



ORIGIN network

cross-disciplinary
science & art - engagement
& networking for education



General Introduction

- Global Scientific Collaboration for Creative Science Education
- Cross Disciplinary Educational Formats

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Cross-Disciplinary Science & Art Education Cultural Collisions

- Cultural Collisions Canada 2018
- Cultural Collisions Vienna 2019/2020 /2021
- Cultural Collisions Be Inspired ICHEP2024
- Cultural Collisions Croatia 2018/2019
- Cultural Collisions Montenegro 2018
- Cultural Collisions BiH 2018

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Cross-Disciplinary Engagement ,online‘

- Cultural Collisions Bosnia and Herzegovina online 2020/2021
- Kick off Bhutan virtual visit to CERN/CMS 2021
- Kick off Oman virtual visit to CERN/CMS 2022

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Cross-Disciplinary Exhibitions

- Hanyang Museum, Seoul/Korea 2021
- IBS Cultural Centre, Daejeon/ Korea 2019
- International Congress Centre, Muscat/ Oman 2022
- Balloon Museum, Chateau d'Oex/ Switzerland 2019 / 2021

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Art University Collaborations

Chelsea College of Arts/ **UK**, Central Saint Martins College of Arts/ **UK**,
University of Applied Arts Vienna/ **AT**, Ecole d'Art Supérieur Lille/ **FR**
Art University Cetinje/ **MO**, KASK Royal Arts Conservatory Ghent/ **BE**
SURATOMICA, Bogota/ **CO**

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Collaborative Artists

- List of various collaborative artists

2013 - 2015

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content



ORIGIN

Since 2017

Cross Disciplinary Science & Art Engagement, Networking & Education

By a network of large scientific global collaborations



ORIGIN

Supported by

ATLAS, ALICE, CMS, LHCb, FCC, AMS

LIGO, VIRGO, KAGRA, LISA, Cosmic Explorer, Einstein Telescope, ICEcube, Muography, Perimeter Institute, Canadian Light Source, and other international partners

Particle Physics

Astrophysics

Gravitational Waves

Neutrino-Physics

Muography

Accelerator

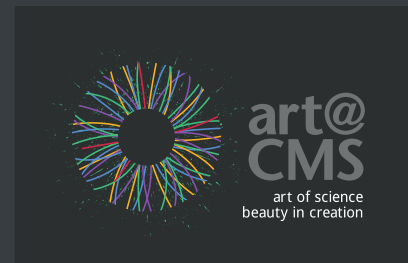
Technologies

Since 2012

Methology developed & disseminated since 2012

By CMS collaboration via art@CMS

Global cross-disciplinary science engagement & networking program



ORIGIN program **Mission**

Objectives:

cross-disciplinary science **engagement** & **networking** with special emphasis on education

- **THINK globally ACT locally** –
- support our science community where they need support –
 - > at their HOME country

“Arts as a tool to engage actively and empower them to own the topic and allow them to contribute”

ORIGIN: What We Do

Exhibitions

The outcome of a dialogue and collaboration between artists, art institutes or communities with our science community. An exhibition or performance will act as catalysts for promoting public interest and understanding of science concepts as well as artistic expressions.

all creative expressions are invited, photo, painting sculpture, music, dance, lyrics, performance

science & art workshops – for graduate and undergraduate students

Interdisciplinary in their nature, SciArt workshops enable young people to gain a better understanding of science in general. Participants get inspired and encouraged to foster their own creativity, linked to scientific methodology. Critical thinking is key to cope with the challenges of the 21st century.

science learning (masterclass) followed by philosophic discussion and creative art production

The **exhibition** serves always as **framework to support** activities like : presentations, round table discussions, science and creative workshops, meet real artist or scientists,

our Scientist and our collaborating professional artists act as authentic **role models for students**

Cross disciplinary EDUCATIONAL Formats

3 models for different implementation scenarios

© Michael Hoch

1) sciARTmasterclass[©]

— short engagement scenarios e.g. science festivals

2) Science&Art@School[©]

— authentic school student engagement & inspiration

3) Cultural Collisions[©]

— full cross disciplinary science engagement inspiration & research



Video of Pupils Interview: Science&Art@School, ECOLINT 2015:

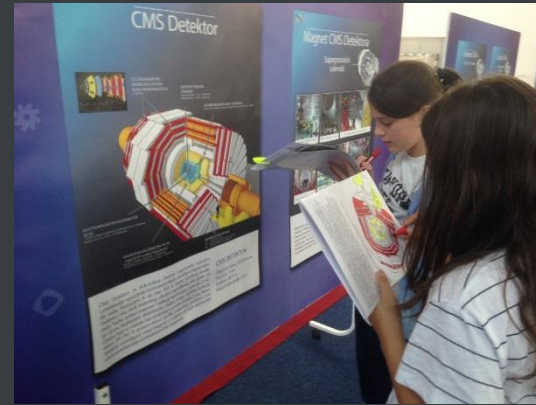
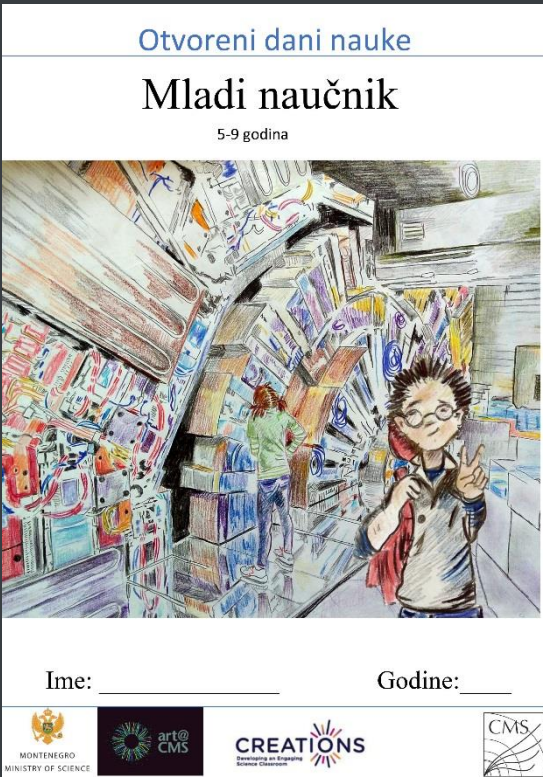
<https://www.youtube.com/watch?v=yTgDm0Yp04E>

EU project CREATIONS (2016 - 2019) was based on the art@CMS program <http://creations-project.eu/>

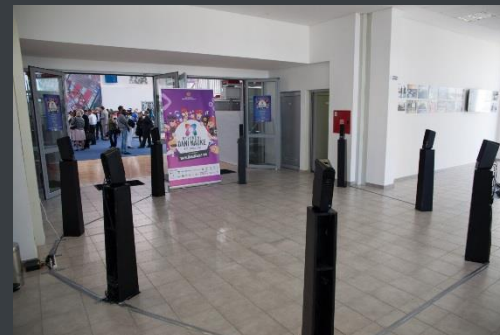
© designed by Michael Hoch

sciARTmasterclass

one day event e.g. science festival or science day, ..



Students participating in the ScienceFlashMob,
CMS Junior Scientist Program -> Booklet
art@CMS interdisciplinary Exhibition with: real detector & accelerator equipment, art works, creative corners, lectures and detector workshops as well as sciART workshops.
Montenegro 2017: <https://www.youtube.com/watch?v=9vflW-Pf7vg>
Athens 2015: <https://www.youtube.com/watch?v=t8MHsCaYks>





Science&Art@School

supporting school curriculum or after school activity



Graz/ AT 2012, 2013, 2014



Sofia Bulgaria 2015, Vienna/ AT 2016



FERMILAB/ US 2015, Athens/ GR 2017



Best National dissemination : Science & Art across Italy <https://web.infn.it/artandscience/index.php/en/> 2016 - 2017 - 2018,

You are cordially invited to Cultural Collisions

An art exhibition, music and dance performance presented
by Austrian and Genevese students



2016 : CERN Bldg 40 became a stage for students



CERN Meyrin Bldg 40

February 24th 2017

In the presence of His Excellency Thomas Hajnoczi,
Permanent Representative of Austria to the international organizations in
Geneva / Switzerland

18h30 Opening
19h00 Welcome
19h15 art show & performance by Haydn Gym. Vienna,
Herz Jesu Gym. Salzburg, ECOLINT LGB Geneva,
20h00 Drinks
21h00 Close



2017 and 2018: NHM – National History Museum Vienna Austria
2017: Museum fuer Vorgeschichte Halle / Germany

Cross-Disciplinary Science & Art program 4 Education: - Cultural Collisions ©

CC Ontario, Canada

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CC Vienna, Austria

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Be Inspired ICHEP2024

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CC Croatia

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Cultural Collisions Canada CCC – Toronto 2018

Venue: **Ontario Science Centre, OSC**

Cross disciplinary exhibition April 9th – 15th 2018

Work at School April 16th – May 28th

Student exhibition: May 29th – June 3rd

entire project followed and formal evaluated by
the Ministry of Education

Organization by **ORIGIN CANADA**

Ontario Ministry of Education: budget and coordination
general and education organization, evaluation

Exhibition curation by Michael Hoch

ORIGIN CANADA: Scientific advisory board

**art@CMS, ATLAS, CLS, CMS, LIGO/VIRGO, Muography, Perimeter
Institute**

Evaluation Report 2018: https://mhoch.web.cern.ch/Art@CMS/CulturalCollisionsCanada_EvaluationReport.pdf

Cultural Collisions Canada **Received the REALM Award 2020** – ORIGIN / Ontario Ministry of Education / Toronto Science Centre



video walk through the exhibition -- Ontario Science Centre
<https://www.youtube.com/watch?v=4Hkrr1mCz7o&t=184s>

Cultural Collisions by **ORIGIN** - Canada



Cultural Collisions Canada — week schedule

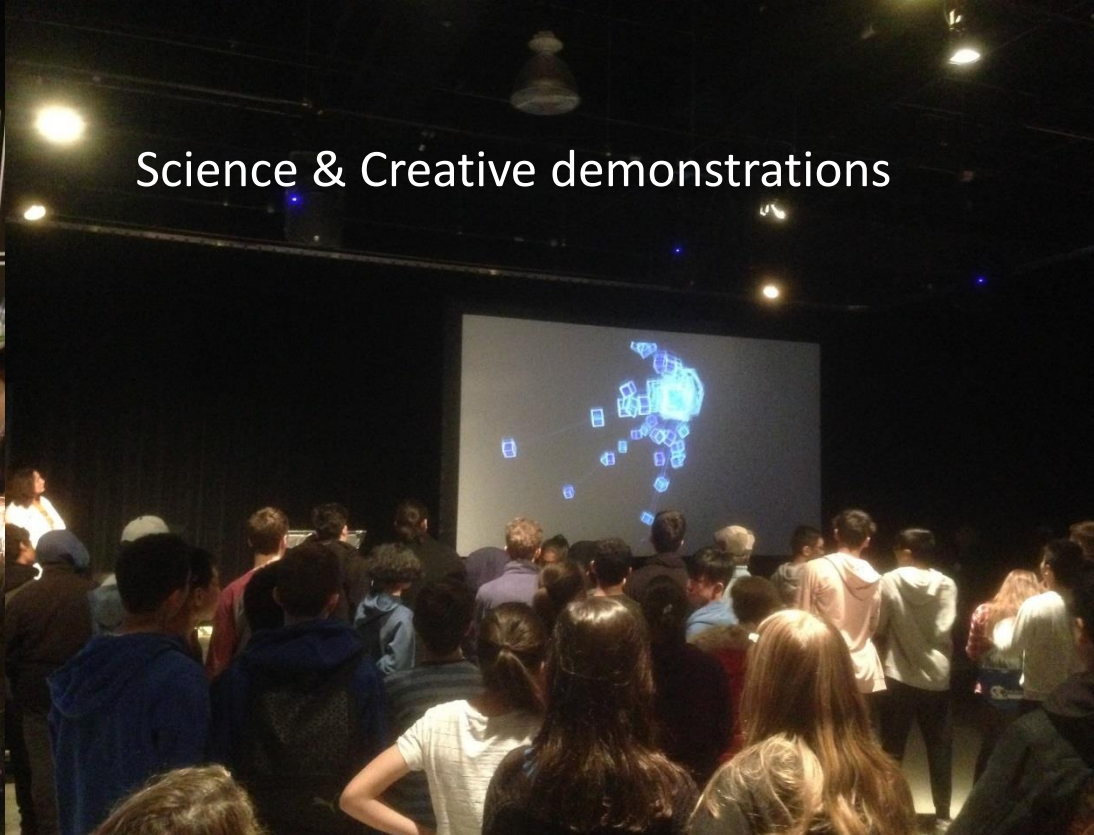


Cultural Collisions Project with Origin - Maximum number of students per day (Tuesday - Friday) is 100 to accommodate workshops - Exhibit can always handle visitors

	Monday April 9, 2018	Tuesday April 10, 2018				Mercredi 11 avril 2018				Thursday April 12, 2018				Friday April 13, 2018				Saturday April 14, 2018	Sunday April 15, 2018
	Schools: Danforth Collegiate, Ecole secondaire Toronto Ouest, University of Toronto Schools	Danforth Collegiate (60 grade 9 and 11 Students) and University of Toronto Schools (6 Grade 11 students) + OSC invitations				Ecole secondaire Toronto Ouest (61 étudiants - 10e et 11e année) - École francophone				University of Toronto Schools (95 students - Grade 8, 10) - Shifted schedule 30 minutes later - Start time is 9:30 am this day only!				Open for Ontario Science Centre Invitations to Participate - York Region Schools				Open to the public - Open at 10 am	Open to the public - Open at 10 am
9:00 AM		20 Minute Talk: Karola Dette, University of Toronto - From Particle Physics to Astrophysics				Mini-présentation: Karola Dette, Université de Toronto - De la physique des particules à l'astrophysique				20 Minute Talk: Karola Dette, University of Toronto - From Particle Physics to Astrophysics				20 Minute Talk: Karola Dette, University of Toronto - From Particle Physics to Astrophysics					
9:30 AM	Opening Event (9:30 - 10:00) - Richard Franz, Maurice (OSC), Rock Paper Science Hall (RPS)	Workshop 1A	Workshop 1B	Workshop 1C	Workshop 1D	Atelier 1A	Atelier 1B	Atelier 1C	Atelier 1D	Workshop 1A	Workshop 1B	Workshop 1C	Workshop 1D	Workshop 1A	Workshop 1B	Workshop 1C	Workshop 1D	Exhibit area activities will be available for the public	Exhibit area activities will be available for the public
9:45 AM		9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am	9:30 - 10:30 am		
		What keeps us stuck to the Earth? (EN)	Playing with Data (EN)	Particle Surprise in a Cloud Chamber (EN/FR)	Celestial Luminescence	Qu'est-ce qui nous garde les pieds sur Terre? / What keeps us stuck to the Earth? (EN)	Jouer avec les données (EN/FR)	Surprise de particules dans une chambre à nuages (EN/FR)	Celestial Luminescence	What keeps us stuck to the Earth? (EN)	Playing with Data (EN)	Particle Surprise in a Cloud Chamber (EN/FR)	Celestial Luminescence	What keeps us stuck to the Earth? (EN)	Playing with Data (EN)	Particle Surprise in a Cloud Chamber (EN/FR)	Celestial Luminescence	People to be within the exhibit area to support the programming	People to be within the exhibit area to support the programming
10:00 AM																			
10:15 AM	Science Flash Mob (10:00 - 10:45)	Perimeter Institute	CMS - CERN, University of Notre Dame	ATLAS, CMS, CERN	York University	Institut Périmètre	CMS - CERN, University of Notre Dame	ATLAS, CMS, CERN	York University	Perimeter Institute	CMS - CERN, University of Notre Dame	ATLAS, CMS, CERN	York University	Perimeter Institute	CMS - CERN, University of Notre Dame	CMS - CERN	York University	Open till 8:00 pm	Open till 8:00 pm
		Kelly Foyle and Kevin Donkers	Tom McCauley	Michael Hoch	Robin Kingsburgh	Dave Vrolyk et Nathan Chow	Tom McCauley	Michael Hoch	Robin Kingsburgh	Dave Fish and Damian Pope	Tom McCauley	Michael Hoch	Robin Kingsburgh	Olga Michalopoulos	Tom McCauley	Michael Hoch	Robin Kingsburgh		
		30 students	30 students	30 students	15-20 students	30 étudiants	30 étudiants	30 étudiants	15-20 étudiants	30 students	30 students	30 students	15-20 students	30 students	30 students	30 students	15-20 students	Pop up Public Talks	Pop up Public Talks
10:30 AM		RPS Hall	Room: Workshop 4	Room: Dry Lab	Exhibit area	Salle avec des tables - RPS Hall	Salle: Workshop 4	Ecosystems Lab	Aire d'exposition	RPS Hall	Room: Workshop 4	Room: Dry Lab	Exhibit area	RPS Hall	Workshop 4	Ecosystems Lab	Exhibit area	11 am - 20 Minute Talk: Peter Krieger, University of Toronto - ATLAS / LHC	
10:45 AM		10:45 am - Talk in Exhibit Area - By Perimeter Institute - Dr. Kelly Foyle, Black holes and the Event Horizon Telescope				10:45 am - Brigitte Tessier, Artiste collaboratrice de la France & Montreal - "QUI DES DEUX INSPIRE L'AUTRE: Le SCIENTIFIQUE ou L'ARTISTE?"				10:45 am - Talk in Exhibit Area - By Perimeter Institute - Dr. Damian Pope - Hidden Patterns in Physics				10:45 am - Talk in Exhibit Area - Peter Krieger				12:00 pm - 20 minute talk: David Griffin (OCAD University)	
11:00 AM		Exhibit Area with Scientists and Artists				Aire d'exposition avec les scientifiques et les artistes				Exhibit Area with Scientists and Artists								1:00 pm - 20 Minute talk: Robin Kingsburgh	
11:15 AM	Moderated Panel: Meet the Scientists and Artists! (10:45 - 11:15)													Exhibit Area with Scientists and Artists					
Lunch	11:15 am - 12:00 pm	11:30 am - 12:15 pm				11:30 am - 12:15 pm				11:30 am - 12:15 pm				11:30 am - 12:15 pm				3 pm - 20 minute Talk: Consensus Science Rap	
12:00 PM	Performance of Consensus, interactive component, Scott Wilson with the audience and then Q & A	12:15 pm - Talk in Exhibit Area - Michael Hoch or Robin				12:15 pm - Talk in Exhibit Area - Peter Krieger				12:15 pm - Talk in Exhibit Area - Peter Krieger				12:15 pm - Talk in Exhibit Area - consensus				Volunteers Coming:	Volunteers Coming:
12:15 PM		Workshop 2A	Workshop 2B	Workshop 2C	Workshop 2D	Atelier 2A	Atelier 2B	Atelier 2C	Atelier 2D	Workshop 2A	Workshop 2B	Workshop 2C	Workshop 2D	Workshop 2A	Workshop 2B	Workshop 2C	Workshop 2D	Peter Krieger (ATLAS Canada, Professor, U of T)	Peter Krieger (ATLAS Canada, Professor, U of T)
12:30 PM		12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	12:45 - 1:45 pm	Michael Hoch CMS	Michael Hoch CMS
		Listening to Einstein's Universe (EN/FR)	Playing with Data (EN)	Accelerating Colours (EN/FR)	Science through Rap	Écouter l'univers d'Einstein (EN/FR)	Des données créatives au son (EN/FR Maybe)	Accélérer les couleurs (EN/FR)	La science à travers le rap	Listening to Einstein's Universe (EN/FR)	Creative Data to Sound (EN)	Accelerating Colours (EN/FR)	Science through Rap	Listening to Einstein's Universe (EN/FR)	Creative Data to Sound (EN)	Accelerating Colours (EN/FR)	Science through Rap		
12:45 PM																		Wen Yi Song (ATLAS Canada, York University)	Bianca Ciungu (ATLAS Canada Toronto MS)
1:00 PM	Workshops and Activities in Exhibit Area	LIGO, University of Glasgow	CMS - CERN, University of Notre Dame	CMS - CERN, Collaborative Artist from Montreal working in France	Consensus	LIGO, University of Glasgow	BEER, University of Birmingham	CMS - CERN, Collaborative Artist from Montreal working in France	Consensus	LIGO, University of Glasgow	CMS - CERN, University of Notre Dame	CMS - CERN, Collaborative Artist from Montreal working in France	Consensus	LIGO, University of Glasgow	BEER, University of Birmingham	CMS - CERN, Collaborative Artist from Montreal working in France	Consensus	Lisa Cole	Lisa Cole
1:15 PM	Activities in the exhibit area	Martin Hendry	Tom McCauley	Michael Hoch and Brigitte Tessier	Antoine Gittens-Jackson	Martin Hendry	Scott Wilson	Michael Hoch	Antoine Gittens-Jackson	Carl-Johan Haster	Tom McCauley	Michael Hoch	Antoine Gittens-Jackson	Heather Fong	Scott Wilson	Michael Hoch	Antoine Gittens-Jackson	Consensus	Vincent Pascuzzi (ATLAS Canada Toronto F)
1:30 PM	Prompts?	30 students	30 students	20 students	20 students	30 étudiants	30 étudiants	20 étudiants	20 étudiants	30 students	30 students	20 students	20 students	30 students	30 students	20 students	20 students	Brigitte Tessier	
1:45 PM	Interaction with staff, scientists in the staff	Room: RPS Hall	Dry Lab	Exhibit Area	Room: Studio 3	RPS Hall	Workshop 4	Aire d'exposition	Salle: Dry Lab	Room RPS Hall	Workshop 4	Exhibit Area	Room: Studio 3	Room: RPS Hall	Workshop 4	Exhibit area	Dry Lab	Bianca Ciungu (ATLAS Canada MSc Student, Toronto)	
2:00 PM	Artists present in exhibit area	Activities in Exhibit Area with Q & A				Activités dans l'aire d'exposition (questions et réponses)				Activities in Exhibit Area with Q & A				Activities in Exhibit Area with Q & A					
2:15 PM																			
2:30 PM	Departure at 2:30 pm	Departure at 2:30 pm				Départ à 2:30 pm				Departure at 2:30 pm				Departure at 2:30 pm					
		Open till 6:00 pm				Ouvert jusqu'à 6:00 pm				Open till 6:00 pm				Open till 6:00 pm					
						Evening Talk - 7:00 pm													



Science personal dialogue



Science & Creative demonstrations



Creative workshops



Specialized topic talks

General science talks

Young audience



Cloud Chamber Workshop



Life Size Photo Wall



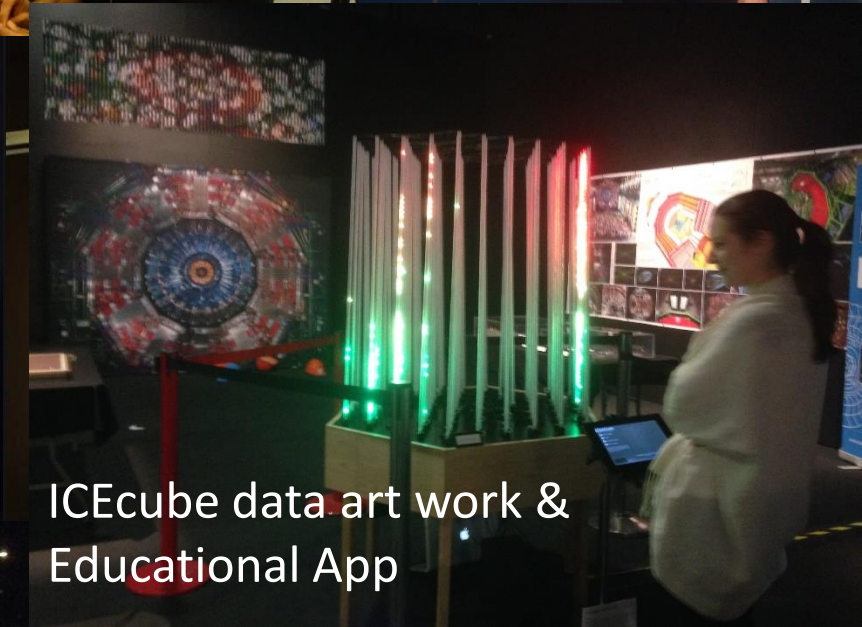
Rap Workshop



Creative Photo Wall



ICEcube data art work & Educational App



General Science Morning Introduction Talk



Exhibition & Great Conversation Evening

“Science engagement through the Arts”



LHC tunnel Photo wall



Science Centre CEO Maurice Bitrain



Direct dialogue



presentation



Guided tour through the exhibition



Entrance CMS life size photo

Concert at the Royal Music Conservatory

Scott Wilson (BEER) world premier "Dark Matter"



Data Sonification Workshop



World Premier "Dark Matter"



Pre Concert Conversation



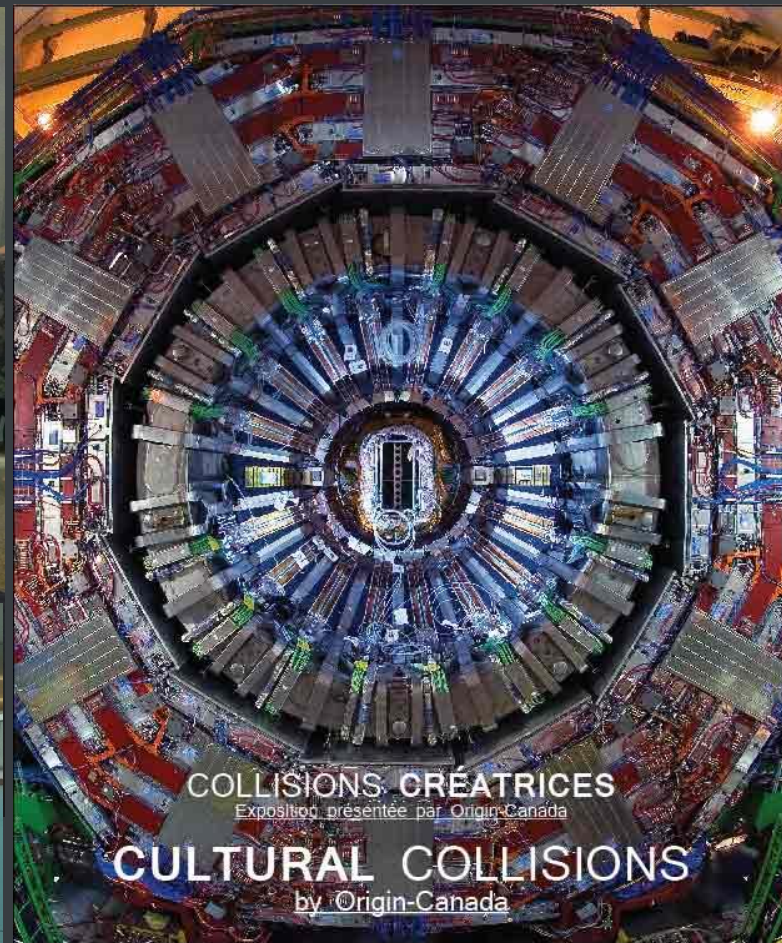
Pre Concert Conversation



OSC data sonification
Life demonstration



Second Exhibition - Student Results - artWorks



COLLISIONS CRÉATRICES
Exposition présentée par Origin-Canada
CULTURAL COLLISIONS
by Origin-Canada

STUDENT ART ŒUVRES ÉTUDIANTES
INSPIRED BY SCIENCE INSPIRÉES PAR LA SCIENCE

From May 29 to June 1, 2018 Du 29 mai au 1^{er} juin 2018

Danforth Collegiate and Technical Institute
École secondaire Toronto Ouest
University of Toronto School

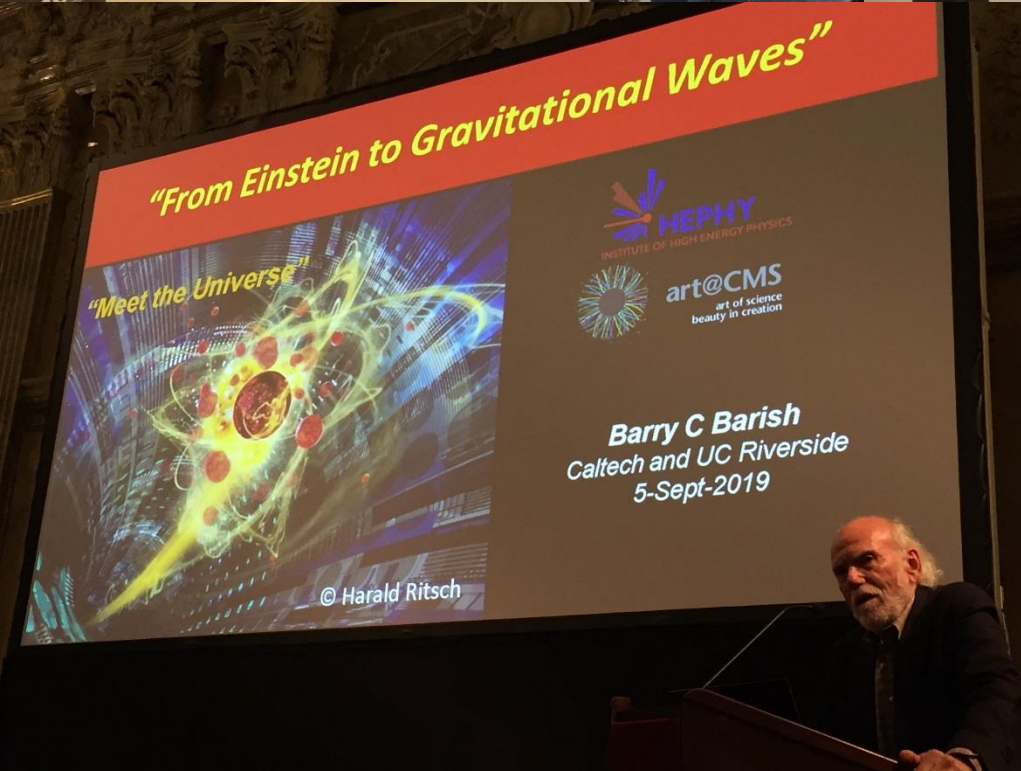


Cultural Collisions Vienna/ Austria 2019/2020

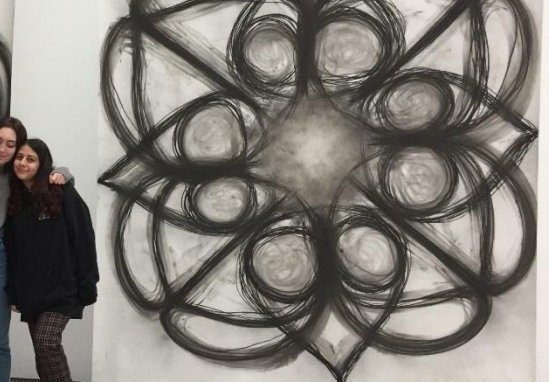
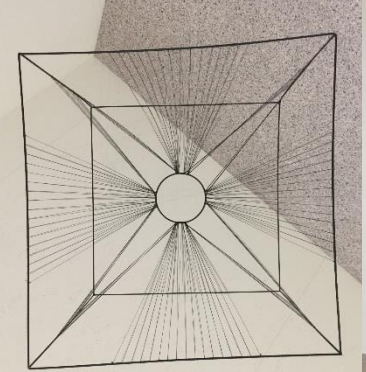
“Meet the Universe” exhibition by HEPHY Institute OeAW & ORIGIN;
exhibition ‘Aula der Wissenschaft’ September 2019; Cultural Collisions September 2019 – June 2020





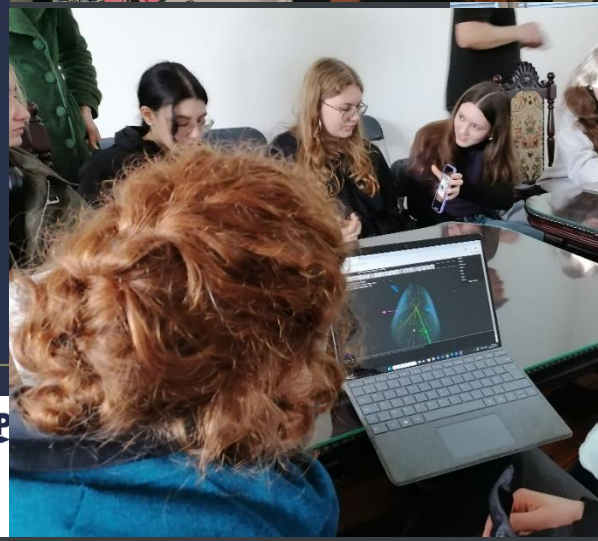
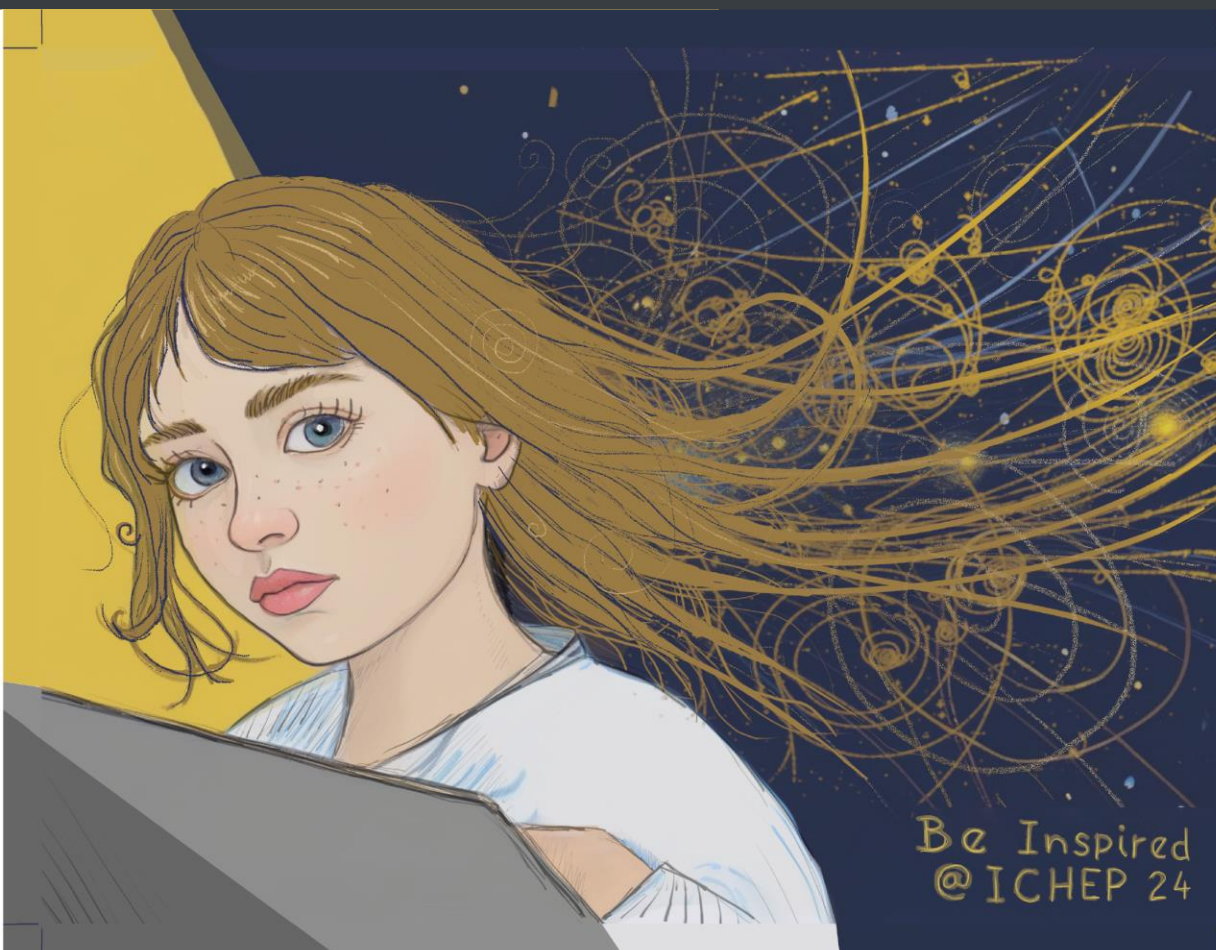


mumok, vernissage Wintersemester 2019/2020 – February 28th



Be Inspried ICHEP2024/ Prague 2024

Initiation Workshop Day at the University for about 100 selected pupils from 14 schools January 2024
scientific introduction / Hands On Science Workshops / Lab Visits



Be Inspried ICHEP2024/ Prague 2024

Initiation Workshop Day at the University for about 100 selected pupils from 14 schools January 2024

Creative HandsOn Workshops with Artists followed by a philosophic summary discussion



Be Inspired ICHEP2024/ Prague 2024

Final Vernissage / Performance and Exhibition during the ICHEP2024 Conference



BeInspired@ICHEP2020

full day - Inspiration Workshop at the University in February

January 2020 Working visit of Prof. Vladimir Kokolina & Team

Preparation meeting for workshop days at the University Prague

Due to the Covid19 pandemic, the Workshop days in Prague has been realized the rest of the engagement and exhibition activities has been online.



BeInspired@ICHEP2020

artist residence visit @ CERN / CMS January 2020

Educational program for >120 high school students

Visit/ Masterclass/ Art WS/ Could Chamber WS/ Science Flash Mob/



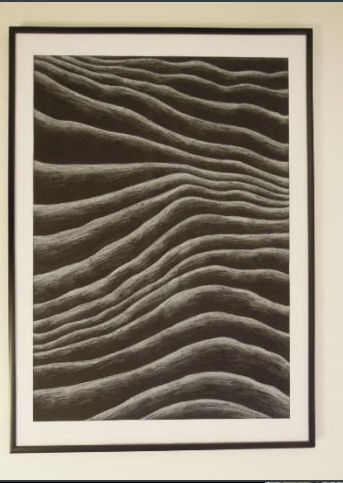
BeInspired@ICHEP2020

final pupil exhibition of the creative results / Due to Covid Online 2020

1) *end of school year exhibition - online June 2020*

2) *ICHEP2020 student exhibition – online July/August*

online Art competition : <http://ichep2020.org/beinspired-vystava-hlasovani.htm>



Cultural Collisions Croatia 2018/2019



workshop program:

Workshop 1: Thursday 15h

- Gravitational waves - building interferometers
- Martin Hendry, Chiara Mariotti, Nikola Godinović with teachers and students from the Science and Math gymnasiums
- Number of students: about 20 + few teachers

Workshop 2: Thursday 17h00

- Higgs boson discovery - event display
- Claire Adam Bourdarios, Chiara Mariotti, Ivica Puljak with teachers and students from the Science and Math gymnasiums
- Number of students: about 20 + few teachers

Workshop 3: Friday 15h

- Gravitational Waves - extreme processes in the universe
- Martin Hendry, Nikola Godinović with teachers and students from the Art school
- Number of students: about 20 + few teachers

Workshop 4: Friday 17h00

- Creating musics with physics - Arduino and other platforms programming
- Chiara Mariotti, Michael Hoch, Ivica Puljak with teachers and students experienced in robotics + a teacher of music
- Number of students: about 20 + few teachers

Workshop 5: Friday 18h30

- Origin and evolution of universe
- Nikola Godinović, Ivica Puljak with primary school teachers and students

public lectures program:

Tuesday 18h30

Science & Art - Michael Hoch

Thursday 18h30

Listening to Einstein's Universe – the

Discovery of Gravitational Waves – Martin Hendry

Thursday 20h00

Round Table Discussion - Understanding

the World Through Arts and Science – Nikola Godinovic

Friday 18h30

LHC physics – James Beacham

Video walk through the exhibition: <https://youtu.be/XYIDehGg4Xs>





Cultural Collisions

by ORIGIN - Croatia



Science: from Astrophysics to Particle Physics

Art: International art@CMS collaborative artists and local artists

Dates Exhibition Sept. 17th – 22nd 2018

Venue: Old City Hall Split,
LHC Days in Split Palazzo Milesi

Organization:

University of Split: general organization

Exhibition curation: M.Hoch

Scientific Advisory Board: ORIGIN network

ORIGIN – South East Europe Network:

art@CMS, ATLAS, CERN, CMS, LIGO/VIRGO, Muographer, University of Split



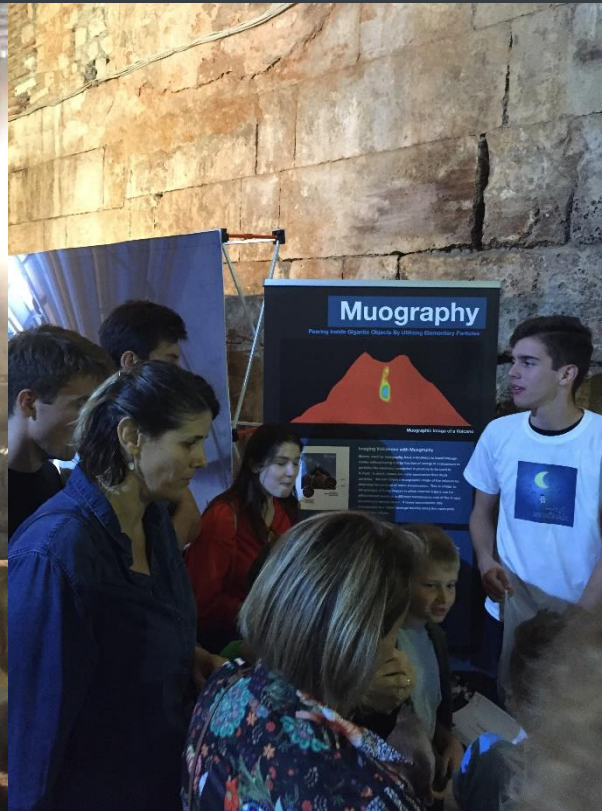


Cultural Collisions – Split /Croatia by ORIGIN

Train the Trainer model - Researchers night

Format: students we trained become lecturer to general public and training other students. During the main exhibition we trained students from primary and secondary schools to act as lectures for following engagement events.

Audience during the researcher's night: few thousands citizens



Cultural Collisions – Split /Croatia

by ORIGIN

4 secondary schools + 1 primary school

Format: exhibition and lectures, one day

Exhibition presented by **trained students**

Lectures given by **CMS scientists**

Audience:

Primary School – 100 students participating

Secondary School : ~500 secondary students





Cultural Collisions - Imotski /Croatia

by ORIGIN

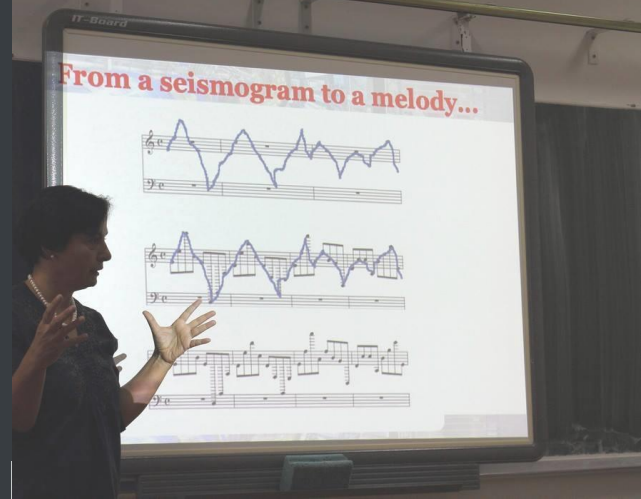
Exhibition and Concert, October 27th 2018

Format: Exhibition, masterclass, lectures, concert with French and local orchestra

-2 workshops in parallel with 2 teams:

Physics & Music, Gravitational Waves, Playing with data

Audience: 400 students of 4 school attending lectures and 70 students workshops participants



Cultural Collisions Montenegro

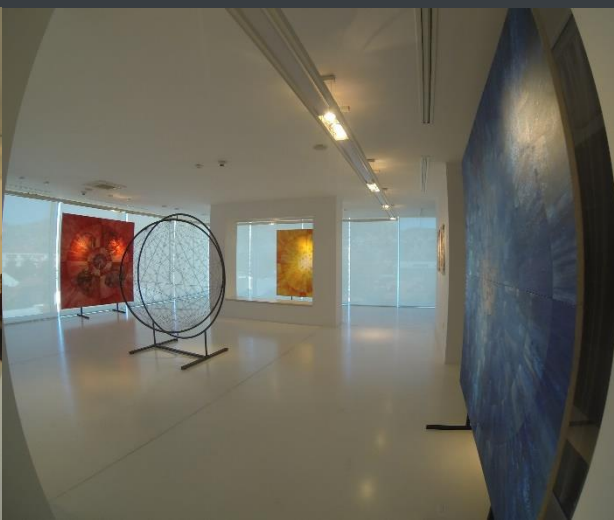
art@CMS – Art University Collaboration + Workshops for School Students

Gallery National Museum, Cetinje/ Montenegro October 2018

Format: art exhibition lectures and Cultural Collisions workshop start 3 schools 85 students

Event is the final show of our 2 semester course “art@CMS – Art University Collaboration, 2017/ 2018”
Presentation: Final presentation of 5 university art students + art@CMS collaborative artists

Video walk through the exhibition : <https://youtu.be/UUnBDYhiSlk>



Cultural Collisions BiH

Science & Art, Sarajevo /Bosnia by ORIGIN -
Fine Art Academy, 15th -22nd October 2018

Format: cross disciplinary exhibition ORIGIN, public lectures in the exhibition

Audience: general public and about high school **students 400 attending lectures**

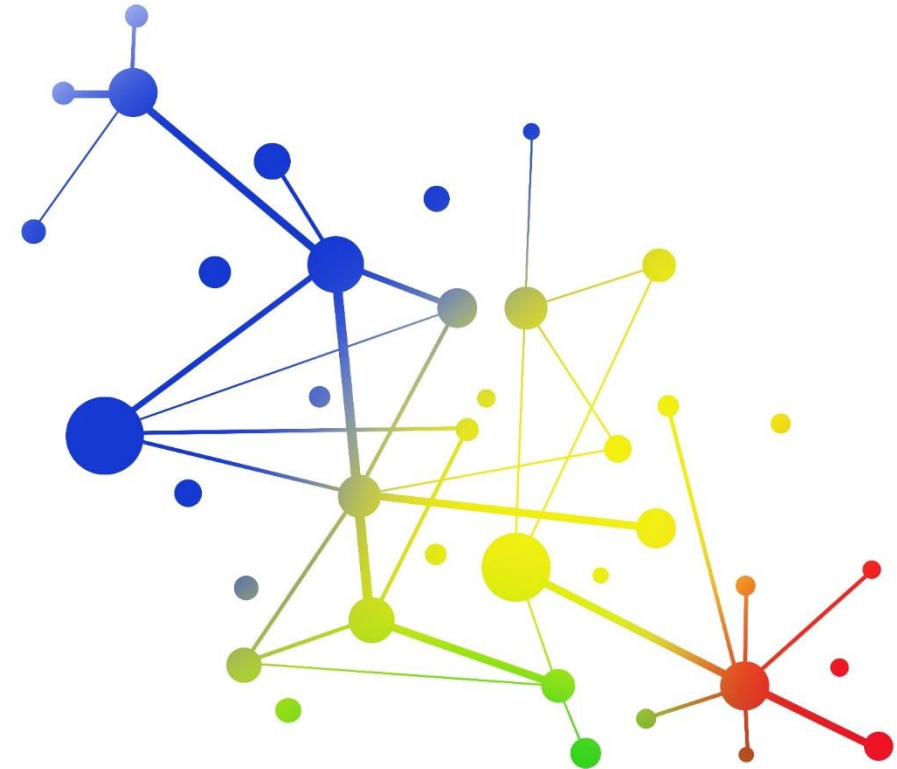
Further remark: Art university Sarajevo requests of art university collaboration



Cross-Disciplinary Science & Art 4 Education 'online activities'

CC Bosnia and Herzegovina 2021
Virtual Visit Bhutan 2021
Virtual Visit Oman 2022

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Cultural Collisions Bosnia and Herzegovina

PAST, PRESENT AND FUTURE OF UNIVERSE SCIENCE&ART - CONNECTING PEOPLE

Jadranko Batista¹, Daniela Brill², Azra Gazibegović Busuladžić³, Nikola Godinović⁴,
Mirza Hadzimehmedović⁵, Michael Hoch⁶, Ivica Puljak⁴, Nemanja Rakić⁷, Christoph Schäfer⁸

¹University of Mostar, Mostar, Bosnia and Herzegovina

²Master, Science & Art, University Applied Arts Vienna, Austria

³University of Sarajevo, Sarajevo, Bosnia and Herzegovina

⁴University of Split, Split, Croatia

⁵University of Tuzla, Tuzla, Bosnia and Herzegovina

⁶FSU – Florida State University, United States

⁷University of Banja Luka, Banja Luka, Bosnia and Herzegovina

⁸CERN - European Organization for Nuclear Research, Geneva, Switzerland

Aim:

Schedule:

to Connect teams from all over BiH
November 2020 – June 2021

11 teams in 6 towns:

- Banja Luka,
- Gradačac,
- Mostar
- Sarajevo,
- Tuzla,
- Zenica

Every team consists of :

- Students
- One teacher
- One scientist
- One local artist



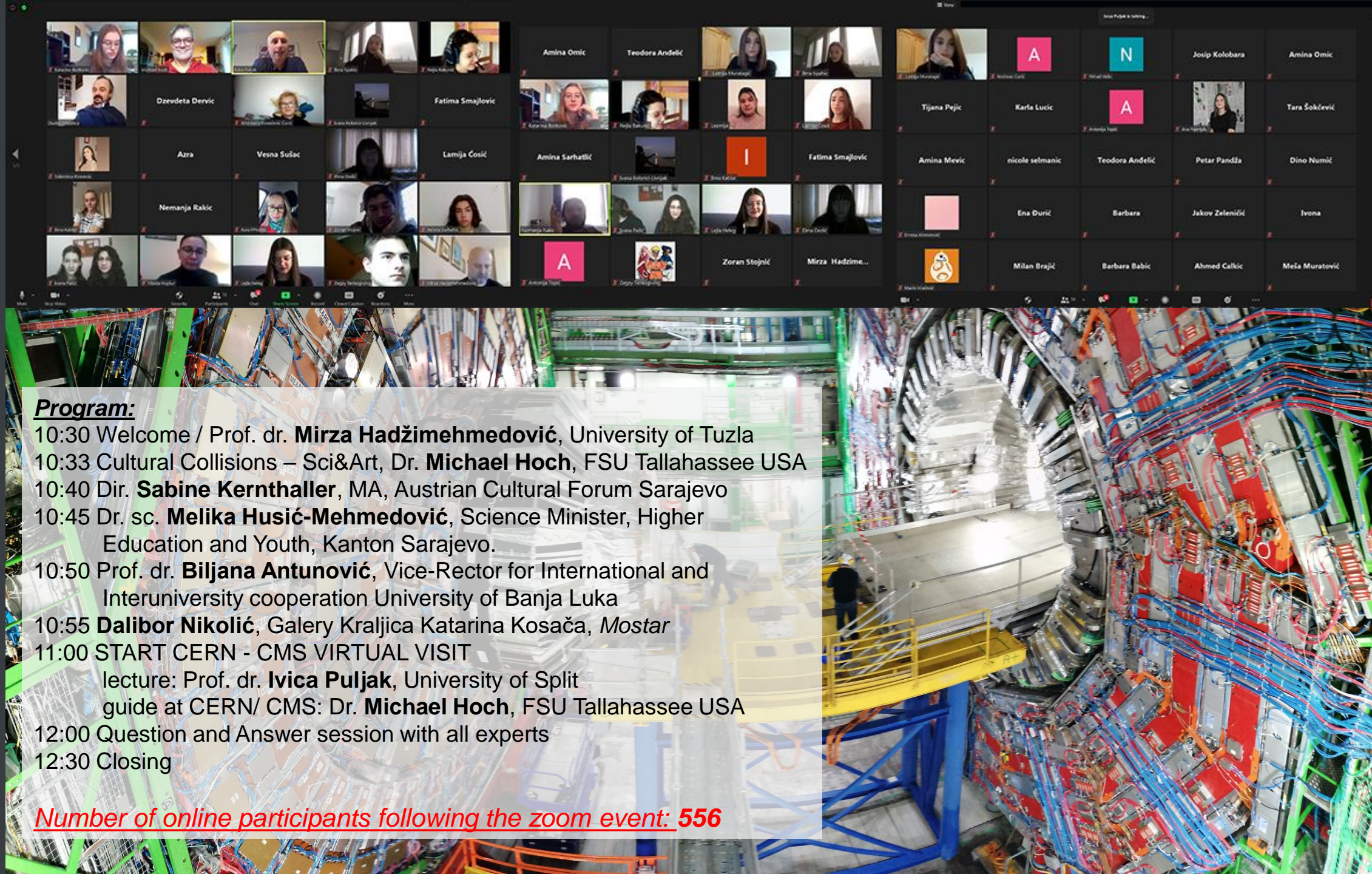
Schedule & Planning:

1. **Pre-Opening:** install in 4 cities small local inspiration exhibitions:
 - 18 printed posters sent to each town to create 4 local science & art exhibitions for inspiration.
 - All 4 exhibitions sponsored by **ACF** and **DAAD** stay permanently with local partners.
2. **Kick-off online Symposium:** – 6 and 7 Nov 2020; <https://indico.cern.ch/event/970862>
3. **First Ideas Exchange Session:** -12 Dec 2020; <https://indico.cern.ch/event/1015445/>
4. **Second General Rehearsal Session:** - Feb. 16th 2021; <https://indico.cern.ch/event/1005605/>
5. **Virtual Visit to CERN / CMS:** - March 25th 2021; <https://indico.cern.ch/event/1018237/>
 - Plenary session contributions by director Austrian Cultural Forum, Science Minister Sarajevo, Vice Rector Univ. Banja Luka, Art Gallery Director Mostar
 - Introduction Presentation & Virtual Visit to CMS/ CERN followed by Q&A session
6. **3rd General Rehearsal session:** - May 26th 2021: <https://indico.cern.ch/event/1041786/>
7. **Closing Hybrid-Vernissage:** - June 18th 2021: <https://indico.cern.ch/event/1047913/>
 - International Zoom Conference + 2 physical presents Vernissages (Sarajevo + Banja Luka)
 - Student presentation + Plenary Session with local partners <https://indico.cern.ch/event/970862>

Virtual Visit to CERN / CMS

Dates: March 25th 2021, CERN/CMS virtual visit:

<https://indico.cern.ch/event/1018237/>



Program:

- 10:30 Welcome / Prof. dr. **Mirza Hadžimehmedović**, University of Tuzla
- 10:33 Cultural Collisions – Sci&Art, Dr. **Michael Hoch**, FSU Tallahassee USA
- 10:40 Dir. **Sabine Kernthaller**, MA, Austrian Cultural Forum Sarajevo
- 10:45 Dr. sc. **Melika Husić-Mehmedović**, Science Minister, Higher Education and Youth, Kanton Sarajevo.
- 10:50 Prof. dr. **Biljana Antunović**, Vice-Rector for International and Interuniversity cooperation University of Banja Luka
- 10:55 **Dalibor Nikolić**, Galery Kraljica Katarina Kosača, *Mostar*
- 11:00 START CERN - CMS VIRTUAL VISIT
 - lecture: Prof. dr. **Ivica Puljak**, University of Split
 - guide at CERN/ CMS: Dr. **Michael Hoch**, FSU Tallahassee USA
- 12:00 Question and Answer session with all experts
- 12:30 Closing

Number of online participants following the zoom event: 556

Cultural Collisions Bosnia & Herzegovina

Hybrid Vernissage June 18th 2021

PAST, PRESENT AND FUTURE OF THE UNIVERSE - SCIENCE & ART CONNECTING PEOPLE

13h – 16h20 General Session:

Students of 6 different cities present the results of their creative dialogue Sarajevo, Banja Luka, Mostar, Tuzla, Zenica, Gradačac

16h30 - 18h General Discussion:

Michael Hoch, ORIGIN program leader
Ivica Puljak, ORIGIN regional coordinator/ Split Mayor
Mirza Hadžimehmedović, ORIGIN Bosnia & Herzegovina coordinator
Sabine Kernthaller, Director Austrian Cultural Forum/ Austrian Embassy Sarajevo
Marcus Bleicher, DAAD /CONNECT 21 project leader
Christoph Schäfer, CERN
Melika Husić-Mehmedović, Minister Higher Education and Science, Sarajevo
Mirza Dautbašić, Vice Rector UNSA
Sanja Bijakšić, Vice-Rector University of Mostar
Elvis Baraković, Minister for Science & Education Tuzla
Vesna Bratovčić, Vice Rector IR UNTZ
Jasmin Imamović, Tuzla Mayor
Srđan Rajčević, Minister Science and Technology, Higher Education Republika Srpska
Goran Trbić, Dean Faculty of Natural Sciences and Mathematics, University of Banja Luka
Biljana Antunović, Vice-Rector for International and Interuniversity Cooperation, University of Banja Luka
Suzana Gotvac Atlagić, Assistant Prof. RMSchools Ambassador at Schools 4.0. EIT

Program:

<https://indico.cern.ch/event/1047913/>

Zoom: <https://cern.zoom.us/j/68405785504?pwd=dU13dG9mOVNLT0FVc052NHJlczFqUT09>

Zoom Meeting ID : 68405785504



Venue:

Sarajevo Druga Gimnazija, Sutjeska 1, Room: Kuća Znanja [13h - 18h]
Banja Luka University, Prirodno-Matematički Fakultet, Mladena Stojanovića 2 [13h - 18h]
Banja Luka Studentsko pozorište Banjaluka, Ulica Veselina Masleše 20; [20h - 22h]



Poster design: Michael Hoch@cern.ch

Hybrid Vernissage June 18th 2021

Online Zoom conference

&

2 physical Vernissages venues

- Sarajevo
- Banja Luka

EPS2021 Jul 31st Aug.3rd

conference contribution
Poster session

Paper in preparation

CULTURAL COLLISIONS

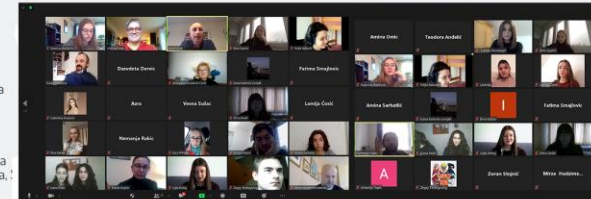
Bosnia and Herzegovina

A creative approach to engage on scientific topics.

November 2020. - June 2021. Authors Jadranko Batista 1, Daniela Brill 2, Azra Gazibegović Busuladžić 3, Nikola Godinović 4,

Mirza Hadžimehmedović 5, Michael Hoch 6, Ivica Puljak 4

Nemanja Rakić 7, Christoph Schäfer 8



- 1) University of Mostar, Mostar, Bosnia and Herzegovina
- 2) Master Science & Art, University Applied Arts, Vienna, Austria
- 3) University of Sarajevo, Sarajevo, Bosnia and Herzegovina
- 4) University of Split, Split, Croatia
- 5) University of Tuzla, Tuzla, Bosnia and Herzegovina
- 6) FSU - Florida State University, United States
- 7) University of Banja Luka, Banja Luka, Bosnia and Herzegovina
- 8) CERN - European Organization for Nuclear Research, Geneva, Switzerland

Abstract

Cultural Collisions is a novel cross-disciplinary science engagement, networking and education programme designed to stimulate the interest of high school students in science by introducing the methods and concepts of art and creativity into their standard science studies. It is based on a unique collaboration of international, national and local partners (scientists, artists and educators), using modern communication tools which in particular facilitate the participation of in city base or rural communities. It provides access to and is supported by science centres and museums through workshops and exhibitions. Cultural Collisions Bosnia and Herzegovina has brought together 11 working groups in 6 different Bosnian cities and has been run entirely online.

During a whole school year, a total of 130 students participated in workshops and 556 in complementary events, including virtual visits and public lectures. They were supported by a unique collaboration of their teachers, local artists, local and international scientists, and demonstrated strong interest and enthusiastic engagement. Their commitment and efforts have resulted in an enhancement of their skills, an improved understanding of big science questions, scientific methodology, and an enhanced ability to discover creative solutions to complex problems. Furthermore, the programme demonstrates that the creative approach to engage on scientific topics encourages an increase in the participation of girls. The program is organized by ORIGIN/CMS following the Cultural Collisions methodology of previous successfully disseminated programs in Canada, Germany, Switzerland and Austria.

6 Different Bosnian cities

11 Working groups

130 Students participating in various workshops

Cultural Collisions is divided into 3 phases:

1. Interdisciplinary exhibition / lectures and Workshops: (beginning of School Year e.g. September or October) - science, technology and art exhibition lectures and workshops held by scientists and artists.

2. Elaboration of the topics at schools: (e.g. October – May) - further research and work of the students with creative supervisors in dialogue with science teachers at the schools.

Several event should be offered: ideas exchange rehearsal sessions, mentoring and discussion sessions with in international partners/ Virtual Visits to large international Science experiments e.g. CERN

3. Final presentation of the students' works: (end of School Year; e.g. May or June) - exhibition of the themes/artworks created by the students in a museum, possibly again with a supporting program.



Each team consisted of:



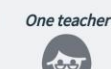
Students



One scientist



One local artist



One teacher

October 2020 - Pre Opening: installation in 4 cities local permanent inspiration exhibitions sponsored by ACF and DAAD
6th and 7th Nov 2020 - Kick-off online Symposium: - <https://indico.cern.ch/event/970862/>
12 Dec 2020 - First Ideas Exchange Session: - <https://indico.cern.ch/event/1015445/>
Feb. 18th, 2021 - Second General Rehearsal Session: - <https://indico.cern.ch/event/1005605/>
March 25th, 2021 - Virtual Visit to CERN / CMS - <https://indico.cern.ch/event/1018237/>
May 26th, 2021 - 3rd General Rehearsal session: - <https://indico.cern.ch/event/104786/>
June 18th, 2021 - Closing Hybrid-Vernissage: - <https://indico.cern.ch/event/1047913/>





<https://www.connect2020.online>



time	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
		Registration and Testing from 6:00				
09:00 - 09:30	Arrival	Opening and Introduction Marcus Blecher / Mirza Hadzmedmedovic	Video editing and camera motion tracker Mirza Hadzmedmedovic	Science communication during pandemics Jelena Kollin	Education system reform Jadranka Sotirovic	Online Science Communication Tijana Prodanovic (online)
09:30 - 10:00		Project writing Sara Caci	Augmented reality technology in education Ksenia Vukobratovic	the Milica Babovic (online)	Multidisciplinary approach for science popularization Nenad Radoicic	International Networks Marcus Blecher
10:00 - 10:30		How to write a project proposal and get funds Elvis Almetovic	Can theatre help with science popularization? Daria Marasovic	Hands-on session 3	Hands-on session 5	art@CMS Michael Hach
10:30 - 11:00		Coffee	Coffee	Coffee	Coffee	Coffee
11:00 - 11:45		Introduction to Science Communication Sara Caci	Storytelling Bradley van Paridon	Hands-on session 4	Hands-on session 6	Future of Science and Humanity Ivica Puljak
11:45 - 12:30						Presentation preparation Martina Marasovic
12:30 - 14:00		Lunch	Lunch		Lunch	Lunch
14:00 - 16:00		Dialogue Forum, Preparing Groups for hands-on sessions	Dialogue Forum	Common excursion	Dialogue Forum	Dialogue Forum, Preparation for final presentations
16:00 - 16:30		Coffee	Coffee		Coffee	Coffee
16:30 - 18:00		Starting projects / Hands-on session 1	Hands-on session 2		Hands-on session 7	Final Presentations
18:00 - 18:15		Wrap-Up	Wrap-Up	Discussions / Social Dinner	Wrap-Up	Wrap-Up



DAAD - CONNET2021 Collaboration with ORIGIN-CMS
Cultural Collisions Bosnia and Herzegovina
Neum/ Bosnia August 8th – 14th 2021

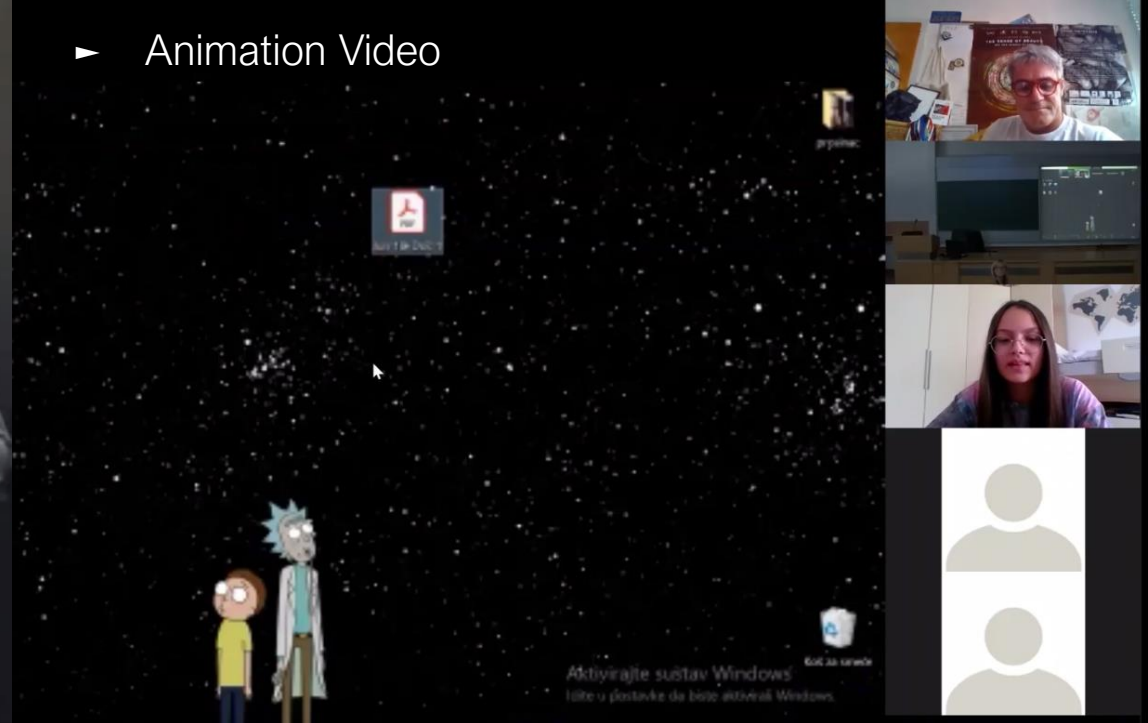


► Round Table Discussion

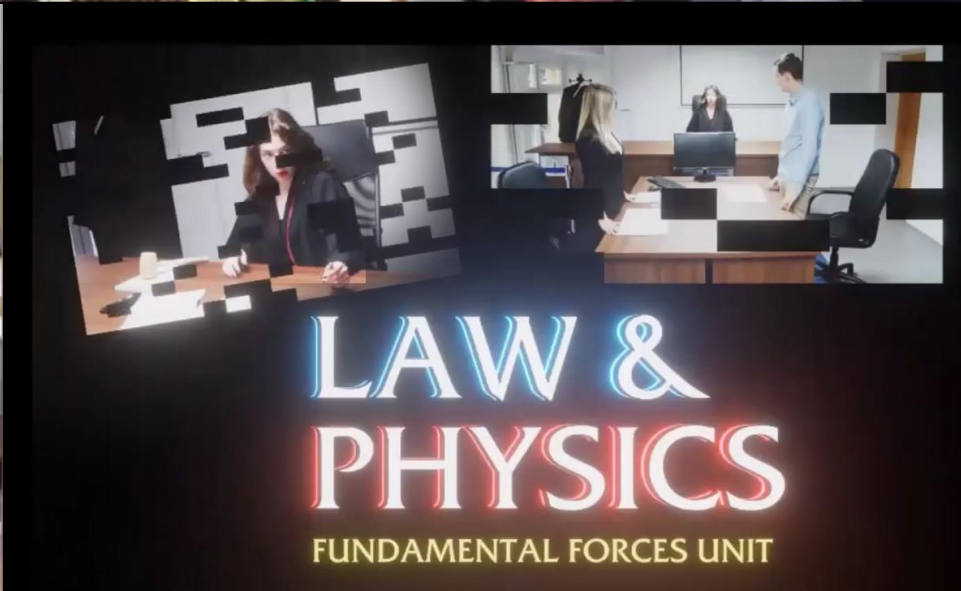


Mira-I research the black holes and that's what attracted me to this project.

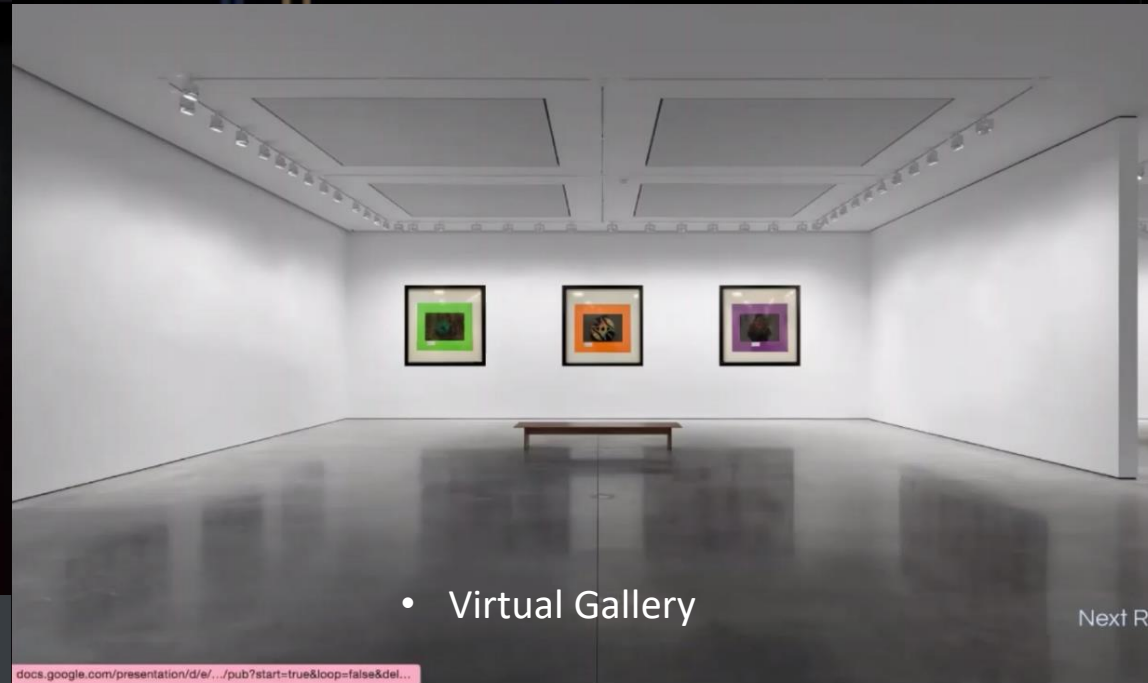
► Animation Video



► Creative Production



► TV Serie Law & Physics Court Room



• Virtual Gallery

Next R



Participatory
art & Science
Practice with
young Children



Theatre Play & Poems



Stop Motion Film



Dance Performance Video

CMS virtual visit for Bhutan

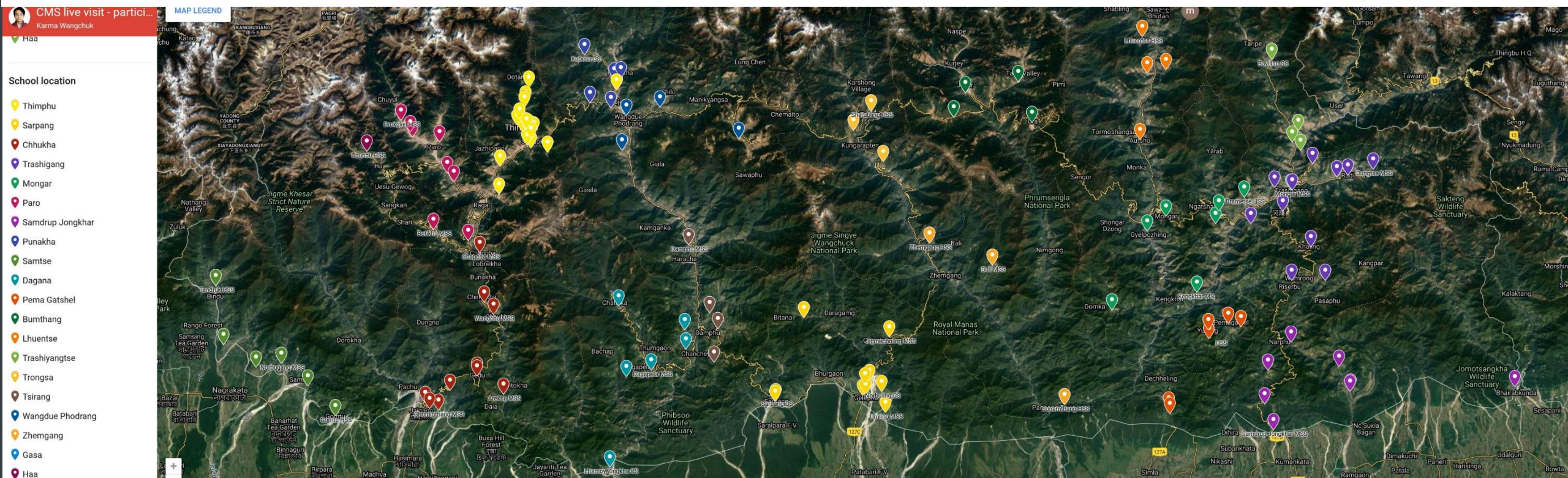
December 2021



INDICO: <https://indico.cern.ch/event/1101596/>

VIDEO: <https://www.youtube.com/watch?v=nv8Oko5A7z4>

Record for CMS virtual visits: **12 792 participants**
693 teachers 12099 students grade 10 and grade12



CMS virtual visit - a science Engagement & Networking tool



- Initiated by the Austrian Bhutan Society ABS in contact with the Bhutan Ambassador in Geneva
- Locally organized by the Royal Society of STEM and the Bhutan Ministry of Education
- run by the CMS virtual visit team and CMS TC : Dawn Hudson/ Noemi Beni / Zoltan Szillasi at CERN P5
- Supported by ABS Michael Hoch, Wolfgang Adam and CERN IR representative Archana Sharma

རྒྱལ་འཛིན་ཚན་རིག་ཐོན་སྐྱེད་ཚོགས་པ།
Royal Society for STEM
(RSSTEM), HMS



Organized in
collaboration with



CMS virtual visit for OMAN

March 15th 2022

4934 participants: 267 teacher , 4676 students

Governorates	No. teachers	No. Students	No. Schools
Muscat	108	2011	39
Ad Dakhiliyah	29	410	17
Al Batinah North	29	410	14
Al Batinah South	29	470	13
Ash Sharqiyah North	13	348	10
Ash Sharqiyah South	10	215	8
Ad Dhahirah	17	337	17
Dhofar	21	283	18
Al Buraymi	9	173	5
Al Wusta	2	19	2
Total	267	4676	143

INDICO: <https://indico.cern.ch/event/1137853/>

VIDEO: <https://www.youtube.com/watch?v=nv8Oko5A7z4>



SULTANATE OF OMAN
MINISTRY OF EDUCATION





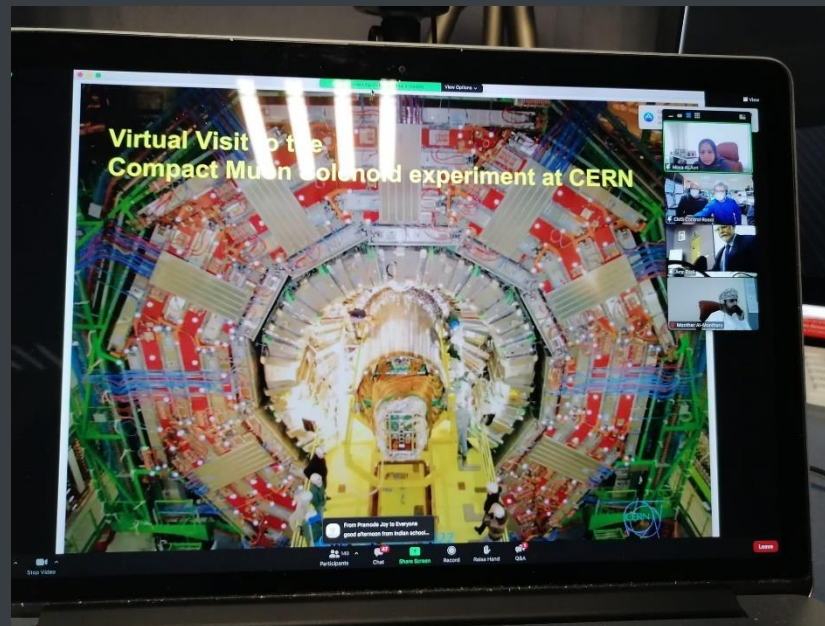
CMS virtual visit – for Oman April 2022

- Initiated by the **ORIGIN CMS**
- Locally organized by the **OMAN Ministry of Education**
- and the **CMS institute** at the **SQU University** in Muscat



ID 193337223 © Momcilojovanov

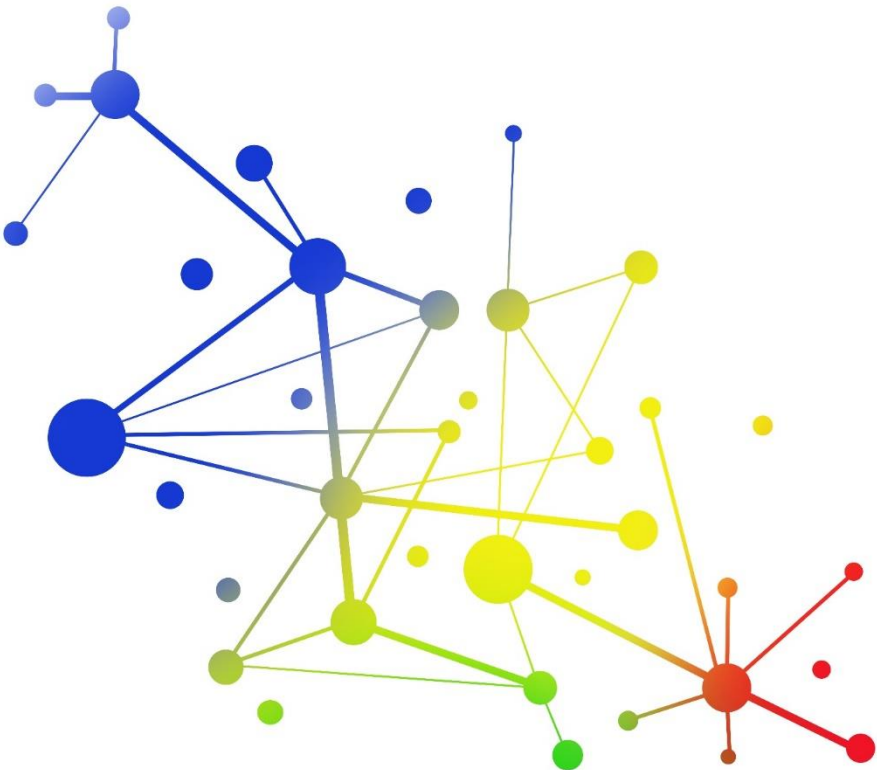
dreamstime.com

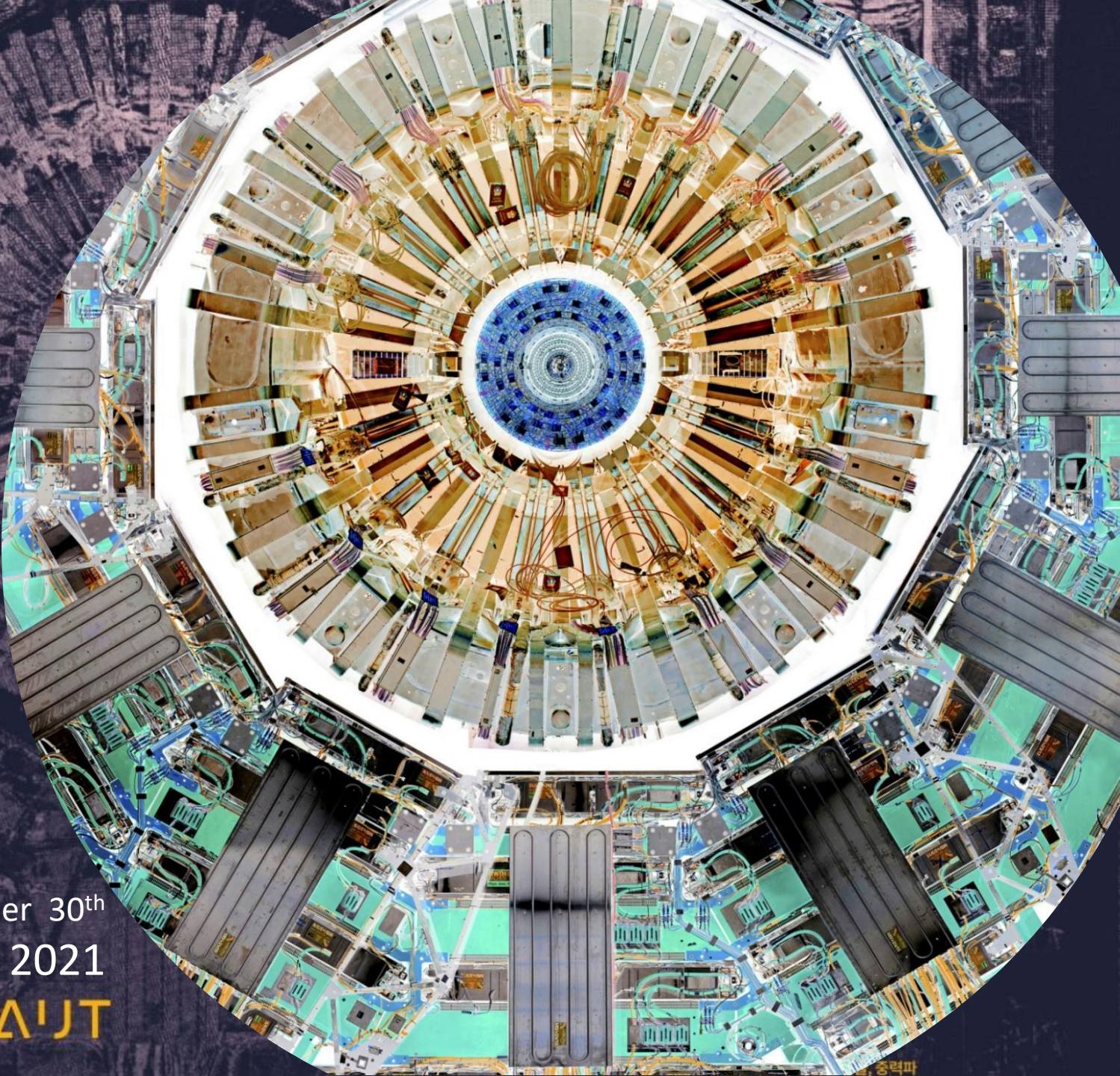




Cross-Disciplinary Exhibitions

Seoul, Korea	2021	p49
Daejeon, Korea	2019	p59
Muscat, Oman	2022, 2019	p61
Chateau d'Oex	2019-2021	p96



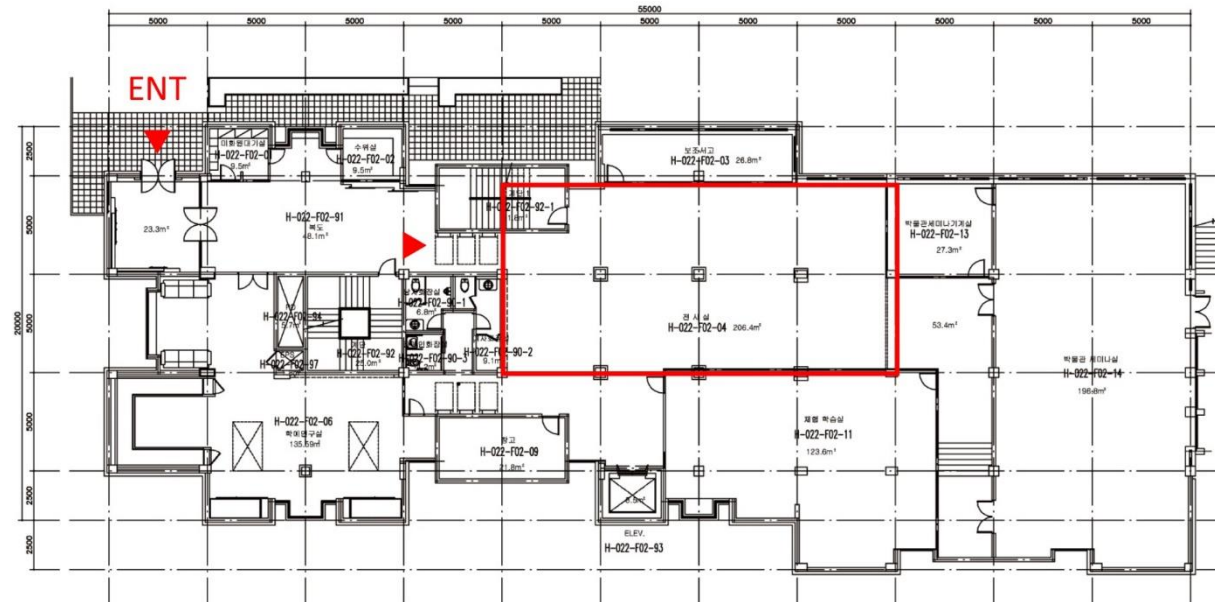
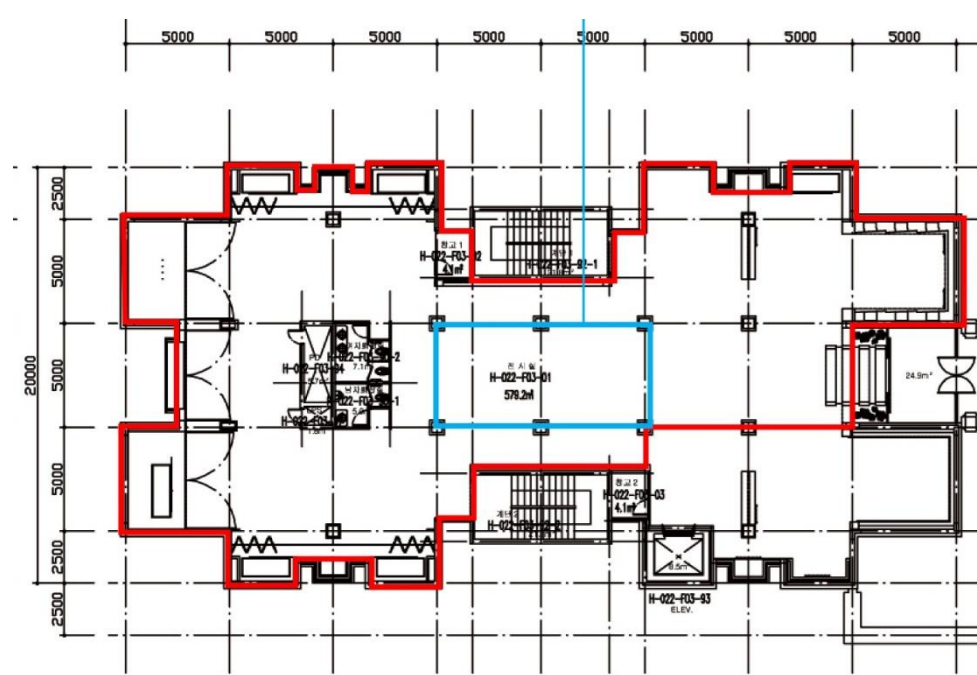
- 
- Where: Seoul /South Korea
 - Venue: Hanyang Museum, ~ 800m² exhibition
 - When: opening 20th May– 30th October 2021
 - Topics: from particle physics to astrophysics
 - Who: CMS, ALICE, CERN, LIGO, ICEcube
= regional ORIGIN network
 - Artists: 4 artist, local and international
 - Local responsible: Tae Jeong Kim
 - Concept: Michael Hoch

Web Site:

<http://www.hy2021cosmonaut.com>

May 20th – October 30th

THE
COSMONAUT



Floor plan

3rd floor science path

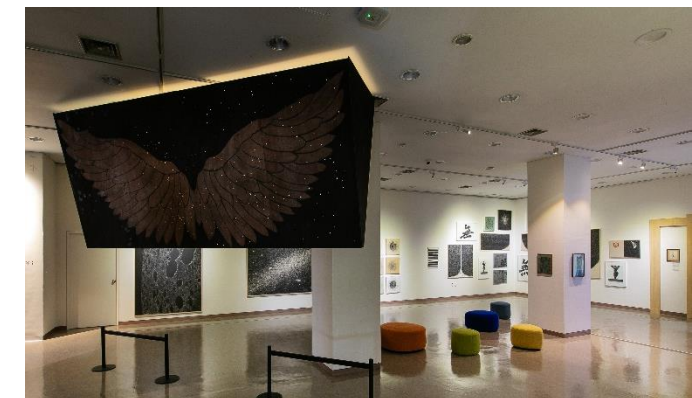
Exhibition space: 518 m²

Floor Height: 270cm

2nd floor art space

Exhibition space: 217m²

Floor Height: 350cm



Virtual Museum with Augmented Information:

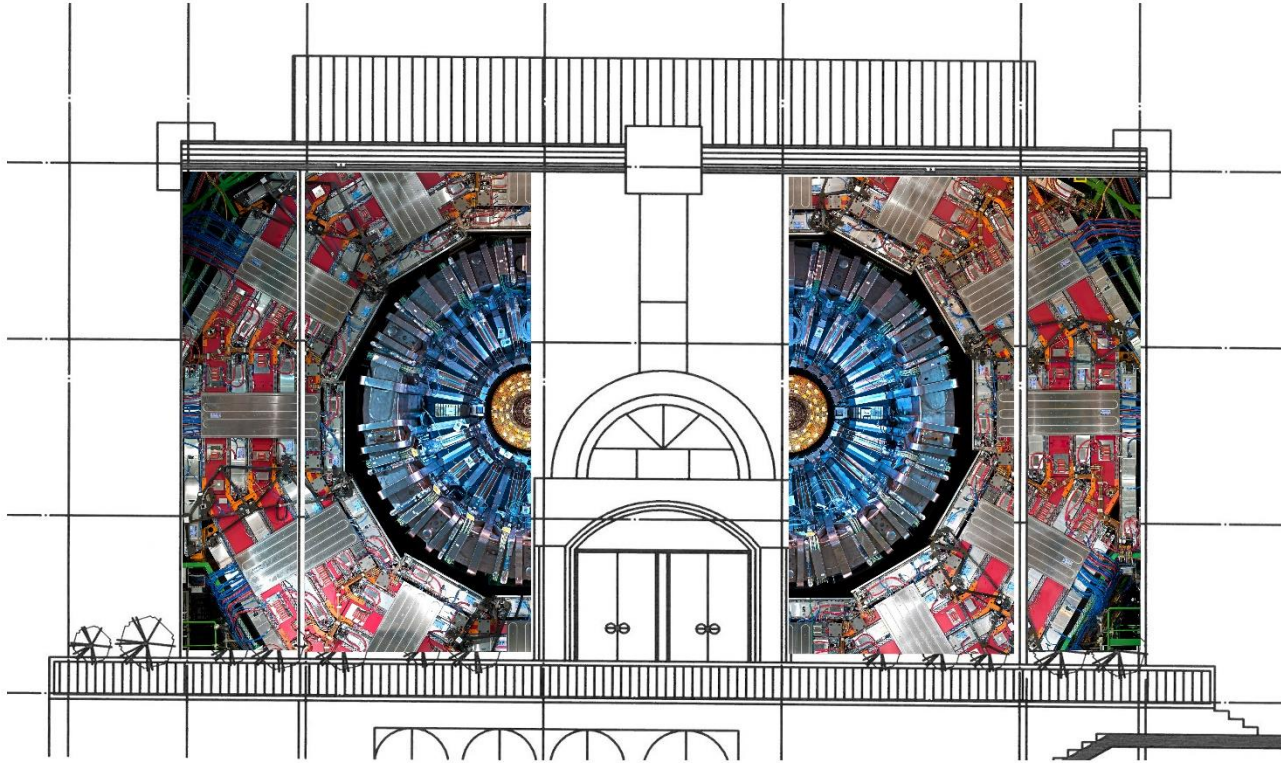
To visit virtual and archive the exhibition

Science floor: <https://my.matterport.com/show/?m=nsafzyhGnic>

Art floor: <https://my.matterport.com/show/?m=cCZF48ZqEyF>



Museum becomes CMS



Video: "MUSEUM becomes CMS":

<https://youtu.be/91rQ2irmsjo>

Art Teaser Video

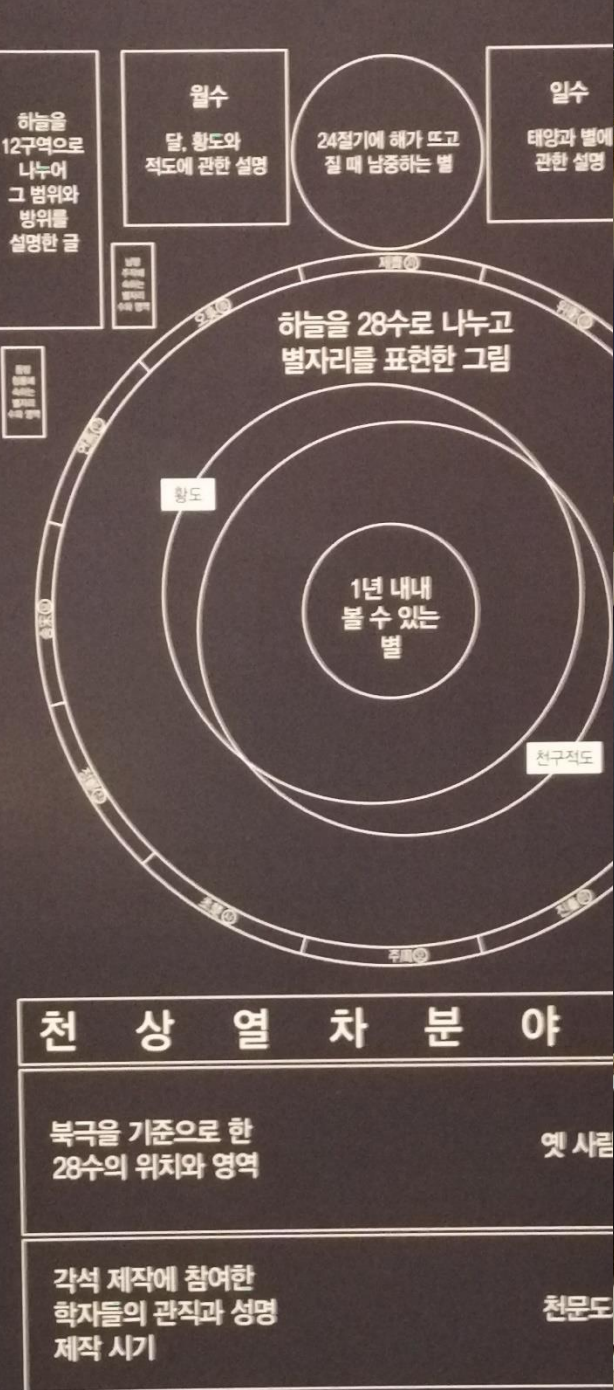
[\(274\) 메인서브 합 마이클호치박사님 - YouTube](#)











CMS&ALICE Virtual Tour

방구석 1열에서 유럽입자물리연구소 CERN의 대형강입자충돌기 LHC로 떠나요!
LHC의 대표적인 입자검출기인 CMS와 ALICE를 집에서도 실시간으로 만나보
실 수 있습니다.

실험 소개

양운기 교수(한국 CMS 실험팀 대표)

윤진희 교수(한국 ALICE 실험팀 대표)

현지 진행

김태정 교수(한양대학교 물리학과)

김도원 교수(분당서울대학교병원 연구행정팀)

생겼을까?

과학워크숍

안개 속 입자를 찾아라!

김태정 교수(한양대학교 물리학과)

안개상자(Cloud Chamber)의 원리를 이해하고 직접
안개상자를 만들어 보며 이온화된 입자의 궤적을 관찰해봅시다.

일시: 6월 12일(토) 오후 1시

장소: 한양대학교 박물관

인원: 총 20명(선착순 접수)



우주, 어떻게 보여줄까?

과학역사
예술로 보는 우주



과학.역사.예술로 보는 우주

한양대학교 박물관

Michael Hoch 박사와 함께하는

art@CMS

유럽입자물리연구소(CERN)의 과학자이자 예술가인 마이클 호치 박사가
희스 입자를 발견한 입자검출기 CMS를 색깔로 알아보는
art@CMS 워크숍을 진행합니다.

아인슈타인의 마지막 선물, 중력파를 찾아서!

대상 중학생 이상 관심 있는 누구나

진행 2021년 10월 30일 토요일 14:00~16:00(온라인 14:30~16:00)

오프라인 특별전 관람(30분), 중력파 강연 및 시연(60분), 질의응답(30분)

온라인 중력파 강연 및 시연(60분), 질의응답(30분)

*온라인 신청자는 휴대전화와 이메일로 ZOOM링크 발송

신청방법 구글 폼으로 신청서 제출(QR코드)

신청인원 오프라인(7명 선착순 접수) + 온라인(제한없음)

장소 한양대학교박물관 3층 전시실, 2층 강당의 세미나실

문의 한양대학교박물관 학예연구실 02-2220-1394

한양대학교박물관과 함께 아인슈타인의
마지막 선물인 중력파를 찾아 떠나요!
중력파에 대한 강연과 함께 중력파가 검출되는
과정을 실시간으로 만나보실 수 있습니다.

강공영 교수

(중앙대학교 미래융합원 교에너지물리센터)

박준규 박사

(한국천문연구원 천문우주기술훈터)

The Art of Science

DR. MICHAEL HOCH

유럽입자물리연구소(CERN)의
과학자이자 예술가

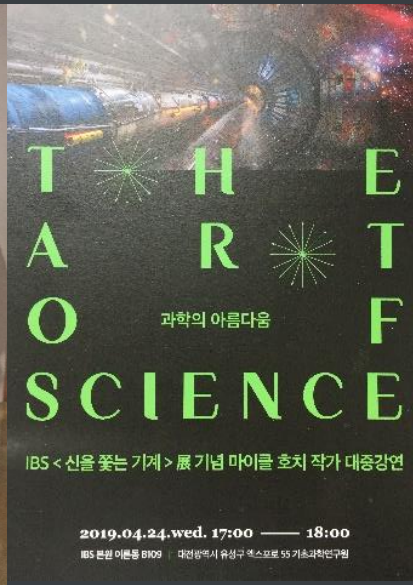
Science engagement

Online Science lectures combined with workshops of all topics presented in the exhibition by Korean scientists of the ORIGIN network



IBS cultural centre, Daejeon/ Korea April 24th – July 26th 2019

next exhibition venue in preparation; Seoul (April – July 2020)



Oman Science Festival 2022

October 10th – 16th



Organizer: Oman Ministry of Education

Total Science Festival Space: 12 000m²

Total number of Visitors: 258 000

Report Michael Hoch November 2022

https://mhoch.web.cern.ch/Art@CMS/OmanScienceFestival2022_summary.pdf



ORIGIN exhibition 'Mysterious Universe



Invited by Ministry of Education to Oman Science Festival 2022
ORIGIN Exhibition area : 300m²



ORIGIN partners contributing to the scientific content:

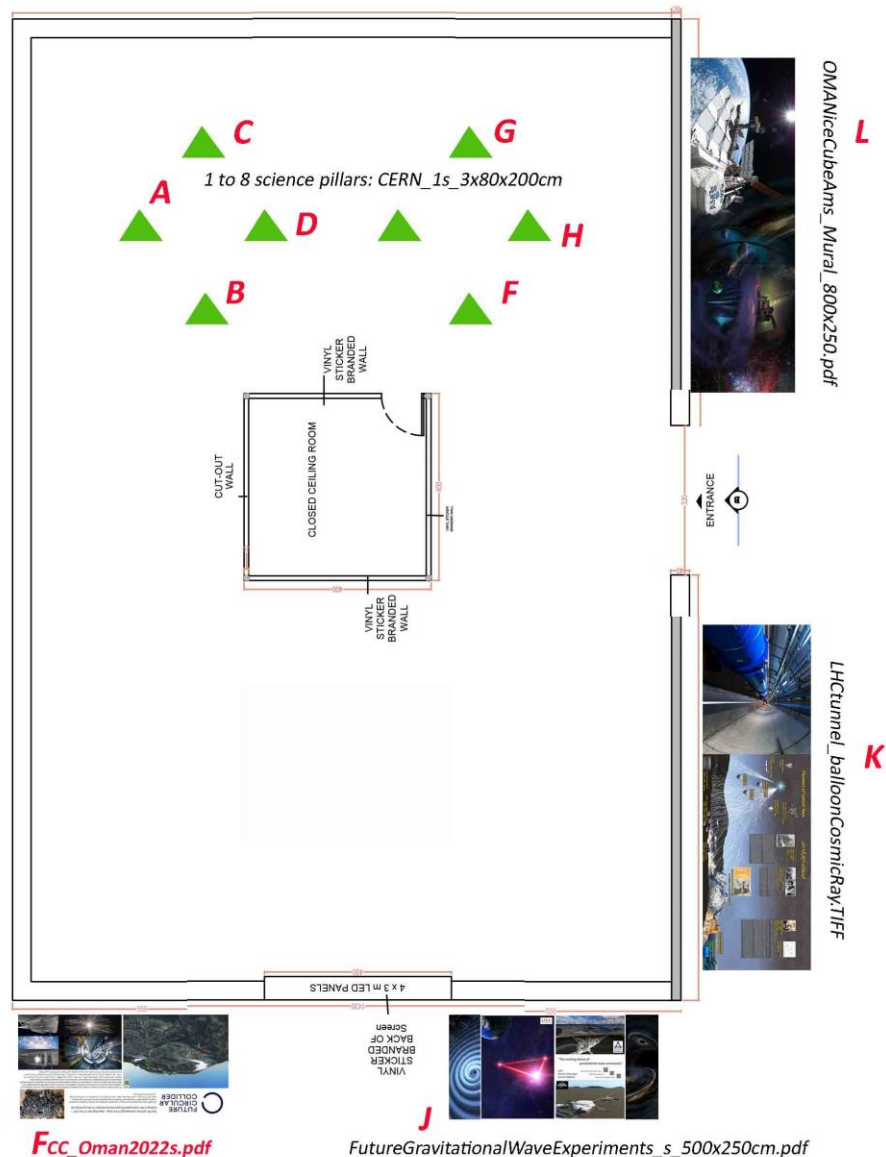
ALICE, ATLAS, CMS, LHCb of the LHC project at CERN, AMS and FCC
LIGO, VIRGO, KAGRA, LISA, Einstein Telescope, Cosmic Explorer
IceCube and Muography





M

OMANgravitationalWaveMural_1500x250_flattern.pdf



ORIGIN total Exhibition Space 300m²



24 science topic posters:

80cm x 200cm

cover all ORIGIN partners and CERN

Large topic murals on:

LHC/CMS/ATLAS/ALICE/LHCb

20m x 4m

LIGO/VIRGO/KAGRA

15m x 2.5m

FCC

5m x 2.5m

LISA/EinsteinTelescope/ Comic Explorer

5m x 2.5m

Block House:

5m x 5m x 2.5m

ICARUS Wings Equinox 2022

Cloud Chamber Workshops

Collaborative Artists:

Clelia Anchisi, Daniela Brill, Doncho Donchev,

Michael Hoch, Enrico Magnani, Denis Schellmann

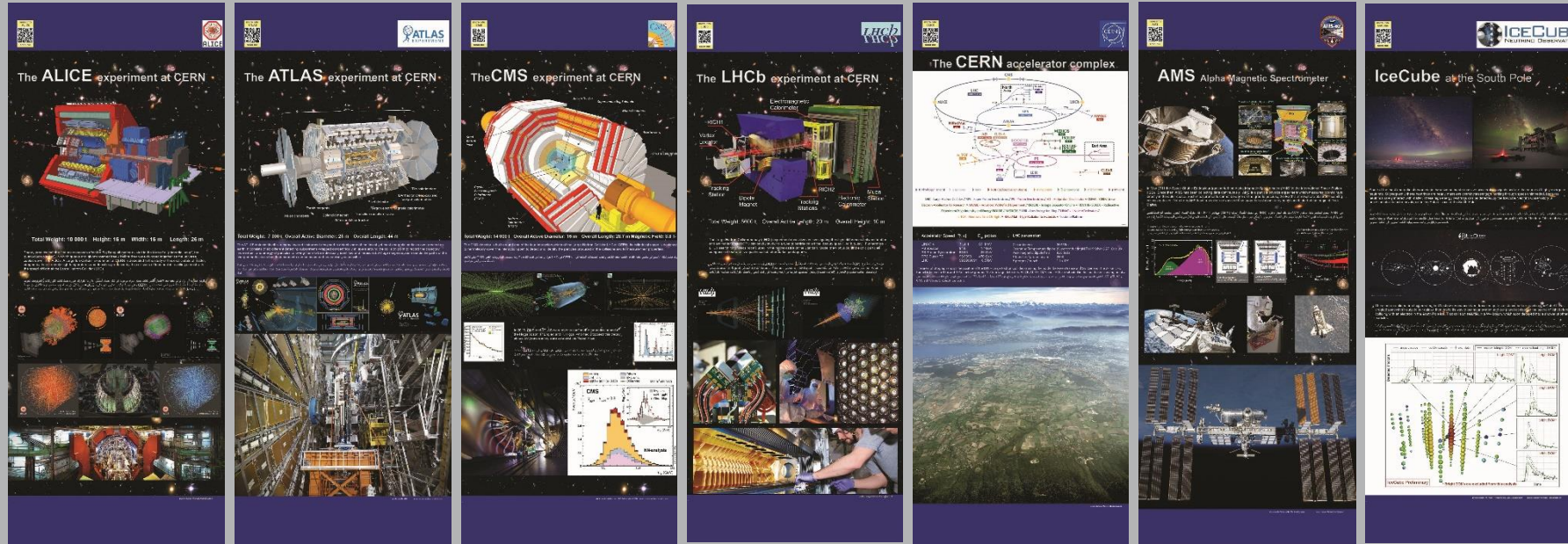
Exhibition Objects:

High Tech Detector vitrine, 3D Model

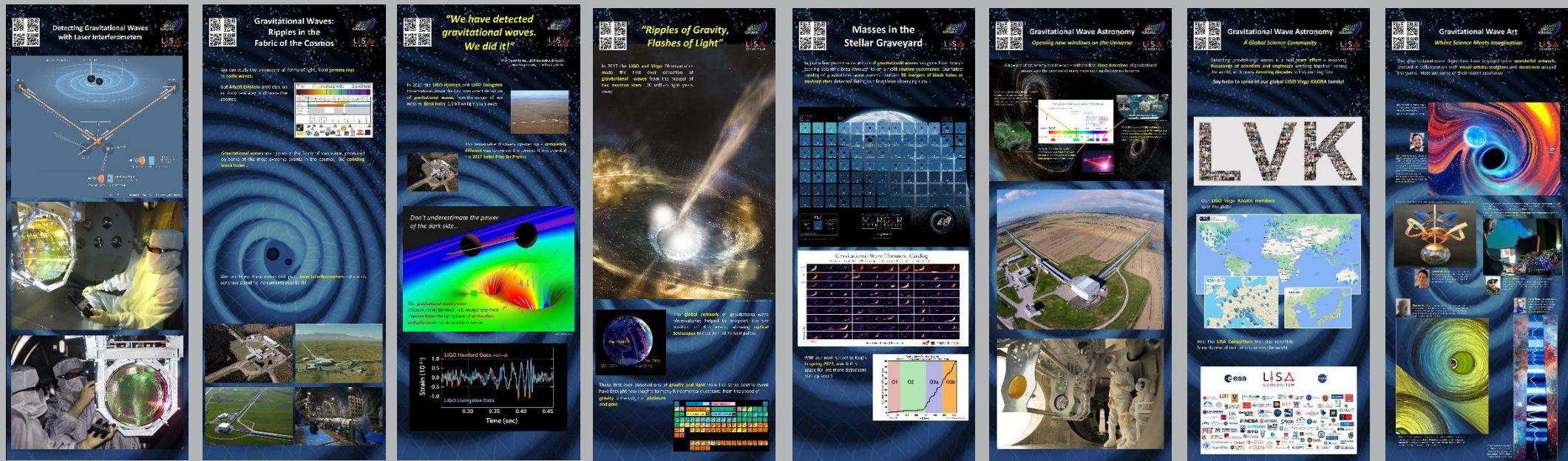
3D virtual exhibition space:

<https://my.matterport.com/models/6wZkEgeY3CN>


Science topic posters of all ORIGIN collaboration: CERN based and particle physics experiments



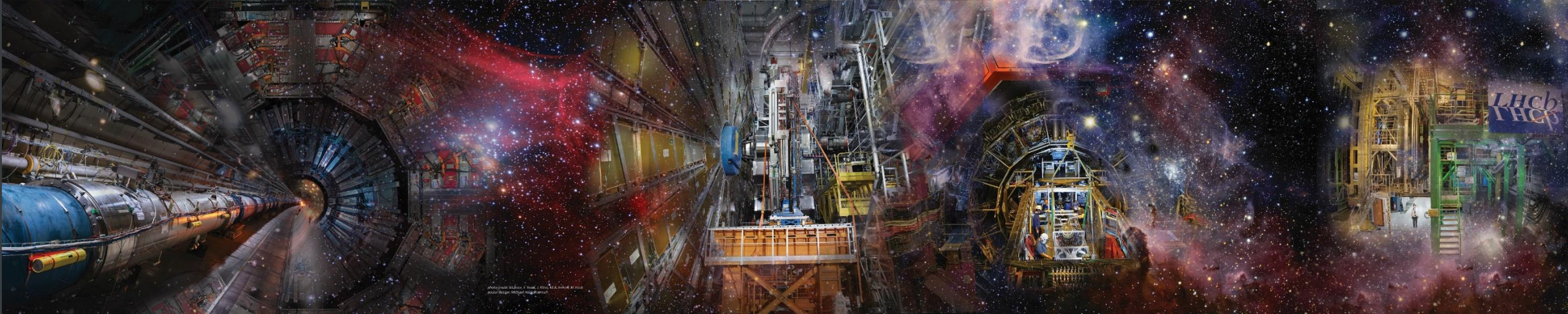
Science topic posters of all ORIGIN collaboration: Gravitational Wave experiments



Gravitational Waves collaborations LIGO VIRGO KAGRA topic posters :

200cm x 80cm

Murals of all participating Science Experiments



Credits: design: M.Hoch; photos: M.Brice, F.Reidt, J.Klein, M.A. Imhoff, M.Hoch

Mural Collage of: LHC, CMS, ATLAS, ALICE, LHCb size: 4m x 20m

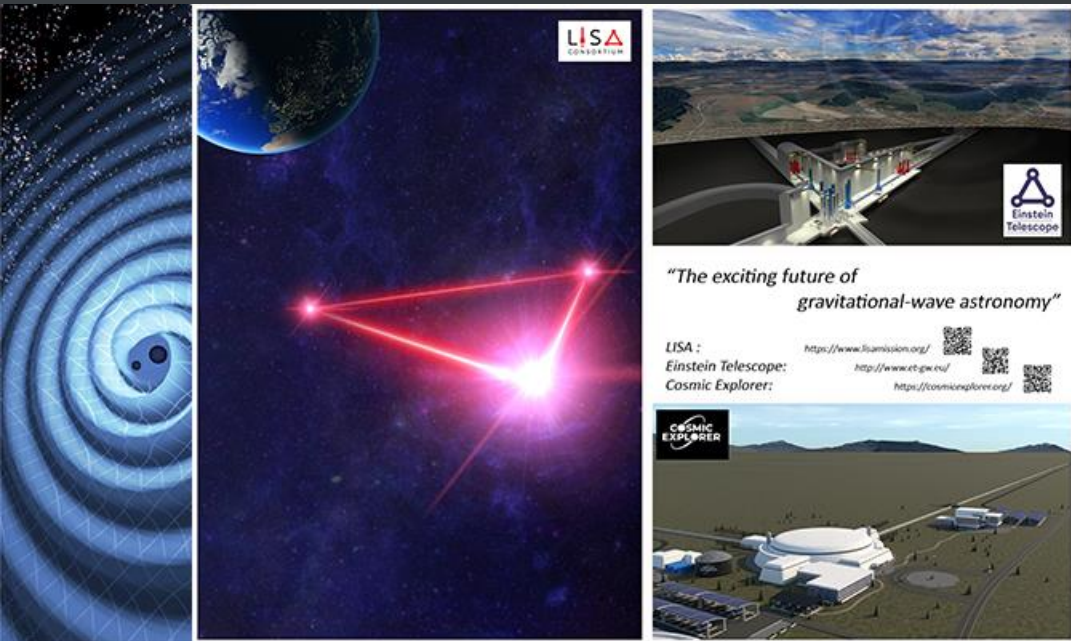


Credits: design: M.Hoch; photos: LIGO, VIRGO, KAGRA collaboration, artist impressions : M.Wolf, E.Sacchetti, A. Simmonet

Mural Collage of: LIGO, VIRGO, KAGRA size: 2,5m x 15m

The FUTURE of :

Gravitational Wave Experiments



LISA Einstein Telescope Cosmic Explorer poster : 2.5m x 5m

Future Circular Collider - CERN



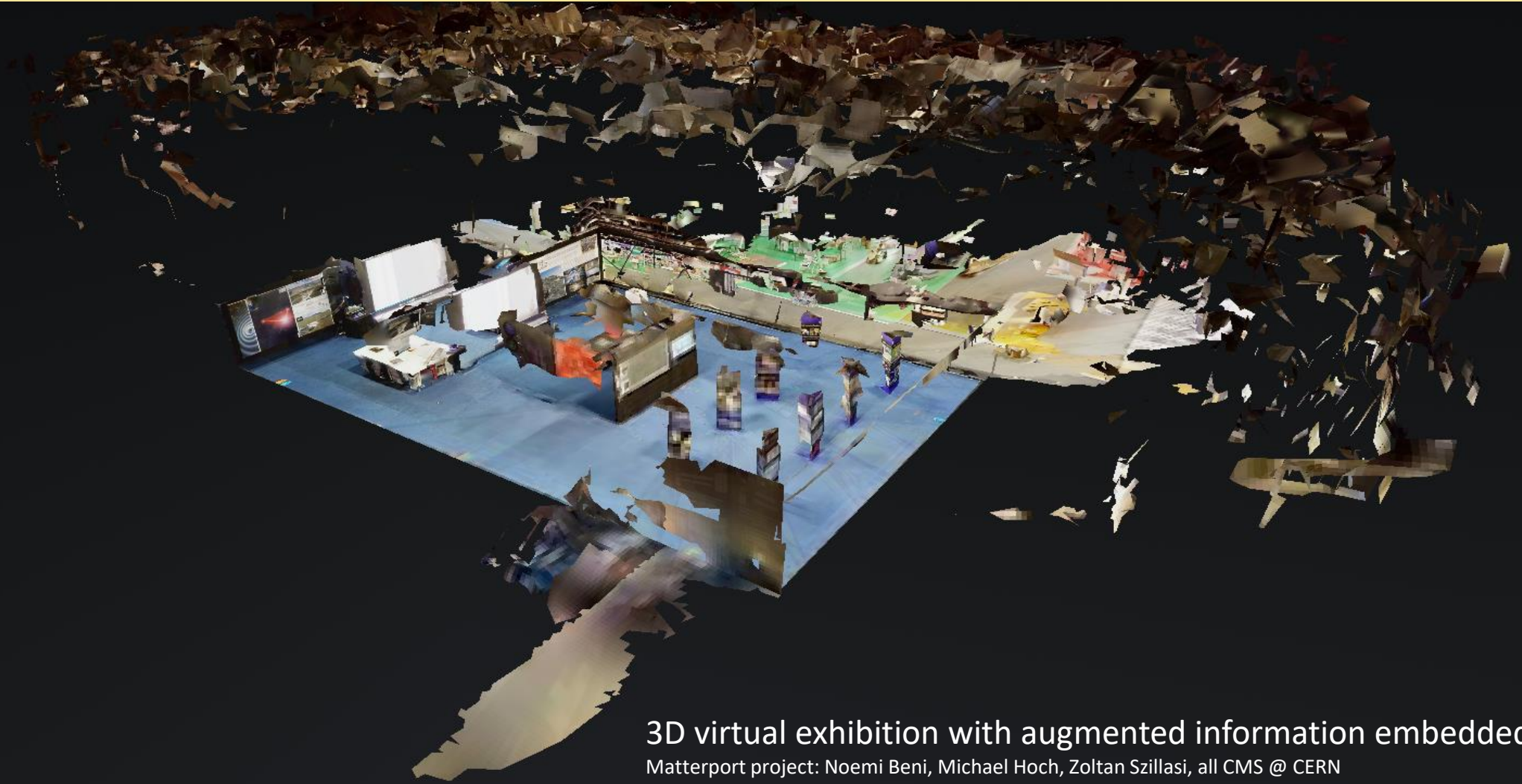
FCC Future Circular Collider poster: 2.5m x 5m

Mural Cosmic Rays from discovery to the present: 2.5m x 5m



ORIGIN exhibition OMAN Science Festival 2022:

To visit the exhibition, click here: <https://my.matterport.com/models/6wZkEgeY3CN>



3D virtual exhibition with augmented information embedded.

Matterport project: Noemi Beni, Michael Hoch, Zoltan Szillasi, all CMS @ CERN

Video Walk through the exhibition: <https://youtu.be/Ku-s6z0bh3k>

ART

Enrico Magnani 2018

Doncho Donchev 2016



Clelia Anchisi /2015



ART



Michael Hoch 2022



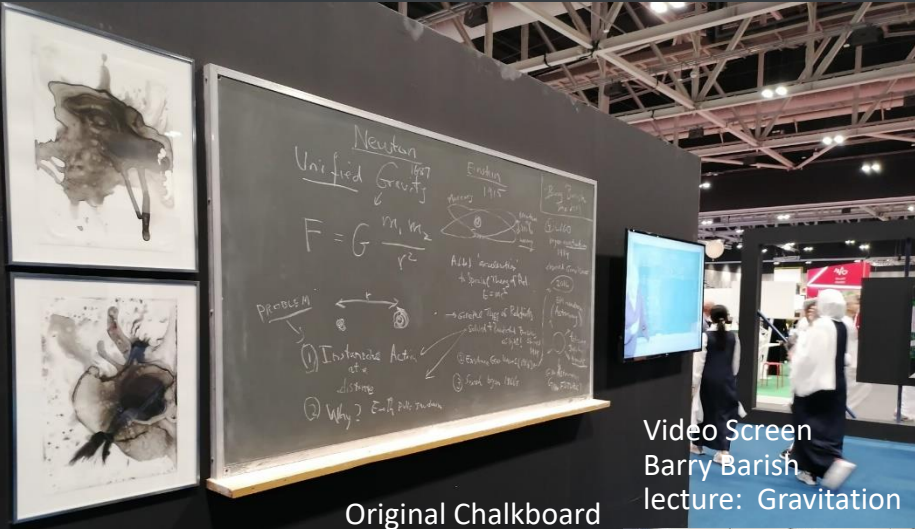
Denis Schellmann 2018



Daniela Brill 2018



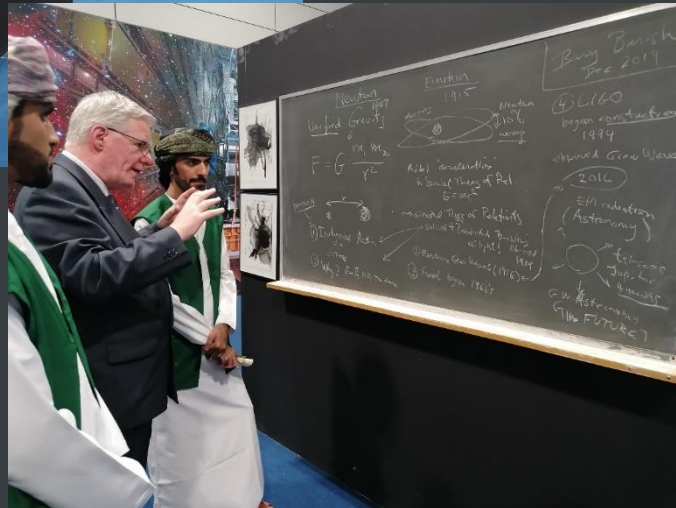
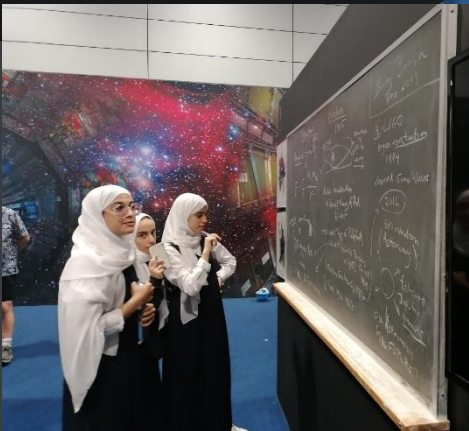
Chalkboard Series: Barry Barish & John Ellis



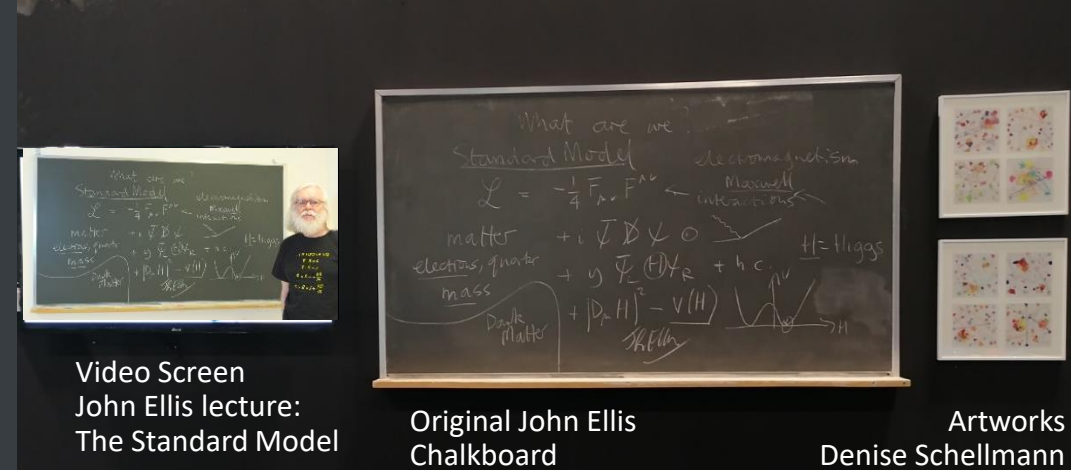
Original Chalkboard
Barry Barish

Video Screen
Barry Barish
lecture: Gravitation

Artworks
Denise Schellmann



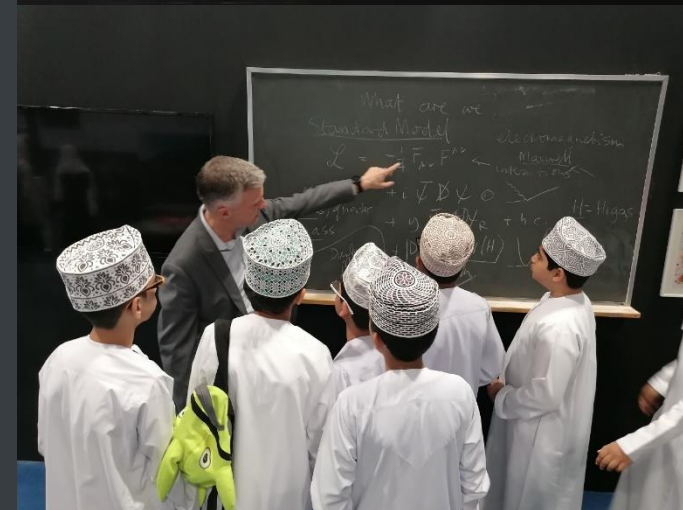
Martin Hendry using the Barry Barish Chalkboard



Video Screen
John Ellis lecture:
The Standard Model

Original John Ellis
Chalkboard

Artworks
Denise Schellmann



Markus Klute gives a lecture on the John Ellis Chalkboard



HH Sayyid Azzan Bin Qais Al Said, the sultan's cousin in discussion
with Prof. Markus Klute KIT/ GER

HE. The minister of Education

HE. The minister of Economy

HE. The minister of Social Development

HE. The Dir. Gen. Arab Bureau of Education for the Gulf States

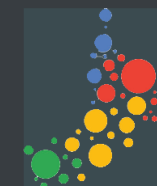
HE. The minister of Telecommunications & Information Technology (Saudi Arabia)

HE. The minister of Transportation, Telecommunications & Information Technology

in discussion with Prof. Martin Hendry Univ. Glasgow

Welcome of Distinguished Guests

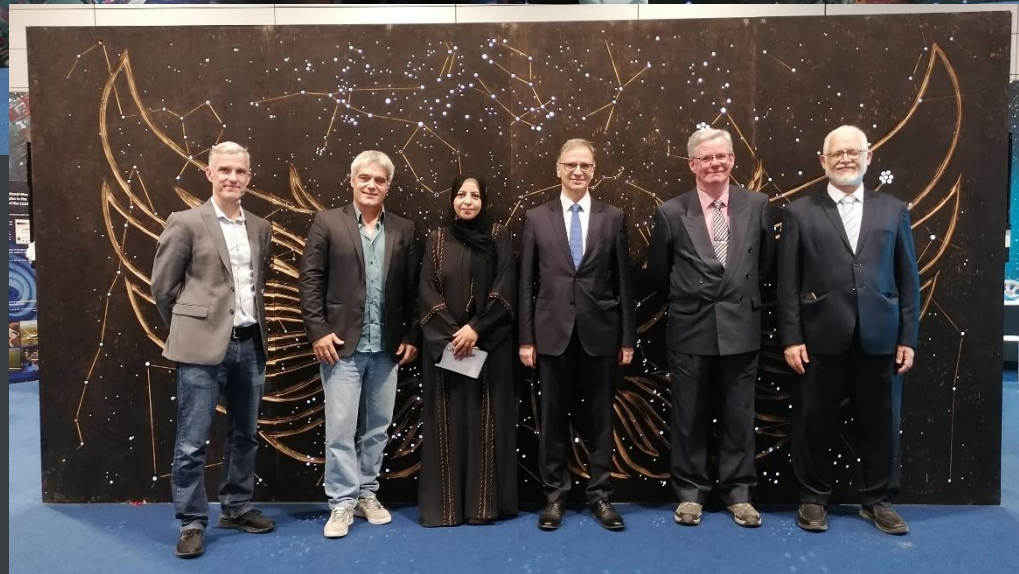
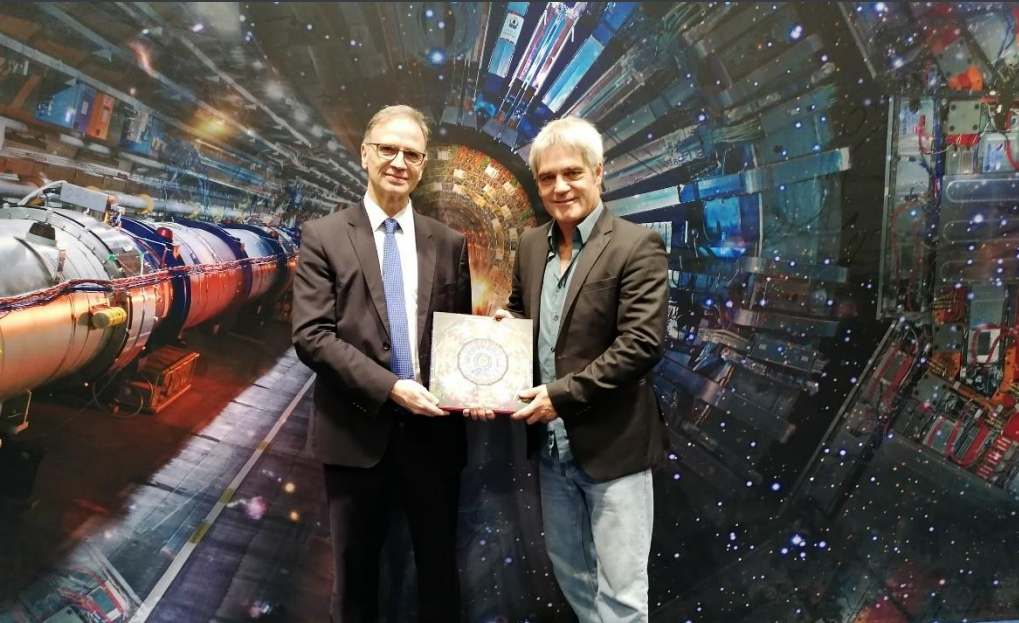
by Martin Hendry, Markus Klute, Michael Hoch



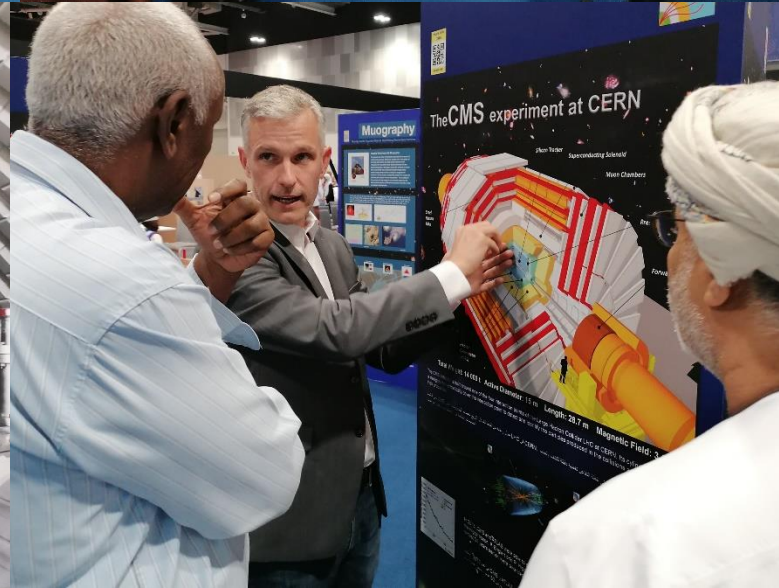
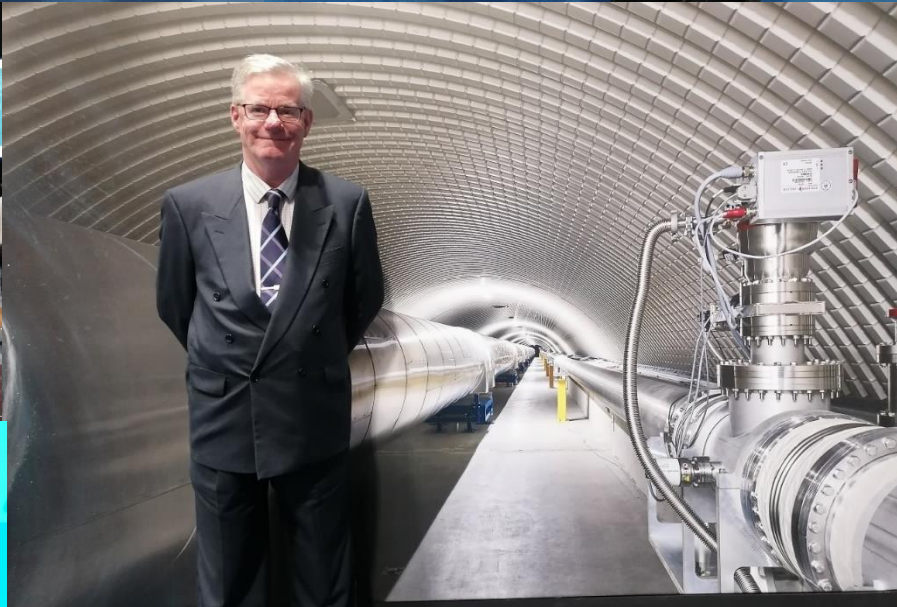
HE. The Minister of Agriculture, Fisheries and Water in
discussion with Michael Hoch KIT/ GER



Visit of the Austrian Ambassador in Oman



His Excellency Austrian Ambassador Mag. Christian Brunnmayr
Undersecretary for Education Ministry of Education
Undersecretary for Finance Ministry of Education



Key Note Presentations

- Martin Hendry => gravitational waves
- Markus Klute => Particle Physics
- Michael Hoch => cross disciplinary SciArt Education concepts

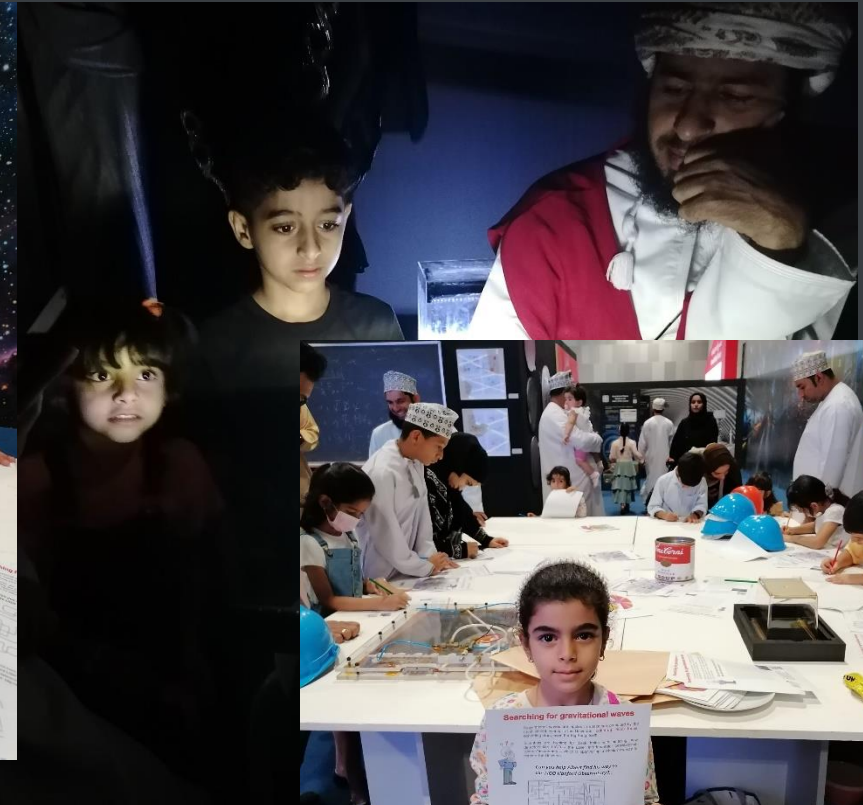


Omani Colleagues engaging with Visitors

Prof. Amr Radi, Malik Rashid Al-Naabi and students of the Sultan Qaboos University / Muscat



Children Workshops



- Walk through the exhibition: <https://youtu.be/Ku-s6z0bh3k>

Videos

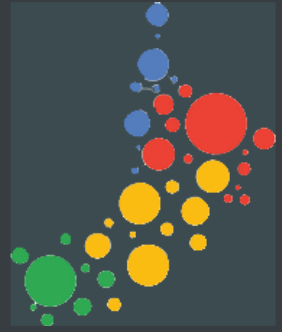
- Walk through the exhibition: <https://youtu.be/Ku-s6z0bh3k>





Oman Science Festival 2019

Cooperation with the Ministry of Education Oman



Michael Hoch for CMS and the art@CMS & ORIGIN team

Oman Science Festival 2019

- M. Hoch received an Invitation to present an exhibition of the style IBS cultural center Daejeon, Korea 2019 <https://www.youtube.com/watch?v=8I7V6pY0lml&t=241s>



Floor plan OSF2019

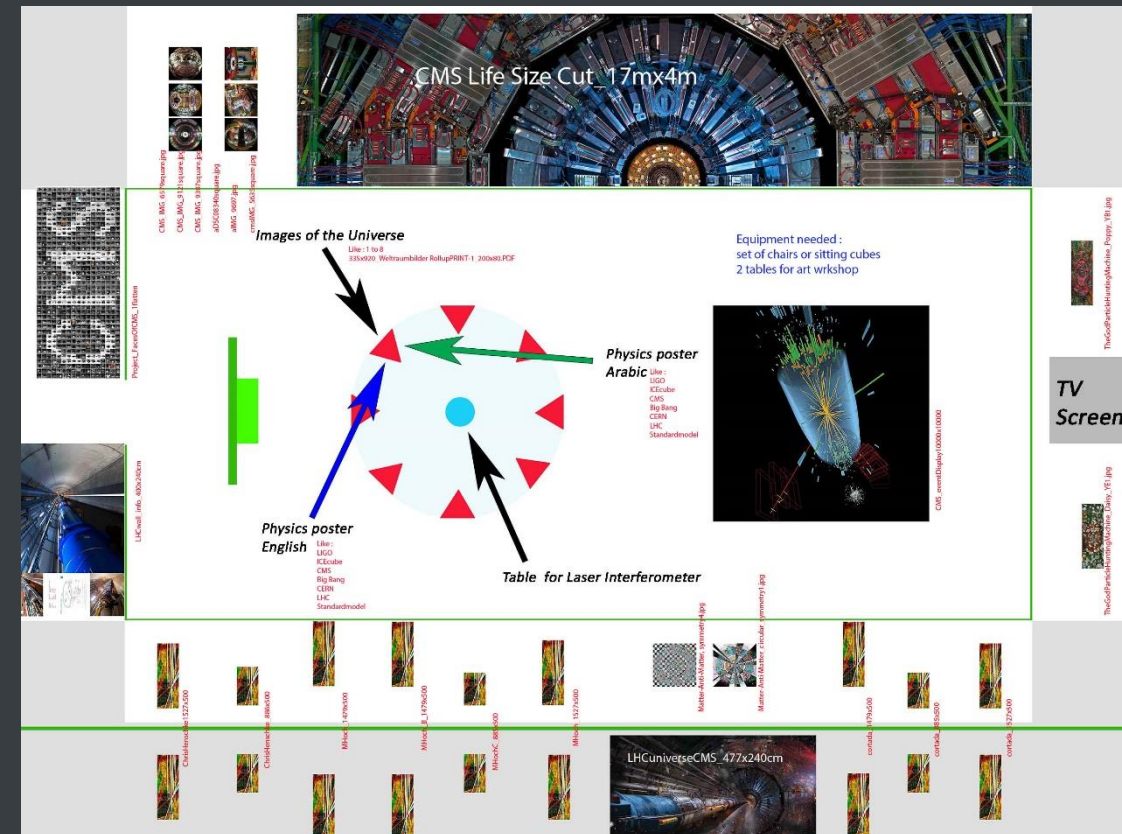
- *Requested Educational program: lectures and workshops on science & art*

Target audience:

- 1) high school teacher
- 2) high school students
- 3) primary school students

- *Introduce “Cultural Collisions” format, style Ontario Science Centre Toronto/ Canada 2018 for a possible project in Oman 2021*

<https://www.youtube.com/watch?v=4Hkrr1mCz7o>



art@CMS Korea -> ORIGIN Oman [to inspire for big Cultural Collisions]

<https://www.youtube.com/watch?v=8I7V6pY0ImI&t=241s>

- Exhibition venue:
Convention Centre Muscat
'Meet the Universe' exhibition 210m²
- Science Topics:
particle physics: CERN & ATLAS, ALICE, CMS, LHCb
Gravitational waves: LIGO, VIRGO
Neutrino physics: ICEcube
- Contributions talks, lectures workshops:
Martin Hendry / LIGO
Michael Hoch / CMS
Amr Radi & Team / Local University
- Contributions material:
 - Handouts CERN, ATLAS, ALICE, CMS, LHCb
 - Laser interferometer : LIGO, VIRGO
 - Detector Hardware: CMS



Oman Government in the exhibition “Meet the Universe”

Secretary General of the
Council of Ministers

Minister of Education

Minister of Information Technology





Using the exhibition to perform :

- Talks
- Lectures
- Guided exhibition tours
- Workshops
 - Science
 - Creative

Audience:

- Government
- High school students
- Primary school students
- University students
- General Public
- Presentations given by





From the right Dr Assous the head of Physics department in SQU, Dr Maya ALAzri Ministry of Education and Undersecretary of the Ministry Education

Dr Amr Radi & SQU University team in public engagement and student education





Creative workshops



Science Flash Mob



primary school student lectures



Creative workshops



Science workshop



creative teacher workshop



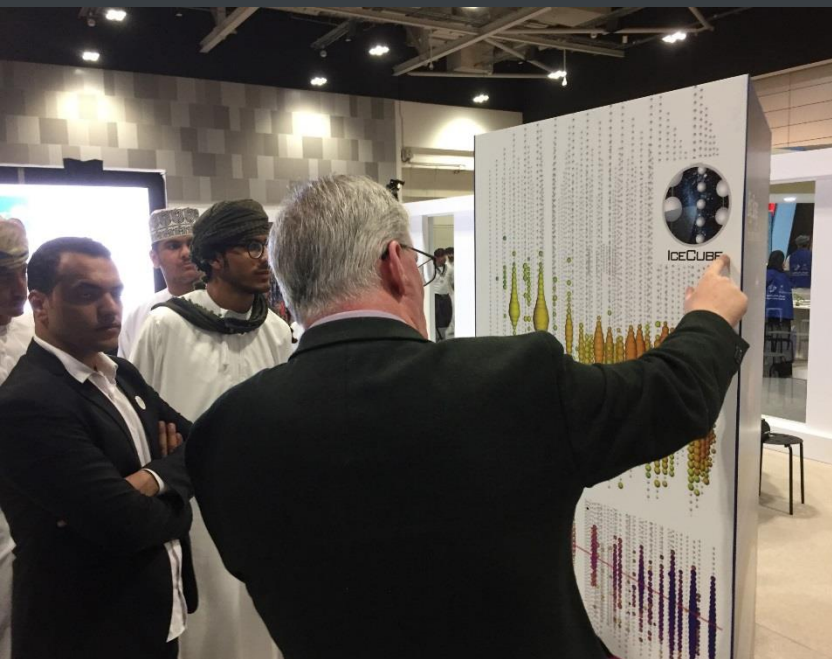
Particle Physics- masterclass
Neutrino Physics - ICEcube



laser Interferometer WS
Creative Teacher Workshop



Creative Primary School Students
CERN Virtual Visit





education material



LHC photo wall



education material



education material



space time distortion workshop



detector hardware on display



Lectures by local scientists from SQU

children workshops

astrophysics

introduction



Public engagement by local SQU University staff

2017 First Invitation to the Oman Science Festival

– Michael Hoch keynote presentation at the opening about interdisciplinary science education.

2015 first Contact with Oman Education Ministry and OMAN Geneva Mission during OMAN delegation at CERN P5



"Art&Science" Balloon Museum Chateau d'Oex/ CH

April 2019 – March 2021 by art@CMS/ ORIGIN

In collaboration with University Bern, University Fribourg, CHIP, HFSJG, CMS, ATLAS

Cross disciplinary exhibition on Cosmic Ray Discovery with Balloons, lectures, Junior Scientist booklet, various science & creative lecture and workshops during Balloon Festival January 25th – February 1st 2020

ART & SCIENCE
du 4 mai 2019 au 31 mars 2020

espace **BALLON**
CHÂTEAU-D'OEX

ÉVEILLER LA CURIOSITÉ

2 chemin des Ballons - CH - 1660 Château-d'Oex www.espace-ballon.ch +41 78 723 78 33

COMMUNE DE CHÂTEAU-D'OEX
PAYS D'ENHAUT
BREITLING
CHALETBAU MATTI

Pioneers of Cosmic Rays

weather balloon 30 000m

Air plane traveling altitude 10 000m

ISS - AMS experiment 400 000m, 2011 - ongoing

Bertrand Piccard World Tour 11 700m

Werner Kolhörster 9300m 1914

Victor Hess 5300m 1911

Albert Gockel 4500m 1909

Entdecker der kosmischen Strahlung

Albert Gockel 1860 - 1927
Professor at University of Fribourg (CH)

Victor Hess - 1883 - 1964
Nobel Prize 1936
Austrian Academy of Science Vienna, later Professor at Universities of Graz (A) and Innsbruck (A)

Werner Kolhörster 1887 - 1946
Balloon flight 1914
Professor at the Physics Academy of Sciences

Ionisation increases with altitude

Eiger Mönch Jungfrau 4158m

Jungfraujoch 3500m
Sphinx Observatory 1931

IceCube South Pole - 2450m, 2005 - ongoing

Super Kamiokande (J) -1000m, 1996 - ongoing

Pierre Auger Observatory (RA) 1400m, 2004 - ongoing

MAGIC, La Palma (E) 2200m, 2004 - ongoing

u⁺ CHIP HFSJG CMS ATLAS

“Art&Science” Balloon Museum Chateau d’Oex/ CH

Through the opening and the duration of the exhibition:

Guided tours

lectures

Junior Scientist booklet



42e Festival International de Ballons

25th January – 2nd February

Scientific Contributions by Swiss and ORIGIN partners to the festival:

25th January Saturday Opening Day

- Historic Balloon flight up to 6000m altitude with real Cosmic Ray measurement – University Fribourg
- Lecture and Workshop program from 11h30 till 19h
- key note presentation during the opening

26th January Sunday

- Lecture and Workshop program from 11h30 till 19h

29th January Wednesday – Children Day

- Lecture and Workshop program from 11h30 till 19h

1th February Saturday

- Lecture and Workshop program from 11h30 till 19h

2nd February Sunday Closing Day

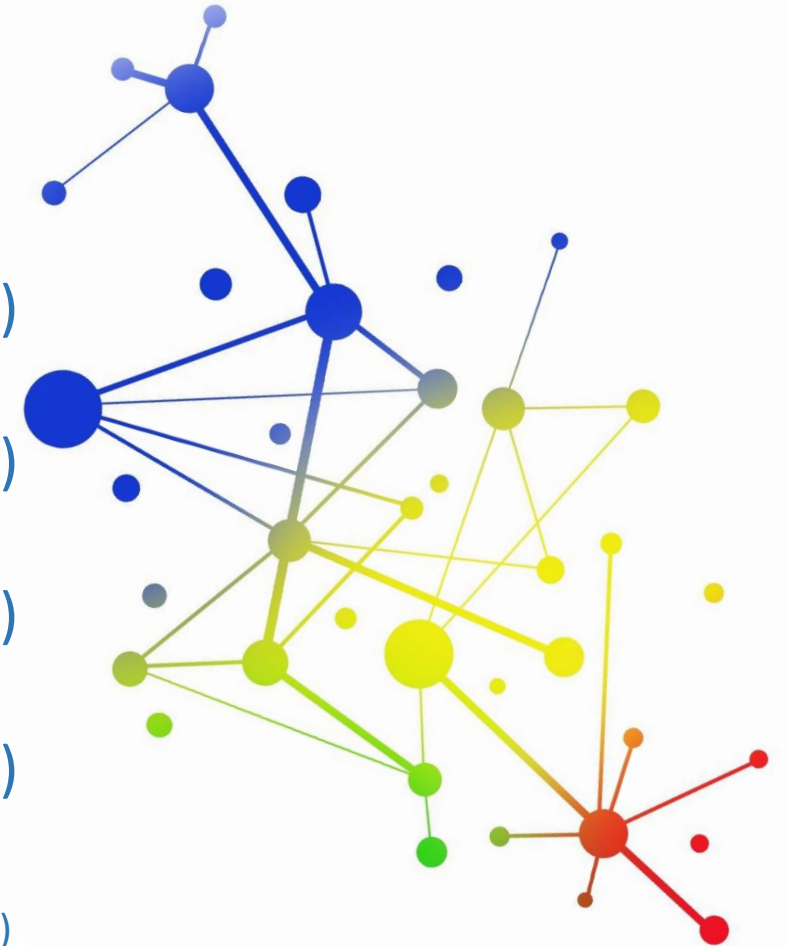
- Lecture and Workshop program from 11h30 till 19h



Avec le soutien des Communes de Château-d'Œx,
Rossinière, Rougemont et Saanen, de Pays-d'Enhaut Région et de la Loterie Romande

Collaborations Art Universities

Chelsea College of Art London/ UK	2014 – 2016	(p98)
Central S. Martins College Arts/ UK	2016 – 2020	(p99)
Applied Art Vienna Univ., Vienna/ AUT	2016 – 2018	(p101)
Ecole d'Art Superieur, Lille/ France	2013 – 2015	(p104)
Art University Cetinje/ Montenegro	2017 – 2018	(p105)
KASK Royal Art Conservatory, Ghent/ BE	2017 – 2019	(p106)
SURATOMICA, Bogota/ Colombia	2018 – 2020	(p108)



Chelsea College of Arts London

1 semester sciART course October 2014-2015-2016

- supervision Prof. Dave Webster
- Weekly lectures and discussions at UAL
2014/ 2015 Visit at CERN with 4 students + 4 trainees Shoreditch Trust
2015/2016 - Visit at CERN 5 days, Final show TriangleSpace London June



our CONCERN

A collaborative project between the CMS collaboration at CERN, Camberwell Chelsea and Wimbledon Colleges of Arts (part of UAL), the Shoreditch Trust and Allminds which involved recent Fine Art graduates from Wimbledon College of Arts and young people from the Shoreditch Trust Active Citizens programme visiting the CERN laboratory.

Friday 28th Nov 2014
Private View: 9 - 6pm
Restaurant Exhibition:
• Performances
• Food and drinks (canapés)

***Saturday 29th Nov to 9th Jan 2015**
Restaurant Exhibition

Waterhouse, 10 Orsman Rd
London N1 5QJ

*Please note Waterhouse will be closed for the holidays from Dec 25th - Jan 6th

ual: university of the arts london | CERN | Shoreditch Trust | Allminds | I&

University of the Arts London -Saint Martins College of Art

local scientific partner: Imperial College

2 semester sciART course October 2016 – June 2017

- 22 students supervised

Responsible: Prof. Nathan Cohen, Prof. Heather Barnett, Dr. Andrew Charalambous

- Weekly lectures at the UAL/CSM
 - Lectures from colleagues of **Imperial College**
 - Visit at CERN 5 days December 5 days May
 - Offered workshops at CERN during May visit
 - Final show in London June and November

Photos: <https://goo.gl/photos/VfSSqkg7cN7Ejzs97>

ARTISTS PRESENTATION EVENING

Central Saint Martins MA Art & Science students (London) present a

PechaKucha Night

Tuesday 9 May
drop in from 5pm

Restaurant 1, next to the glas box



PHOTOGRAPHY WORKSHOPS

with Central Saint Martins MA Art & Science (London)
students at CERN this Wednesday – FREE

Wed 10 May 10.30–12.30pm UP TO 12 PEOPLE
Pinhole Camera Workshop
with Olga Suchanova

In this workshop, you will learn how to make a pinhole camera in a 30-minute demonstration using a special edition beer can designed and sold by Tate Modern and the basis of Olga's camera. We will take photographs with this device and develop them in a DIY darkroom. Also, you can become part of the project 'Chasing the Sun' and learn how to take Solargraphs. All materials provided.

To register, email Olga at olga.suchanova@hotmail.com

Meeting point Bldg 40 coffee area CMS side 10:25



Wed 10 May 2.30–3.30pm UP TO 12 PEOPLE
Solar Prints–Cyanotype Workshop
with Lisa Pettibone

This workshop will use the sun's ultra-violet rays to interact with ferric-based chemicals on paper, creating beautiful images called cyanotypes, an early photographic process used by Sir John Herschel in 1842. We will make contact prints using objects arranged on pre-coated paper and placed in the sun. Mysterious shapes emerge from an intense blue background. **Please bring several objects to use, other materials are provided.**

To register email Lisa at lpettibone@btinternet.com

Meeting point Bldg 40 coffee area CMS side 14:25



for any further questions please contact Michael.Hoch@cern.ch
CERN phone 16 5720



facebook.com/entangledcsmcms

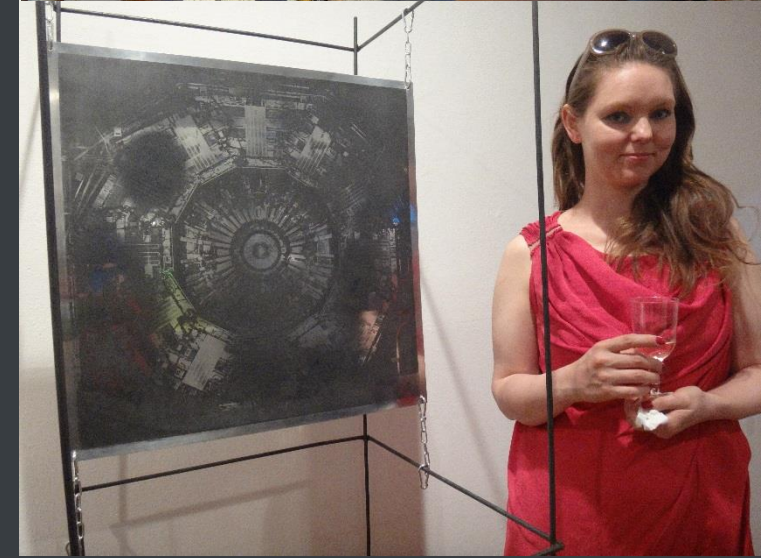
fourcorners CMS art@CMS ual: central saint martins

design by Victoria Westerman

University of the Arts London -Saint Martins College of Art

local scientific partner: Imperial College

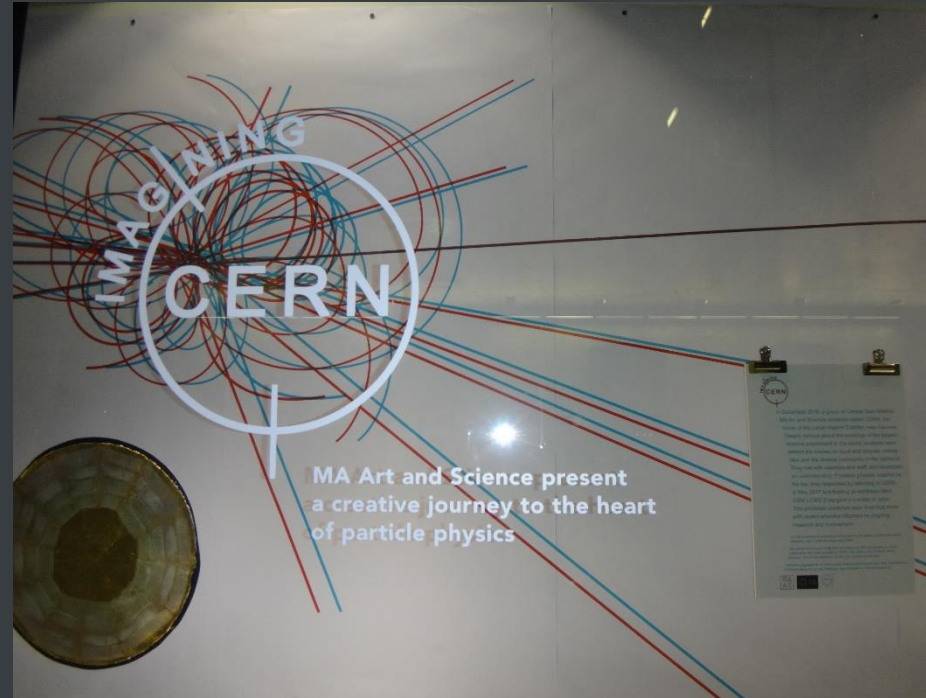
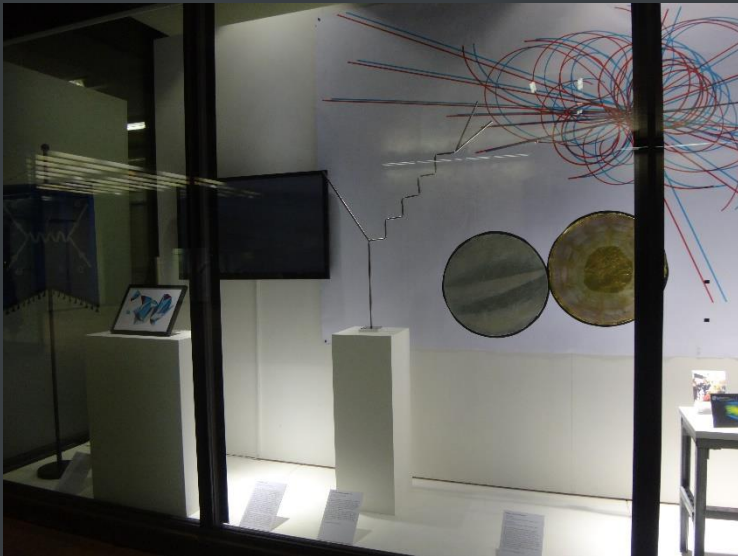
Vernissage / Exhibitions: June (Labyrinth) November (CSM) 2017



University of the Arts London -Saint Martins College of Art

local scientific partner: Imperial College

Windows Gallery Exhibition CSM –Nov 2017 Jan 2018 – Symposium November 24th
(collaboration 2019 – 2020 interrupted due to Covid March 2020)



Applied Arts University Vienna

local scientific partner: HEPHY

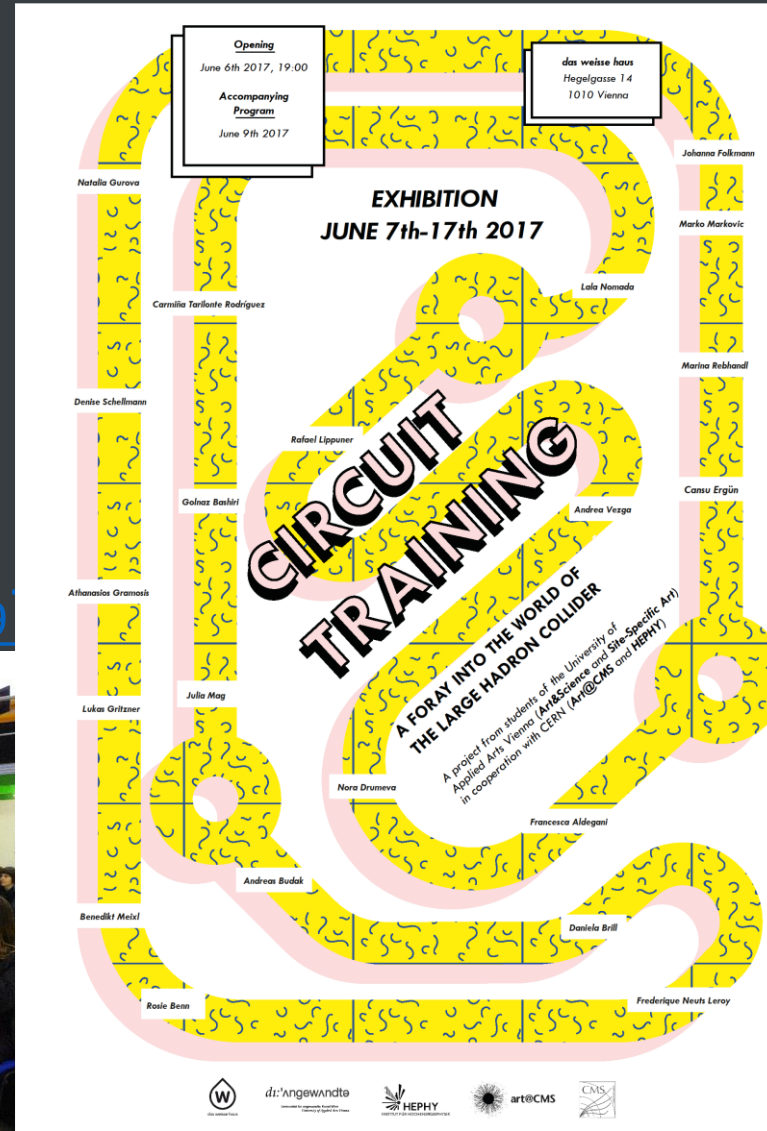
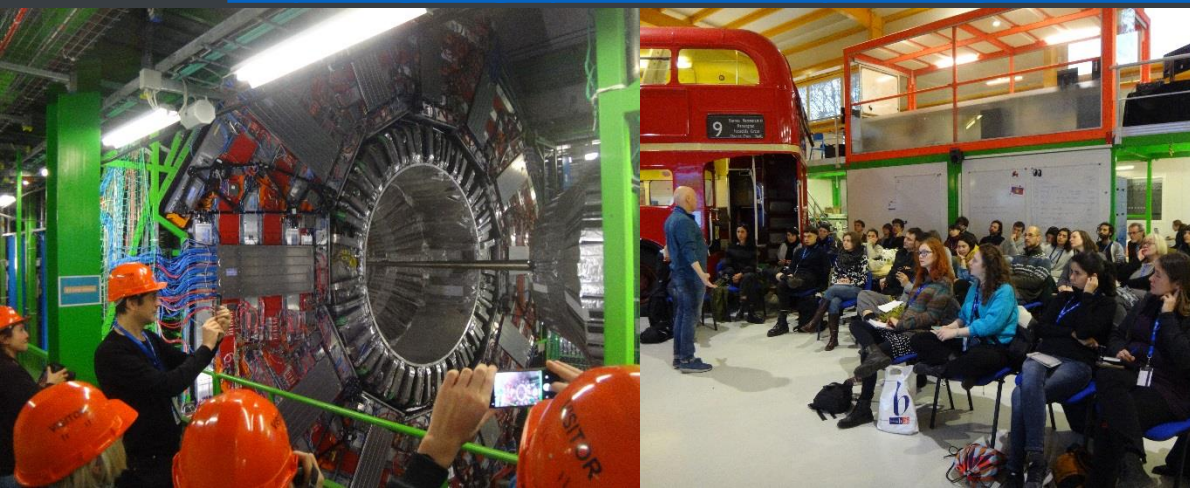
2 semester sciART course October 2016 – June 2017

- 2 classes each 11 students + 11 staff

responsible: Prof. Virgil Vidrich, Prof Paul Petritsch

- Weekly lectures at the Applied Arts University
 - Visit & Lectures from colleagues of HEPHY & TU
 - Visit at CERN 5 days December
 - Artwork rehearsal March
 - Particle detector construction workshop March
 - Final show in Vienna June

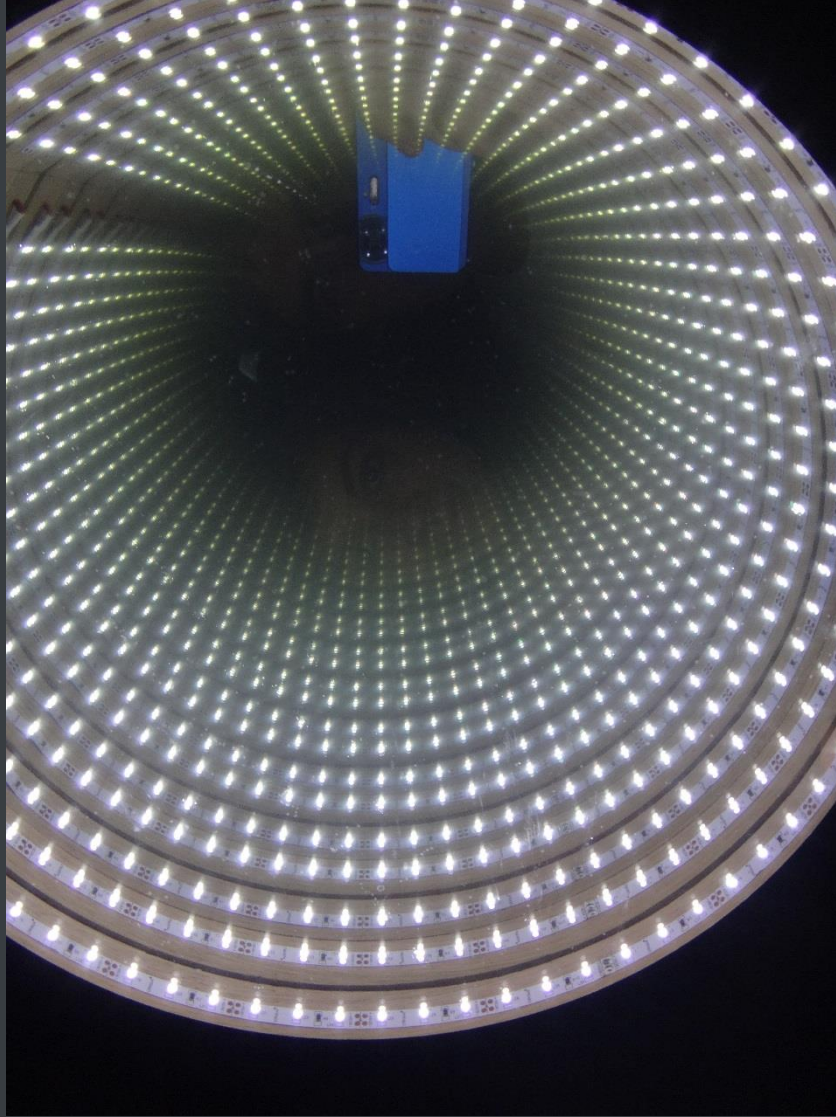
Photos : <https://goo.gl/photos/i6MqYfwCRgnNVs4N9>



Applied Arts University Vienna

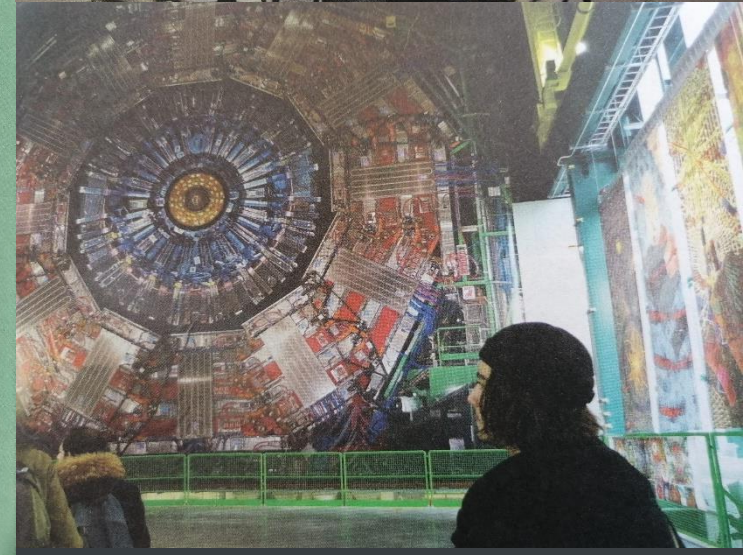
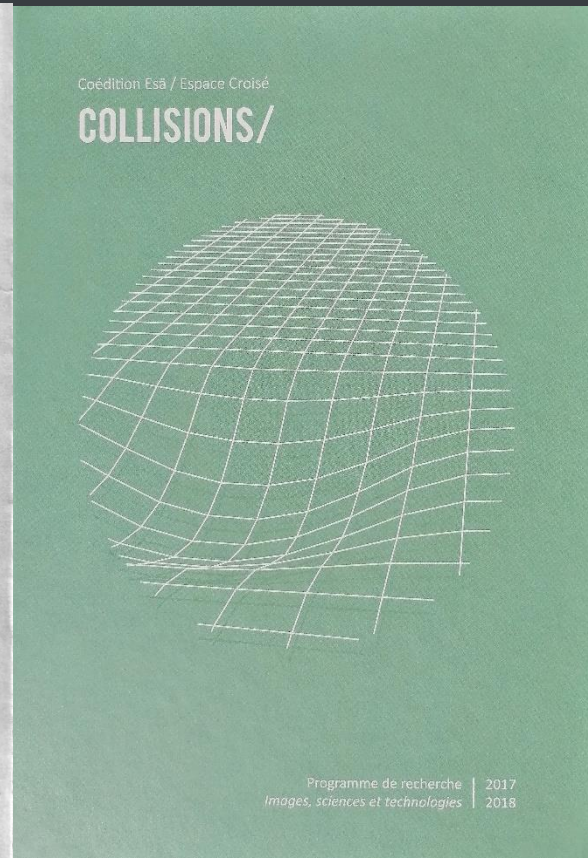
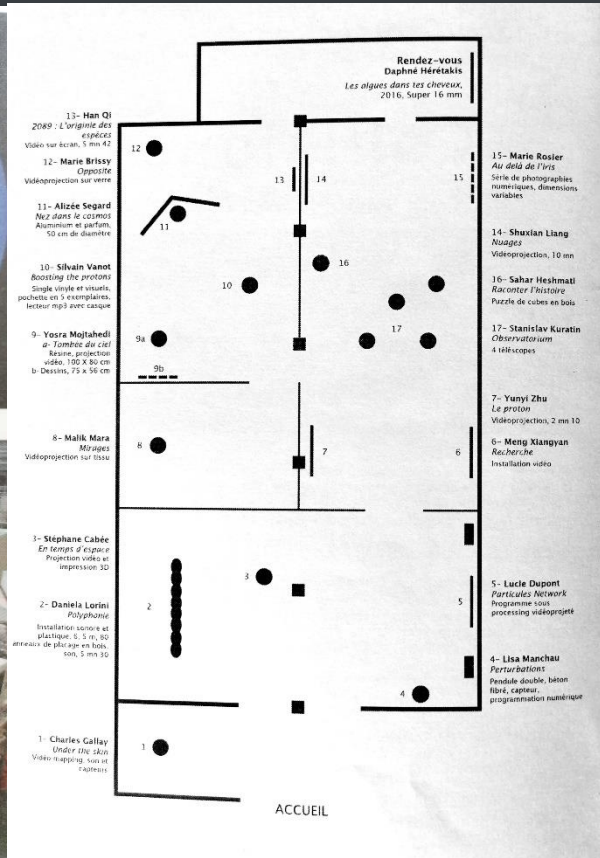
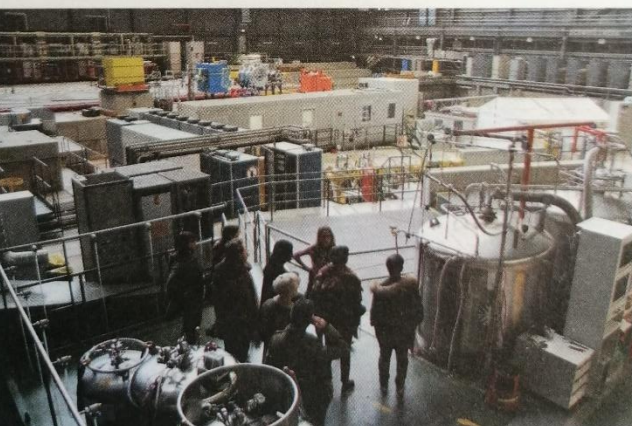
local scientific partner: HEPHY

Vernissage / Exhibition June 2017



ESA – Ecole Supérieure d'Art Lille/France 2017-2018

Collisions est une co-réalisation de l'esa, école supérieure d'art du Nord-Pas-de-Calais, l'Espace Croisé et art@CMS au CERN, l'institute Paul Scherrer, l'Ecole Polytech Lille.



Art University Cetinje/ Montenegro

art@CMS – Art University Collaboration

Gallery National Museum, Cetinje/ Montenegro October 2018

Event is the final show of our 2 semester course “art@CMS – Art University Collaboration, 2017/ 2018”

Presentation: Final presentation of 5 university art students + art@CMS collaborative artists

Video walk through the exhibition : <https://youtu.be/UUnBDYhiSlk>



KASK Ghent / Belgium 2017-2019



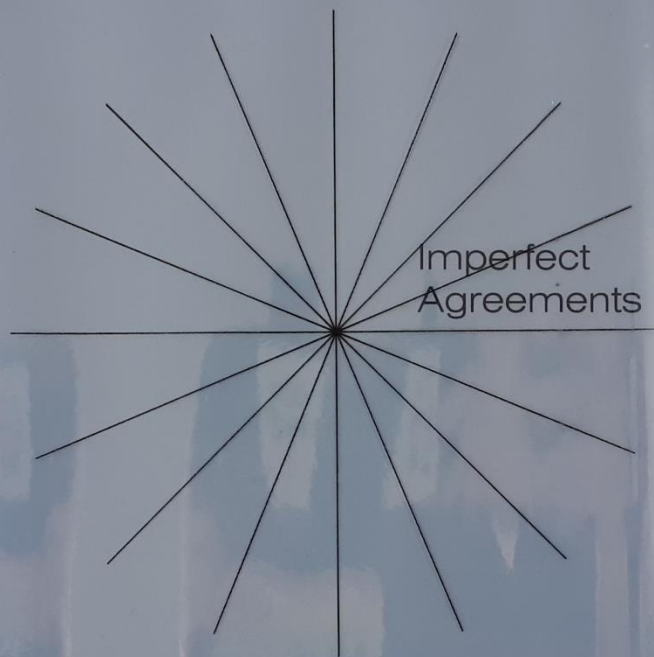
2 Exhibitions during EPS2019 conference by

1) KASK curatorial class 2018/2019
Botanic Garden; "Harbinger- Subtle Collisions"

2) art@CMS art University collaborative artists
Zwarte Zaal – 'ORIGIN poetics 2019',



Harbinger



Imperfect
Agreements

Curatorial Studies
2018 – 2019

ORIGIN POETICS 2019

Venue: "Zwarte Zaal" KASK, Ghent/BE

Dates: July 10th – 17th 2019

The artworks on show have been produced by a range of international artists and art students from various art Universities who are working in collaboration with the art@CMS-ORIGIN programme.

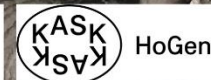
Based on personal interests and research by each artist each piece has been created using a wide range of media and provided by the artist to be exhibited here. The inspiration for these works is either scientific knowledge, research or meditations around the scientific world.

The artists involved are linked to a number of art groups and institutions, which include Cuántico /CO, Central Saint Martins /UK, Chelsea College of Arts /UK, University of Applied Arts /AT, Art University Montenegro;

Collaborating Artists:

Daniela Brill Estrada, Denise Schellmann, Andy Charalambous, Iva Kasalica, Lois Bentley, Sleepwalker, Jylle Navarro, Raji Jagadeesan, Mariana Heilmann, Diane Wingate, Riko Yasumiya, Lottie Bolster, Laura Madeley, Hannah Pratt, Hannah Brown, Debi-Sara Wilkinson, Rose Megmei Zhou, Yang Li, Maximilian Gallo, Johannes Frauenschuh, Hannah Scott, Mila Balzhieva, Istem Ozen Ruber, Monica C. LoCascio, Lisa Pettibone, Nicolas Strappini, Olga Suchanova, Maria Macc, Peter Bellamy, Rosa Nussbaum, Stephen Bennett, Reggy Liu, Chiara Campanile.

The Harbinger Essential, Daniela Brill Estrada, 2019.



South America, Bogota/ Colombia
December 2018 – April 2020

“SURATOMICA” cross-disciplinary science engagement & networking
with Colombian artists and Colombian school in dialogue with our
ORIGIN partners in Colombia and at CERN.

Supported by _



CONTACT

Daniela Brill - Wien, Austria.
+43 677 61297012
suratomica@gmail.com

FIRST
CREATION SPACE
BY SURATÓMICA
AT CERN

Images: Reverberations of a Topological Daydream. Artist Santiago Tavera. Piz. Abraham Mercado.
/ Distiller of the Self. Artist Natalia Rivera / Vi Creation - Art & Science Encounter. District.
Cinemathiques / Poetry in Particle Collisions / Thinking Group Suratómica / CMS Experiment /
Ideasquare at CERN / Concuero?mov Collective / Queer Architectures and the Virtual Body
Workshop. Artist Santiago Tavera. / Colorful Spaces of Transformation. Artist Martin Roro.



“SURATOMICA” cross disciplinary science engagement & networking with Colombia

Collaboration schedule 2018/2019:

Nov/2018 – April 2019 project preparation

April 2019 kick off symposium

- selection of artist groups
- each 2 weeks work meetings
- dialogue with ORIGIN partners

Sept/Oct 2019 working visit CERN 2 weeks

Oct 2019 School visit at CERN 1 week

- Alcaparros school, Bogota

April 2020 science & art festival Bogota

- art exhibition of participating artists
- school students exhibition

Project: <https://mhoch.web.cern.ch/Art@CMS/Suratomica.pdf>

artists @CERN: <https://indico.cern.ch/event/793349/>

project video : <https://youtu.be/E4f85WpEevo>

Outlook 2020 – 2022:

- Second SURATOMICA Colombia
- first contacts to Mexico, Brazil

04-19_
04-20

Suratónica

Suratomica is a space for creation and collaboration between art and science where artists from the Global South will strengthen their practice through cooperation and encounters with scientists and their environments.

The program enables new ways of dialogue between scientific thinking and artistic knowledge, promoting open access to creation in these fields and aiming to strengthen the reflection from the Global South upon science, development and access to knowledge.

This first edition, which will be held in Bogotá and Geneva, will host Colombian artists at CERN European Organization for Nuclear Research in Switzerland, for a two-week interdisciplinary science program. Likewise, artists and scientists currently associated with CERN will be invited to Colombia.

Organized by:
Mutante.Lab - Bogota, Colombia
Cuántico - Wien, Austria
art@CMS | ORIGIN - Geneva, Switzerland

www.suratomica.com
@suratomica

CONTEXT



04.19



RESEARCH

06-08.19

RESIDENCY



09.19



CREATION

10.19 - 03.20

FESTIVAL



04.20



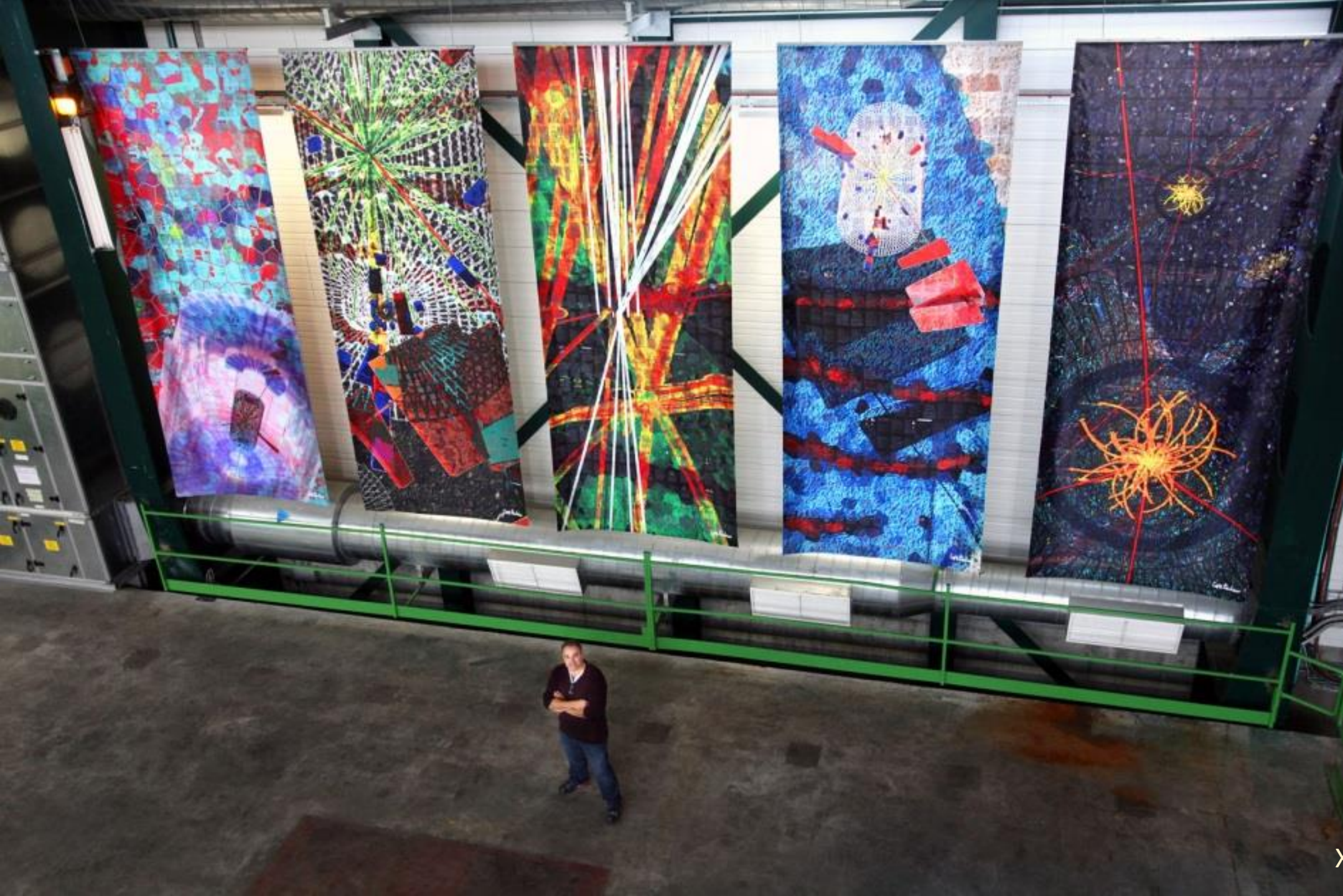
PROPAGATION

04.20 +

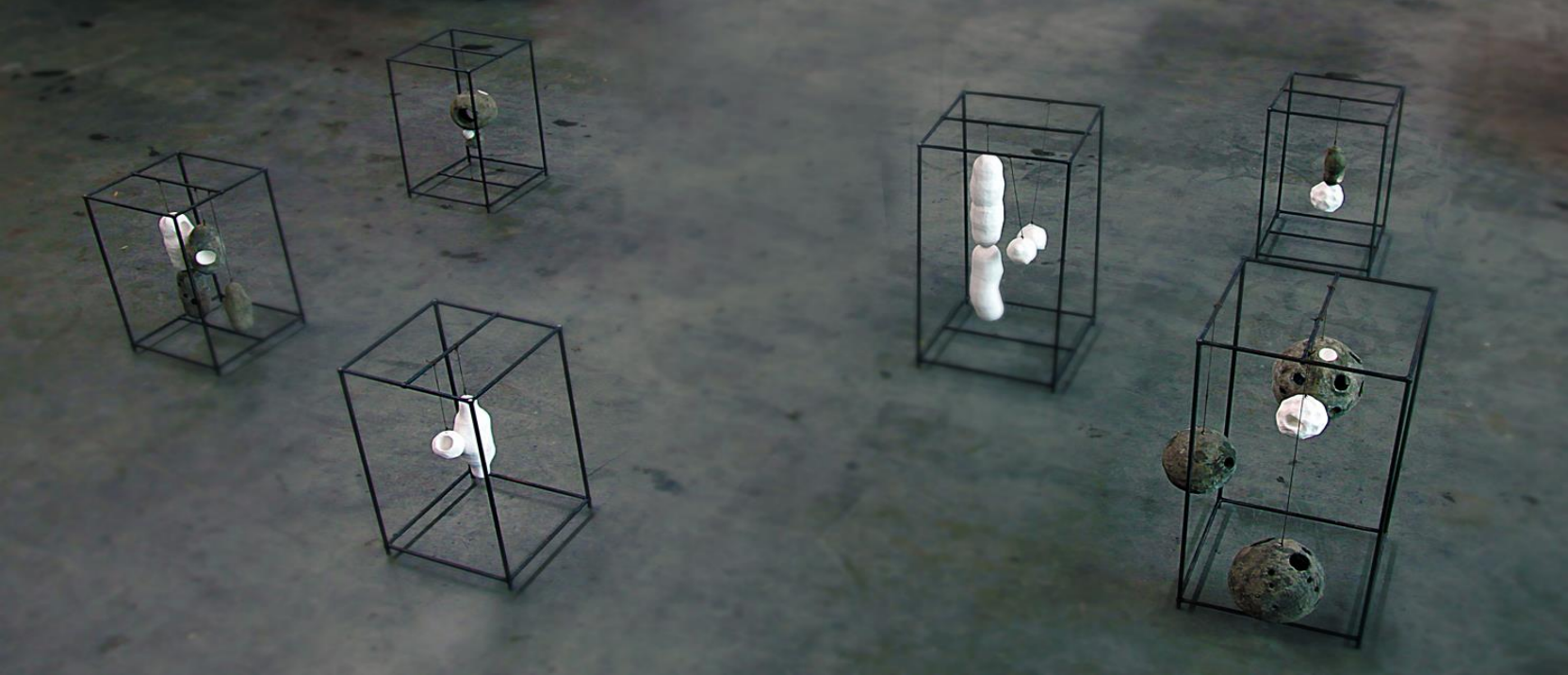
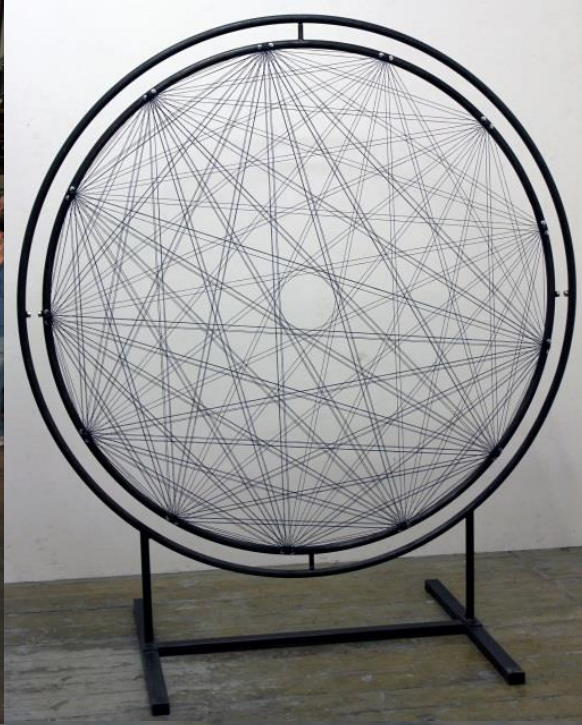
Collaborative Artists

Some examples :

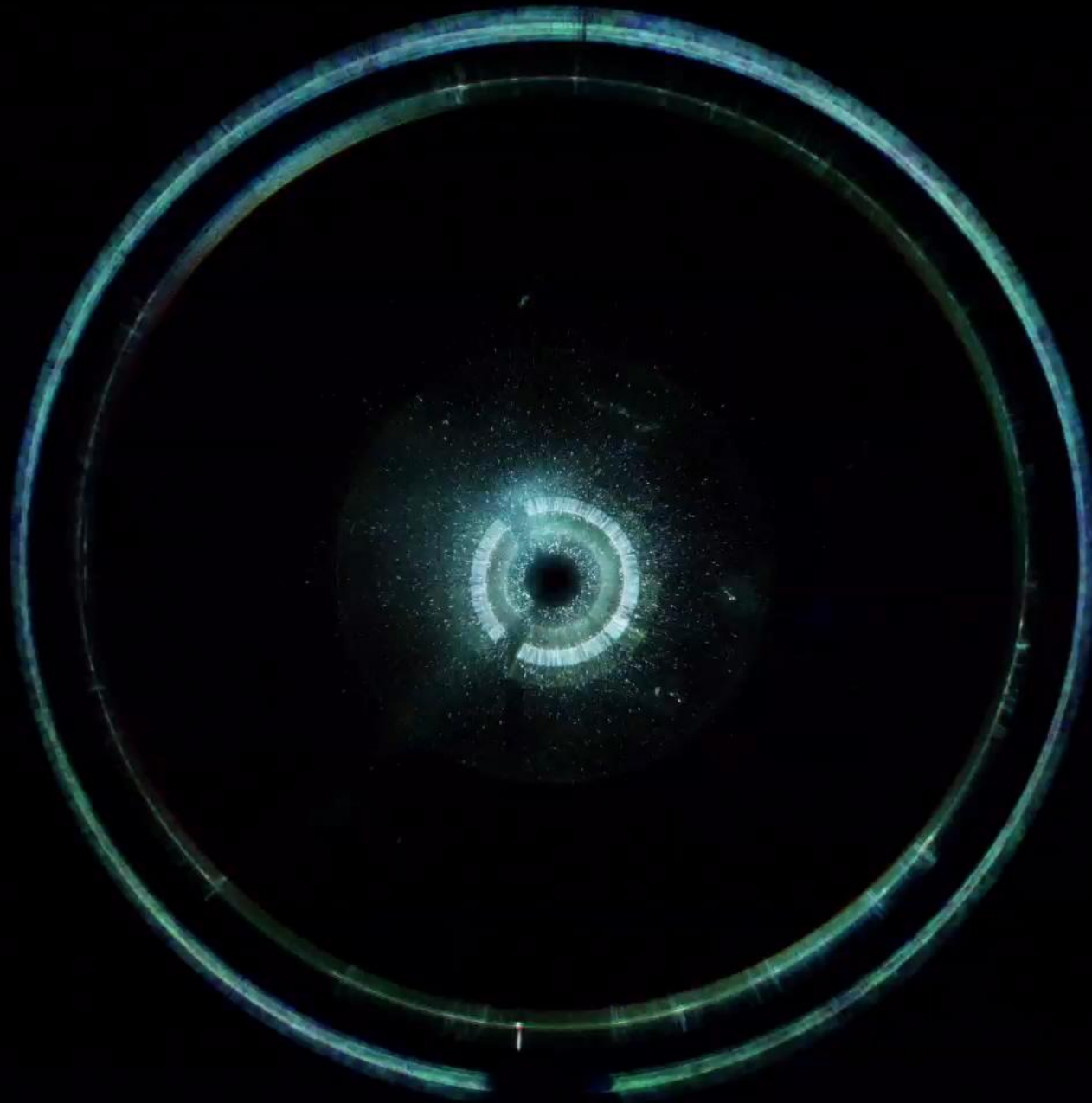








Alison Gill / UK



art@CMS: collaborative artist CONSENSUS

CONSENSUS participates as well in science & art workshops



*UK Rapper launches album **CONCERNED***

after 2 years of collaboration his science rap album ConCERNed.

CERN Article (all info): <http://cms.cern/news/concerned-using-hip-hop-engage-new-audiences-particle-physics>

FERMILAB talk: <http://events.fnal.gov/arts-lecture-series/events/event/rapper-consensus-free-lecture-demonstration/>

More Infor & Links:

Interview on the Financial Times 2018 : <https://www.ft.com/content/b4ecf4d8-d940-11e8-aa22-36538487e3d0>

BBC interview 2018 : <https://www.bbc.co.uk/sounds/play/p06qfhr5>

The BBC interview of ConSensus and Sudan 2017 [the sequence starts at 1:11.18 until 1h26.26]

- <http://www.bbc.co.uk/programmes/p04zv0g0#play> <https://www.youtube.com/watch?v=MJXaBq5VTNc>

Press article in the journal "The Voice" and "ProBeta magazine" 2017 :

- <http://www.voice-online.co.uk/article/south-london-geneva-hip-hop-science-lessons>
- <http://www.probetamagazine.com/en/lyrical-collisions-rap-meets-particle-physics>

Music videos of his 9 tracks album "conCERNed" on youtube :

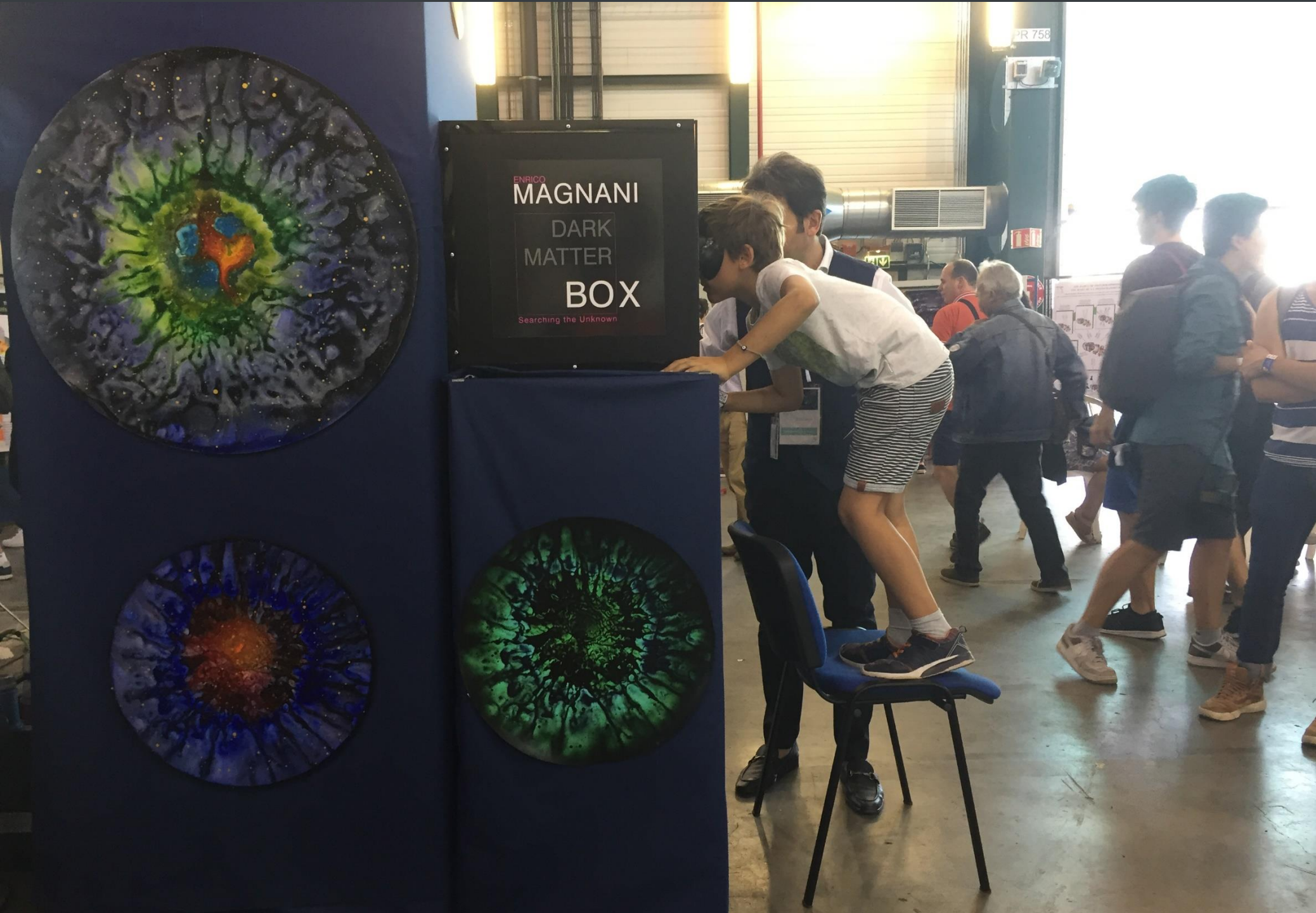
- Method to the Madness <https://www.youtube.com/watch?v=tJI8-ArzkBg&feature=youtu.be>
- CMS [Grim Music] <https://www.youtube.com/watch?v=1ju3fo37yLE&feature=youtu.be>
- Antimatter <https://www.youtube.com/watch?v=2UupDCfq-LA>
- Dark Matter <https://www.youtube.com/watch?v=OkeA2ePJGK8>
- Science Rap videos by students after his StudentsRapWorkshop 2016 "Particle Love": <https://youtu.be/sdB2PydXUW8>





Lindsay OLSON
Discoveries, 2015
100, 100C, embroidery thread, cotton,
acrylic on linen









Inspiring the next generation in **science methodology** & **art practice**, fostering **critical & creative thinking**, and highlighting the significance of **both science & the arts for humanity** require **collaboration & networking** among professional communities.

Diversifying 'languages' to communicate via **cross-disciplinary Engagement & Networking** is a very powerful way to reach out to Society

Together, they can **create richer** and more **impactful educational experiences**.

Michael.Hoch@cern.ch

art@CMS/ORIGIN program leader
KIT – Karlsruher Institute for Technology/ GER
Visiting Professor FSU Tallahassee/ US
phone: +41 754115720



Summary **ORIGIN 2017 – 2024** :<https://mhoch.web.cern.ch/Art@CMS/ORIGIN.pdf>
art@CMS summary 2012 – 2016: <https://mhoch.web.cern.ch/Art@CMS/Art@CMSprojects.pdf>

Biography : Dr. Michael Hoch

Michael.Hoch@cern.ch

[phone:+41 75 4115720](tel:+41754115720)



scientist

artist

educator

TU Wien : applied physics Dipl.Ing.

CERN / TU Wien: PhD, Particle Physics .

Employment: CERN, Austrian Academy of Science, University Wisconsin, Florida State University, KIT Karlsruhe Institute for Technology

Solo&group exhibitions: NHM, Aula Wissenschaft. Vienna, Johanneum Graz/ Austria; Deutsches Museum Bonn Germany; Technopolis Athens/ Greece; Ontario Science Centre Toronto/ Canada; South Florida Art Gallery Miami, Impact SBCast Santa Barbara, FERMILAB Gallery/ USA; Earth & Man Museum Sofia/ Bulgaria; Palazzo Milesi Split/ Croatia; City of London School, Triangle Space-ACL, London/ UK; Ferrari Gallery Vevey, Cite du Temps Geneva/Switzerland; Royal Academy Palace Brussels, Zwarte Saal-KASK, Ghent/ Belgium; Tama Art Museum, Italian Mission in Tokyo/ Japan; IBS Cultural Centre Deajeon, Hanyang Museum Seoul/ South Korea;.

University Vienna: High School Teacher programme for physics and sports

Creation: of various interdisciplinary science and art programmes disseminated in 18 different countries as well as specialist on facilitating transdisciplinary collaborations between diverse shareholders

<https://mhoch.web.cern.ch/Art@CMS/MHoch CV March2024.pdf>

<https://mhoch.web.cern.ch/Art@CMS/MHoch Art CV 2024.pdf>

<https://mhoch.web.cern.ch/Art@CMS/ORIGIN.pdf>



project documents on YouTube:

Ontario Science Centre, Toronto/ Ontario 2018: a walk through the exhibition
<https://www.youtube.com/watch?v=4Hkrr1mCz7o>

Ministry of Education Ontario, Evaluation report, Toronto / Ontario 2018
https://mhoch.web.cern.ch/Art@CMS/CulturalCollisionsCanada_EvaluationReport.pdf

Ministry of Education Ontario/ Project report: Toronto / Ontario 2018
<https://mhoch.web.cern.ch/Art@CMS/CulturalCollisions%20CanadaFinalPresentation.pdf>

art@CMS/Origin Canada summary report: Toronto / Ontario 2018
https://mhoch.web.cern.ch/Art@CMS/CulturalCollisionsCanadaORIGIN_summaryJune2018.pdf

Cite du Temps, Geneva/ Switzerland 2016:
<https://www.youtube.com/watch?v=LvHGb2DglqA>
https://mhoch.web.cern.ch/Art@CMS/CMS_TheArtofScienceGeneva2016.pdf

Ferrari Gallery, IMAGE2016 festival Vevey/ Switzerland 2016
<https://www.youtube.com/watch?v=rX828uRBy5U&feature=youtu.be>
https://mhoch.web.cern.ch/Art@CMS/IMAGES2016_FERRARIGallery.pdf

IBS cultural centre, Daejeon/ South Korea 2019:
<https://www.youtube.com/watch?v=mw-FMGVLcZ8>
<https://www.youtube.com/watch?v=8I7V6pY0ImI>
https://www.kps.or.kr/content/community/post_view.php?bt=2&post_id=3326&page=2

Tbilisi Georgia 2018
<https://www.youtube.com/watch?v=wAYkB5fgyVo>
National Museum Gallery Cetinje /Montenegro2018:
<https://www.youtube.com/watch?v=UUnBDYhiSlk>

Science Festival, Podgorica/ Montenegro 2017:
<https://www.youtube.com/watch?v=ikNhOIXtdgQ>

National Museum Gallery Cetinje /Montenegro2018:
<https://www.youtube.com/watch?v=UUnBDYhiSlk>

Science Festival, Podgorica/ Montenegro 2017:
<https://www.youtube.com/watch?v=ikNhOIXtdgQ>
<https://www.youtube.com/watch?v=ikNhOIXtdgQ>

ORIGIN, Cultural Collisions, Town Hall, Split/ Croatia 2018:
<https://www.youtube.com/watch?v=XYIDehGg4Xs>

science flash mob, Athens/ Greece 2017:
https://www.youtube.com/watch?v=ixlWlq3_paw

science flash mob, Museum fuer Vorgeschichte Halle/ Germany:
<https://www.youtube.com/watch?v=z9v-EhWd6Hc>

Cultural Collisions Dance NHM, curated and performed by students Vienna/ Austria 2017:
https://www.youtube.com/watch?v=Bly_iERk5Ps

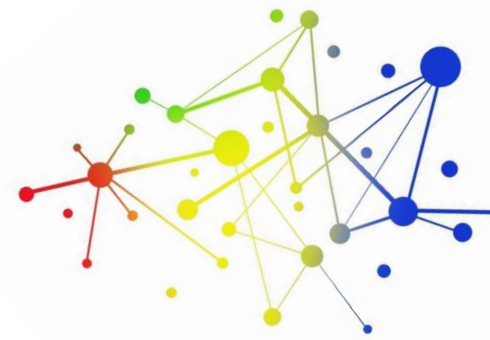
Art Centre South Florida, Miami Beach 2015:
<https://www.youtube.com/watch?v=VMSRgoktAK0>

Technopolis Museum Athens/ Greece 2015:
<https://www.youtube.com/watch?v=tT8MHsCaYks>

CERN P5, Cessy/ France 2015:
<https://www.youtube.com/watch?v=HezqXZW8PM>

Art University Sarajevo/ Bosnia 2018:
<https://www.youtube.com/watch?v=60-GeKtFpQg>

Castel dell Ovo, Napoli/ Italy 2015:
<https://www.youtube.com/watch?v=Z8DJDRIA13k>



Further Collaborations & Ideas



Feynman inspired art

a construction manual

Andy Charalambous in collaboration with CERN HST Programme 2017

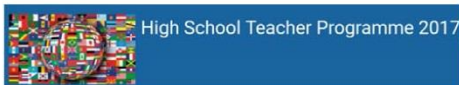


Fig.1: Coreen, 2012

1. Introduction

When I left school I went to work as a technician for the Physics and Astronomy department at a university in London. I trained as an engineer and spent many years designing and building equipment for the research groups there. My interest in science grew as I worked with these groups and got a better understanding of the science they were researching. I loved my job because it gave me so much insight into the science involved.

When I left that job and started as an artist I found that the excitement of science was something I didn't want to move away from. So, I decided to use science as the inspiration for my art. Most of the art I make comes from some bit of science that has seeded an idea. Science is a tool for letting us see our world more clearly, and for me it also inspires my work. By the way, I have not moved very far from the university I worked at. I am Artist in Residence for the Astronomy group and the High Energy Physics groups there, as well as being part of the art@CMS project run by Michael Hoch at CERN.



sciARTbooklet

a manual for an art and a science teacher to re- create and create topical artworks

art@CMS 2017

UK collaborative artists :
Rachael Nee , Andy Charalambous

in preparation:
“data sonification” by Federico IT,
“particle detection” by Ch. Henschke AU

Orders of Magnitude – Potato Powered Cosmos

a construction manual

Rachael Nee in collaboration with HST Programme 2017



1. Introduction

This booklet is written for science and art teachers with the aim of interdisciplinary learning. It assumes no knowledge of the other disciplines subject. In it you will read about the art installation from both the science and art viewpoints and how to reconstruct it. This becomes a jumping off point for the development of new artworks by High School students, with questions along the way.

Science and contemporary art have different end goals; however, they also have a lot in common. Both contemporary art and science have similar methodologies involving; investigation, research, testing out of ideas and theories through experiment. They share imagination, curiosity, quest for knowledge and are forms of inquiry. When successful both allow the world to be seen in new ways.



