back to #2 (on the previous page): the people skills needed to build a support network. Then, when a CEO takes a 2:00 a.m. phone call about a fire, financial scandal, or other urgent issue, he/she can call on a strong supportive network for help addressing the situation.

(I had three such situations during my 22 years as CEO of a science center in a major city. In all three cases I was prepared by my network within a few hours to deal with the press, lawyers, and combative, sometimes angry citizens. We came out in good shape from what could have been existential crises for the institution. My pre-existing network of colleagues and stakeholders made all the difference.)

The likelihood of long-term success is significantly greater for CEO candidates who have all four of these characteristics, and a strong disability in any one of them could prove fatal. Having said all this, I must admit that there are always exceptions, so I offer these thoughts with appropriate modesty. For each of these four characteristics, I can think of at least one individual who lacked that ability yet became a great science center leader. So the board’s judgment should always be the final determinant in the decision to hire a CEO.

If you would like to write about what your institution has learned from a project in exhibit development, education, finance, and/or operations, contact us at dimensions@astc.org (subject line: What We Learned).

Alan J. Friedman (Alan@FriedmanConsults.com) is a consultant for museum development and science communication, based in New York City. He served as director of the New York Hall of Science, Queens, from 1984 to 2006. More of his essays are available at www.FriedmanConsults.com.
The field of media is rapidly changing along with new technologies and ever-evolving audience expectations. Many science centers and museums are at the forefront of these changes, whether they are partnering with local public broadcasting stations or producing their own media offerings in house. In this issue, we examine how science centers and museums are using media (including TV, radio, planetarium shows, and internet platforms) to increase science literacy, deepen engagement, and empower their communities.

QUEST series producer Amy Miller (left) and the KQED camera and sound crew film California Academy of Sciences entomologist Brian Fisher (foreground) for a QUEST TV segment entitled “Ants: The Invisible Majority.” Photo by Sheraz Sadiq/KQED-QUEST
Supporting Innovation in a Changing Media Landscape

By Marti Louw

From its inception in 1983, the Informal Science Education (ISE) program of the U.S. National Science Foundation (NSF) has played a pivotal role in establishing and stimulating innovative science media programming for the nation. From investing in early children’s science TV programming such as 3-2-1 Contact, Bill Nye: The Science Guy, and The Magic School Bus, to launching ongoing adult science programming by supporting NOVA and the National Public Radio (NPR) science unit, to testing the educational potential of emerging media forms such as 3D giant screen films, games, and networked learning platforms—NSF has fostered and continues to cultivate innovative media projects to increase public interest in, understanding of, and engagement with science, technology, engineering, and math (STEM) (caise.insci.org/uploads/docs/Ucko_%20NSFInfluenceonISE.pdf).
In 2007, NSF established the Center for Advancement of Informal Science Education (CAISE) (caise.insci.org) through a cooperative agreement with ASTC, the University of Pittsburgh, the Visitor Studies Association, and the University of Oregon. At CAISE, we aim to foster connectivity, build capacity, and generate resources for the wide variety of ISE sectors, including museums and science centers, out-of-school time programs, youth and community programs, cyberlearning projects, science journalism, and broadcast media.

As part of this field-building work, CAISE has undertaken a series of initiatives targeting needs in the ISE field. Our Media Initiative, launched in 2011, focuses on finding ways to support the collective efforts of producers of NSF-funded science media projects (e.g. TV, radio, films, games, and online platforms) to understand and articulate the impacts of media-based projects on science interest, learning, and engagement for diverse learners and networked users.

Many recently funded media projects in the NSF ISE portfolio show synergistic cross-sector collaborations, including museum-media partnerships, which seek to increase the reach and relevance of these projects to broader audiences. Recent examples include WNET’s The Human Spark series on PBS (www.pbs.org/wnet/humanspark), which worked with science museums to design complementary local engagement initiatives (informalscience.org/research/show/5352) and Ice Stories (icestories.exploratorium.edu/dispatches), led by San Francisco’s Exploratorium, which trained scientists in media production skills so they could produce live dispatches and web-based media about polar research activities and findings.

THE CAISE MEDIA CONVENING

Mass media, as an important sector of ISE, is currently experiencing significant upheavals as the notions of audience, engagement, participation, and learning continue to evolve with emerging (and sometimes disruptive) information and communication technologies. New digital production tools, distribution platforms, and social media services, coupled with a proliferation of media devices, are...
both democratizing and challenging traditional STEM media making.

Large media projects seeking NSF funding have become increasingly complex as proposers seek to 1) complement their traditional core science programming in radio, TV, or film with participatory cyber-learning and educational gaming opportunities; 2) maintain complex partnerships; 3) plan authentic opportunities for public engagement; and 4) push the uncertain boundaries of social networking. Meanwhile, a cohesive body of evidence describing the impact of these various science communication and learning strategies is just beginning to emerge.

In order to better understand a complex media landscape and its implications for ISE, CAISE convened 20 ISE field leaders in science media production, policy, research, and evaluation to identify critical action areas and strategy for our Media Initiative. These leaders gathered at the CAISE Media Convening (caise.insci.org/activities/media) on July 12 and 13, 2011, to think strategically about: 1) identifying ways to foster more coordination, collaboration, and community among ISE media professionals and with other sectors focused on informal STEM learning; 2) strengthening our evidence base and communicating the value of ISE media projects to a diverse set of constituents; and 3) navigating future directions in science communication, media, and learning.

The convening strove to include a diverse and representative set of ISE media professionals representing TV, radio, film, giant screen, and online formats, most with active NSF project awards underway. To achieve a diversity of perspectives, we gathered first-time and prospective grantees as well as veteran principal investigators (PIs) in ISE media. We invited both institutional and independent producers from across the United States who represented a range of audience types (such as youth, adults, online, and underserved). We also brought in a small set of informed outsiders—including media researchers, evaluators, and leaders in public media—to keep our conversations informed by new research and policy directions.

Matt Nisbet, a science communication expert from American University, gave a keynote presentation to provoke discussion around how to define and frame impacts for science media projects. He urged the group to consider public engagement, convening events, community capacity-building, and personal and collective decision-making with science topics, as both measurable and important impacts.

**OUTCOMES AND ACTION AREAS**

An important outcome for the CAISE Media Convening was to identify and prioritize critical issues faced by STEM media producers, and then to develop a set of shared objectives around which participants and the broader field could collectively begin to organize themselves. Participants clearly identified needs such as wanting to learn more about each other’s projects, building a better evidence base to articulate the impacts and value of ISE media, and finding ways to bring more young and diverse professionals into the producing community.

Some participants suggested we should think more deeply about and reconceive our notions of audience, while others pushed for more experimentation with engagement strategies. Some advocated strongly for more innovative uses of social media technologies to reach underserved, niche, and networked learners. After two days of lively conversation, convening participants formulated three areas of action.

**Action Area 1: Fostering a Community of Science Media Professionals**

There was unanimous consensus among the attendees at this convening that ISE media professionals would benefit greatly from the development of a more cohesive professional community or network, where, at present, no formal organization, professional society, nor annual gathering is seen to exist for STEM media that cuts across formats. It was noted that this was the first time some of the most active members of the ISE media community had come together to exchange ideas, learn about one another’s projects, and discuss possible collaborations. Participants
agreed on the great value a regular meeting event would have, and made reference to the many benefits the ASTC Annual Conference brings to the community of science center and museum professionals. While instigating the creation of an organization for STEM media professionals and a series of annual or semi-annual gatherings was seen as high priority, participants also raised several other issues for consideration:

- Identifying a STEM media community. How should “media” be defined and what are the implications of defining the term either too narrowly or too broadly?
- Finding ways to recognize best practices and reward excellence
- Developing ongoing training and professional development opportunities with the support of an online presence/community
- Ensuring the inclusion and participation of young, diverse professionals in the community through special initiatives and earmarked support
- Sponsoring strands and sessions at other professional meetings that build off the CAISE Media Convening agenda and support cross-sector connections.

**Action Area 2: Building Shared Evidence of Impact**

Attendees generally agreed that ISE media professionals need to be better able to articulate the value and impacts of their STEM media projects to a diverse set of stakeholders, including public audiences, funders, and policy makers. The following objectives were generated to address this perceived need:

- Gather evidence of audience impacts from PIs across the ISE media field
- Create a statement from the science media field about the impact of our work
- Consider developing a common set of questions and possibly framing a broad research and evaluation agenda for ISE media projects.

**Action Area 3: ISE Media Awareness Campaign**

Attendees at the CAISE Media Convening discussed the need for a communications strategy that defines stakeholder audiences and tells a compelling story of the impact and value of ISE media. The strategies discussed included:

- Raising the awareness and visibility of ISE media and, more generally, ISE projects
- Developing distribution channels to seed the science media story
- Seeking funding to plan a meeting around this topic to broaden participation, partners, and sponsorship of an ISE communications plan.

**NEXT STEPS**

Several CAISE Media Convening participants joined together around the first action area to submit a conference planning grant, which was successfully funded. The aim is to lay the groundwork for creating a professional organization and a series of gatherings that bring together the increasingly diverse array of professionals who make science media. Leading this endeavor is Richard Hudson, director of science production at Twin Cities Public Television, with JoAnna Baldwin Mallory, president of Center for Science and Society, and Ari Epstein, director of the Massachusetts Institute of Technology’s Terrascope Youth Radio.

Progress on these strategic goals will be shared via caise.insci.org, professional networks, and conferences. To learn how to get involved in CAISE’s Media Initiative, contact Sue Ellen McCann (smcann@kqed.org) or Jamie Bell (jbell@astc.org). ■

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Partners on a Science QUEST

By Sue Ellen McCann

When KQED, San Francisco’s public broadcasting station, launched QUEST (science.kqed.org/quest) in 2006, it became the organization’s largest project to fully integrate a multimedia design of all of its four content platforms—radio, TV, web, and education—into a single project. Each platform had editorial input from the early stages of story idea development to distribution.

But for KQED, what was really revolutionary about the project was its “fifth platform.” Twelve community science and environment organizations—including science museums, research centers, zoos, parks, and aquariums—were invited to participate in the project. These partners worked to achieve QUEST’s goal of raising science and environmental literacy in the community by acting as experts, contributing story ideas, coordinating events and education opportunities, and showcasing the project’s media in their institutions, on their websites, and in their classrooms.

A SHARED COMMITMENT
These partnerships were novel and uncharted territory for KQED, but quickly became an essential part of QUEST’s Northern California science and environment project. QUEST is now in its sixth year, and the partnerships have grown to include seven additional organizations with a shared mission to serve science literacy and education in the community.

There were some bumpy times in early partnership conversations, but a shared commitment to community service kept the group coming back to the table. Early tensions surfaced on the value of hands-on learning versus learning through media, potential replication of services and content, and the possibility of competing for the same funding resources. But as the group members got to know each other and the work of each organization, a more comprehensive picture emerged of the unique and differentiated services each organization provided. There was overlap, but it became clear that collectively, the partners would have a bigger impact in the shared goal of greater science literacy. Now the QUEST team can’t imagine doing its work without the partners.

A CROSS-PLATFORM APPROACH
From the beginning, KQED convened conversations with the science community and informal science educators in designing the QUEST project. Very quickly, it became apparent KQED wasn’t going to be producing just a TV program as originally envisioned, but a project that would bring a cross-platform approach, under a shared set of editorial guidelines and direction, along with community involvement.

The project creates TV and radio programming, original web content, and educational learning objects and services. The content is made available for embedding on partner websites, for exhibition at partner locations, for conferences, and for film festivals. Social media opportunities are used to cross-connect audiences through posts on news and events related to the partners and also through photo contests and quizzes.

In this QUEST TV production still, a graduate student from the lab of Professor Daniel Costa at University of California Santa Cruz prepares to remove a satellite tag from a female northern elephant seal at Año Nuevo State Park. Photo by Amy Miller/KQED-QUEST
Sue Ellen McCann (smccann@kqed.org) is executive producer, science and environment, at KQED, San Francisco. QUEST’s Community Partners include the Bay Institute; the California Academy of Sciences; Chabot Space & Science Center; the East Bay Regional Park District; the Exploratorium; the Girl Scouts of Northern California; the J. David Gladstone Institutes; Golden Gate National Parks Conservancy & the National Park Service; the Lawrence Berkeley National Laboratory; the Lawrence Hall of Science, University of California, Berkeley; the Monterey Bay Aquarium; the Monterey Bay Aquarium Research Institute (MBARI); the Oakland Zoo; the Precourt Institute for Energy at Stanford University; the Tech Museum; the University of California, Berkeley, Natural History Museums; the University of California, San Francisco, Bay Area Science Festival; the U.S. Geological Survey; and the Woods Institute for the Environment at Stanford University.
Influencing Change:
Community Initiatives Are not Museum Projects

By Ayesha Rowe and Hooley McLaughlin

On New Year’s Day, Jamahl Franklin, age 20, was murdered at a house party in Toronto, Ontario, Canada. He had grown up and lived in Flemingdon Park, a highly diverse Toronto neighborhood across the street from the Ontario Science Centre. There, he and his friends formed the nucleus of a mutually supportive group of young people brought together by their love of music and spoken word.
After Jamahl’s death, the group held a benefit concert of hip hop music—which had been created by and with Jamahl (also known as Wizzle) during his life—to raise money for his family and his funeral. Some of these same young musicians are part of the Flemo City Media youth advisory group, the Youth Engagement Leaders. They are currently involved in intense discussion about the governance of a planned shared space for youth programs that will foster community engagement, reduce the sense of youth isolation, and build skills that will enable further education and future employment.

Flemo City Media is a non-profit organization that has been busy influencing change in Flemingdon Park and surrounding communities since its inception in 2006 when it began receiving funding from the Toronto-based Youth Challenge Fund that supports grass-roots initiatives in priority neighborhoods. Using media arts as a youth engagement tool, the organization reaches youth from some of the most marginalized neighborhoods in Toronto. It offers opportunities to explore web development, music production and recording, leadership training, and our cornerstone: radio broadcast. Now an independent, community-run organization managed by Executive Director and co-author Ayesha Rowe, Flemo City Media has its roots in an experiment that led to a unique relationship between the Ontario Science Centre and the Flemingdon Park community.

ORIGINS AND EVOLUTION

In 1997, co-author Hooley McLaughlin of the Ontario Science Centre conceived of the idea of teaching neighborhood youth to make their own radio transmitters and helping them start a community-built radio station. Many of the youth in Flemingdon Park were not going to the science center. The idea of helping them to break into science and technology through the back door was appealing.

After a number of attempts at getting an initiative started, in early 2004, science center staff started meeting with a small group of young people once a week to teach basic radio technology and to work together on building a radio transmitter that could broadcast a very short distance on the FM dial.

After months of classes, we had our first broadcast in late 2004. But our enthusiasts from the community were not content to stay in a back room with soldering irons, talking about wave forms. It is significant that the majority of the early participants in this experiment were musicians focused on African-Canadian urban music. They were modern troubadours. Their poetry told of street life in the diverse communities of Toronto.

The science center replaced electronics experts with staff that could teach computer skills and DJ techniques. We moved from the science center back rooms to the Flemingdon Park community resource center. For several months, open-mike sessions allowed young people to express themselves.

Ontario Science Centre staff worked with young people in Flemingdon Park to build a radio station in 2004. Photo by Kathy Nicolaichuk, Ontario Science Centre
with hip hop and reggae, or with dub poetry (performances that combine spoken word poetry with reggae rhythms). Broadcast distances were limited to the building itself, to keep in line with the rules set down by the Canadian Radio-television Telecommunications Commission. Although many of the young people involved wouldn’t cross the street to come into the science center, this initiative captured their interest—and the prospect of extending the science center’s activities beyond its walls to reach youth from marginalized neighborhoods excited the science center staff, as well.

In 2006, a small group of young adults and teens, who would later become the board of directors and the youth staff of Flemo City Media, started to come regularly. They asked if they could put together a radio program. The program included commentaries on local events and sports and featured original music produced and recorded in the music studio that the science center built for the radio station. (This same music studio was later used by Jamahl and his friends to create the music that was subsequently performed at the benefit concert for his family following his death.)

At a session in late October 2006, a singular event occurred. Frustrated by what was perceived as the science center’s delay in installing an aerial to allow for a clear broadcast signal, the youth group seized control of the radio station. In one moment, the station crossed over from being a science center activity to being an autonomous community-run initiative. Most notable is how quickly people stopped talking about it as a science center project and started to realize that the real roots lay within the community itself. The science center authority had been overthrown. This was success—a bittersweet realization that true community initiatives are not museum projects.

The Ontario Science Centre has learned an interesting lesson in allowing the community to take charge and set the directions. This experiment is a model for community engagement in the future. We learned that even though a project may be carefully conceived and nurtured by science center experts, its ultimate success depends on leadership from the community. Projects take root only when the participants feel a sense of ownership. This is often difficult for institutions to accept, and we were not exempt from feelings of surprise and even hurt when we were first asked to step down from project leadership. But those feelings of upset were soon replaced with pleasure when we saw the new Flemo City Media organization emerge with strong leadership and a determination to work for the benefit of everyone in the community.

A CENTER FOR YOUTH

Toronto, a city with one of the lowest rates of violent crime on the continent, has nevertheless had a recent surge of violence involving youth in transitional communities such as Flemingdon Park. The Flemo City Media family has lost three young men to gun violence in the past 18 months.

The soon-to-be newly renovated Flemo City Media Studio and Youth Centre for Opportunities—slated to open later this year, in the Dennis R. Timbrell Resource Centre, with support from the Youth Challenge Fund and the Jays Care Foundation—will become a force for systemic change. Led and directed by the young people themselves, the Studio and Youth Centre will be a platform for discussion and change, empowering and mobilizing young people to work together on community development. With the memory of their friend and colleague Jamahl in mind, Flemo City Media’s board, staff, and Youth Engagement Leaders are creating a legacy of opportunity for the youth of the future.

In memory of Dianthony Evans, Melvin Gomez, and Jamahl Franklin.

Ayesha Rove (arowe@flemocity.com) is executive director of Flemo City Media in Toronto. Hooley McLaughlin (hooley.mclaughlin@osc.on.ca) is vice president of science experience and chief science officer at the Ontario Science Centre, Toronto.
Science Centers as Science Media Centers

By Morten Busch

Experimentarium in Hellerup, Denmark, is trying to make a difference in the field of science communication. Every Sunday, Experimentarium produces an hour-long program, Third Planet from the Sun, on Radio24syv, heard nationwide by Danish listeners. Experimentarium creates WebTV movies to accompany international press releases from the University of Copenhagen. And Experimentarium’s journalists write two science articles for each issue of Ud & Se, one of Denmark’s most widely read monthly magazines.

Experimentarium has truly become a multimedia science center. But why, and how?

Experimentarium began in 1986 as a nonprofit, independent institution. Its mission is to increase public interest in science and technology, particularly among young people, and to promote knowledge of methods and results in science.

In 1991, Experimentarium opened its exhibition center in Hellerup, near Copenhagen, and has since had more than 7.2 million visitors. From the beginning, Experimentarium’s goal has been to present interactive, hands-on exhibits. However, by 2001, most other Danish museums had adopted Experimentarium’s interactive nature—hands-on exhibits had become mainstream in Denmark.

Therefore, Experimentarium refocused its goals to undertake other tasks that meet the institution’s mission statement. Our strategy was to become a multimedia communications center. Since 2002, Experimentarium has worked diligently to communicate through all available media. Whereas we previously focused on exhibitions, the new strategic focus is to disseminate science via TV, radio, the internet, printed articles, educational materials, school competitions, and continuing professional development for teachers, researchers, and journalists. Of course, we still produce interactive exhibits.

SLOW NEWS
A key step in this new strategy was to establish a news department in 2008. Through grants from two Danish foundations, Novo Nordisk Foundation and Knud Højgaard Foundation, Experimentarium created a news production facility and engaged two science journalists and a manager to turn the plans into reality.

First and foremost, the role of Experimentarium journalists is to improve the quality and quantity of communications about science research results—both Danish and international—in the media. From the beginning, we decided that our reporters would write articles based on the original science behind each news story. This decision was partly to ensure the credibility of the news stories, but also to cultivate the kind of stories that regular reporters didn’t already write. We choose the scientific stories that are not obvious news stories but that have a good hidden story. We call these stories “slow news.”

To begin news production, Experimentarium contacted media outlets about their interest in our news articles and quickly established several important contacts.

At Experimentarium, a demonstration of the effect of dry ice in water is filmed for a WebTV movie. Photo by Kristoffer Lottrup
Our news department has become a resource for Experimentarium’s other projects, such as our exhibitions, which are now updated with the most current research results.

Since 2008, Experimentarium has contributed three science news stories to each issue of the Danish weekly newspaper *Weekendavisen*, with an Experimentarium Research byline. We also write for other newspapers such as *Jyllands-Posten* and provide news articles accompanied by WebTV movies to the web portals Ritzau and Videnskab dk. An example WebTV movie is available at news.ku.dk/all_news/2011/9/aboriginals-get-new-history/. Because we have our own recording and filming equipment (handheld camcorders), our journalists are able to work in multimedia to create written, radio, and TV pieces about the same story.

The funding grants made it possible for Experimentarium to establish its news production facility without having to depend initially on the revenue from delivering articles to the media. However, we’ve always contributed our services to media that pay, because good science journalism costs money.

**BROADENING OUR REACH**

In addition to fulfilling Experimentarium’s purpose and creating revenue, our news production has strengthened Experimentarium’s brand. After four years of regularly contributing to many Danish media, Experimentarium has become such a well-known and reliable supplier of science news that we are now being approached by many different institutions. For example, the University of Copenhagen uses our expertise in WebTV to promote its research internationally in press releases (e.g., see www.eurekalert.org/multimedia/pub/40739.php?from=204906). We also assist patent agencies, foundations, and businesses to communicate difficult research issues by writing articles and arranging events.

We teach “science communication” at the Danish School of Journalism in Aarhus, and we teach students and researchers at Danish universities how to communicate their research and also how to work with media. Our journalists have taught at the University of Copenhagen, University of Southern Denmark in Odense, and Lund University in Sweden.

Our news department has become a resource for Experimentarium’s other projects, such as our exhibitions, which are now updated with the most current research results. We also write newsletters with scientific news stories for our visitors, and our project managers now use WebTV movies to document visitor responses to their projects.

**BUILDING A BRIDGE**

On March 1, 2012, Experimentarium expanded its activities to become a media center with eight full-time journalists earning their own salaries through news production, consulting, and internal project assignments. News production has become a core business at Experimentarium.

The ultimate goal is to transform the media center to have a mediator role and build a stronger bridge between Danish research institutions and the media. Along with our teaching activities for researchers and journalists, we have also organized “speed dating,” where scientists and journalists meet in an informal setting. We plan to build databases that will allow the media center to get rapid responses from scientists about news stories such as genetically engineered organisms, climate change, stem cells, and future technologies.

Experimentarium’s goal is to play an active part in bringing balance to public discussions and debate to help society make the right decisions about issues rooted in science.

**Morten Busch** (mortenb@experimentarium.dk) is head of the media center at Experimentarium in Hellerup, Denmark.
“Ideas Worth Spreading”: TEDxColumbus at COSI

By Andy Aichele

Last November, hundreds of people attended two TEDx events at COSI in Columbus, Ohio. They listened to and engaged with speakers exploring topics ranging from modern urban violence to the future of architecture, from hospice care in South Africa to the habits of wasps in California. And with provocative titles like “Eat the Eyeball,” the topics were definitely engaging! The audiences were also treated to dynamic performances by dancers, poets, and a band offering up “musical gumbo.” They even experienced COSI’s own demonstration of exploding hydrogen balloons, synchronized to the cannon fire of Tchaikovsky’s 1812 Overture.

TEDx events (www.ted.com/tedx) are independently organized by communities, organizations, and individuals to stimulate dialogue at the local level. These events are licensed by TED (www.ted.com), whose conferences highlight presenters from the worlds of Technology, Entertainment, and Design. TED talks feature “ideas worth spreading” and are widely watched around the world through online broadcasts.
TEDxCOLUMBUS

TEDxColumbus (www.tedxcolumbus.com) was launched in 2009 with a half-day program hosted by the Wexner Center for the Arts at the Ohio State University. The event grew in 2010 and was hosted by the Columbus College of Art and Design. As the energy around TEDx increased, the conference needed a new, bigger venue in 2011. We at COSI were approached to be not only the venue, but also the host partner, collaborator, and fiscal agent. The third annual TEDxColumbus, celebrating “A Moment in Time,” was presented on November 11, 2011, with around 600 participants and 15 speakers and performers. In accordance with TEDx guidelines, each presentation was no longer than 18 minutes.

Ruth Milligan, TEDxColumbus curator, met with COSI education, development, strategy, finance, and facility rental teams early in 2011 to create a true partnership event. We at COSI were approached to be not only the venue, but also the host partner, collaborator, and fiscal agent. The third annual TEDxColumbus, celebrating “A Moment in Time,” was presented on November 11, 2011, with around 600 participants and 15 speakers and performers. In accordance with TEDx guidelines, each presentation was no longer than 18 minutes.

Ruth Milligan, TEDxColumbus curator, met with COSI education, development, strategy, finance, and facility rental teams early in 2011 to create a true partnership event. “COSI provided a dynamic environment and assisted in creating unique experiential programming that added great value to TEDxColumbus,” Milligan states. COSI served as the fiscal agent for the TEDxColumbus organization, so that sponsorship, funding, and underwriting from organizations such as the Columbus Foundation could “pass through” COSI’s finance department to support the event. By donating the space for the event, COSI was able to expand its reach to a new adult and corporate audience.

Kim Kiehl, COSI senior vice president and chief strategy and operations officer adds, “Partnering with events like TED helps the public see us as contributing to our community in a broader way—as a place that stimulates and hosts all types of intellectual conversations and interactions rather than those only associated with traditional science museum topics. In addition, it brings people to the museum who may not have thought of coming on their own.”

The ticket price for the attendees included parking, lunch, and some special COSI experiences, such as the demonstration of exploding hydrogen balloons (which, incidentally, took place at 11:11 a.m. on 11/11/11—a true “moment in time.”) Attendees also had the opportunity to explore COSI’s exhibits during two breaks.

Milligan and the TEDxColumbus team worked with local and regional vendors to bring in seating, staging, lighting, and sound to complement COSI’s systems. Because the true legacy of TED events is the ability to view talks online after the event, we also engaged COSI in-building partner WOSU Public Media, Columbus’s and Ohio State University’s Public Broadcasting Service affiliate, to record and webcast the video content.

ENGAGING YOUTH

Early in the planning process, Milligan approached COSI with an additional opportunity—the possibility of launching the inaugural TEDxYouth@Columbus. This event would mirror the structure of the TEDx event, targeted at a youth audience. COSI saw this as a unique opportunity to engage with teens and college-age students in central Ohio’s first-ever TEDxYouth event, while using the same stage, seating, video capabilities, and financial and staff support as TEDxColumbus. Milligan held the license for TEDxYouth@Columbus and tapped school designer and youth advocate Christian Long and me as the two co-curators for the youth event.

We began our planning late in May 2011 with the goal of producing a half-day event with speakers and performers, followed by an intensive two-hour mentoring session with local adults who could guide the youth participants, or “change agents” as we dubbed them, in developing and pursuing their own “idea worth spreading.” We formed a committee with adult mentors and youth participants (including members of COSI’s Teen Advisory Council and Volunteer Program) to plan, market, and deliver the event. Change agents were
middle school or high school students who applied via the TEDxColumbus website with an idea of how they wanted to change their school, neighborhood, community, or the world, ranging from planning neighborhood crime prevention events to raising awareness around social issues like child abuse.

Speakers and performers also applied via the website and were then invited to audition. Speakers were coached on constructing and delivering their talks, which focused on an idea that originated when each speaker was between 14 and 25 years old. Most presenters were high school age and included performers from programs at a local community center. Speakers also included two COSI team members: Shashank Sirivolu (Teen Advisory Council member) and Justin Boggs (part-time floor faculty member).

The inaugural event on November 10, 2011—the day before TEDxColumbus—was a resounding success with around 100 change agents, 20 adult mentors, and 24 speakers and performers. Long is following up with the change agents through 2012 to track progress on their ideas. Videos, bios, and event descriptions for both TEDx events are available at www.tedxcolumbus.com.

LOOKING AHEAD
With the success of these events, and the feeling that TEDxColumbus and TEDxYouth@Columbus have found a new home, the dates for 2012 have already been set. COSI will again serve as host partner with the youth event on October 3 and the adult event on October 5. Milligan has transferred the license for TEDxYouth@Columbus to me so that COSI can be even more deeply engaged. COSI will again serve as fiscal agent for the events. The events will be part of a week of events at COSI focused on the City of Columbus’s bicentennial celebrations, and are one week before the 2012 ASTC Annual Conference comes to Columbus on October 13-16!

GETTING INVOLVED
Anyone or any organization can apply for a TEDx license. Events can be big or small, covering a single classroom or an entire metropolitan area. The TED website (www.ted.com/pages/organize_tedx_event) provides guidance on how to build an event. An important step is to determine the scope and select partners in the community who will help your TED event meet your goals.

Andy Aichele (aaichele@mail.cosi.org) is director of COSI University at COSI, Columbus, Ohio, and co-curator of TEDxYouth@Columbus.
At over 50 million people, the Latino population is now the largest ethnic minority group in the United States, but Latinos and especially Latinas are vastly underrepresented in science, technology, engineering, and math (STEM) professions. Science centers have been challenged in designing effective strategies for engaging Latino families in science. To help address these issues, SciGirls—a multimedia science education program combining TV, community outreach, and web-based resources—designed SciGirls en Familia to engage Latino families through programs conducted at science centers and other organizations. This article presents some of the lessons learned in engaging Latinas and their families in science.
SciGirls, produced by Twin Cities Public Television in St. Paul, Minnesota, and funded by the U.S. National Science Foundation, encourages children ages 8-13 to make STEM a part of their lives and future careers. Each half-hour episode, broadcast nationally on PBS Kids, follows a different group of middle school girls (not actors). The girls’ passion and their eagerness to understand the world provide an energetic model of inquiry-based science, appealing to tweens, parents, and educators alike. The accompanying website (pbskidsgo.org/scigirls) is a safe social networking site that allows youth to upload and share their own science and engineering projects.

SCIGIRLS EN FAMILIA
Twin Cities Public Television developed SciGirls en Familia with an “air and ground” strategy—combining broadcast media with community-level outreach. Many education initiatives, such as public health campaigns, have found this combination to be effective at achieving significant impacts (e.g., Backmann, 2003). SciGirls en Familia includes Spanish- and English-language versions of the SciGirls video and educational resources and provides professional development for participating organizations to carry out family-focused, inquiry-driven STEM programs.

Over the past three years, SciGirls en Familia, and its parent project, SciGirls en Español, provided 10 science museums with mini-grants, which resulted in training over 100 educators and community leaders. The resulting programs reached 1,200 girls in grades 3 through 8 and over 1,000 family members. (While mini-grants are not currently available, bilingual program resources for girls, parents, and educators are still available at scigirlsconnect.org).

The New York Hall of Science (NYSCI) in Queens, the Imaginarium of South Texas in Laredo, and Explora Science Center in Albuquerque, New Mexico, were among the sites selected to participate. These science centers offered a range of programs to Latinas and their families, including afterschool science clubs, weekend science workshops, and community events, among others.

These three science centers also joined SciGirls staff at the 2011 ASTC Annual Conference to lead the session Engaging Latino Families in Informal Science Programming: SciGirls en Familia. Drawing upon the training, our experiences delivering SciGirls en Familia programs, and the small group work of session participants at the conference, we have compiled guidelines for designing science center programs to engage Latino families:

1. **Build relationships and establish trust.**
   Ask members of the Latino community to help you plan programs. As you build trust with the community, recognize that it takes time. Working with community “gatekeepers” or “cultural brokers” may facilitate the process (Russell and Jimenez, 2009). For example, Explora has built relationships with the Albuquerque school district and with organizations serving the Latino community across New Mexico. These relationships have evolved into two successful programs—Niñas Explorando la Ciencia (Girls Exploring Science, an afterschool program) and Family Science Nights—that have helped to establish trust with Latino families and increase museum attendance by Latino audiences.

2. **Plan for families.**
   Many Latino families use leisure time to promote and build family unity. Informal learning experiences that involve the entire family may be very attractive to Latino families (Russell and Jimenez, 2009). NYSCI offered participating girls take-home activities, engaged families in three successive weekend workshops facilitated by bilingual educators, and provided family memberships.
3. Integrate experiences that are culturally relevant and meaningful.
Infrequent museum goers may believe they need to know the conventions and subject matter of a museum before visiting. Some Latinos may also feel unwelcome in museums because of a lack of cultural relevance (Garibay, 2011). In brief, it is important to present a welcoming environment. At Explora, exhibit signs and educational programs are offered in English and Spanish, and bilingual explainers are always present in exhibit areas. The topics, materials, and language used for Explora’s activities are carefully selected so that all visitors can find something familiar and can make connections with their own experiences. In this way, visitors can take some ownership of their experience, which leads to greater interest in and understanding of the topics.

4. Take science to the community.
In impoverished areas surrounding Laredo, over 70 families from seven different colonias (Latino communities along the Texas/Mexico border) participated in Spanish-language science workshops held at their community centers. The workshops were anchored by SciGirls en Familia inquiry-based investigations. The Imaginarium of South Texas engaged families by facilitating these hands-on science workshops in trusted community organizations and churches. By offering repeat experiences and, in some cases, offering family memberships, participating science centers have built enduring relationships and enjoyed continued participation by these families.

5. Emphasize the program’s educational merit.
Latino parents have high educational aspirations for their children (Zarate, 2007) and are more likely to choose a leisure activity that they perceive has some educational value (Garibay, 2011). Therefore, by emphasizing the educational relevance of the SciGirls en Familia programs, participating science centers found it much easier to engage parents.

Many Latino science professionals have described the importance of teachers and other role models in guiding and supporting their career choices. Girls who participate in Explora’s program Niñas Explorando la Ciencia are introduced to Latina scientists who volunteer their time and knowledge as positive role models. The participating girls start expressing stronger interest in a STEM career path after meeting the scientists. Other programs used the SciGirls videos to showcase Latinas succeeding in STEM.

7. Be willing to try new approaches to programming.
SciGirls en Familia provided professional development to help each participating organization enhance its ability to engage Latino families. For example, a major focus and new approach for NYSCI was to provide one-on-one support for each family. To do so, NYSCI invited Spanish-speaking members of its Science Career Ladder program to serve as assistants in its SciGirls en Familia camp. These high school and college Explainers developed bonds with the families, kept all family members actively engaged, and served as role models for the girls. Also, after the workshops were over, families could return to the science center and see a familiar face.
LASTING IMPACTS
The professional development and bilingual science resources available through SciGirls en Familia have enabled participating science centers to develop effective programs to engage Latino families. The programs have had lasting impacts in two ways. First, evaluation showed that programs positively influenced the students who participated, raised their parents’/guardians’ awareness of opportunities available to their daughters, and increased staff sensitivity to and awareness of Latino families’ needs related to their daughters’ STEM education and careers. Second, participating science centers have strengthened their relationships with the Latino community, have added new dimensions to their family programming, and continue to see greater Latino family participation at their exhibitions and programs.

REFERENCES

Lisa Chappa is former programs director and Melissa R. Cigarroa is former executive director at the Imaginarium of South Texas, Laredo. Jennifer Correa is former senior manager of Explainers at New York Hall of Science, Queens. Derlly González is bilingual science education coordinator at Explora, Albuquerque, New Mexico. Lisa Regalla is manager of science content and outreach and Alicia Santiago is science advisor/Latino outreach specialist for SciGirls at Twin Cities Public Television, St. Paul, Minnesota. Robert L. Russell, senior education associate at the National Center for Interactive Learning/Space Science Institute, contributed to this article. For further information about SciGirls en Familia, contact Lisa Regalla at lregalla@tpt.org.

TIPS FOR WORKING WITH YOUR LOCAL PUBLIC BROADCASTING STATION
• Find a station liaison willing to partner with your organization. Ask for the outreach or community relations department.
• Be specific about your project and the help or relationship you would like.
• Clearly establish the roles and expectations for your organization and the station.
• Determine what resources each partner will contribute.
• Develop a timeline for your project and make sure it doesn’t conflict with other commitments.
• Look for opportunities to tie into existing initiatives and events at the station and your organization.
• Discuss how you will evaluate the success of the project and your partnership.
• Check in regularly to make sure each partner still feels comfortable with the relationship and the project.

IDEAS FOR COLLABORATION
• Cross-promote your project. The station can potentially pitch your project to its press connections. Create a joint press release. Share press contacts for story placements.
• Link your organization’s website to the station’s home page. Provide the station with information about your project to post on its site.
• Work with stations that have joint licenses with radio to create features for local news shows and tie in with public radio.
• Work with the station to feature your project in its printed communications, such as the monthly program guide or members’ magazine.
• Create flyers about your project to include in the station’s membership mailings or to distribute at events.
• Jointly host community events such as the opening of an exhibition or family science event.
—Adapted from Public Broadcasting Service (PBS) materials
The Worldviews Network: Planetariums for Ecological Literacy

By Ka Chun Yu, Healy Hamilton, Rachel Connolly, David McConville, and Ned Gardiner

Planetariums have long been associated with life-changing experiences. Gazing on the apparent motions and patterns of celestial bodies has inspired generations of audiences to reflect upon their place in the cosmos. In recent years, new digital display technologies have expanded our reach far beyond the dome of the sky visible from our Earth-bound perspective. Today, planetariums are full-fledged virtual reality theaters equipped with computer-generated models of planets, stars, and galaxies based on the latest scientific discoveries. By immersing audiences within virtual journeys across vast scales of time and space, today’s planetariums provoke questions regarding the nature of the universe and humanity’s place within it. We use these new capabilities not only to reveal the depths of space, but also to reflect back on ourselves and our home planet.
THE WORLDVIEWS NETWORK

Taking advantage of the unique capabilities of digital dome theaters, the Denver Museum of Nature & Science (DMNS); the California Academy of Sciences in San Francisco; NOVA/WGBH in Boston; design/engineering firm the Elumenati in Asheville, North Carolina; and the U.S. National Oceanic and Atmospheric Administration (NOAA) Climate Program Office in Silver Spring, Maryland, have joined to form the Worldviews Network (www.worldviews.net) through a three-year Environmental Literacy Grant from NOAA’s Office of Education.

The network’s mission: Place Earth within its cosmic context and connect audiences with ecological and biodiversity issues in their backyards. The network launched with partners across the United States, including the American Museum of Natural History, New York City; the Noble Planetarium at the Fort Worth Museum of Science and History, Texas; the Journey Museum, Rapid City, South Dakota; the Bell Museum of Natural History, Minneapolis, Minnesota; the Exhibits Museum, Ann Arbor, Michigan; NASA Goddard, Greenbelt, Maryland; NASA Ames, Mountain View, California; and the National Environmental Modeling and Analysis Center, Asheville, North Carolina.

The project links informal science institutions, researchers, and community-based organizations to create interactive planetarium programs for promoting ecological literacy. We have designed a professional development strategy that supports partners in the areas of technology skills, pedagogy, and content knowledge. Using resources provided online, as well as regular calls with the Worldviews team, partners identify a global change issue that has local impacts and then build a coalition of highly motivated individuals involved in that issue. This blended internal/external team co-constructs a narrative that spans cosmic, global, and local perspectives. Delivering this storyline, the team connects its own target audience with opportunities to engage with issues at the nexus of science and society.

SEE, KNOW, DO

We use a “see, know, do” framework to design the events. “Seeing” involves the creation and presentation of compelling immersive visualizations within the planetarium to engage visitors. For “Knowing,” the narratives are constructed to help visitors understand the web of physical and biological systems that interact on Earth. The “Doing” component emerges from interaction among participants; for example, researchers and nongovernmental organizations help audience members conceive of their own relationship to the highlighted issue and ways they may remain involved in the resolution of problems the audience identifies.

Given the scale and scope of anthropogenic (human-caused) global changes, we have found it essential to provide inspiring examples of how small groups and individuals are addressing complex challenges from whole-systems perspectives. By highlighting examples from the Buckminster Fuller Institute’s Idea Index (www.ideaindex.org) and elsewhere, we demonstrate how organizations around the world are developing and implementing innovative strategies to solve humanity’s problems. Such examples provide a positive heuristic for audiences to gravitate toward as they deepen their awareness of the complexity of the challenges we face on the planet today.

ENCOURAGING DIALOGUE

Given the varying sizes of venues, events may serve from dozens to hundreds of people at a given time. Since external groups participate in the curation of the story and in the dialogues that ensue from public programs, their unique viewpoints propel discussions and lend expert credibility for audience members.

For example, after DMNS’s A Global Water Story dome presentation, 40 audience members moved from the Gates Planetarium to a classroom where the director of a Colorado water education organization led a group discussion. Participants shared perspectives with one another about what they had seen and heard, discussed how it related to their own work and lives, and conferred on strategies for addressing water issues. Such dialogues help audiences remain engaged with network partners and the issues they highlight long after each event.

The DMNS team has also continued to work with its external partners, leading to presentations of its water story via a portable dome to a statewide water congress and a water conservation workshop.

JOIN US

Focusing on Earth might be the most powerful and relevant application of dome technology. Visit us at www.worldviews.net to find an event in your area and to inquire about how our production and professional development models apply to your institution and region.

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ASTC’s staff and board wish to thank our Corporate Partners for their leadership and generosity. We are truly grateful for their visionary support.
The Denver Museum of Nature & Science has received an $8 million lead gift from the Morgridge Family Foundation to support a new $56.5 million, 126,000-square-foot (11,700-square-meter) Education and Collections addition. The project is also supported by the citizens of Denver, individuals, foundations, and corporations, including a 2007 voter-approved bond that is providing $30 million.

The Massachusetts Life Sciences Center has given a $5 million grant to the Museum of Science, Boston, to build the Hall of Human Life, a 10,000-square-foot (930-square-meter) exhibition on biology and biotechnology, scheduled to open in mid-2013. In all, the museum has raised more than $182 million for the new exhibition.

Carnegie Science Center, Pittsburgh, has received several grants, including:

- A total of $1.955 million from title sponsor Chevron and founding partners California University of Pennsylvania, Duquesne Light, Eaton Corporation, LANXESS Corporation, NOVA Chemicals, and PPG Industries Foundation to support the Chevron Center for STEM Education and Career Development

- $764,000 from NASA’s Education and Public Outreach for Earth and Space Science Program to develop SolarQuest: Exploration of the Sun-Earth System, an education and public outreach program in heliophysics (an environmental science that combines meteorology and astrophysics)

- $143,800 from PPG Industries Foundation to develop a new Science on the Road educational outreach show in partnership with the Pittsburgh Zoo & PPG Aquarium.

The William Penn Foundation has given $1.2 million to Drexel University to help underwrite the costs of the university’s merger with the Academy of Natural Sciences, Philadelphia, and to help create a department of biodiversity, Earth, and environmental sciences.

The U.S. National Endowment for the Arts has awarded a $39,000 grant to begin YOU ARE HERE, an artist residency program to develop public art for the new site of San Francisco’s Exploratorium at Pier 15, which is scheduled to open in 2013.

Schenectady Museum & Suits-Bueche Planetarium, Schenectady, New York, has received several grants, including:

- $10,000 from the William Gundry Broughton Charitable Private Foundation, Inc., to help fund FETCH! Lab, which features science and engineering challenges inspired by the TV show FETCH! with Ruff Ruffman

- $7,658 from the New York State Council on the Arts for the Artifact Storage Improvement Project

- $6,840 from the National Institute for Conservation’s Heritage Preservation Program to help improve collections care

- $3,000 from the Nanoscale Informal Science Education Network (NISE Net) to help cover the cost of integrating real-world examples of nanotechnology into the museum’s existing exhibits.

For the third year in a row, Texas’s Fort Worth Museum of Science and History’s Distance Learning program has been named Teacher’s Favorite for Best Multidisciplinary Museum and Organization by Berrien Regional Education Service Agency. The annual awards program is based on votes cast by educators around the world.

The Children’s Museum of Indianapolis has been named the best children’s museum in the United States by Trekaroo, a family travel website, based on feedback from the site’s members.

The Environmental Teen Leadership Program (E-Team) at ECHO Lake Aquarium and Science Center, Montpelier, Vermont, has won the Governor’s award for Youth Environmental Citizenship.

The Academy of Natural Sciences, Philadelphia, has received a Green Power award from Citizens for Pennsylvania’s Future (PennFuture) for its leadership in supporting sustainable energy and for its renewable energy policy.

At-Bristol, England, United Kingdom, has been recognized as Visitor Attraction of the Year at the Bristol Tourism and Hospitality Industry Awards 2011. The center was recognized for its communications, marketing, and customer service.

The Museum of Life, Rio de Janeiro, has received two Interaction Awards (People’s Choice and Best in Category, Engaging) for the Interaction Cubes exhibit in its A Química no Cotidiano (Chemistry in Daily Life) exhibition.
Q&A

Jennifer Stancil

*Interviewed by Joelle Seligson*

Transmedia, or storytelling across multiple platforms, is the biggest trend in media today, according to Jennifer Stancil—which would make her a trendsetter. Before signing on as executive director of education at the Pittsburgh public television station WQED in 2010, Stancil had already experimented with an array of media over nearly 15 years in the museum field, including five years as executive director of the Girls, Math & Science Partnership at Pittsburgh’s Carnegie Science Center. Her goal: to engage youth, especially girls, with science, technology, engineering, and math (STEM). Here, Stancil discusses media’s fast-paced path and how museums and science centers can keep up to speed.

**How have you changed WQED’s educational path?**

Kids from 8 to 18 are consuming 10 3/4 hours of media a day. My calling was to figure out how WQED could help parents, teachers, and kids speak the language of that new media landscape.

We’ve developed a strategy called “iQ: smartmedia” to change the way media is used for education—through gaming; using our radio, TV, and online signals in completely different ways; and integrating the wonderful content we get from PBS [Public Broadcasting Service] in local at-risk communities.

**You earned a degree in biological science. What motivated you to pursue STEM education?**

My high school in Nebraska was great. The value of that culture was being smart. Our prom queen was an engineer and still is today.

Media influenced me, massively. *3-2-1 Contact*, a PBS show, was all about mysteries and science. It held my attention. That combined with the fact that I loved math and things like animal behavior—it was something I felt compelled to do.

**How can new media bolster traditional broadcasts?**

We have a show called *Wild Kratts*. It’s all about animals. We wanted to put clips from that show into the place where they could be most useful. We made *iQZoo.org*, an online and mobile platform. At our zoo in Pittsburgh, after scanning a QR code, you’ll get the PBS video that explains more about that crocodile or walrus you’re seeing. I think that’s the power of media: It’s portable. And so we went from being on the air with *3-2-1 Contact* to being with you at all times.

**How could science centers and museums incorporate a fuller media experience, especially with limited funds?**

It’s really about partnerships. When I worked at Carnegie Science Center, we engaged girls with *Design Squad*, a reality TV show for high schoolers interested in engineering. We brought the cast to a live event where we did fun engineering challenges. We had 5,000 people that weekend. You use television as your marketing point to get people to come into the museum and experience it live.

**What’s next?**

We’ve long looked at science centers as a hands-on environment. What happens when they are also a media-rich environment? What happens when you can scan a code and find out more about an exhibit, or log into a system within a museum and see who else is there that’s interested in robots?

I think many people use media in a way that isn’t educational at a museum. That doesn’t have to be the case. I think we have to ratchet the conversation in a whole different direction. How are you facilitating the use of media in your museum so that so that people can have a deeper learning experience and a deeper social experience?

For a podcast and full transcript of this interview, visit [www.astc.org/blog/category/astc-dimensions/q-and-a/](http://www.astc.org/blog/category/astc-dimensions/q-and-a/).
Blue Telescope uses technology, storytelling, and design to create engaging interactive exhibits and experiences. From multi-touch and mobile apps to games, quizzes, and social interactives, our innovative solutions use the latest technology to educate, communicate, and connect with your visitors.
BESTSELLERS

A Place for Learning Science: Starting a Science Center and Keeping it Running
Sheila Grinell • ASTC (2003)

In this expanded and updated version of her 1992 A New Place for Learning Science, Grinell offers advice based on more than 30 years of experience in the field.

Members: $30 • Nonmembers: $35 • #143 • 130 pp.

Planning for People in Museum Exhibitions
Kathleen McLean • ASTC (1993)

This book provides a broad understanding of the many disciplines needed to produce effective exhibitions, from industrial, graphic, and interior design to writing, editing, psychology, and management. Appendices lay out an approach to exhibition critiques and provide guidelines for using environmentally friendly materials.

Members: $29 • Nonmembers: $35 • #67 • 196 pp.

The Convivial Museum
Kathleen McLean and Wendy Pollock
ASTC (2011)

This book offers reflections about key dimensions of a defining quality of vibrant public places, which the authors call “conviviality”—a welcoming spirit, orientation to the community, comfort, opportunities for social engagement, and places for healing and renewal.

Members: $17 • Nonmembers: $22 • #158 • 200 pp.

SOON TO BE RELEASED

ASTC-ACM 2011 Workforce Survey Report
Co-produced by ASTC and the Association of Children’s Museums (ACM), this report is based on a survey of 155 U.S. institutions and features detailed data on 14 positions, including salaries analyzed by museum size, educational requirements, benefits provided, and turnover rates. Salary information for 10 additional positions, as well as information from CEOs at 25 institutions outside the United States are also included. This source for human resources planning and management also includes a special section detailing staff diversity.

Members: $75 • Nonmembers: $150 • #103-2011

2011 ASTC Statistics Analysis Package
(electronic copy only)

Based primarily on data reported in late 2011 and early 2012 by science centers and museums around the world, this electronic report includes a full-color summary document, graphs in individual files suitable for dropping into digital presentations, and over 40 tables of information on facilities, attendance, membership, employees and volunteers, and finances.

Members: Free • Nonmembers: $50 • #4-2011
BASICS

A Lifetime of Curiosity: Science Centers and Older Adults
Wendy Pollock, editor
ASTC (2009)

A Lifetime of Curiosity offers positive examples, inspirational stories, and resources for museums to expand their engagement with older adult audiences. Enjoy stories by older staff and volunteers making a real difference through their work in and with science museums, highlights of several science museum programs that are popular among older adults, as well as valuable and practical resources you can use, including a checklist and reminders about issues of comfort and accessibility.

2010 Statistics Analysis Package
(electronic copy only)

Based primarily on data reported in late 2010 by 161 science centers and museums, this electronic report includes a four-page, full-color summary document, graphs in individual files suitable for dropping into digital presentations, and over 40 tables of information on facilities, programs, attendance, membership, employees and volunteers, and finances.

Members: FREE  Nonmembers: $50  #4-2010

Collaboration: Critical Criteria for Success
Pacific Science Center and SLi (1997)

This publication is a must for museums engaged in or considering collaboration. The result of a seven-month, 1995 study involving four focus groups and 23 in-depth interviews with professionals from science centers at all stages of development, the book provides seven assessment criteria for choosing a project and 12 keys to successful collaboration.


Business Planning for New Facilities
(electronic copy only)

Whether starting a new science center or expanding an existing one, a sound business plan is vital to success. This ASTC Bulletin describes why and how to create one and includes a sample plan.

Members: $10  Nonmembers: $15  #111  26 pp.

SPECIAL BUNDLES!

Visitor Voices in Museum Exhibitions and the companion volume, The Convivial Museum, at a discounted price.
#159 • Members: $33 • Nonmembers: $41

Science on Stage Anthology and The Passionate Fact: Storytelling in Natural History and Cultural Interpretation at a discounted price.
#164 • Members: $20 • Nonmembers: $26

RESEARCH AND EVALUATION:

Communicating Controversy: Science Museums and Issues Education
Issues Laboratory Collaborative (1995)

The Issues Laboratory Collaborative found that the public wants to see controversial exhibits, as long as the museum shows both sides of the issue. Communicating Controversy indicates how museums can examine controversial issues without themselves becoming the focus of the controversy.

Members: $10  Nonmembers: $15  #83  36 pp.

Questioning Assumptions: An Introduction to Front-End Studies in Museums
Lynn D. Dierking and Wendy Pollock
ASTC (1998)

“Front-end studies”—research done at the onset of the planning process—can help museums to build bridges between themselves and visitors. This volume, based upon dozens of studies in the field, guides the reader through the planning process.

EDUCATION

**Girls at the Center: Girls and Adults Learning Science Together**

Dale McCreedy and Tobi Zemsky


The result of a four-year collaboration between the Franklin Institute Science Museum and the Girl Scouts of the U.S.A., this guide features tested programs and ready-to-use materials on six basic science themes for girls ages 5–10 and 11–14. Museums are using the curriculum in their scout programs and with homeschoolers and families to cultivate intergenerational learning and interaction.

Members: $20

Nonmembers: $24

#145 • 226 pp.

**Science Center Know-How**

Pacific Science Center (1996)

Science demonstrations, science exhibits, special event plans, and enrichment class curricula make this an ideal publication for those who are just starting a science center or want to infuse new life into their present programs. This publication grew out of the NSF-funded Science Carnival Consortium Project at Pacific Science Center.

Members: $20

Nonmembers: $35

#99 • 275 pp.

**In Their Own Voices**

Minda Borun, et al.

The Franklin Institute (2011)

*In Their Own Voices* is the story of 13 families from the African-American, Latino, and Asian communities who have been actively involved in grant-funded outreach programs for nearly two decades. These programs are the work of the Franklin Institute, the Academy of Natural Sciences, the Academy for Aquatic Sciences, and the Philadelphia Zoo, working with community partners.

Members: $15

Nonmembers: $19

#160 • 70 pp.

**Math Momentum in Science Centers**


*Math Momentum in Science Centers* is based on the experiences of 13 U.S. science centers and aquariums that took on the challenge of making mathematics not only more visible in their institutions, but also more engaging, inquiry based, and broadly accessible. It emphasizes the central role in scientific inquiry of making measurements, analyzing data, and recognizing patterns.

Members: $12

Nonmembers: $15

#151 • 168 pp.

**Science on Stage Anthology**

Tessa Bridal and Susan McCormick, editors
ASTC (1991)


Members: $10

Nonmembers: $14

#51 • 128 pp.

**The Passionate Fact: Storytelling in Natural History and Cultural Interpretation**

Susan Strauss


Susan Strauss shows how good storytelling weaves a magical web around scientific facts and theories. Strauss uses examples from Native American myths and legends, stories told by friends and colleagues, and anecdotes from her work as a storyteller at the Smithsonian Institution’s National Museum of Natural History and the National Park Service.

Members: $10

Nonmembers: $14

#51 • 128 pp.

**NEW!**

If you are a student with a valid student ID, please take advantage of our discounted student rate! You’ll only pay the ASTC member rate!
The ASTC Exhibit Cheapbooks
Paul Orselli
Shrink-wrapped and hole-punched to fit into a three-ring binder, these three collections of inexpensive exhibit ideas are perfect for small museums and exhibit developers on a budget. Each volume provides construction tips and exhibit schematics for 30 time-tested interactive exhibits.
Members: $10 • Nonmembers: $12
Cheapbook: A Compendium of Inexpensive Exhibit Ideas #89 • 69 pp.
Cheapbook 2: A Compendium of Inexpensive Exhibit Ideas #125 • 49 pp.
Cheapbook 3: A Compendium of Inexpensive Exhibit Ideas #150 • 55 pp.

Experiment Bench: A Workbook for Building Experimental Physics Exhibits
Colleen M. Sauber, editor
Science Museum of Minnesota (1994)
The Science Museum of Minnesota’s Experiment Gallery has been praised for giving visitors more control over exhibits. Experiment Bench describes 10 benches, including components, construction diagrams, suppliers, and text. Includes critiques of and suggestions for improving each exhibit.
Members: $28 • Nonmembers: $35
#78 • 215 pp.

Fostering Active Prolonged Engagement: The Art of Creating APE Exhibits
Thomas Humphrey, Joshua P. Gutwill, and the Exploratorium APE Team
The Exploratorium (2005)
This book documents the exploration and findings of the Exploratorium’s NSF-funded Active Prolonged Engagement (APE) project. It includes 15 “APE Tales” (exhibit recipes with photos, drawings, and detailed construction specifications); discussions about setting explicit goals for visitors’ exhibit experiences; research and evaluation methods and results; and lessons learned for building constructivist-style exhibits.
Members: $19 • Nonmembers: $23
#205 • 144 pp.

Visitor Voices in Museum Exhibitions
Kathleen McLean and Wendy Pollock, editors
ASTC (2007)
This timely survey examines ways that museums are incorporating user-contributed content in exhibitions and other media. Overviews by the editors and 29 other articles describe a variety of experiments—from comment books to sticky notes, video kiosks to blogs—dating from the 1970s to the present. For professionals and students alike, Visitor Voices offers inspiration, food for thought, and practical advice.
Members: $20 • Nonmembers: $23
#152 • 168 pp.

Architecture and Exhibition Design: A Survey of Infrastructure
Charles H. Howarth, Jr., and Maeryta A. Medrano
ASTC (1997)
An ASTC Bulletin that provides guidelines for designing a science center, including ceiling heights, floor loads, lighting systems, electricity, and more. Ten case studies show how the guidelines work in the real world of science-center construction.
Members: $10 • Nonmembers: $15
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