

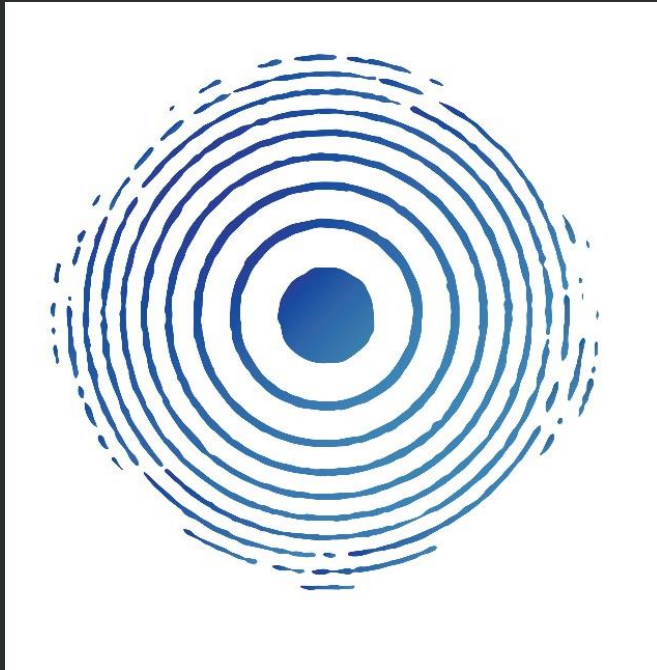


# ORIGIN

cross-disciplinary  
science education  
engagement & networking



Since 2017



**ORIGIN**

## Supported by

ATLAS, ALICE, CMS, LHCb,

LIGO, VIRGI, ICEcube, DUNE

Muography, Perimeter Institute,

Canadian Light Source, and other  
international partners

**Particle Physics**

**Astrophysics**

**Gravitational Waves**

**Neutrino-Physics**

**Muography**

**Accelerator**

**Technology**

Since 2012

## Methology develped & disseminated since 2012

By CMS collaboration via art@CMS

Global Cross Disciplilnary science engagement & networking program



# ORIGIN program **Mission**



## Interdisciplinary science **engagement** & **networking**

Help our science community to reach out to **especially school students**, general public and policy makers to relate and engage actively with various science topic via the arts or creative involvement.

“Arts as a tool to engage actively –

Empower them to own the topic and allow them to contribute”

Scientific Methodology triggers Critical Thinking

Art fosters Creative Thinking



# 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 21<sup>st</sup> 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**



# sciARTmasterclass

## Science&Art@School

### Cultural Collisions

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

# sciARTmasterclass

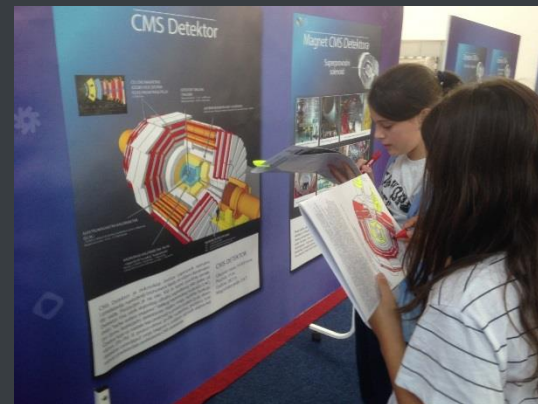

one day event e.g. science festival or science day,..



Otvoreni dani nauke  
**Mladi naučnik**  
5-9 godina



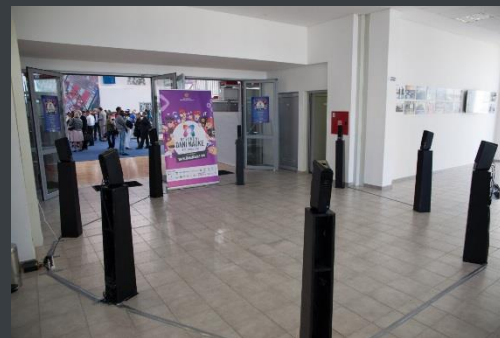
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Students participating in the ScienceFlashMop,  
**CMS Junior Scientist Program -> Booklet**  
art@CMS interdisciplinary Exhibition with: real detector & accelerator equipment, art works, creative corners , lectures and detector workshops as well as 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



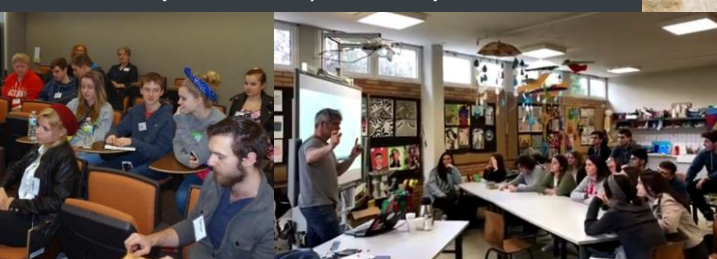
Graz/ AT 2012, 2013, 2014



Sofia Bulgaria 2015, Vienna/ AT 2016



FERMILAB/ US 2015, Athens/ GR 2017



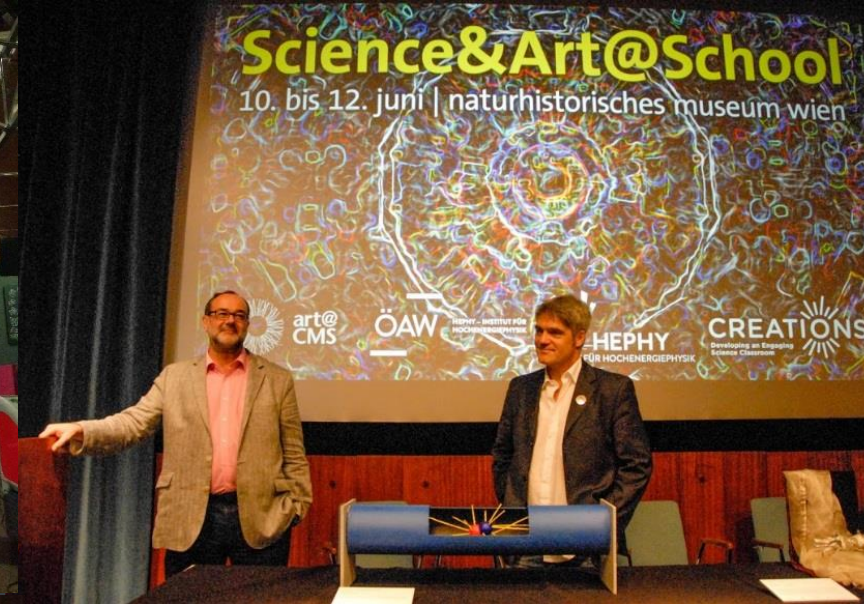
Best National dissemination : Science & Art across Italy <https://web.infn.it/artandscience/index.php/en/> 2016 - 2017 - 2018,

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 24<sup>th</sup> 2017

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

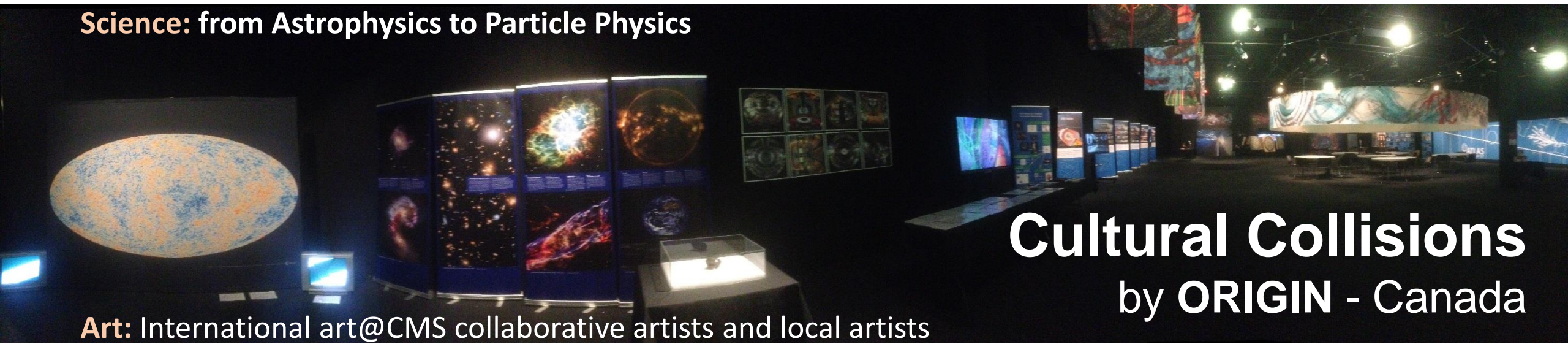
18h30 Opening  
19h00 Welcome  
19h15 art show & performance by Haydn Gym. Vienna,  
Herz Jesu Gym. Salzburg, ECOLINT LGB Geneva,  
20h00 Drinks  
21h00 Close



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



# Science: from Astrophysics to Particle Physics



# Cultural Collisions by ORIGIN - Canada

**Art:** International art@CMS collaborative artists and local artists

**Venue:** Ontario Science Centre, OSC

**First exhibition April 9<sup>th</sup> – 15<sup>th</sup> 2018**  
student research and inspiration

**Second exhibition: May 29<sup>th</sup> – June 3<sup>rd</sup>** at OSC :  
students art-works presentation

A formal evaluation by the Ministry of Education

**Organization:**

**creation of ORIGIN**

**Toronto Ministry of Education:** general and education organization,  
evaluation

**art@CMS:** Exhibition curation

**ORIGIN:** Scientific curation

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

**More institutions are interested to join: TRIUMF, Snowlab**



**ORIGIN**



# 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	9:30 - 10:30 am	
10:00 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
10:15 AM		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 6:00 pm
	Science Flash Mob (10:00 - 10:45)	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		
10:30 AM		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
		RPS Hall	Room: Workshop 4	Room: Dry Lab	Exhibit area	Salle avec des tables -RPS Hall	Salle: Workshop 4	Salle: 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					
11:00 AM		Exhibit Area with Scientists and Artists				Aire d'exposition avec les scientifiques et les artistes				Exhibit Area with Scientists and Artists								12:00 pm - 20 minute talk: David Griffin (OCAD University)	
11:15 AM	Moderated Panel: Meet the Scientists and Artists! (10:45 - 11:15)													Exhibit Area with Scientists and Artists				1:00 pm - 20 Minute talk: Robin Kingsburgh	
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 Rep	
12:00 PM		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	Performance of Consensus, interactive component, Scott Wilson with the audience and then Q & A	Workshop 2A	Workshop 2B	Workshop 2C	Workshop 2D	Atelier 2A	Atelier 2B	Atelier 2C	Atelier 2D	Workshop 2A	Workshop 2B	Workshop 2C	Workshop 2C	Workshop 2A	Workshop 2B	Workshop 2C	Workshop 2C	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	12:45 - 1:45 pm	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	Wen Yi Song (ATLAS Canada, York University)	Bianca Ciungu (ATLAS Canada Toronto MS)
12:45 PM		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		
1:00 PM	Workshops and Activities in Exhibit Area																	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													

# IBS cultural centre, Daejong / Korea April 24<sup>th</sup> – July 26<sup>th</sup> 2019

## “CMS@CERN the art of science”

Cross disciplinary exhibition, science talks, round table discussions, science cafes, Walk through the exhibition : <https://www.youtube.com/watch?v=817V6pY0ImI>

CMS@CERN  
-The Art of Science

### 신을 쫓는 기계

“우리가 새로운 입자도 조사하고(99.9999999%의 확률로 보았을지라도)”

2012년 7월 4일, 핵융합 실험 장치 CMS(Compact muon Solenoid)의 실험 결과로 인해 새로운 입자 발견의 가능성이 제기되었다. 이 발견은 입자 물리학의 새로운 장을 열어줄 것으로 기대되고 있다. 이 발견을 기념하여 CMS 프로젝트의 리더인 로저 브라운 박사는 “우리가 새로운 입자를 발견하고 싶었다. 하지만 그것은 우리에게 주어지지 않았다. 그것은 우리에게 주어졌다. 그것은 우리에게 주어졌다. 그것은 우리에게 주어졌다.”

CERN의 과학자이자 예술가 Michael Hochberg는 LHC의 가장 중요한 실험 장치인 CMS(Compact muon Solenoid)를 위한 예술작품을 제작했다. 그는 예술과 과학의 경계를 허물기 위한 입자 물리학의 세계를 보여준다.

‘신을 쫓는 기계’라는 제목과 관련된 상징적인 CMS 과학의 아름다움을 선보인다. 인간 지성의 신성함과 창조적 예술적 표현인 CMS를 통해 과학의 경계를 허물기 위한 열정을 보여준다. 이번 전시에는 CERN의 CMS를 통해 대중들에게 예술의 힘으로 소개하는 것이었다. 더불어 현대 CMS 실험, 가속기(입자 가속기)의 원리 및 입자 물리학의 중요성에 대해 한눈에 볼 수 있는 전시를 선보인다.

We observe in our data clear signs of a new particle, at the level of five sigma. (Dr Fabiola Gianotti, spokeswoman for the ATLAS experiment at CERN)

The discovery of the Higgs boson announced by CERN (European Organization for Nuclear Research) on July 4 2012 was met with local excitement and “chewing the world”. It is a historic milestone that may enable us to come closer to answering the question “Where do we come from?” “What are we?” “Where are we going?”

The Higgs bosons so called “god particles” are believed to disappear immediately after the Big Bang after unleashing mass to matter. CERN experimentally proved the existence of this new particle with results from the Large Hadron Collider (LHC), the world’s largest and highest-energy accelerator which explores the secrets of the universe.

As a CERN scientist and artist, Michael Hochberg highlights the extraordinary beauty of a high scientific architecture, CMS (Compact muon Solenoid), located at the heart of the LHC. His artworks unveil the world of particle physics in a unique way which makes it easier to comprehend for everyone.

Besides “chasing the gods of the universe”, this exhibition presents photography, collage and installation that capture the symmetry and beauty of the CMS detectors. You will also be able to follow the process of museum to collect and understanding of nature by viewing CMS data which unveils the ultimate nature of great achievements in modern physics. The magnificent beauty of the technological scientific architecture makes you marvel about the boundary between art and science.

We hope that you enjoy this unique exhibition which is the first that features CERN and CMS for Korean people. You will also learn about the contribution that Korean, CMS and CERN scientists have made in the great attempt to reveal the secrets of the universe.

일시 2019. 04. 24 - 2019. 07. 26

시간 10:00 - 17:00(매주 무료입장)

장소 IBS과학문화센터 1층 전시관

대전광역시 유성구 엑스포로55 기초과학연구원IBS

문의 042.878.8185 / rpsa0417@ibs.re.kr / www.ibs.re.kr

DATE 2019.04.24 - 2019.07.26

TIME 10:00 - 17:00

OPENING (only on calling every Monday)

PLACE IBS Exhibition Hall,

1F of the IBS Science Culture Center,

Indusong-ro153, Science55, Expoon,

Yuseong-gu, Daejeon, Korea

INQUIRY 042.878.8185

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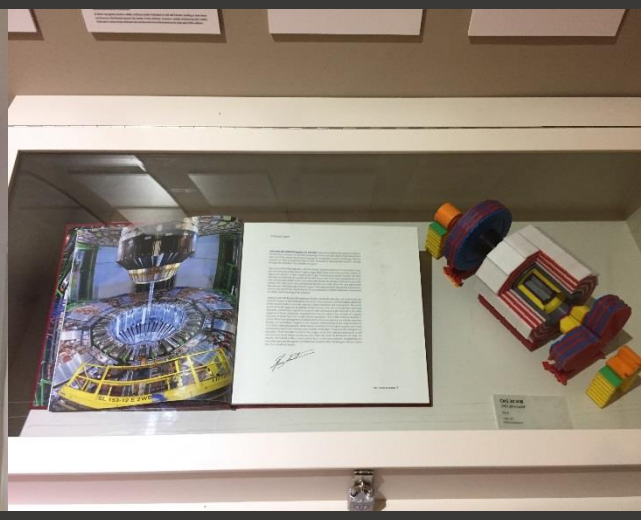
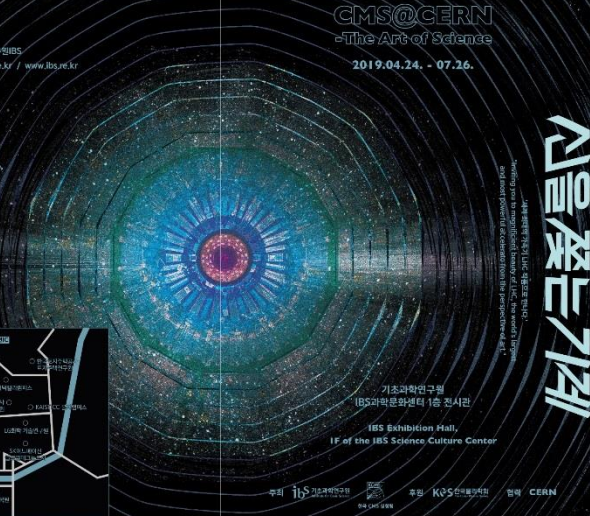
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# IBS cultural centre, Daejong / Korea April 24<sup>th</sup> – July 26<sup>th</sup> 2019



**T H E**  
**A R T**  
**O F**  
**SCIENCE**

과학의 아름다움

IBS <신을 쫓는 기계> 展 기념 마이클 호처 작가 대중강연

2019.04.24.wed. 17:00 — 18:00

IBS 본원 이문동 8109 | 대전광역시 유성구 엑스포로 55 기술과학연구원



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

April 2019 – March 2020 by art@CMS/ ORIGIN

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

Cross disciplinary exhibition on Cosmic Ray Discovery with Balloons, lectures , Junior Scientist booklet, various science & creative lecture and workshops during Balloon Festival January 25<sup>th</sup> – February 1<sup>st</sup> 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 Chateau-d'Oex www.espace-ballon.ch +41 78 723 78 33

**Pioneers of Cosmic Rays**  
Entdecker der kosmischen Strahlung  
Pionniers des rayons cosmiques

weather balloon 30 000m  
ISS - AMS experiment 400 000m, 2011 - ongoing  
Bertrand Piccard World Tour 11 700m  
Air plane traveling altitude 10 000m  
Werner Kohlhörster 9300m 1914  
Victor Hess 5300m 1911  
Albert Gockel 4500m 1909

**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 Kohlhörster 1887 - 1946**  
Nobel Prize 1936  
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**

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

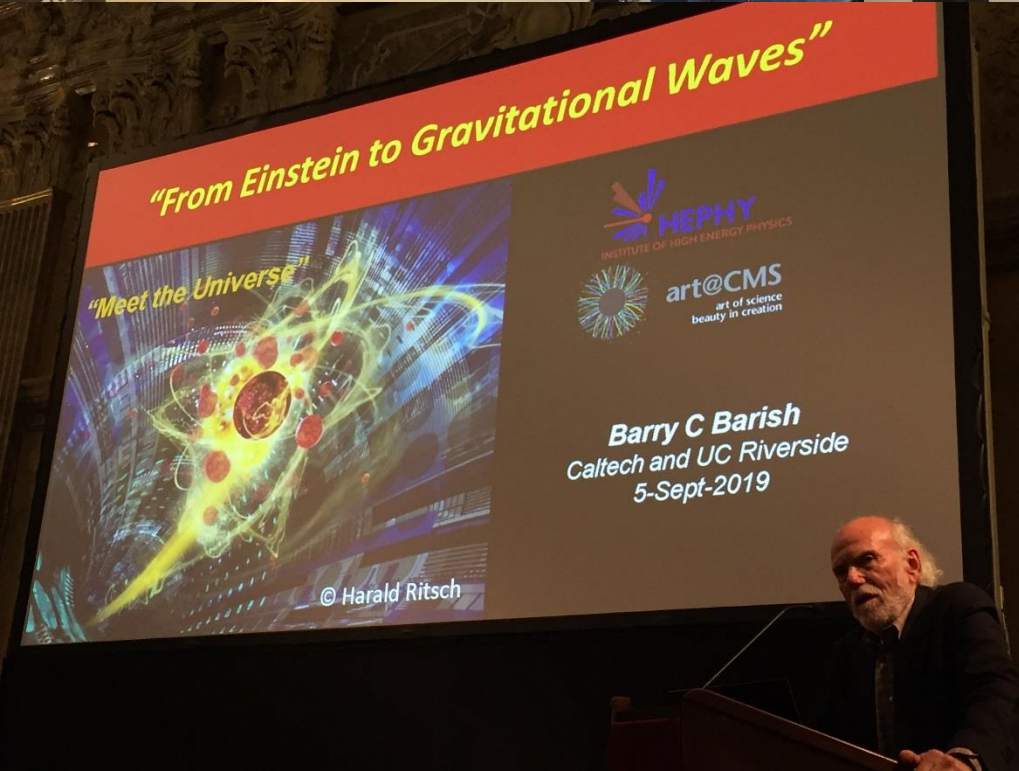
# “Meet the Universe” – Cultural Collisions Vienna /Austria

by HEPHY Institute OeAW & ORIGIN;

science & art exhibition [Univ. Applied Arts Vienna], cross disciplinary workshops for schools  
exhibition September 2019; Cultural Collisions September 2019 – June 2020











# Cooperation with the Ministry of Education Oman Oman Science Festival 2019

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



# Contact with the Education Ministry and Geneva Mission since 2015

2017, Invitation to the Oman Science Festival – Michael Hoch to give a keynote presentation at the opening about interdisciplinary science education.

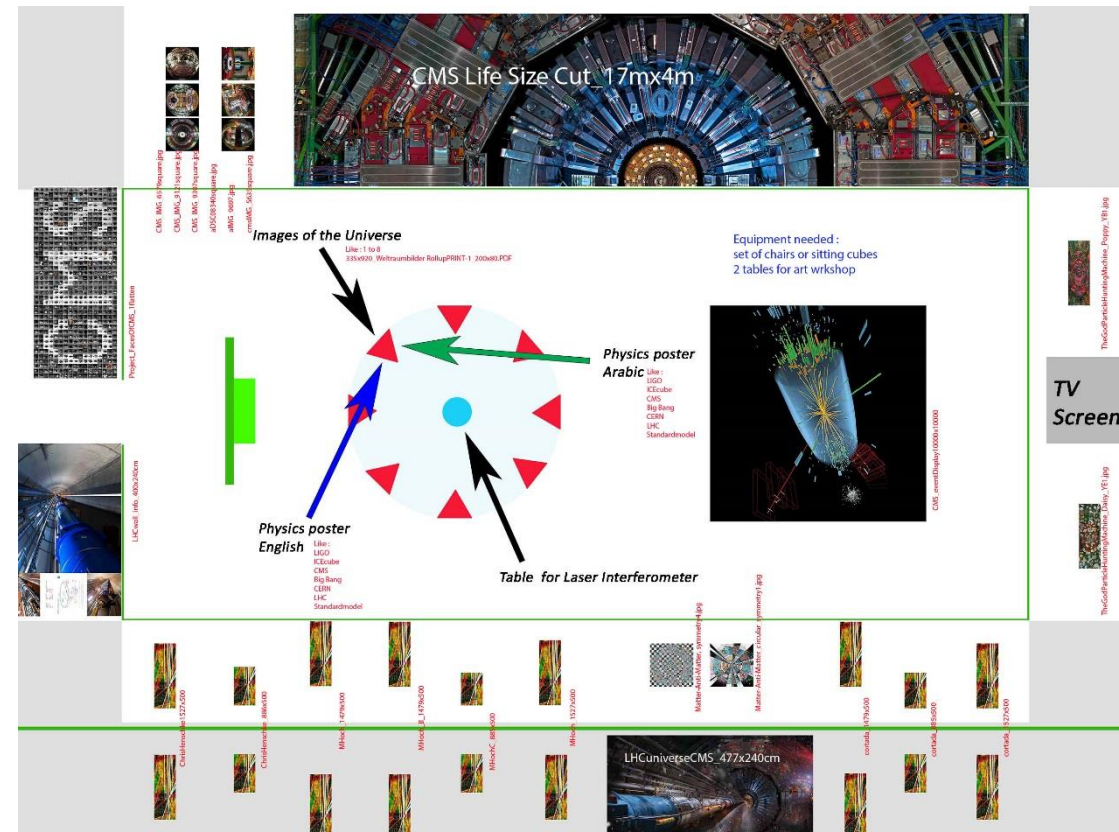


# Oman Science Festival 2019

- M. Hoch received an Invitation to present an exhibition of the style IBS cultural center Daejon/ Korea 2019 <https://www.youtube.com/watch?v=8I7V6pY0lml&t=241s>
- *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 project in Oman 2021  
<https://www.youtube.com/watch?v=4Hkrr1mCz7o>



Floor plan OSF2019



# art@CMS Korea-> ORIGIN Oman [to inspire for big Cultural Collisions event 2021]

- Exhibition venue 210m<sup>2</sup>
- Topics:
  - particle physics: CERN & ATLAS, ALICE, CMS, LHCb
  - Gravitational waves: LIGO, VIRGO
  - Neutrino physics: ICEcube



# Oman Government in the exhibition “Meet the Universe”

Prime Minister

Minister of Education



Prime minister and Minister of Information







Lectures by  
Amr Radi & team  
Local Scientists,  
Particle Physics/ CERN

Martin Hendry LIGO  
Gravitational waves &  
Astrophysics

Michael Hoch CMS  
Particle Physics /CERN &  
Educational Formats





Head of Physics State University, Ministry of Education State Secretary

Amr Radi & team in public engagement and student education







Creative workshops



Science Flash Mob



primary school student lectures

Creative workshops



Science workshop

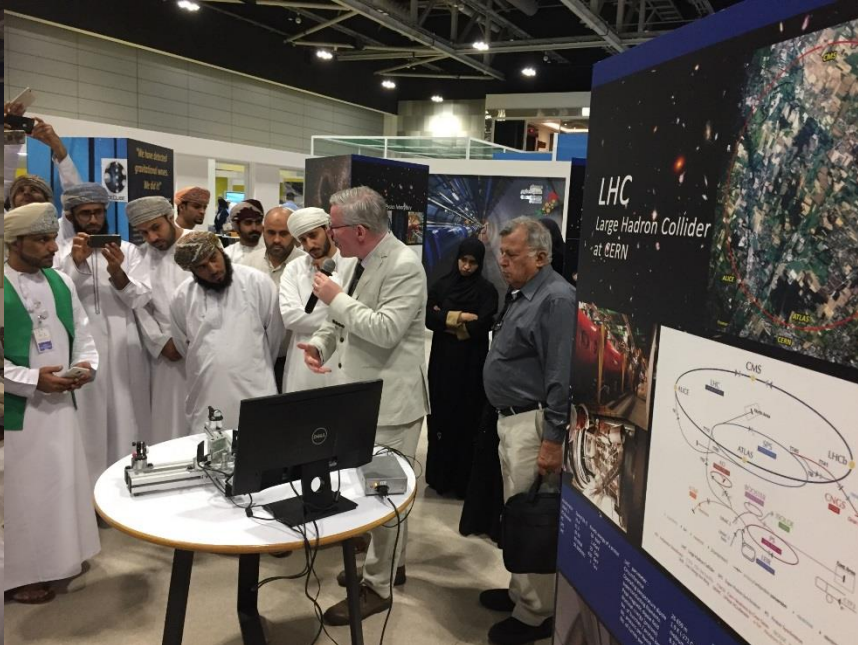


creative teacher workshop





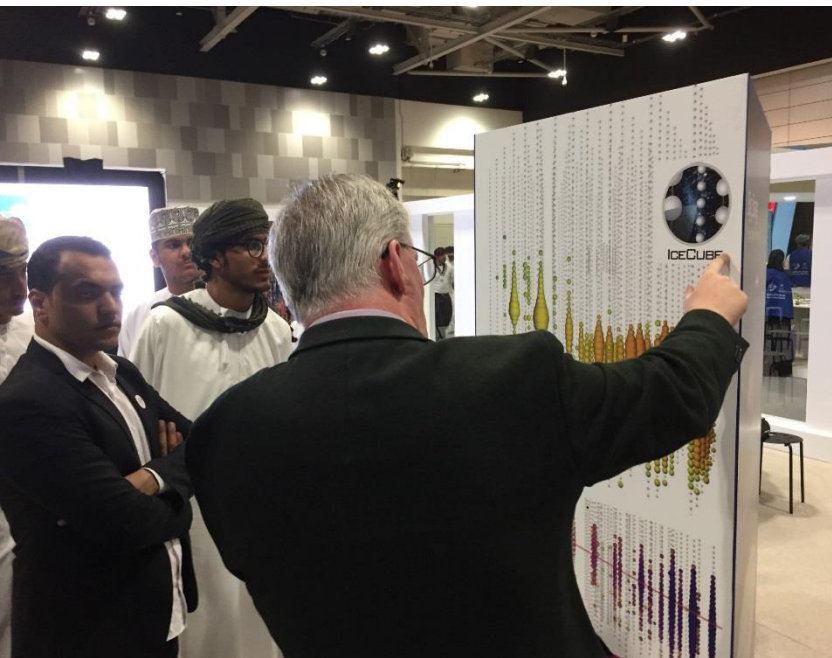
Particle Physics- masterclass  
Neutrino Physics - ICEcube



laser Interferometer WS  
Creavite Teacher Workshop



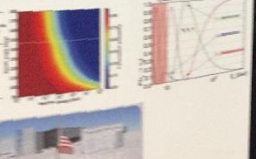
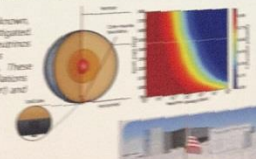
Creative Primary School Students  
CERN Virtual Visit







**Neutrino Properties:**  
They are the second most abundant particles in the universe, but their properties are still being investigated. Neutrinos are produced in the sun, in nuclear reactors, and in cosmic ray showers. They are the only particles that can pass through matter almost unimpeded. They are also the only particles that can change their identity (flavor) as they travel. This is called neutrino oscillation. The ATLAS experiment is studying neutrino oscillation by measuring the number of neutrinos that interact with matter as they pass through it.





# Cultural Collisions – Split /Croatia by ORIGIN

Old City Hall – Sept. 17<sup>th</sup> -22<sup>nd</sup> 2018

Exhibition, lectures, round table discussion, workshops;  
Workshops: Physics and Music (Arduino Explora), Gravitational waves (Torino interferometer), Playing with data (CMS tool developed for Canada)  
Next years event :

Izložba

## POSTANAK I EVOLUCIJA SVEMIRA KROZ UMJETNOST I ZNANOST

Stara gradska vijećnica, Narodni trg, Split  
17. do 21. rujna 2018.  
u vremenu od 10h - 20h

Ulaz slobodan

**PROGRAM**

**Ponedjeljak, 17. rujna 2018.**  
19h Otvaranje izložbe

**Utorak, 18. rujna 2018.**  
18h30 Javno predavanje  
Michael Hoch, CERN - Geneva: "Art and Science"

**Četvrtak, 20. rujna 2018.**  
18h30 Javno predavanje  
Martin Hendry, University of Glasgow:  
"Listening to Einstein's Universe: the Discovery of Gravitational Waves"  
20h Okrugli stol  
"Razumijevanje svijeta kroz umjetnost i znanost"  
Sudjeluju: James Beacham, Branko Franceschi, Nikola Godinović,  
Michael Hoch, Chiara Mariotti

**Petak, 21. rujna 2018.**  
18h30 Javno predavanje  
James Beacham, Ohio State University:  
"A Big Bang Machine on the Moon"

\* Javna predavanja i okrugli stol će se održati u palači Mileš, u okviru konferencije "LHC Days in Split", ulaz slobodan

\*\*\* Moguće su grupne posjete izložbi za učenike svih uzrasta. Za dogovor se javite emailom na Nikola.Godinovic@fesb.hr ili Ivica.Pujjak@fesb.hr



walk through exhibition **Split** - > <https://youtu.be/XYIDehGg4Xs>





# Cultural Collisions – Split /Croatia by ORIGIN train the trainers

During the main exhibition we trained students from primary and secondary schools to act as lectures for following (see next slides).



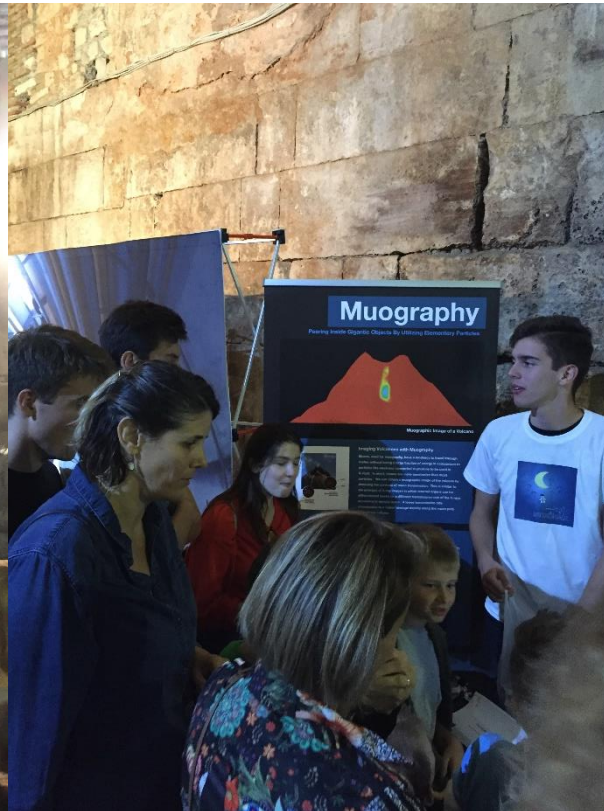


# Cultural Collisions – Split /Croatia by ORIGIN

## Researchers night – September 28<sup>th</sup>

**Format:** students we trained become lecturer to general public and training other students.

Audience during the researchers night: few thousands citizens



## art@CMS/ORIGIN action Summary – Outlook 2019:

### January

Applied Arts University Vienna/AUT, CERN working visit 5 days  
Central Saint Martin's London/UK, CERN working visit 5 days  
Submission COST project and Western Balkan Funds

### February

KASK – Ghent/ Belgium CERN working visit 5 days  
EU project CREATIONS final presentation in Germany

### March

E.A. School CERN inspiration visit Science&Art@School

### April

Estonian Teachers visit science&art@school training 5 days  
**IBS cultural centre Exhibiton Daejeon/ Korea** Opening 24<sup>th</sup> April - 31<sup>st</sup> July  
**Director General Landesmuseum Zuerich/ CERN** visit for future collaboration  
**JRC director CERN** visit – networking and collaboration with art@CMS

### May

**Balloon Museum Chat Chateau d'Oex/ Switzerland** Open 4<sup>th</sup> May – March 2020  
**Kunsthau Vienna/ Austria** exhibition 25<sup>th</sup> May

### June

**Cultural Collisions final exhibition Vienna/ Austria**  
**Suratomic desire – GLOBE and CMS party concert**

### July

**EPS conference – HARBINGER and ORIGIN POETICS exhibitions Ghent/ Belgium**

### September

**ORIGIN Exhibition** 60<sup>th</sup> anniversary Austria CERN member, cultural collisions **Vienna/ Austria**  
**CERN open Day CERN P5 ORIGIN** exhibition – Cessy/ France  
Suratomica – artist working CERN visit 15 days – Bogota/ Columbia

### October

Montenegro Science Festival – science & art @ School workshops  
JRC – Resonance III festival – present formats S&A@school, Cultural Collisions

### November

Oman science Festival – install exhibition, Cultural Collisions workshops  
Bulgarian ScienceWeek – 20Years BLG CERN member ship anniversary

## OUTLOOK 2020

**January** – Central Saint Martin's College of Arts London/ UK

**February** – Balloon Festival Chateau d'Oex – celebration of cosmic ray discovery

**March** exhibition in Seoul/ Korea

**April** – Suratomica Bogota/ Columbia

Furthermore

Request by LHCP Paris in May 25<sup>th</sup> – 30<sup>th</sup>

ICHEP by ICHEP Prag July 30<sup>th</sup> – August 5<sup>th</sup>

Request for collaboration with Perimeter Institute, Ontario/ Canada



# Art@CMS events to date

## Art@CMS Exhibitions 2017 :

24<sup>th</sup> February Cultural Collisions, CERN Meyrin, Geneva / Switzerland  
16<sup>th</sup> March IndianTour / India  
April 6<sup>th</sup> MACT HUB Santa Barbara / US  
10<sup>th</sup> – 24<sup>th</sup> April ItalianTour / Leonardo da Vinci Museum Milano/ Italy  
3<sup>rd</sup> – 10<sup>th</sup> May RE: Logia – Art/Science / Technology Conference Sofia/ Bulgaria  
9<sup>th</sup> – 13<sup>th</sup> June NHM school competition show, Vienna / Austria  
14<sup>th</sup> -17<sup>th</sup> June Four Corners Gallery – Central Saint Martins College of Arts London/ UK  
17<sup>th</sup> – 30<sup>th</sup> June Weisse Haus University Applied Arts final show / Vienna / Austria  
21<sup>st</sup> – 30<sup>th</sup> June art@CMS vernissage CERN P5, Cessy / France  
1<sup>st</sup> July Mairie de Thoiry , Thoiry / France  
22<sup>nd</sup> – 30<sup>th</sup> July Palazzo del Cinema, ItalianTour/ EPS2017 Venice / Italy  
1<sup>st</sup> – 9<sup>th</sup> August IndianTour / India  
29<sup>th</sup> Sept – 3<sup>rd</sup> Oct MuoGrapher art Workshop, Tokyo/ Japan  
9<sup>th</sup> – 11<sup>th</sup> October Science Festival, Podgorica/ Montenegro  
14<sup>th</sup> -28<sup>th</sup> October ItalianTour / Padoa / Italy  
23<sup>rd</sup> – 29<sup>th</sup> October Science Festival OMAN  
26<sup>th</sup> October art@Science Workshop Tbilisi/Georgia  
6<sup>th</sup> Nov 2017 – Jan 2018 UAL final show / London / UK  
November IndianTour / India  
December BOZAR Brussels / Belgium  
artUNIVERSITY Podgorica Montenegro

2018 start ORIGIN Canada, Japan, Croatia, Montenegro, Bosnia, Georgia, UK, Korea, Austria ,

## Art@CMS Exhibitions 2016:

Jan 5<sup>th</sup> – 21<sup>st</sup> - Ettore Fico Museum, Turin/ Italy  
Feb 28<sup>th</sup> – Apr 10<sup>th</sup> - Cite du Temps, Geneva / Switzerland  
Mar 24<sup>th</sup> – Oct 30<sup>th</sup> JINR Library Dubna / Russia  
Apr 4<sup>th</sup> – 10<sup>th</sup> Athens Science Festival  
Apr 14<sup>th</sup> – 21<sup>st</sup> Triangle Space Chelsea Coll. Arts, London / UK  
Apr 27<sup>th</sup> – Jul 31<sup>st</sup> CERN, Preveessin Site, Bld. 774 – Preveessin / France  
May 1<sup>st</sup> – 6<sup>th</sup> Arte & Scienza – Castello Giusso, Vico Equense / Italy  
May 6<sup>th</sup> Physics Conclave, New Delhi/ India  
Jun 22<sup>nd</sup> – Aug 5<sup>th</sup> art@CMS vernissage & exhibition, CERN, CMS site, Cessy / France  
Jul 3<sup>rd</sup> – 6<sup>th</sup> SUSY conf. – Melbourne / Australia  
Aug 22<sup>nd</sup> - 30<sup>th</sup> Global Hands on Universe, HSN, Stord / Norway  
Sept 2<sup>nd</sup> – Oct 3<sup>rd</sup> IMPACT, SBCAST, Santa Barbara / US  
Sept 11<sup>th</sup> – Oct 3<sup>rd</sup>, IMAGE2016, Ferrary Gallery, Vevey / Switzerland  
Sept 19<sup>th</sup> – 24<sup>th</sup>, LHCdays Split, Palazzo Milesi, Split / Croatia  
Oct 3<sup>rd</sup> – 9<sup>th</sup>, SCCTWG – TeacherHouse & University Tbilisi / Georgia  
Oct 18<sup>th</sup> – Aug 2017 Natural History Museum Vienna / Austria  
Oct 25<sup>th</sup> – Nov 2<sup>nd</sup>, IEEE, Palais de Congres, Strasbourg / France  
Oct 24<sup>th</sup> 2016 – Jun 2017 Landesmuseum fuer Vorgeschichte, Halle (Saale) / Germany  
Nov 10 Nehru Planetarium- Cosmic Soup- INDIAN tour Mumbai / India  
Dec 10<sup>th</sup> Sambhavana Sci. Festival - INDIAN tour Gurgaon / India  
Dec 10<sup>th</sup> - 11<sup>th</sup> TeacherDays Conference - TeacherHouse Tbilisi / Georgi

## Art@CMS Exhibitions 2015:

Jan 22<sup>th</sup> – Mar 3<sup>rd</sup> -WELIOS- Galerie Wimmer, Wels / Austria  
Feb 2<sup>nd</sup>– Apr 23<sup>rd</sup> Wilson Hall, FERMILAB / USA  
Mar 17<sup>th</sup> – 22<sup>nd</sup>, Athens Science Festival, Technopolis Museum, Athens / Greece  
May 2<sup>nd</sup> – 31<sup>st</sup> Art Center South Florida, Miami Beach / US  
May 14<sup>th</sup> – 17<sup>th</sup> TIF –Hexexpo, Thessaloniki's Science Festival / Thessaloniki/ Greece  
Jun 24<sup>th</sup> – Jul 17<sup>th</sup> – art@CMS vernissage, CERN, CMS site, Cessy / France  
Jun 26<sup>th</sup> – Jul 14<sup>th</sup> KIT – Karlsruhe / Germany  
Jul 19<sup>th</sup> – 31<sup>st</sup> EPS2015 conference Vienna / Austria  
Aug 31<sup>st</sup> - Sept 5<sup>th</sup> LHCP2015 - St. Petersburg / Russia  
Sept 15<sup>th</sup> – 20<sup>th</sup>, Castel dell Ovo, Naples / Italy  
Sept 19<sup>th</sup> – Oct 1<sup>st</sup>, l'Origine, C. Cultures Jean Monet, St.Genis / France  
Dec 2<sup>nd</sup> – 5<sup>th</sup>, Mediterranean Science Festival / Cyprus

## Art@CMS Exhibitions 2014:

Feb 20<sup>th</sup> – Apr 8<sup>th</sup> Colegium Hungaricum, Vienna / Austria  
Mar 21<sup>st</sup> – Apr 4<sup>th</sup> WienerWunderkammer, Vienna / Austria  
Apr 4<sup>th</sup> Science Night Vienna CERN 60<sup>th</sup> Celebration Vienna / Austria  
Jun 6<sup>th</sup> QualysmART Science – Technology – Art, Vienna / Austria  
Jun 25<sup>th</sup> Art@CMS vernissage at CERN P5, Cessy / France  
Jul 2<sup>nd</sup> – 9<sup>th</sup>, ICHEP2014 Conference Science & Art –Congress Palace, Valencia / Spain  
Jul 10<sup>th</sup> – 30<sup>th</sup>, S. Francis College, New York / USA  
Sept 29<sup>th</sup> – Oct 5<sup>th</sup> EPI , Split / Croatia  
Oct 13<sup>th</sup> -30<sup>th</sup>, CERN 60<sup>th</sup> Earth&Man Museum, Sofia / Bulgaria  
Nov 15<sup>th</sup> – 21<sup>st</sup>, Earth&Man Museum, Sofia / Bulgaria  
Nov 28<sup>th</sup> – 31<sup>st</sup> December, Shoreditch / London / UK  
Dec 16<sup>th</sup> – Jan 8<sup>th</sup> 2015 Academy Palace, Brussels / Belgium

## Art@CMS Exhibitions 2013:

Feb 11<sup>th</sup> – 15<sup>th</sup>, VCI Conference, Palais Ferstel, Vienna / Austria  
Apr 4<sup>th</sup> – Jul 10<sup>th</sup>, Art@CMS opening & exhibition, CERN P5, Cessy / France  
Jun 12<sup>th</sup> – 14<sup>th</sup>, CMSart Workshop, Joanneum Museum, Graz / Austria  
Sept 23<sup>rd</sup> – 30<sup>th</sup>, 'Quantum', CERN P5, Cessy / France  
Sept 27<sup>th</sup> – 30<sup>th</sup>, Art@CMS show, CERN OpenDay, CERN P5, Cessy / France  
Oct 28<sup>th</sup> – Dec 9<sup>th</sup>, 'Unseen Dimension', CLS, London / UK  
Nov 11<sup>th</sup> – Dec 13<sup>th</sup>, 'Art of Science- Beauty in Creation', RWTH, Aachen / Germany  
Nov 28<sup>th</sup>, US Higgs Discovery Event, Washington / USA  
Nov 15<sup>th</sup> – Jan 15<sup>th</sup> 2014, 'Faszination Ursprung', Bonn / Germany  
Dec 12<sup>th</sup> – March 30<sup>th</sup> 2014 'To See a World', Art@CMS exhibition, CERN P5, Cessy / France

## Art@CMS Exhibitions 2012:

Jul 1<sup>st</sup> – 31<sup>st</sup>, Science Coffee, Aula der Wissenschaften, Vienna / Austria  
Dec 10<sup>th</sup> – 21<sup>st</sup>, 'Art of Science- Beauty in Creation', CERN Meyrin, Geneva / Switzerland