

## Comment

### SCIENCE FESTIVALS

# When science makes us who we are: known and speculative impacts of science festivals

**Ben Wiehe**

*ABSTRACT: Science festivals (or just “festivals”) are currently ascendant in the United States with more than 40 new initiatives emerging in just the past 5 years, but their story is not so easily told. The schedule of any one individual festival may contain a staggering array of events, and each festival is different both from year to year, and from other festivals. One multi-festival evaluation points to potential strengths of the format, as well as the importance of the participation of STEM practitioners. Collaboration and social identity formation are considered as powerful festival impacts, and potential challenges for festivals are discussed.*

### Introduction

Thick smoke swirled around scattered encampments as I turned my back on the drums and hollering. Cries of “Let’s go state!” could still be heard rising from the clamor behind me. A procession of energetic cheerleaders, giant mascots, an orderly marching band, and an entire football team had just departed the tent city for a huge stadium across a sprawling parking lot.

The Arkansas State University homecoming football game, an annual tradition drawing almost 30,000 fans, would soon begin. But many of us were going into our fifth hour of pre-game tailgating (an American sports tradition named after the open back tailgates of the pick-up trucks at these pre-game parties). For me much of that time was spent in and around a science tailgating tent set up for the inaugural Arkansas Science Festival.

The science tent was doing a brisk business when I returned from the parade. Crowds flowed past as they headed from the tent city to the game, and exhibitors inside busily facilitated hands-on experiences with a renewed sense of urgency. Bubbles from a demonstration floated into the crowds. A gaggle of young girls shrieked with delighted disgust as biologists helped them handle native fish and insects. A ring of onlookers gathered around a large electric tricycle. They were out of hot dogs at the solar cooker.

In the center of the tent an organizer of the festival was surveying the scene with a counter in her hand. While attending to the chaotic needs of the tent she was trying to apply a consistent methodology for tracking the number of attendees. With engagement

ranging from getting elbows-deep into an interactive to simply lingering outside the tent and peering in, determining who counts was proving to be less than straightforward.

In front of the tent I checked in with a professor who had brought a burst of enthusiasm with him earlier in the day. His demeanor was now muted as he recounted the reaction of a senior administrator that had just stopped by. The science tent had taken a tossing game that was prevalent throughout the tent city and adapted it into a lesson on perception. Gazing upon this the administrator had quipped, “I thought this was a science tent. Why are you playing games?”

A few minutes later, I was helping to disassemble the exhibits when I overheard a woman speaking loudly into her phone in a pronounced Arkansas accent. “I know,” she was responding, “I know. I’m at the science tent, I’ll be right there.” I was struck by the ease with which she said this. The science tent was a new experiment on the part of the Science Festival to make the best of a crowd assembled for beer, food, partying, and American football. I wondered if the person on the other end of the phone just took it as completely natural that there is now science in the homecoming tailgate tent city.

At this point the Arkansas Science Festival was barely 24 hours into its eight-day schedule. The day before over 1,000 people (in a city of around 70,000) paid admission to see men in chainmail Faraday suits get shocked with a million Volts of electricity while playing classic rock covers. The discharges were modulated such that the lightning itself served as the guitar amplifier, belching out melodies at a deafening volume. The crowds in Jonesboro went so wild for Arc Attack that it took at least an hour for them to disperse. The Sunday edition of the local paper featured the stage show on the front-page.

Over the week that followed the festival would go on to present a broad range of events, from dialogue events for adults, to theater productions written by students, to a family friendly grand finale built around staffed interactive exhibitions, performances, and other spectacles. The cumulative impact will be summarized in a short report to stakeholders, featuring some highlights, references to media coverage, evaluation findings, and finally a single number indicating how many people participated. After a brief respite the festival organizing team will get right back at it, working to bring on additional collaborators and refresh the festival for next year.

### **The diverse nature of science festivals**

There are many generalizations to make from this vignette that apply to most science festivals operating in the United States today, but the particulars of the story will look significantly different for each case. To begin with, the scale and ambition of festivals vary widely: annual budgets for the most and least expensive are separated by a factor of 1,000, and geographic ambitions range from reaching a single neighborhood, to covering entire states, to the even more grandiose. Even the structures that science festivals employ differ greatly: some are multi-venue, multi-modal extravaganzas spread over a week or two; others concentrate their efforts on transforming a single venue into a science fairground for a weekend; still others find it best to eschew free-standing events and insert science activity into existing non-science gatherings.

Compounding these differences is the fact that, at their best, each festival is a unique response to the cultural geography that makes the communities they serve a special source of pride. Many festivals consciously use meaningful cultural norms to make events resonate with local audiences. What that strategy produces in semi-rural Arkansas is bound to look very different than what it produces in downtown San Francisco.

Within an individual festival the idea of community is rarely approached as a monolithic block. Science festivals usually seek to serve an entire region, and most acknowledge that this requires a nuanced understanding of how the many different audiences within their community operate. Tens of thousands may respond to the “come-one, come-all” call of a festival main event, but some audiences require productions that are carefully crafted with them in mind.

The result is that anyone trying to take part in as much activity as possible at a single science festival is likely to quickly be overwhelmed. Several science festivals in the U.S. now boast one-week schedules with more than 100 discreet events in nearly as many venues. In 2013, the Science Festival Alliance reported that 30 of its members celebrated festivals. During their short bursts of activity, those festivals cumulatively produced more than 2,600 events, 279 of which drew more than 1,000 attendees. To add one more layer to this complexity, festival celebrations are inevitably ephemeral: they may refresh content, change partners and venues, and reinvent their structures from year to year.

It is therefore not a straightforward matter to summarize the types and levels of interactions science festivals are capable of presenting. Over 40 new festival initiatives have emerged in just the past five years in the U.S., making it much easier to simply refer to all of this activity with the catch-all category of “science festivals”. However, festival interactions range from the merely incidental sighting of public art by a passer-by, to watching a stage show of several hours’ duration, to a full day of hands-on exploration, to participation in a program requiring months of teamwork.

### **Identified impacts**

In 2013, the independent evaluators Goodman Research Group (GRG) completed a report on a three-year study of four multi-modal festivals in the U.S. [1] The findings of that evaluation, commissioned by the Science Festival Alliance, were based, among other data points, on intercept surveys with more than 11,000 festival attendees at 130 distinct events. GRG’s aggregated findings may not be reflective of any one festival celebration or single festival event, but they do begin to outline some of the distinct strengths of science festivals.

GRG found that the science festivals provided people with new science engagement experiences. For example, of those that reported voicing a question or comment with a scientist, engineer, or other STEM practitioner, 20% had never done so before the festival. The extent to which these experiences were new for festival attendees differed significantly along racial lines. Of all non-white survey respondents, 39% reported never before having voiced a question or comment in any discussion with a STEM practitioner, com-

pared to 22% for white respondents. Surveys of festival attendees that had attended the previous year's festival found that they had followed up their previous festival experience with additional action: 69% of returning attendees reported that they looked for information on something they learned, while 64% reported taking part in activities related to what they had learned at the festival previously.

The presence of STEM practitioners at festival events was found to be a key ingredient by GRG: "Attendees who intermingled with STEM practitioners at a festival had more fun, were more interested, and learned more than attendees who did not interact with a scientist." In fact, a regression analysis using these data found that interaction with a scientist was the greatest predictor of positive learning outcomes for festival attendees, and that the more types of interactions an attendee had with a scientist, the greater the positive effect on the outcome.

The impact of science festivals upon presenting STEM practitioners also proved powerful. GRG found that the festivals involved substantial numbers of STEM practitioners that were new to informal science education. Such involvement increased their confidence in interacting with public audiences, and encouraged them to participate in other informal science education projects throughout the rest of the year. These findings suggest festivals can both provide an ideal short-term way for scientists to practice telling their story, and make a long-term impact by developing a volunteer workforce of STEM practitioners eager to participate directly in public outreach.

The 30 Science Festival Alliance members celebrating in 2013 combined to involve a total of 7,714 STEM practitioners as presenters in some way. In the absence of data about what drives this incredible participation, I would like to speculate that the intense concentration of a festival into a short period of time is most responsible. The urgency of a one-week festival, the variety of ways to get involved, and the large number of participating peers draw researchers out of the field and off of the bench.

### **The importance of collaboration**

The driving urgency of a festival both rallies the stakeholders in a community to work together, and conspires to convince festival organizers that they cannot do this without the support of collaborators. It is not possible to pull off a multi-modal festival with events serving tens of thousands in many locations and overlapping times of day without either a resource-intensive staff or a clear-headed embrace of collaboration. Faced with the decision, the majority of science festivals choose the collaborative route.

Though a single organization usually serves as the administrative lead for a science festival initiative, many of the festivals in the US arise from an initial collaboration of founding institutions. For example, the Atlanta Science Festival launched as a collaboration of Emory University, the Georgia Institute of Technology, and the Atlanta Metro Chamber of Commerce. These founding collaborators fulfilled specific organizational roles, mobilized the various personnel and assets of their institutions, and built credibility for the event through the use of their considerable names. By the festival's inaugural

celebration in 2014, it had grown into a multi-modal event involving over 80 collaborating organizations. Nearly all of these collaborators provided content that the festival could feature, most assisted with marketing and publicity efforts, many produced unique programs for the festival schedule, and some took on specialized tasks.

It can take a longer lead-time to establish the relationships of trust required to launch a truly collaborative festival, but these relationships yield a high return in future years. For example, GRG found that more than 85% of festival partners participate year after year. Significant collaboration, with many organizations taking ownership of their involvement, requires the administrative lead to take the uncomfortable steps of relinquishing a degree of credit and control. It also requires an investment of effort to thoughtfully include collaborators in the process of festival organization. In addition to relationship building this means the formation of organizational structures — committees, teams, working processes, lines of communication, understood roles and responsibilities — that provide many points of entry for interested collaborators. However, once a collaborative organizational structure is in place, it is not long before it is recognized as both a major impact and a remarkable asset in its own right.

GRG found that a significant number of collaborating organizations with publicly available programs reported increases in public participation within six weeks of a science festival. Substantial numbers of collaborating organizations also reported that they made productive new professional relationships as a result of collaborating with a festival. The collaborative call-to-arms of a festival also activates unconventional partners for science outreach, with one-quarter of collaborators reporting that they were new to informal science education.

Collaborations initially forged for the purpose of launching a science festival are now considering what more they can achieve within a region. Some are working on year-round public outreach initiatives, some are conducting new research together, and some are working to address education policy issues. For organizations that took on a lead role with a new festival initiative, the efforts expended in getting collaborations started are being paid back as they are recognized for their essential place in these new regional initiatives.

### **Action oriented communication**

Effective collaborative organizational structures would not be produced in the same way if the activities within a science festival were scattered as independent stand-alone events. This collaboration is born from the practical demands of a multi-modal festival, but has effects beyond the festival itself. In a similar way, an action oriented communications campaign is generated by a festival out of the necessity of driving attendance, but has impact beyond that immediate purpose and reaches beyond the specific goals of any one institution.

A new branding and marketing effort always accompanies new festivals. This provides lead organizations with a sub-brand that delivers new capabilities, new audiences, and a heightened profile. Science festival names, taglines (“Be Curious”, “Unleash Your Inner

Scientist”, etc.), and visual identities combine to convey an overall message that brands not only festival activity, but science itself. While talented professionals are involved in crafting this messaging, the resources are rarely available for market research that evaluates either the efficacy of this messaging or the overall impact on audiences.

Since festival communications are action oriented, the characteristics of events presented by a festival are themselves a powerful aspect of the message. For example, some science festivals proudly proclaim events that feature alcohol thereby of conveying that science learning is not the exclusive domain of children. Similarly, festival events designed to make for a fantastic night on the town make it clear that science enthusiasm is not reserved for awkward introverts.

I am not aware of specific research that supports the claim, but I speculate that this action-oriented messaging is more powerful than conventional branding efforts, even for someone that never plans to attend any festival events. The message takes the conventional branding of “this is science...” and adds to it “...and people in your community are participating.” You may be science averse, but when science festival banners line the main streets of your neighborhood you must at least (perhaps begrudgingly) admit that science is alive, local, and being celebrated.

This participatory message is now particularly timely. Science has for too long had associations with the worst elements of the academic enterprise: something conducted in exclusive ivory towers (or basement bunkers) by myopic, “mad” experts so dedicated to the minutiae of their subjects that they have foregone the vitality of the good life. It was this that the administrator at the science tent was alluding to when he condemned (in jest, we hope) the adaptation of a drinking game for science learning, even though everyone else tailgating was playing that same game.

### **Building a shared science identity**

Returning once more to that tent city, there is another lesson to be found in the pomp and promotion of the homecoming game: the day culminates with a sporting event, but whether the team wins or loses may not mean so much. That day a huge banner hanging from the stadium proclaimed that we were all members of the “Red Wolves pack”. Known call and response cheers emerged spontaneously from the crowd. Everyone, and nearly everything, was dressed in red and black. This was about football, yes, but also about being a part of something bigger, something like family but not, something of which to be proud. This was first and foremost about the social formation of identity.

Science festivals have the potential to play an integral part in reflecting and crafting an analogous shared identity for science, and doing so in ways that accommodate and play off of the varied cultural geographies of the regions they serve. As we know from sports there is a special power to the live event that allows us to come together in a shared space, define our “pack”, and deepen our ties to it. After all, community affirmation and transformation is at the heart of festivals of any type. What does this look like when it is done for science? Science festivals are just beginning to work that answer out.

## Current challenges

The challenges facing science festivals are those of a brand new sector. The business models of most science festivals in the U.S. rely upon continuous and aggressive fundraising. The organizational models often rely on a small handful of truly committed leaders (or even a single champion). Even as multiple festival models proliferate, there is the potential for a stultifying adherence to a particular formula for generating festivals that vary only in the type of territorial dominance that they seek.

The greatest challenge before the sector is to quickly gain a deep understanding of the special things that festivals are so good at providing, and to build legitimacy for these services. What does it mean to foster science learning in childless twenty-something's, and why does it matter? What does the most effective collaborative structure look like, and why should sacrifices be made to obtain it? How should we count the casual onlookers that received our message even though we never met? Why must we play games outside of our tents? Research will help in the long run, but evaluations are starting, naturally, by importing rubrics from other informal learning settings. As long as festivals are measured by the same indicators as other modes of science engagement it will be hard to escape being seen as redundant, or even compared unfavorably. In the meantime, science festivals' multiple layers of impact make it difficult for advocates to grasp or tell the full science festival story, which is currently what is needed most.

Getting to a shared deep understanding of the levels that festivals are operating on is the first crucial step in building legitimacy for those impacts at the heart of the festival enterprise. Since those impacts are not business as usual for the larger field, generating the narratives and advocacy to build that legitimacy will require cooperation. This is fortunately an area where the science festivals in the U.S. have a head start. The overwhelming majority seem naturally predisposed to reach out supportively to each other, even as they work to stand tall on their own.

## References

- [1] C. Manning, K. Lin and I.F. Goodman (2013), *The Science Festival Alliance: Creating a Sustainable National Network of Science Festivals - Final Summative Evaluation Report*, Goodman Research Group, Inc., Cambridge, MA, U.S.A. .

## Author

Ben Wiehe is the founding manager of the Science Festival Alliance at the MIT Museum. Ben was previously Outreach Program Director at WGBH, where he supported the grassroots growth of science cafes throughout the US. His experience includes education and fundraising in museums, natural parks, and public schools. He received his MA in the social sciences from the University of Chicago, and holds a degree in philosophy and physics from Bowdoin College. E-mail: [wiehe@mit.edu](mailto:wiehe@mit.edu).

HOW TO CITE: B. Wiehe, "When science makes us who we are: known and speculative impacts of science festivals", *JCOM* **13**(04)(2014)C02.