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Comment

SCIENCE FESTIVALS

# From liquid nitrogen to public engagement and city planning: the changing role of science events

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ABSTRACT: *Public understanding of science has been replaced by engagement and participation, and science events, like festivals and science days, have become significant actors by offering direct contacts between scientists, public and policy-makers, as opportunities to engage and participate. After more than 20 years of festivals and events, the need for impact evidence is strong, although it is acknowledged that it will have to be based on complex data and observations. Many science events look for collaboration within the cultural sector. Social inclusion and participation in local and regional development are other important issues for the science events community.*

KEYWORDS: *Science events, Science festivals, Public engagement*

## Context

Science festivals have been around for more than 20 years now. They were initiated for a wide range of reasons, by an equally wide range of organizations, but the part of "raising awareness for science and technology" was almost always there, in one way or another. The "celebrating science" objective was common, although there are examples of Festival organizers and founders — also from the 90's — that explicitly talk about festivals as forums for discussions and debate: "everybody was regarded as a participant, especially those in the audience" [1].

Now, one or two decades later, the science festivals find themselves in this new landscape, not unlike the one described by some event organizers, where traditional roles of universities and research organisations are questioned, and where dialogue and 2-way communication are key words. "Public understanding of science" has been replaced by "engagement" and "participation" in the political discourse and this is reflected not least in the work programme for "Science with and for Society" of the European Union.

The outcome and impact of science festivals and other science communication events have not been the focus of much research. Evaluations are certainly done, but normally

on a local level, in the local language, and without any connection to other evaluations being done elsewhere [2].

## The European Science Events Association

The development of and within the European Science Events Association, Eusea,[1] may serve as a mirror of the changes and evolution of science events on a larger scale. The Association was formed in 2001 by a group of science festival organizers from different European countries. Today, the Association has about 100 members in almost 40 countries, including some outside Europe, in countries such as Israel, Abu Dhabi and Georgia. The 100 members constitute quite a diverse community. Festivals and events organisations, universities, science centres and museums, NGO's, private companies and other institutions together form a network of people dedicated to events, engagement and communication between the public, science and policy-makers.

The first 3–4 years were spent on "mapping", finding out what similarities and differences could be seen among the members. A resulting "white book" was published in 2005, describing some 20 festivals and events around Europe, regarding objectives, stakeholders, content, marketing, organisation, funding, media and other criteria [3]. This was a useful exercise and it gained a lot of interest. The book is still being downloaded from the Eusea website, even though the need for updates is becoming more and more apparent.

## Eusea's role in changing the science events agenda within Europe

Since Eusea's initiation the organisation has worked hard to share practice and develop the wider recognition and role of science events within both policy and practitioner communities. This has included a range of large-scale programmes encompassing partners and contributors from across Europe, the highlights from which are explained here.

The work on the white book brought an interest from the participating events to exchange events and activities between them, not least to get a wider European participation in the local events. The WONDERS project was designed by Eusea and funded by the European Commission for two years, 2006 and 2007 [4]. The second year, 31 members participated by sending their "best events" to another partner event, and by hosting an event from another member, to be included in the local programme. All of these activities were presented under the WONDERS signature, and all of them were presented at final events at Heureka, Finland, in 2006 and at the Pavilion of Knowledge in Lisbon in 2007.

This was all very good, and created strong links between members all over Europe. However, on a closer inspection, it turned out that some of the "best events" were based on the same knowledge or phenomena, e.g. DNA extraction. Or on the use of liquid nitrogen as a key protagonist of science demonstrations that have been representing a relevant part of the engaging side of science events since Faraday's Christmas Lectures.

[1] Eusea, the European Science Events Association, was until 2010 known as EUSCEA; the abbreviation was then changed to Eusea.

The 2WAYS project [5] also created by Eusea and funded by the European Commission in 2008–2010, added a dimension of actually developing new presentations of ongoing life science research. A series of completely new activities were produced, including games, plays, and interactive experiments.

The 2WAYS project also introduced the Young Europeans Science Parliament, thus adding elements of dialogue and participation into the events. Young people from 30 cities took part in local parliaments, discussing life science issues such as stem cells and access to genetic information, in committees and hearings, with a resolution handed over to local policy-makers in the end. A final parliament was organised for representatives from all countries in the European Parliament in Brussels.

The 2WAYS project highlighted how the direct meetings and interaction with scientists and researchers that festivals and events offer also create opportunities for engagement and participation. Discussion in small groups on controversial scientific topics boosted the enthusiasm and interest of the students that took part in the project. Although many festivals and events organizers have experience, anecdotes and knowledge to support these claims, there is so far little direct research evidence and few, if any, dedicated studies in this field.

The most recent step in this development from "mapping" to "networking" and "new formats" is the "participation" and "policy-making" dimensions. In 2010, the PLACES project [6] started as a 4-year project, coordinated by Ecsite, the science center and museums network, with Eusea and ERRIN, the European Regions' Research and Innovation Network, as main consortium partners.

The primary objective has been to develop the networks and understanding between policy-makers, science and the public. 65 cities and regions took part, forming local "City Partnerships" to develop policies for science communication and promoting the "City of Scientific Culture". The final conference, in Bremen in March 2014, brought almost 150 cities together. Mayors and other leaders from more than 40 cities have signed the PLACES declaration, thus acknowledging the importance of evidence-based policies and public access to science, in order to promote a successful development of the city or region.

The PLACES project triggered a cultural shift experienced by many science communicators taking part in the project. They started reconceiving their role as political actors within the local and national context. Being part of a city urban development or taking part in the planning of health care policy was something new for many of those who were originally enchanted mainly by the festivals as pure cultural entertainment events. While taking part in the PLACES project some concepts and processes — like the correlation between evidence in policy making and science communication — became clearer, but still controversial and complex to implement. The engagement that was originally interpreted as motivation of the audience to tackle science topics, enthusiasm for science and pleasure to take part in science events acquired new meanings and nuances.

The engagement of members within projects like PLACES means taking part in decision making processes and including in those processes a strong connection with sci-

entific and technical knowledge. This cultural and democratic role is a new direction for many science events, but one that offers a much deeper connection with and role within their local communities.

The other strategic development noticeable across Europe during this period is the harnessing of the enthusiasm for and excitement about science events to stimulate other science communication activity. Science events are often seen as points of departure for ambitious larger projects, such as the establishment of a science centre. Several such examples can be found, including the Science Picnic in Warsaw, a predecessor of the Copernicus Science Centre that opened in 2011 [7].

## Reaching beyond the already interested

How to reach the audiences that would not normally visit a museum or go to a lecture is one of the questions that is discussed most intensively within science communication communities. "Social inclusion" is an important criterion and a key focus for many science festivals and projects; "underserved audiences" constitute top priority target groups in many cases. But how well do science events achieve such goals?

Science events are flexible and adaptable to varying conditions and demands. Several Festivals have started out as true "grassroots" events, characterized by a clear bottom-up approach — with virtually no budget at all. On a general level, a key characteristic of science events is the use of "unusual places" — not necessarily unusual meaning "exotic", but places not normally connected or associated with research or science [8]. Places such as shopping malls, train stations, parks and city squares all constitute environments with broader audiences than those normally visiting science centres, museums or universities.[2] The importance of the physical location has been emphasised, not least by Ray Oldenburg who coined the expression "third places" (not at home, not at work) as important locations for community connections and grassroots democracy [9].

For example, The Gothenburg Science Festival in Sweden has as one of its most important arenas the major shopping mall, Nordstan, with more than 100,000 people passing through every day. In contrast to the rest of the programme of the Festival, the Nordstan site is the "unplanned visitor's arena" — within this location passers by and shoppers can spend time listening to brief presentations or watching exhibits. They do not have to actively decide to attend the event; instead the event comes to them.

A comparison with established visitor attractions such as science centres and science museums may be useful here. The International Science Centre Impact Study, ISCIS, conducted by John H Falk Research and published in 2014 [10] was designed to elicit the correlations between science centre visits and various science literacy related outcomes. Using an epidemiological approach this work investigated what happens if a science centre is established in a region.

The study shows a correlation — but not a causality — between the level of engagement and interest and the number of visits to a science centre. The findings indicated in the study could possibly be relevant also to visitors to science events. However, it has to be

[2] According to the Eurobarometer, about 15% of the European population visit a science centre or science museum during a year.

kept in mind that events, through their location in "unusual places", may potentially attract a significant number of visitors who did not plan to take part in a science event. The audience is therefore likely to reach beyond those already interested in science, but whether this results in similar impacts is an interesting question worthy of further research.

In addition to potentially attracting new and more diverse audiences, the unique aspect of the science events — unusual places — may be a key and strategic element to trigger new engagement processes of researchers from Universities. The relevance of the physical context in science communication stressed by Falk and Dierking [11] is a crucial element in science events too. Inviting researchers to meet new audiences in squares, streets and shopping malls induces researchers to analyse their communication styles from completely different points of view. Meeting new audiences and unexpectedly interested people was and still is a training experience for many science communicators and researchers engaged with communication. The aforementioned strategy of reaching new audiences that uniquely characterises a science event compared to other forms of science communication can thus also be considered a strong generator of new communication formats.

The reasons for not engaging or participating in science form a complex pattern, with attitudes, background, education and — for many people — the ordinary everyday challenges in life [12]. But, the actual way that public engagement activities are carried out may also be an obstacle for participation; "the fact that we are part of the solution, does not mean that we're not also part of the problem", as it was phrased at an Ecsite Annual Conference session in 2013.

Projects that have been carried out by Eusea members in the suburbs of Paris, in former Yugoslavia, in Vienna, in Palestine and places where conflicts between people are part of their everyday lives point at some encouraging results. It turns out that science — where different opinions and challenging the authorities are parts of the context — may be a valuable contribution to building capacities and citizenship. These ideas have been developed and tried out e.g. by L'Atelier des Jours A Venir in France, which is developing a model for co-creation of research issues between citizens and researchers, and by the Science Center Netzwerk in Vienna, which developed a "pop-up-shop" model for science communication as part of the network's participation in the PLACES project.[3]

In these and other ways, the profile of science communication has changed from a primarily "deficit" model, i.e. "informing" the public to reach higher levels of scientific literacy, to a "communication" and "engagement" model, based on dialogue and participation. And finally, a socio-political perspective is emerging, where "mediated realities" become more and more important, significantly influencing public understanding of science [13].

## Ongoing challenges

Science festivals and events form part of larger structural efforts concerning the role of science in society, and the role of research organizations in dealing with a wide range of

[3] See e.g. http://www.joursavenir.org/ncs/en and http://www.openplaces.eu/resources/places/81254.

societal challenges. These cover a wide spectrum from global energy and climate change issues to the training of science teachers and the promotion of scientific careers among young people. However, many science events face increasing funding challenges. This most likely has several reasons; general cuts in corporate sponsorship due to the economic downturn, and lack of solid evidence of conclusive impacts from the events may be two of the most important.

Evidence of the impact of science events — as well as of science centres and museums — is based on very complex data and observations. Learning or changed attitudes e.g. to participation in societal development are the result of cumulative processes, and the impact of individual events or visits are practically impossible to describe. Related to the issue of impact is the question of evaluation. Objectives like "raised awareness of science and technology" are hard to quantify. Furthermore, as Christopher Edwards notes [14], most evaluations seem to be carried out through questionnaires with qualitative measures, asked immediately after the event, and thus are of little value concerning sustainable effects of the event or awareness-raising initiative. During the 10 years that have passed since Edwards' article was published, some new approaches to evaluation have been developed and implemented. One example is the "Impact Assessment Toolkit" that was developed as part of the PLACES project, covering 26 case studies, carried out in 2012, in many European countries [15].

Among the other major challenges that festivals and events are facing, there is the need to renovate formats and interest new target audiences. To create new ways of communicating scientific content is one of the priorities of most event organisers. This process may mean that their approach (and even responsibility) needs to evolve from a pure event planning role into a communication research programme.

The risk of building a science event using the standard recipe is clear; mixing famous speakers, good shows and nice exhibitions is not enough after thirty years of science festivals. The community must work on a constant dialogue with other cultural sectors to implement the science event of future years. To be successful, such events must blur the edge between science and culture as it is still perceived in many contexts; despite some apparently open-minded approaches, science is all too often seen as outside normal cultural activities.

A closer connection to culture and cultural events, in a broad sense, may also contribute to a wider view on science and science events' role as a place for debate, questioning and advocacy. Even though science festivals frequently create programmes and promote events in "science and art", it seems to be a field that can be developed further, in many directions. At the one end, there are films and plays, like "Copenhagen" by Michael Frayn that discusses the moral responsibilities and ethics of individual scientists, which may be used as a starting point for discussions. At the other, there are initiatives to help researchers develop their own performing skills, like the Alan Alda Center for Communicating Science at the Stonybrook University in New York City.

Finally, the role of science events in the social-political context is a relatively new challenge. The four year PLACES project (2010–2014) forms the basis for the devel-

opment of "Cities of Scientific Culture" where partnerships between local and regional policy-makers and science communication organisations (like science centres, museums and science events) constitute the creative hubs for new ways of making science more accessible for citizens. This is also reflected in the most recent European Commission work programme "Science with and for Society" [16], where a widening of the social and political support for science in society constitute over-arching objectives of the calls for proposals from actors in the field.

## Conclusion

Science events clearly represent a tremendous opportunity to contribute to many of the key challenges facing science communication today. They potentially provide ways of harnessing grassroots enthusiasm and support for science, and to adapt to local and regional priorities and interests. Through their focus on 'unusual spaces' and the incorporation of new and creative formats they provide a way of engaging different public groups on their own terms, rather than expecting participants to actively seek out science-related activities. Central to this is recent efforts to connect with cultural events and the cultural sector, and to encourage the perspective that science is a central part of wider culture. Their focus on inclusion and dialogue, and their growing role within democratic processes linking science and citizens, means they are well placed to take a central role within important policy decisions. There is no doubt that science events, within Europe at least, are becoming a recognised and important phenomenon within the wider science communication landscape.

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