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BEST PRACTICE RESOURCES

Delivering a popular science talk

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Delivering a Popular Science Talk at a Science Festival
Good Practices

Science festivals offer a great platform and opportunity to scientists to share the value and excitement of their research with the public and engage in a dialogue with them. While science festivals are designed to serve as informal learning spaces and spark interest in science especially in young people, they normally attract people from all walks of life.

Over the years, the India Science Festival or ISF (now a flagship event of FAST India) has invited a wide range of experts from India and around the world to deliver talks on current, futuristic and socially relevant trends and advancements in science and technology (S&T) in creative and engaging formats. The ability of the speaker to communicate the relevance and excitement of science is critical for audience engagement and their subsequent action based on the knowledge gained by them.

In this resource guide, we draw from some of the exemplary popular science talks at the recently held ISF2022 to share some pointers for delivering engaging and impactful talks to non-specialist audiences, specially in settings like science festivals. Even though ISF2022 was held online owing to the pandemic, talks and discussions at science festivals are typically organised in open air theatre or grounds, under a canopy, in an auditorium or amphitheatre, etc. Consequently, these settings significantly influence the speaker-audience interactions.

Science Talks at ISF2022

The table below includes a rough estimation of how many speakers at ISF2022 followed some of the well accepted best practices for delivering science talks:

Best practices	% of speakers who followed good practices Total number of speakers: 14
Provided a big picture view of the topic / field	100
Made the research/science topic relevant and relatable	64.3
Interactive and engaging (used polls, props, videos, live demo, asked audience questions, etc.)	21.4
Used simple, non-technical and inclusive language	64.3
Visually appealing presentation (if using PPT)	33.33
Used other creative communication techniques (story-telling, anecdotes, call to action, etc.)	50
Adhered to time	92.8
Offered additional reading resources	50
Engaging and enthusiastic audience Q&A	78.5
Available for post- event audience engagement (in-person/social media/ email/ etc.)	50

This table does not include an exhaustive list of best practices and the assessment has been carried out by the organisers. An online event with a large audience has certain limitations for both speakers and organisers so this is a freehand assessment. See the sections below for some exemplars from ISF 2022 and some specific pointers on how to deliver an effective science talk.

Exemplars from ISF 2022

1. **Mind Games: Exploring the psychology behind magic**
   Prof Richard Wiseman

   At ISF2022, Richard Wiseman, psychologist and Professor of the Public Understanding of Psychology at the University of Hertfordshire, UK, in his talk 'Mind Games" explored the psychology behind magic. From his early encounters with magic to his entry into scientific research, Wiseman shared his fascinating career journey before leading the audience into understanding psychological underpinnings of sensory illusions. Peppered with personal anecdotes, reference of books and exciting scientific discoveries and impromptu live magic tricks, Wiseman placed the study of the science of magic in the larger context of health and well-being. He also provided practical insights into how magic can be used as an effective science communication tool.

   Watch the session here.

2. **Future of Automated Robots: How far have we come?**
   Prof Sethu Vijaykumar

   Very few things capture an audience's attention as much as robots do - even more so if they are human-like. Prof Vijaykumar Sethukumar of Edinburgh University, UK, provided a fascinating overview of automated robots and their possible applications in various sectors in the times to come at ISF2022. As he swept through a range of traditional robotic applications which included building of the space station, manufacturing of smart cities, autonomous driving cars, agritech, prosthetics, and other tech innovations for the medical industry. He then introduced the research that's helping them move from traditional robots to creating robots that can act more autonomously all the while describing the various applications of his research. Vijaykumar weighed on the rationale for such research along with challenges and ethical dilemmas. To help the audience visualise his research, Vijaykumar showed multiple videos featuring semi-autonomous robots doing a variety of tasks in his laboratory. He also showed a video featuring his students and researchers which provided a much-needed human touch to a field of research that may appear to be devoid of people and emotions.

   Watch the session here.

3. **Breaking Barriers: Bringing Science, Dance and Archaeology together**
   Prof Sharada Srinivasan

   You would usually imagine an archaeologist in a wide-brimmed hat or bandana and khakis carrying various tools digging some ancient sites. Prof Sharada Srinivasan from National Institute of Advanced Studies, Bengaluru, India, an archaeometallurgist, Padma Shri awardee and a trained bharatnatyam dancer, helped the audience overcome this stereotype at ISF2022. In her talk, Srinivasan elegantly combined archaeology, metallurgy, history and culture to help audiences appreciate the evolution of technology and use of metals during human civilisation and how her studies into ancient metal artefacts can provide insights into old technological practices to inform current preservation techniques. Her presentation featured photos of archaeological sites in India, metallurgical techniques involved in preservation, interspersed with her own expressions of Bharatanatyam. Alluding to the bigger picture, Srinivasan underscored the importance of studying

diverse disciplines such as history, philosophy to make sense of scientific evidence that archaeologists generate.

Watch the session here.

Best practices for delivering a popular science talk:

Based on the talks organised at ISF, we have put together a handy list of good practices for delivering popular science talks.

1. The primary goal of a popular science talk is to get the audience excited about your topic of research. The talk should raise your audience's curiosity and introduce them to the big questions, ideas and outcomes in the topic area.

2. Ideally, you should go beyond your own work on the topic area in your talk. Explain why this research area is relevant: Does it address a societal problem? Does it address a long-standing question about the world/universe/life? Introduce the big-picture questions of your field, if applicable, the history of attempts to solve them and the current status. Your talk should address the question 'so what?' early on.

3. The audience at the festival is usually not a specialist in any field so avoid using a lot of jargon/technical terms or scientific acronyms in your talk. If at all you want to introduce certain scientific terms, ensure you explain them succinctly and use these terms repeatedly in your talk to help the audience remember them.

4. Make your talk interactive. Ask open questions, conduct polls, show some interesting clips and images. Perform live demo (if appropriate), use props and other tools to help your audience engage and participate in your talk. Be aware of the venue where your talk will be held so that you can prepare for a live demonstration and integrate other interactive elements accordingly. For example, take cognisance of availability of power sources, podium versus ground level stage, and so on.

5. You may engage in a brief conversation with the host or the audience (depending on the size and setting).This will help you gauge the level of your audience and build a rapport that you can use to engage with them during the course of your talk. Based on these interactions, you may also consider improvising your talk depending upon the understanding of your audience.

6. Instead of using your presentation as a crutch without which you're unable to deliver your talk, use your slides as pointers to different parts of the talk so that you can adjust the content based on the live feedback or questions you may get from the audience.

7. Speak in a language and diction that your audience understands. Make sure you have this information beforehand. Give day-to-day or easy to understand analogies or allegories to your work/methods. As far as possible, avoid excessive scientific terminology and jargon and replace them with easy to understand words. For e.g. replace 'pedagogy' with 'teaching'; 'vector control' with 'infectious disease prevention'; 'Type 2 error' with 'accepting something that was untrue.' Additionally, use inclusive and gender-neutral language.

8. Keeping in line with the spirit of a festival, keep your talk light-hearted and fun. Use humour not to offend but to entertain and engage your audience.

9. Be careful of using [double-meaning words](#) that may hold a different meaning for non-expert audiences. For example, theory, significance, risk, etc.

10. Receiving plenty of questions at the end of a talk is a useful indicator that you have been successful in getting the audience interested in your subject area. The goal of your talk is achieved if the audience is excited enough to further delve into the topic, do further reading or take a course / project in it or take some other positive action.

11. Stick to the prescribed time and keep sufficient time for questions and answers with the audience. One of the best ways to gauge whether your talk was successful is based on the number and type of questions you get at the end or during your talk.

12. You may take audience questions at the end or after completing certain sections in your talk. The latter is usually preferred as it breaks the monotony of one-way communication.