

[WARNING: FLASHING LIGHTS IN VIDEOS]

COLLIDERSCOPE:
REACHING NEW AUDIENCES W/
ELECTRONIC(S) MUSIC

LAWRENCE LEE

PRODUCTION WITH TOVA HOLMES (UCHICAGO)

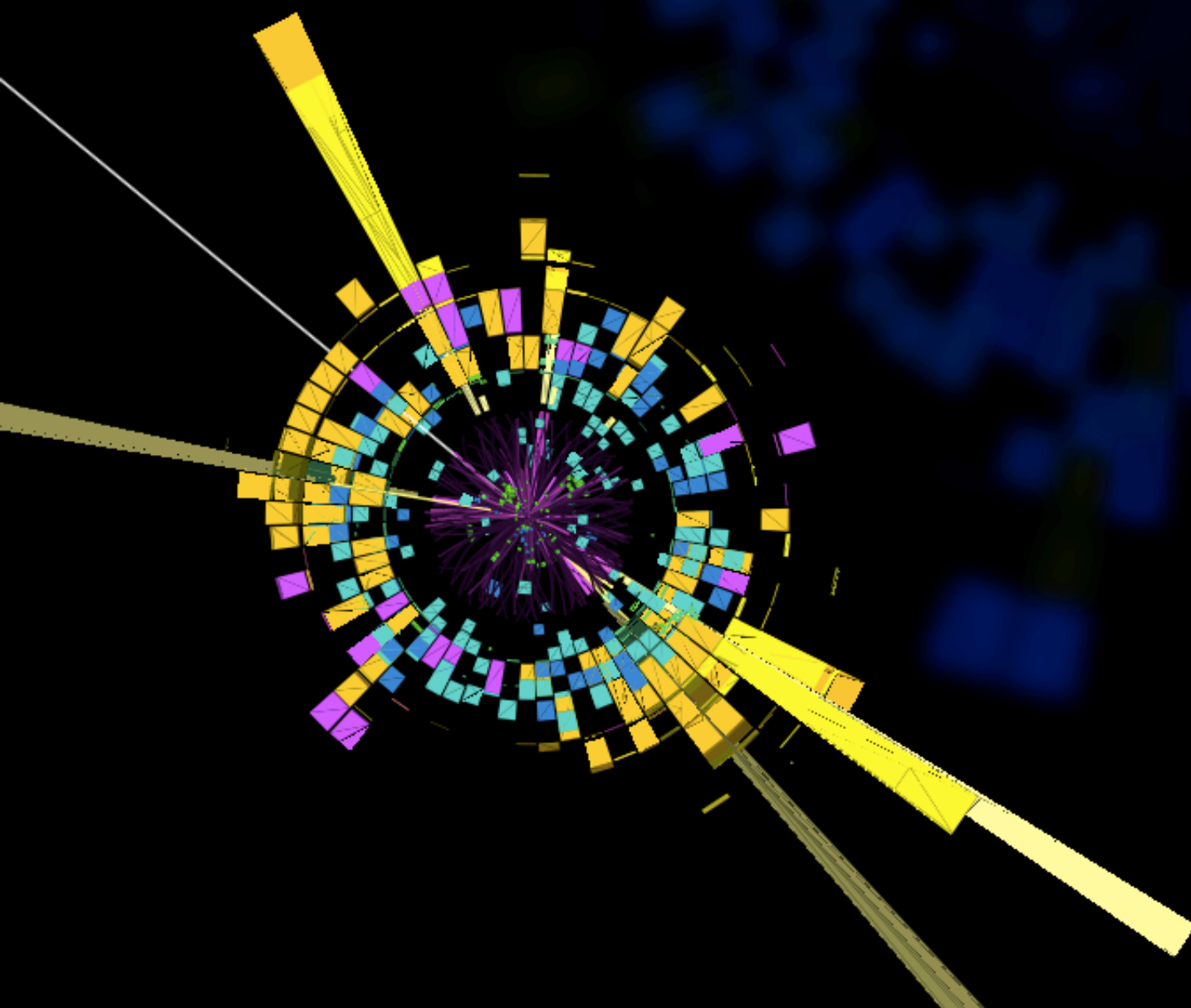


HARVARD
UNIVERSITY

011A6K2117

I WORK ON ATLAS

WHEN I'M NOT SEARCHING FOR BSM PHYSICS,
I'M IN THE LAB WORKING ON OUR MUON UPGRADE

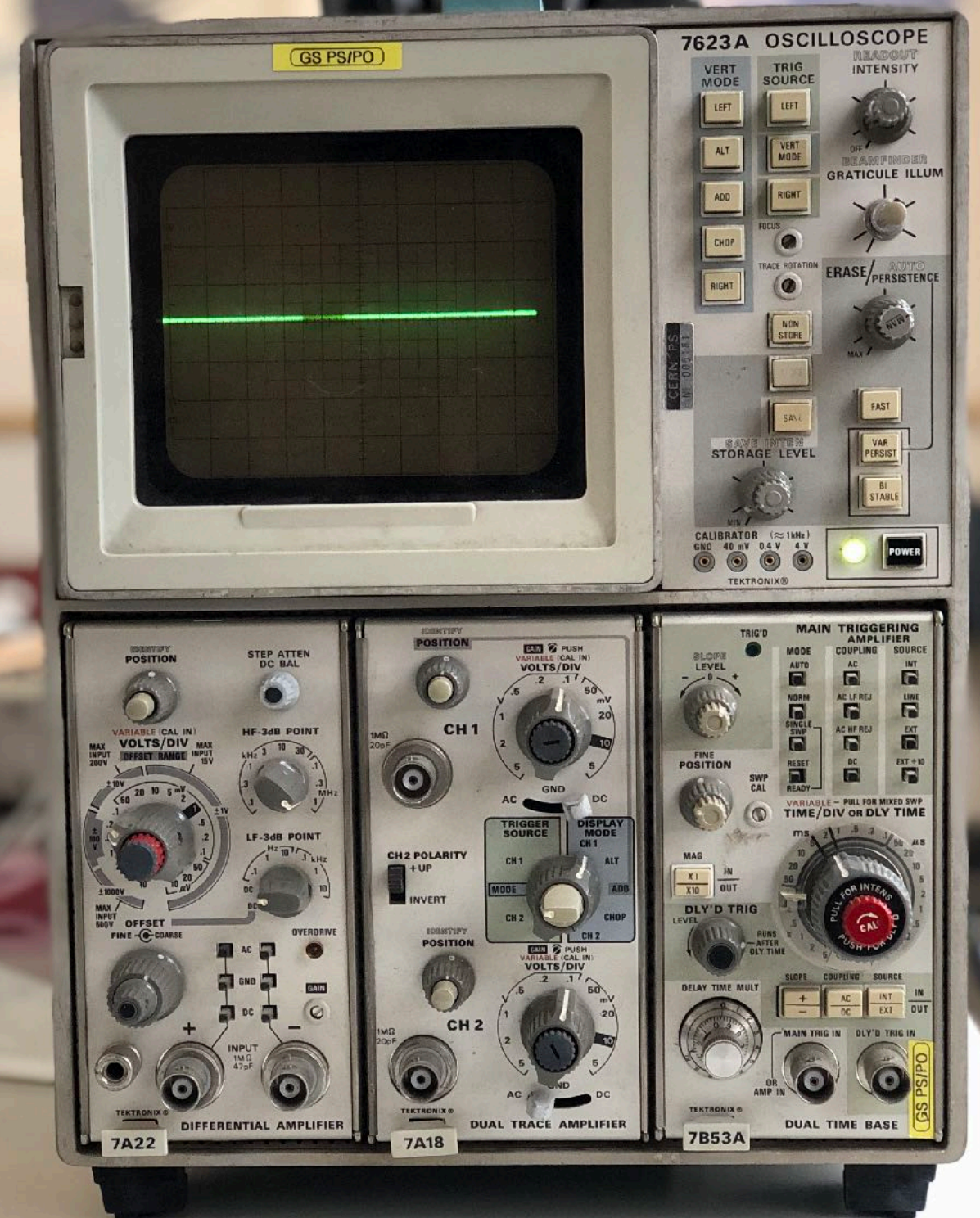


In lab, I work a lot with
scopes...

Remember old analog
scopes?

So satisfying to play with

...though a lot less
practical...



"Oscilloscope music"



What if you make stereo sounds

Whose waveforms draw images if piped into a scope in XY mode...

[YouTube Channel for Jerobeam Fenderson](#)

R vs T

L vs R

L vs T

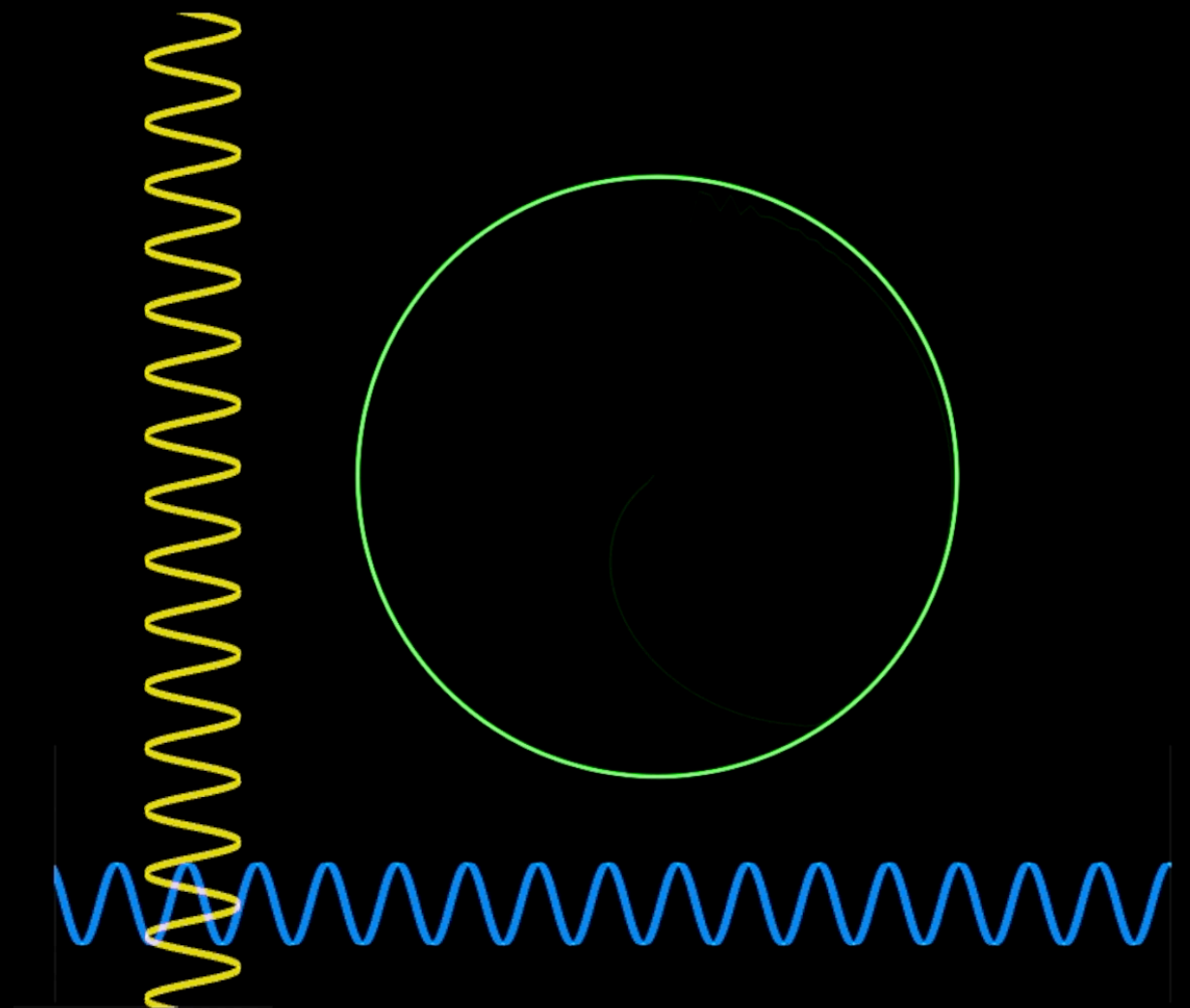
[YouTube Link](#)

[YouTube Link](#)



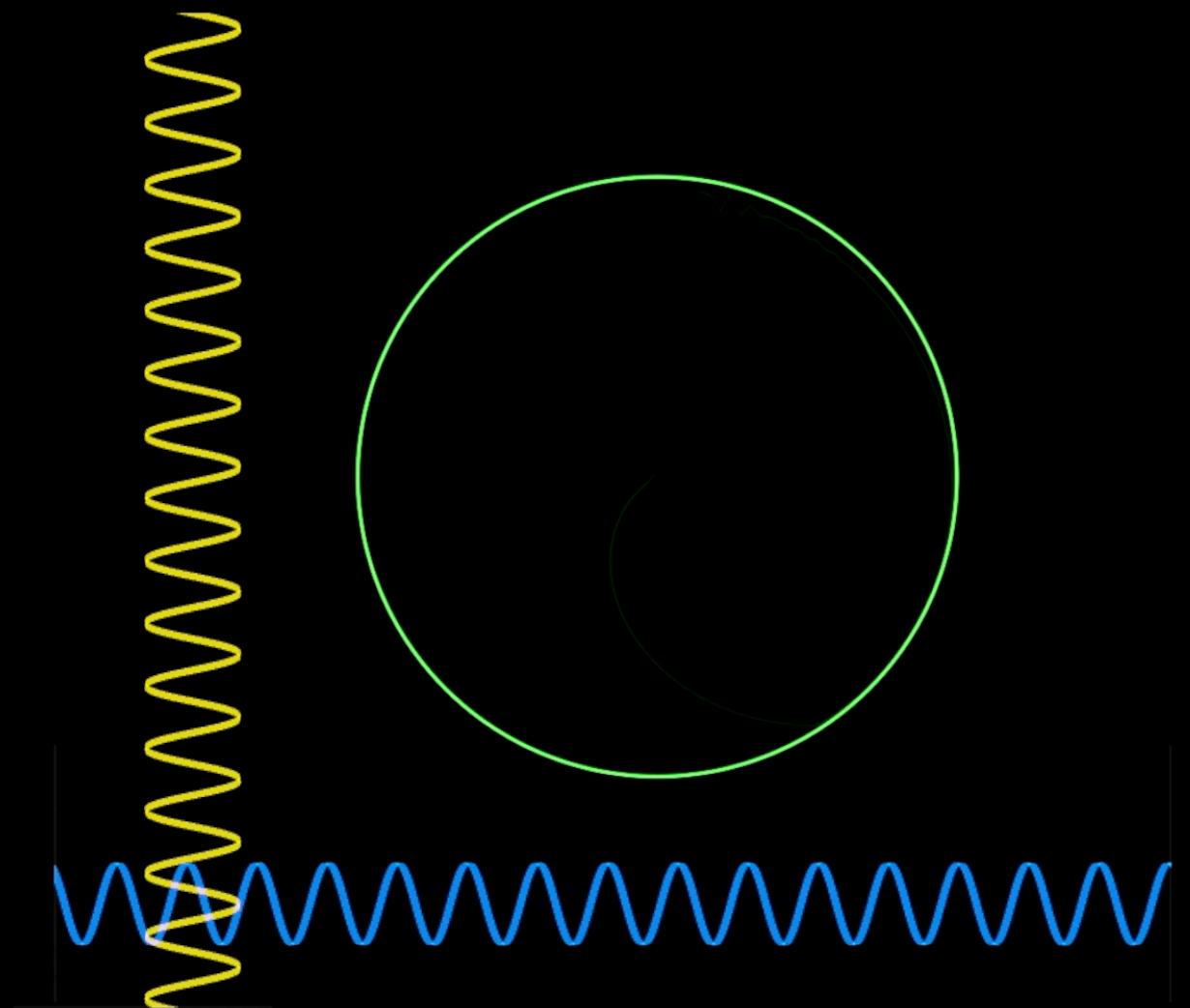
Audio waveform encodes the visual show.
Play WAV file [cern.ch/ColliderScope] into a scope and
see the images

Shape ↔ **Timbre**
Speed ↔ **Pitch**







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The project has been a huge success.


**ColliderScope** is at [CERN](#).
Published by Larry Lee [?] · April 2 · Meyrin · 

 Like Page 


Oscilloscope Music Tour of the ATLAS Experiment at CERN's Large Hadron Collider

Warning: Flashing Lights




Check out ColliderScope — Reconstruct the [ATLAS Experiment at CERN](#) detector [CERN](#) with the stereo waveforms of music! Watch the video, or pump the audio into an oscilloscope, to see a tour of the detector.... [See More](#)







Oscilloscope Music Tour of ATLAS Experiment
03:09










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Boost this post for Fr.10 to reach up to 3,500 people.

76,160 People Reached	6,000 Engagements	Boost Post
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Performance for Your Post

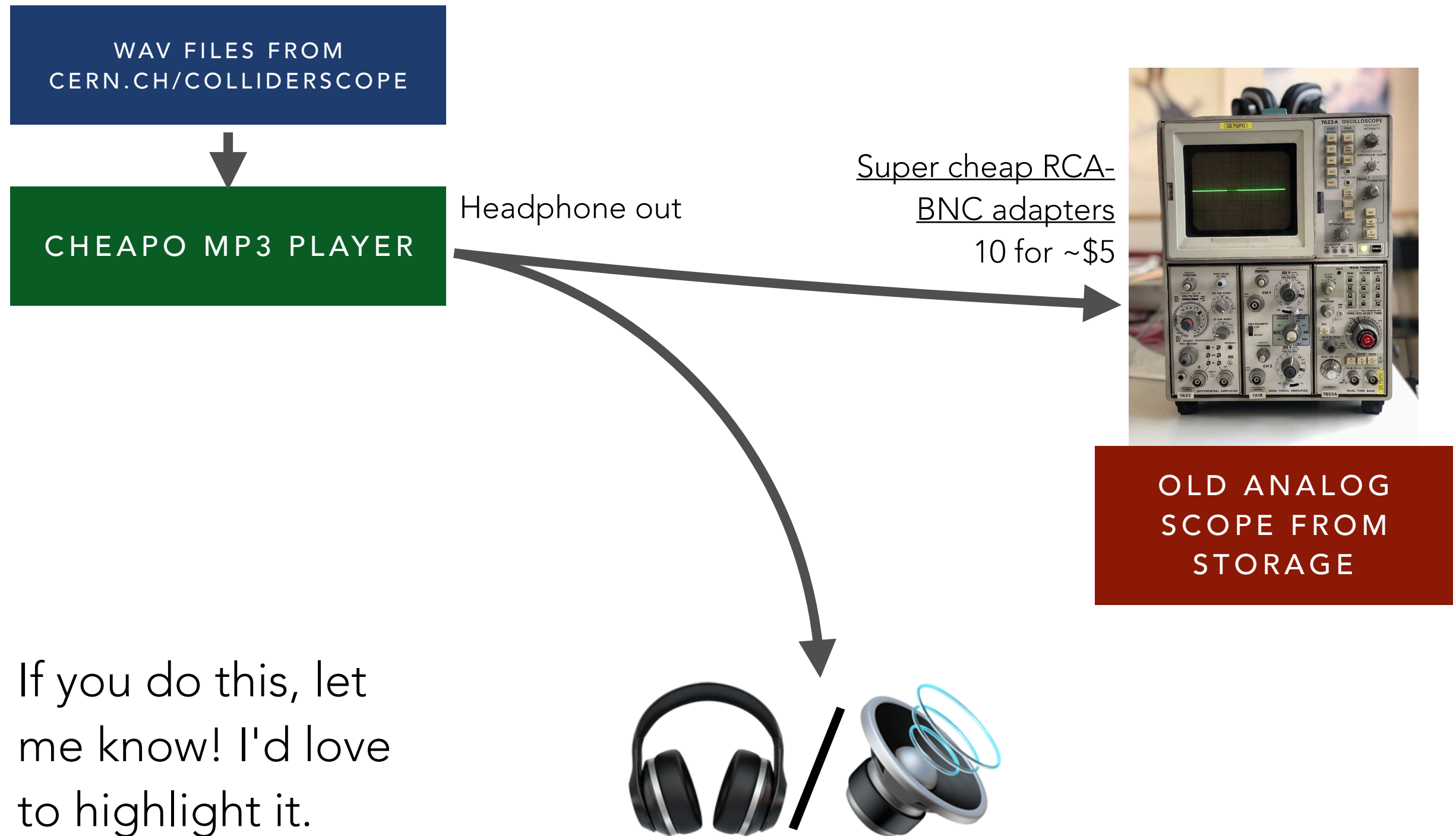
76,160 People Reached		
15,008 3-Second Video Views		
1,136 Reactions, Comments & Shares 		
666  Like	92 On Post	574 On Shares
105  Love	20 On Post	85 On Shares
11  Haha	3 On Post	8 On Shares
41  Wow	4 On Post	37 On Shares
2  Sad	0 On Post	2 On Shares
1  Angry	1 On Post	0 On Shares
103 Comments	15 On Post	88 On Shares
211 Shares	195 On Post	16 On Shares
4,864 Post Clicks		
1,235 Clicks to Play 	99 Link Clicks	3,530 Other Clicks 
NEGATIVE FEEDBACK		
12 Hide Post	2 Hide All Posts	
0 Report as Spam	0 Unlike Page	
Reported stats may be delayed from what appears on posts		



ATLAS Experiment Tour @ CERN by ColliderScope on ScopeMusicClock

Someone even played it on their own scope and posted it to YouTube! [User: konohh](#)

Easy/cheap outreach display at your institute!



If you do this, let me know! I'd love to highlight it.

ColliderScope @ Music Festivals



A summer of festivals for CERN

This summer CERN scientists will be showcasing particle physics at festivals across Europe

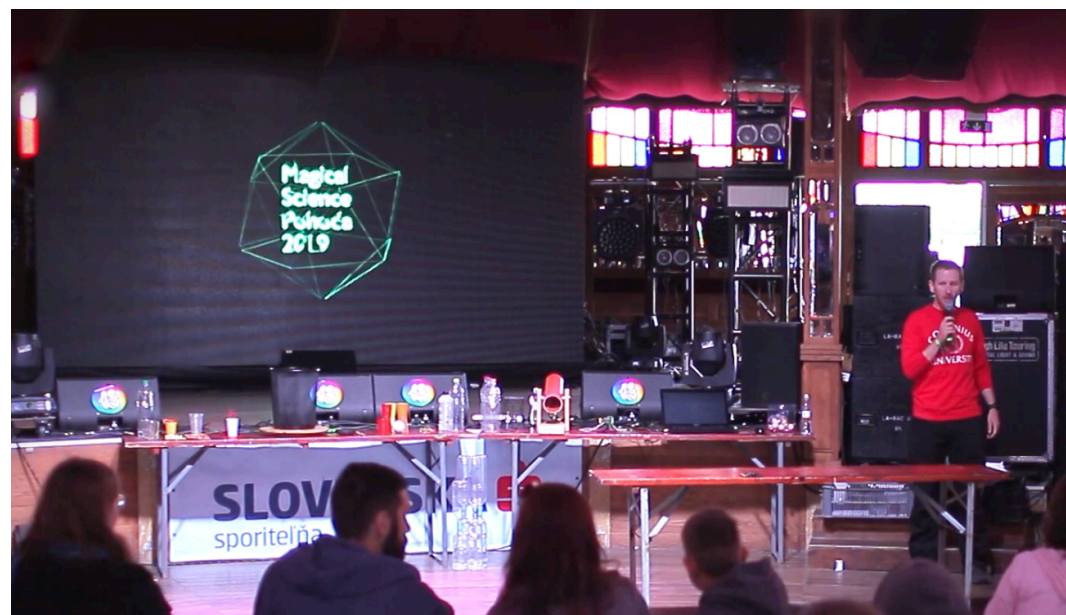
28 JUNE, 2019 | By [Connie Potter](#)



Your huge program of Science Pavilions at music festivals!
Connie has been a huge supporter of ColliderScope

Created customized songs to introduce the science programs

[YouTube Link to Roskilde Intro](#)





CERN & COMENIUS UNIVERSITY PRESENT
CERN A UNIVERZITA KOMENSKÉHO UVÁDZAJÚ



*A unique live set
using vintage
lab equipment
from CERN*

Lawrence Lee
Harvard University

*Unikátny live-set
ktorý využíva
vintage prístroje
z laboratória
v CERN-e*

COLLIDERSCOPE

EXPERIMENTAL MUSIC FROM EXPERIMENTAL PHYSICS
EXPERIMENTÁLNA HUDBA Z EXPERIMENTÁLNEJ FYZIKY



FRIDAY 12 JULY
PIATOK 12 JÚL

12 : 20

CCC CLUB

ColliderScope Live

Huge privilege of being given a stage at **Pohoda Festival**. 30k attendees. We'll hear more this afternoon about the rest of the science program!

Hour-long set at the stage for experimental electronic music

15 minute intro presentation:
LHC, the science of sound, electronics

Live 45 minute electronica/hip-hop set
w/ projected scope trace

Each shape is sampled and repitched to
perform melodies that draw pictures live

[See clips from the set on YouTube](#)





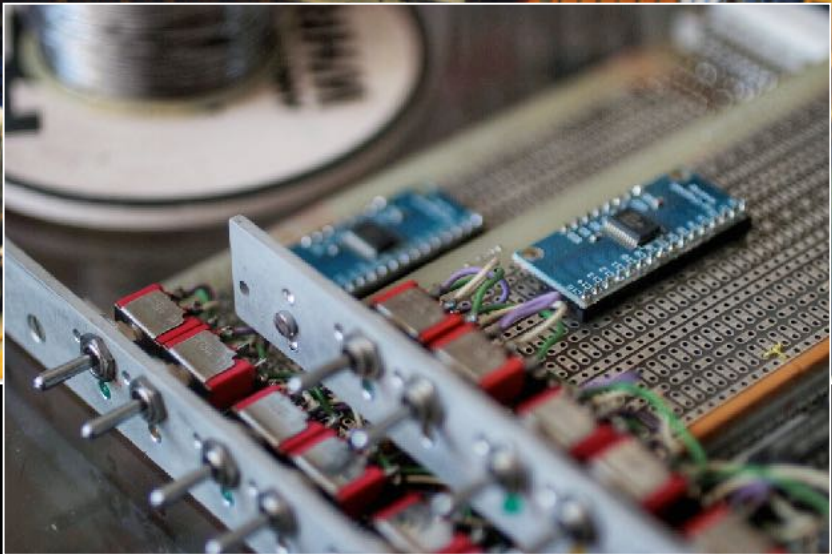
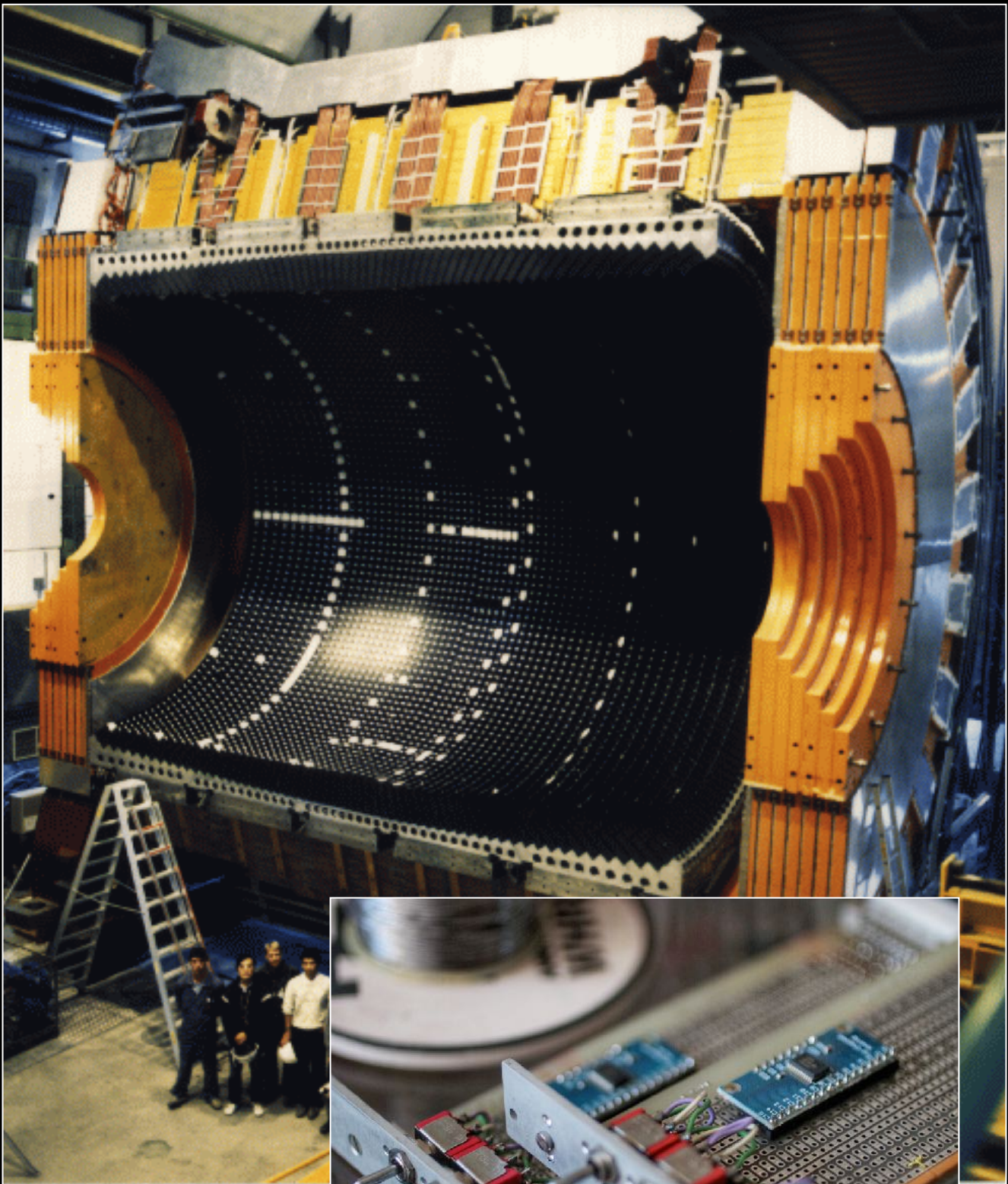
Electronic(s) Music

Make live music with
repurposed electronics
from old experiments

Brings us full circle back
to the electronics of
particle physics



LV Control Panel for
UA1 (best guess) Muon System



NIM Power Supply
from SSCL

VME Switch Array
from OPAL



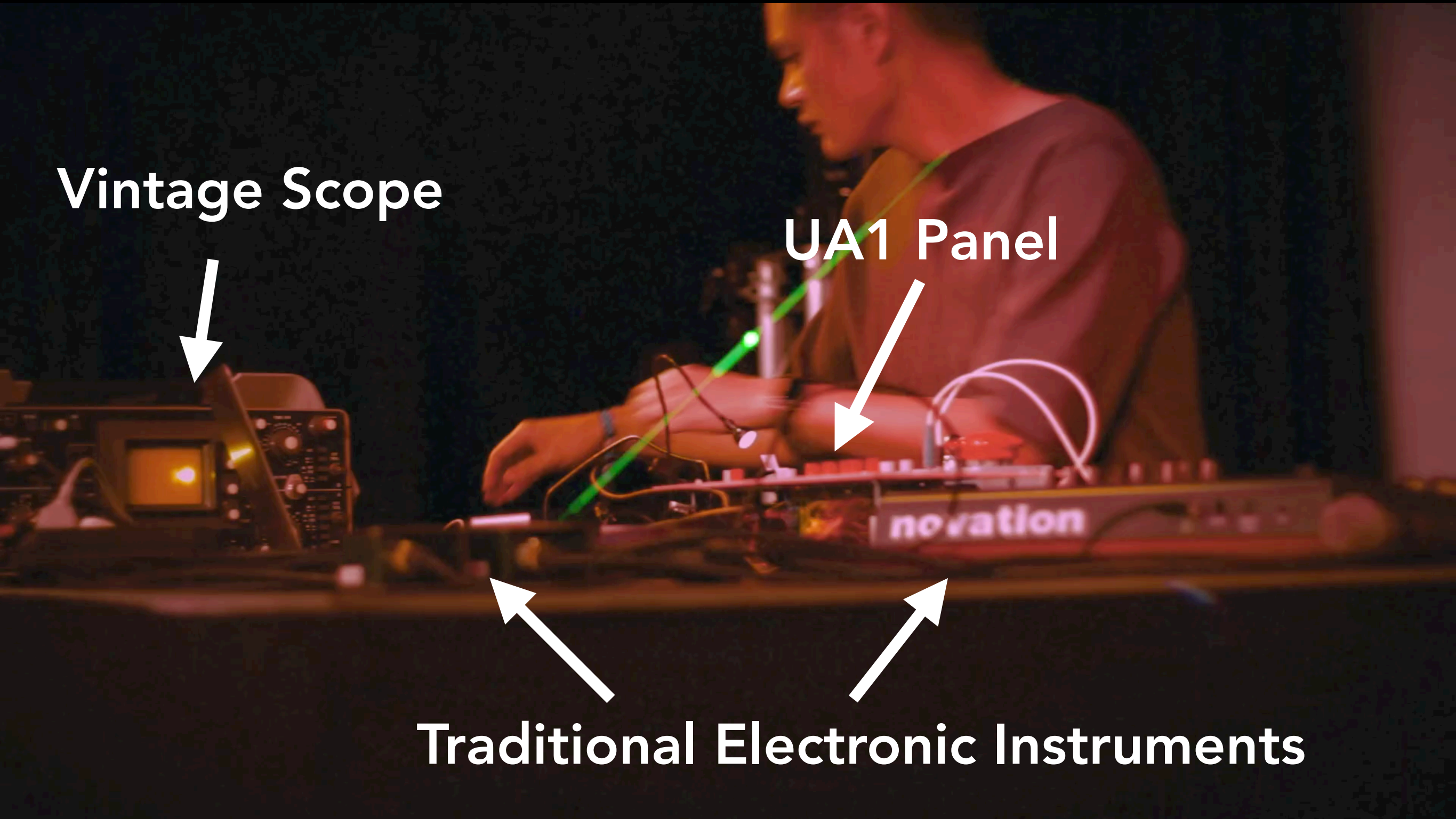
Vintage Scope

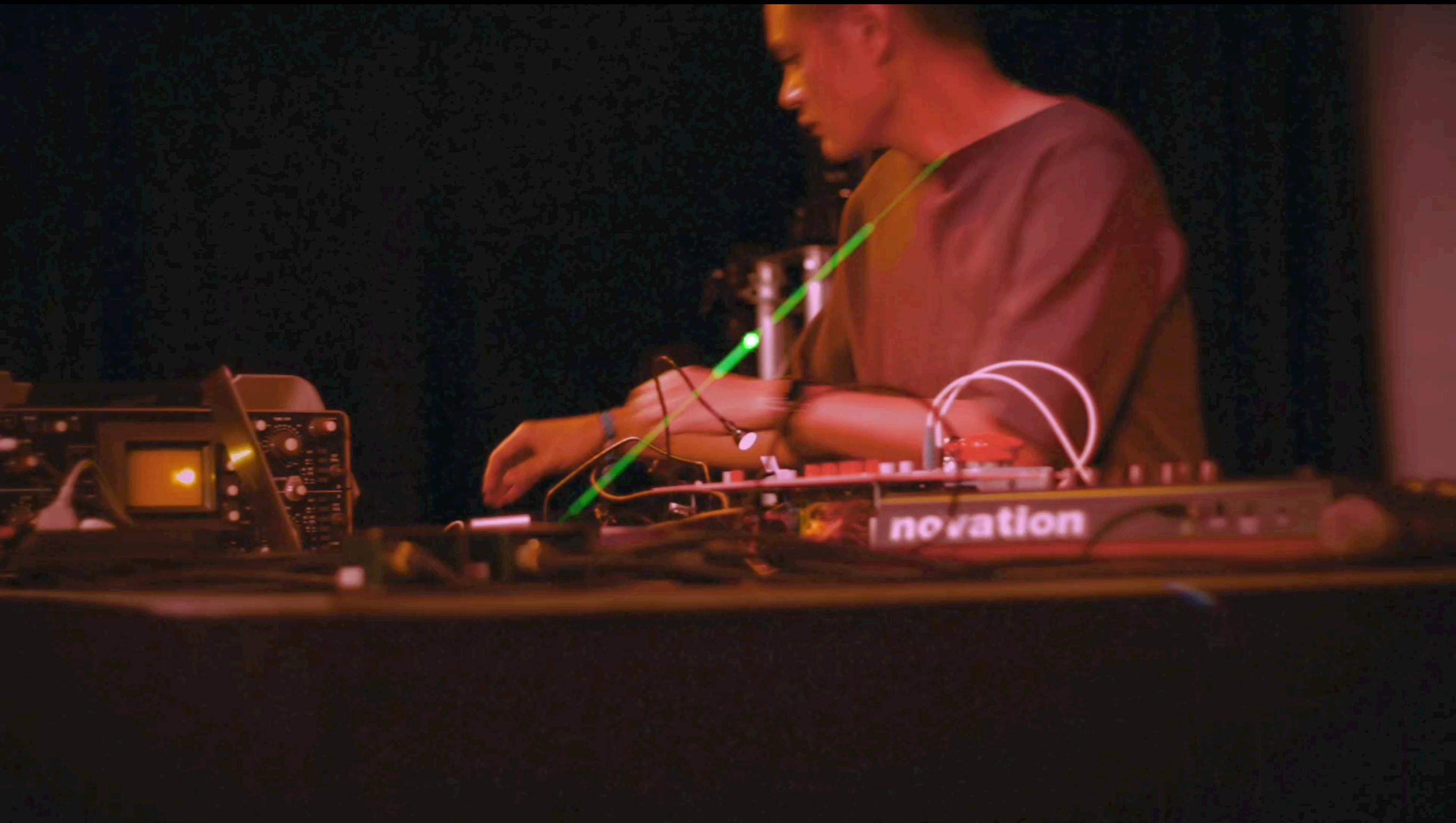


UA1 Panel



Traditional Electronic Instruments





REPORTÁŽ: Pohoda Festi x POHODA PREDSTAVILA F x +

https://protisedi.cz/pohoda-fe...

I chose a small stage, which I used to play for hours last year and enjoyed great musical insights, featured the project ColliderScope, founded by Lawrence Lee, an American. This particle accelerator man at CERN created parts of his old instruments with his musical instrument, which uses mathematical knowledge of the universe to produce sounds, and has done a great electronic set with his help.

photo by Daniel Kopecký

photo by Daniel Kopecký

After this musical introduction, the main stage has already begun to come to life through the sounds, and you suddenly did not know where to go, unless it was as clear as I did not miss P / ST, a pair of guys who met at DAMU and made it to the final round of Starter by radia Wave. At Pohoda it was their seventh concert at all, and for those who haven't experienced it yet, there is a possibility to visit Beseda u Bigbítu, where they will perform on the same day as creating similar WWW Neurobeat. Rapper Dan Kranich and musician Ivo Sedlacek send their audience to ecstasy. They are crowded with energy and power, they seem to want to conquer the world. Piece Landscape without a Door is a complex poetry in a cheeky design, has an existential aftertaste (but you know it, do you know?) And to this great musical component, I highly recommend and I tend to share the opinion of the group who stood by the railing with me - "This is my headliner! ". A nice bonus was 4 copies of the CD, whose metal wrappers were made by Dan rapper. Yes, we have it at home, a

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Translated from Czech

REPORTÁŽ: Pohoda Festi x POHODA PREDSTAVILA F x +

https://www.newmodelradio.s...

newmodelradio

ON AIR Shantel The Streets Where The Kids Have Fun

Živé vysielanie

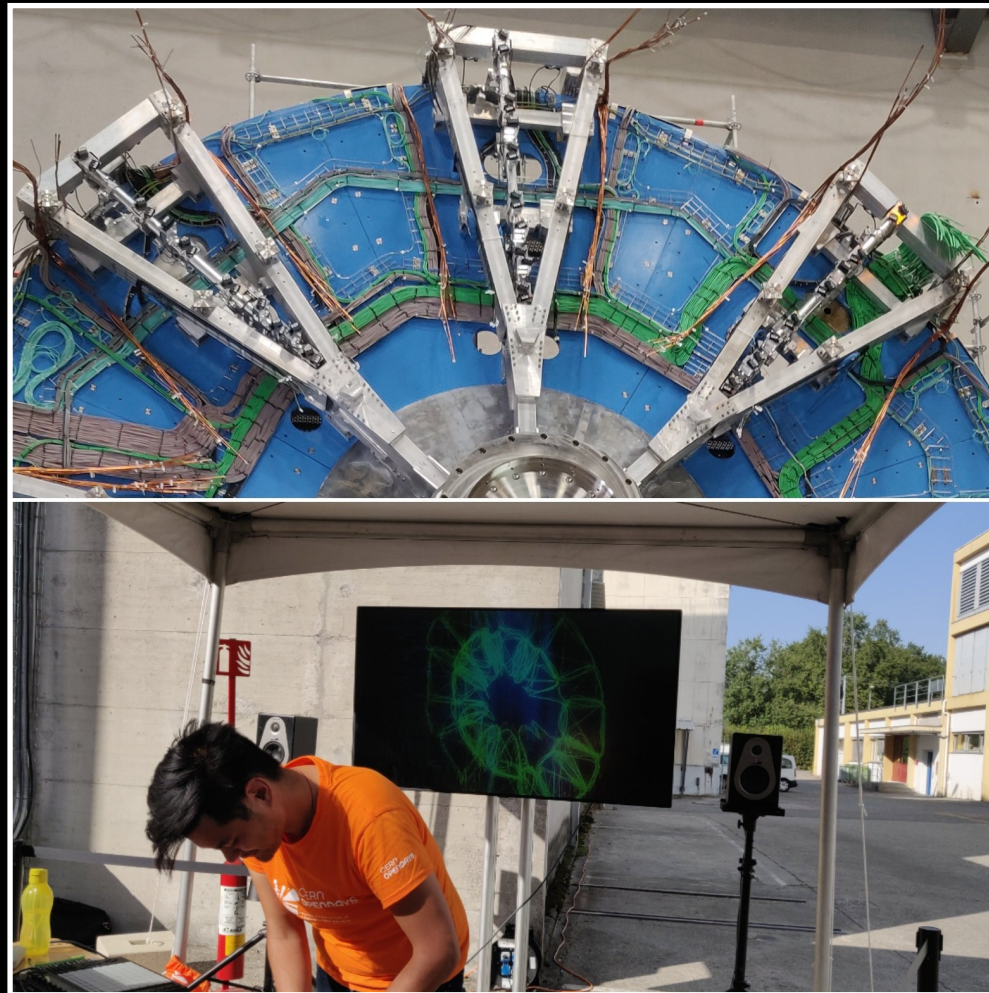
On Friday, at 12:20, Lawrence Lee will stop at the CCC Club to introduce the ColliderScope Experimental Music from Experimental Physics project.

ColliderScope is a musician and physics project on the Great Hadron Accelerator at CERN. With a unique form of synthesis, it paints dynamic images directly with the sound using an oscilloscope. Audio waves are designed to show images from the world of experimental particle physics. By converting old instrument waste from past musical instrument experiments, it creates a

Translated from Slovak

Other shows

From C. Doglioni



Upcoming show at Boston-area Brewery

CERN Open Days in front of
ATLAS Muon Upgrade

AERONAUT

BEER EVENTS ABOUT STORE

Regular hours of operation
Mon: 6pm-11pm
Tue - Thu: 5pm-midnight
Fri: 5pm-12:30am
Sat: noon-12:30am
Sun: noon-9:30pm

Calendar of Events

Live music most nights; NO COVER, EVER!
Interested in playing? Email play@aeronaut.net

WED 12/11	THU 12/12	FRI 12/13	SAT 12/14
Jobi Riccio 8-10PM	GrownUp StoryTime 7-8PM Macuco Quintet Truly delightful Brazilian jazz saxophone ensemble headed by some of Boston's top jazz musicians and composers! 8:30-10:30PM	Le Prestige Travel to the rumpshakin' 90s except a reality show version where all drum tracks and synths are replaced by dopeass living musician humans. 7-9:30PM ColliderScope: Experimental Music from Experimental Physics featuring Lawrence Lee, a musician and physicist at CERN's Large Hadron Collider 10-11:30PM	Cindy Latin 8-11PM

And for those on ATLAS...
this year's ATLAS holiday party

Working on a show in Sweden

A person in a red shirt is shown from the side, operating a DJ mixer. The mixer is heavily modified with custom electronic circuitry, including various components, wires, and a small red LED light. The scene is dimly lit with a red glow from the person's shirt and the mixer's lights.

Gives the public exposure to:

PHYSICS OF SOUND

FOURIER ANALYSIS

ELECTRONICS

PARTICLE PHYSICS

**all on the dance floor or in
their headphones**

Music is the ultimate form of outreach

Mostly everyone interacts with music
It cuts deep into the core of our culture

There are ways for scientists to use music for
public engagement and outreach

Project not just the science geeks, but
Slovakian festival-goers looking to dance.

For the music world, I've made a **sample pack**
for people to make their own LHC
oscilloscope music!



A person is shown from the side, focused on their laptop. The room is dark, with ambient light from screens and stage lights. In the background, a large, out-of-focus crowd of people is visible, suggesting a public event or conference. The overall mood is professional and tech-oriented.

OUR RESEARCH

DISTILLED
VERSION FOR
PUBLIC

Science

Public

OUR RESEARCH

PUBLIC CULTURE

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SCIENCE-
INJECTED
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CULTURE

Science

Public

A person is shown in profile, working on a laptop in a dark environment. In the background, a large, glowing green particle detector visualization is visible, resembling a complex network of lines and nodes. The person's laptop screen displays some data or code.

I need your help!

Set up displays in your depts.

See cern.ch/ColliderScope to download some WAV files.

{Like, share, follow} x {[Facebook](#),
[Instagram](#), [Twitter](#), [YouTube](#)}

Reach out if you want some physics-themed music at your next outreach event or want to throw party w/ science at its core



Thanks for your attention!



Use music to engage non-geek audiences!

Outreach display at your institute using old scopes!

Online, or in live events

Two past performances.
More in the works.

cern.ch/ColliderScope and social media

