



International Particle
Physics Outreach Group

Public Engagement

Universal Science & Music of Physics

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Two Public Event Recipes

Universal Science

University of British Columbia, Earth Sciences Building atrium (under the Pleistocene) | 18:00 PDT

Curiosity, Diversity, Discovery

Universal Science is organized as part of the ATLAS Collaboration Week hosted by the University of British Columbia and TRIUMF

An evening with the experts on how we are using basic research and an internationally diverse set of scientists to answer our most fundamental questions about the universe, and how this effort directly benefits humankind.

The event will feature short presentations on Particle Physics, Applications to Society (Hockey!) and International Collaboration, followed by an open panel discussion and Q&A on current and future possibilities in each area.

This event has been organized by members of the [University of British Columbia](#), [TRIUMF](#), [Templeton Secondary School](#), the [International Particle Physics Outreach Group](#) (IPPOG) and the [ATLAS](#) experiment at [CERN](#).

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Universal Science

R RATIO

The Sound of
SCIENCE

13 МАЙ 2023
ВРАТИ: 19:00
НАЧАЛО: 20:00

THE SOUND OF SCIENCE

13.05.2023 (19:00) | БАП SINGLES | ВХОД: 20/25 BGN

През вековете човечеството винаги се е опитвало да разбере същността на Вселената. Още от първите ни наблюдения към нощното небе та чак до невероятните технологии, с които разполагаме днес, всяка стъпка ни помага да разберем повече света около нас.

Свикнали да мислим за наблюдението на Вселената основно чрез зрението – телескопи ни показват снимки на далечни галактики, експерименти „виждат“ сблъсъците между елементарни частици. Можем ли обаче да чуем Вселената? Или да я усетим с телата си? Точно за тези неочаквани перспективи ще стане

Music of Physics



Commonalities

Common methods of both activities

- Optimise interaction between scientists & public
- Grab attention of public
- Bring scientists into public engagement
- Create environment that encourages conversation

Common goals

- Audience should learn more about the goals of particle physics
- Scientists should learn more about public hopes and concerns
- Connections should be made
- Fun should be had



Universal Science

Description

- Public event attached to conference or collaboration meeting
- Underlying theme of Diversity in Science (never explicitly emphasised)

Ingredients

- Small public auditorium with nearby exhibition space
- 3 Local scientists adept at making engaging public presentations
- 3 Additional students / young scientists willing to engage an audience
- Local partners with access to media, existing audience

Recipe

- Event starts with scientists at exhibits meeting with public
 - **Food & Drink an important catalyst**
- Three short (15-minute) talks on physics, *something*, and diversity
 - ***Something* has been computing, gaming, education, etc.**
- Talks followed by a panel discussion including more local scientists
- Extra time for one-on-one discussion



Universal Science

Steve's Tips

- *Need dedicated local partner*
 - *Publicize, publicize, publicize*
- *Get meeting participants involved*
 - *Posters, exhibits, brochures*
 - *Answering questions one-on-one*
- *Keep talks short and sharp*
- *Use Q&A app like <http://sli.do>*
- *Need effective moderator for Q&A*
- *Listen to the audience*
- *Concerning diversity:*
 - *Show off international diversity*
 - *Admit weaknesses*
- *Remote participation possible*
- *Photograph & record everything!*





Music of Physics

Description

- Public event engaging audience with music triggered by science
 - Cosmic piano, Sonification, Science-themed compositions, Cool instruments (theremin),...
- Can also include component on Physics of Music

Ingredients

- Small public stage / pub
- Local musicians, composers, scientists
- Local partners with access to media, existing audience

Recipe

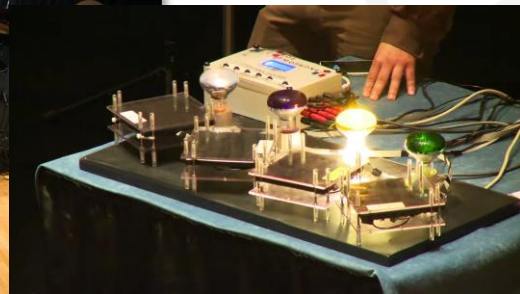
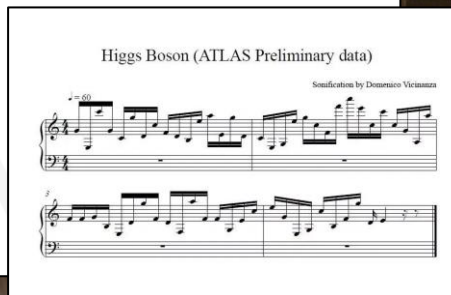
- Narrator tells a story (e.g. cosmic rays, LHC, Higgs, Voyager, etc.)
- Musical acts are threaded into the story
- Final act should be climactic and perhaps a bit chaotic (a crescendo)
 - E.g. Duet with cosmic piano, followed by full ensemble



Music of Physics

Steve's Tips

- *Need dedicated local partner*
 - *Publicize, publicize, publicize*
- *Works best in a cosy location*
- *Needs sound expertise*
- *Use local talent whenever possible*
- *Popular acts:*
 - *Cosmic piano*
 - *Ensemble playing science-themed music*
 - *Cyborgs*
 - *Interactive physics of music demos*
 - *The Theremin*
- *Minimise lecturing*
- *Maximise music*
- *Photograph & record everything!*





Music of Physics





Past Events

Universal Science

- CHEP 2018 – Sofia, Bulgaria
- CHEP 2019 – Adelaide, Australia
- ICHEP 2020 – Online
- ATLAS Week 2022 – Lisbon, Portugal
- ATLAS Week 2023 – Vancouver, Canada

Music of Physics

- Montreux Jazz Festival 2013, 2014, 2015 – Montreux, Switzerland
- Bluedot Festival 2016 – Jodrell Bank, UK
- Science Festival 2018 – Sofia, Bulgaria
- Science Festival / IPPOG / RATIO 2023 – Sofia, Bulgaria



In Summary

Lessons Learnt

- Public engagement benefits from attention-grabbing catalysts
- Conversations need to go both ways:
 - Convey the fundamental messages of science and society
 - Listen to your audience and try to address concerns
- Effective local partners are essential for organising events
 - Local publicity
 - Local talent
- Make it fun!