



ORIGIN

# ORIGIN

cross-disciplinary  
science education  
engagement & networking



Recent & ongoing – international relations support via cultural and educational networking & engagement

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## General Introduction

- Global Scientific Collaboration for Creative Science Education (p3)
- Cross Disciplinary Methodology – Science Engagement & Networking (p5)

## Ongoing projects Outlook 2019/2020

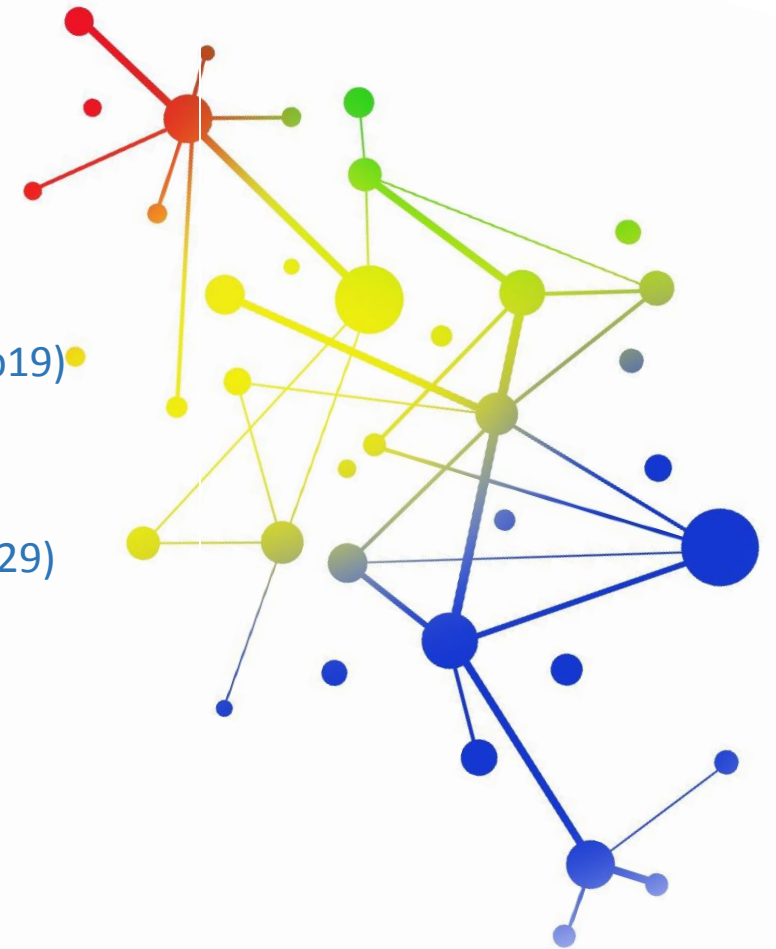
- Cultural Collisions Canada 2018 – Ontario Ministry of Education (p10)
- Cultural Collisions Vienna 2019/2020 – City of Vienna, School Council, MUMOK (p19)
- Bulgaria 20 years at CERN (p23)
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### Established and self-sustaining Spin Off programs or collaborations:

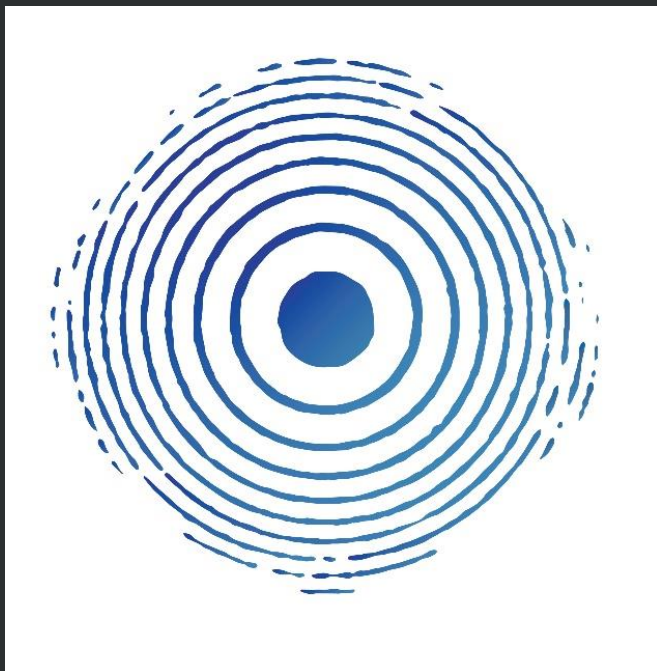
- Art&Science across ITALY – by Pigi Paolucci/ INFN (since 2016)
- Creative Science for INDIA – Archana Sharma/ LifeLAB (since 2015)

## Urgend Needs to make it sustainable for particle physics community –

Methodology is applicable for diverse science & technology topics or other fields and partners



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**

**Technologies**

## Methology develped & disseminated since 2012

By CMS collaboration via art@CMS

Global cross-disciplilnary science engagement & networking program



Since 2012

# 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”

(NOT for the sake of the ARTs => art@CERN program)



# 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

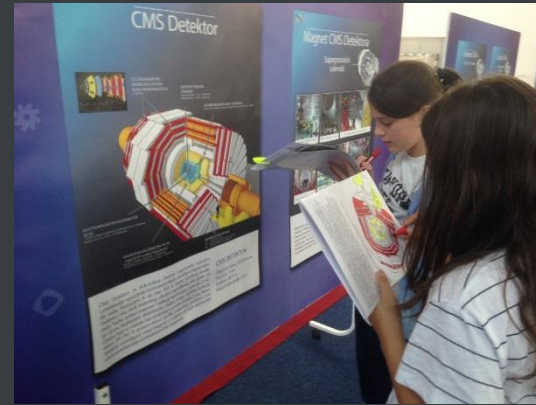
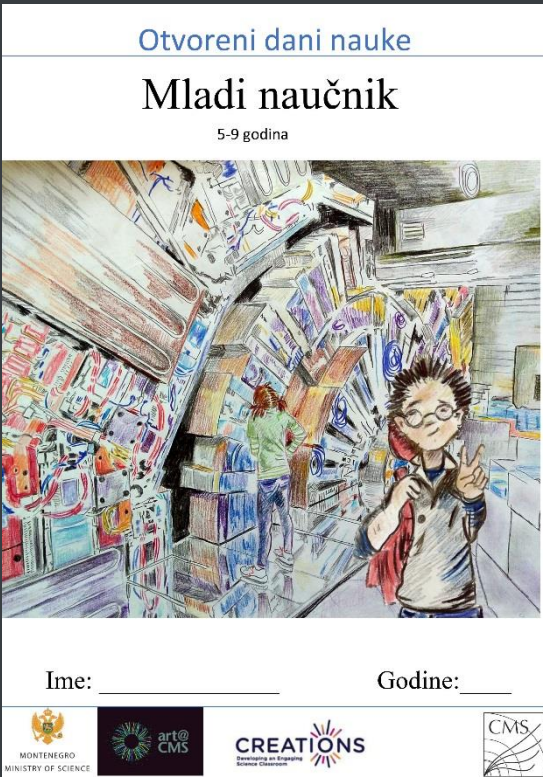
3 models for different implementation scenarios © Michael Hoch

- 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

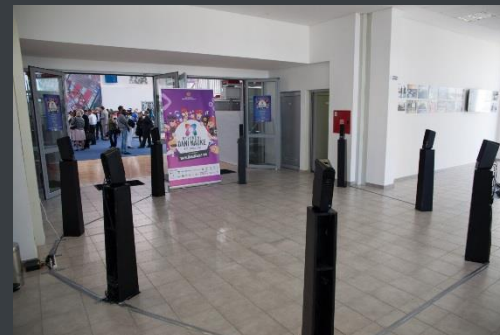


# sciARTmasterclass

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



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=tT8MHsCaYks>







# 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,

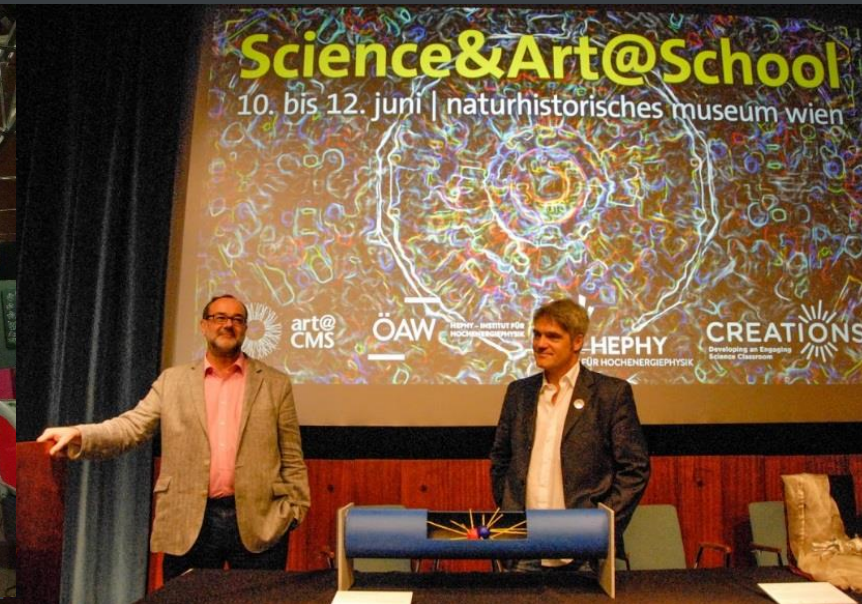


## You are cordially invited to Cultural Collisions

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 Hajnoczi,  
Permanent Representative of Austria to the international organizations in  
Geneva / Switzerland

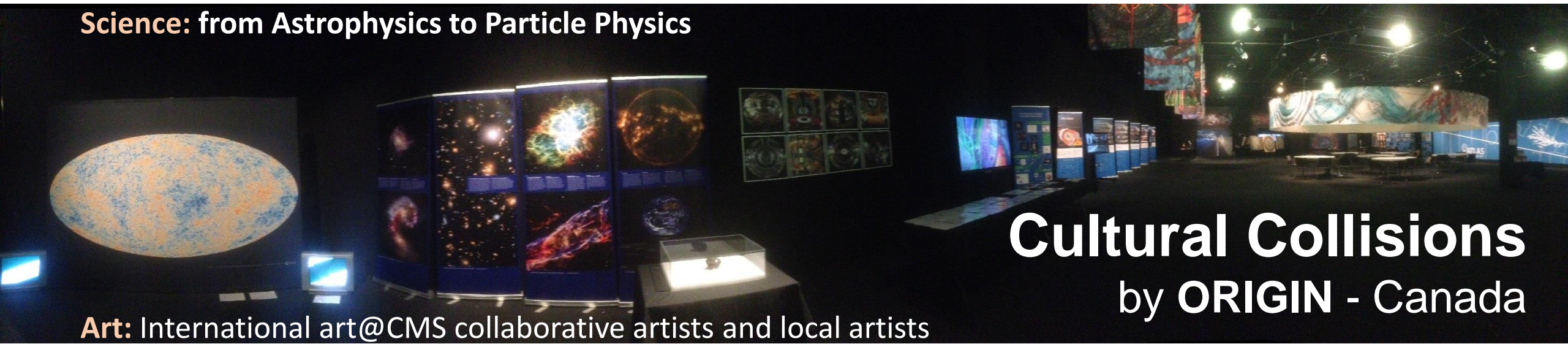
18h30 Opening  
19h00 Welcome  
19h15 art show & performance by Haydn Gym. Vienna,  
Herz Jesu Gym. Salzburg, ECOLINT LGB Geneva,  
20h00 Drinks  
21h00 Close



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



# 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



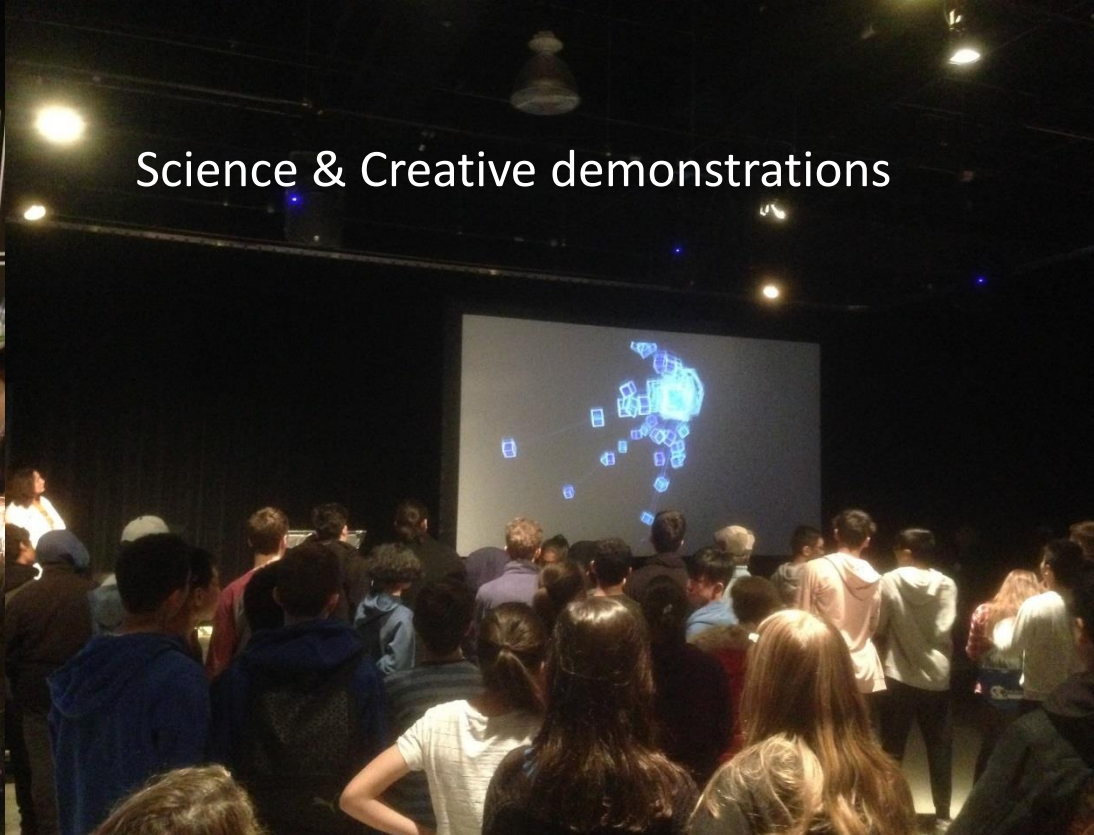
Cultural Collisions Project with Origin - Maximum number of students per day (Tuesday - Friday) is 100 to accommodate workshops - Exhibit can always handle visitors

	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		
		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



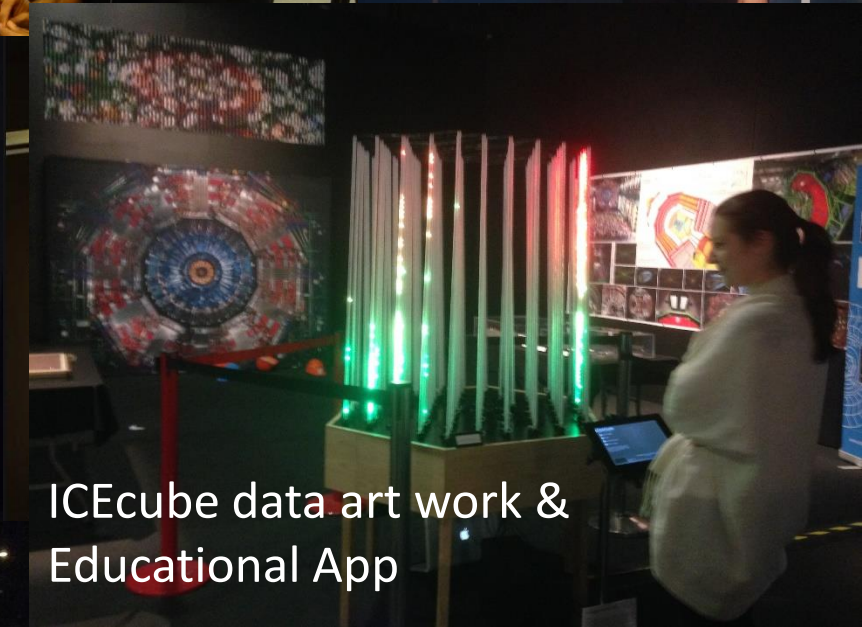
Rap Workshop



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

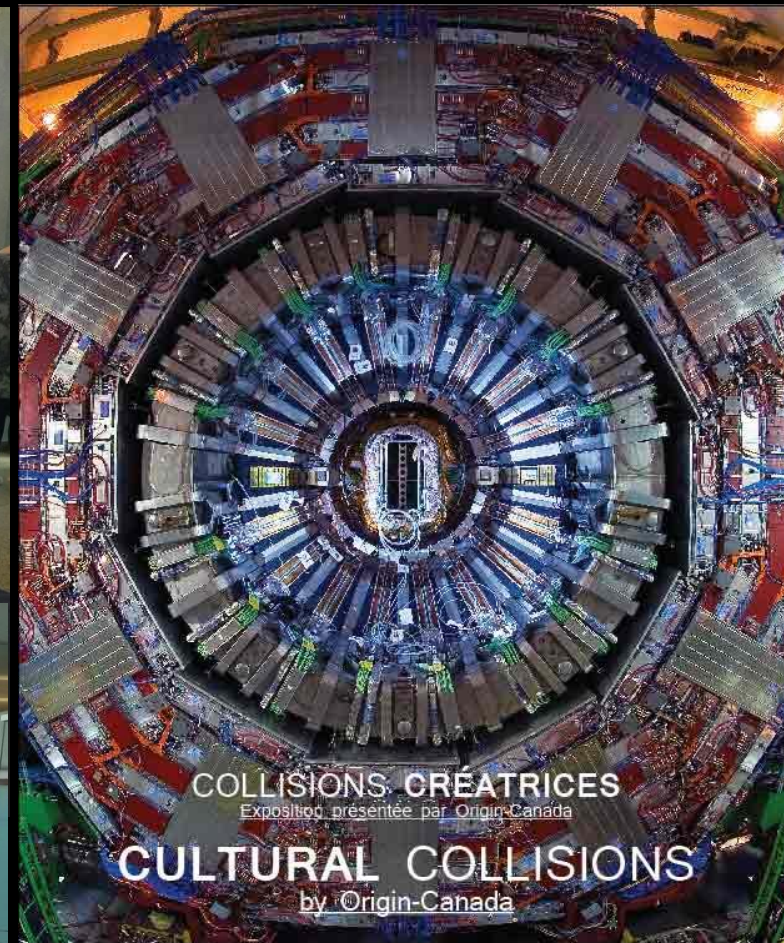


OSC data sonification  
Life demonstration





# 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<sup>er</sup> juin 2018

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







# Student Exhibition Opening – Rap & Dance Performances



Rap performance & HipHop



# Ontario Ministry of Education evaluation & report



*Some links to documents on the CCC project and the evaluation;  
with courtesy of the Ontario Ministry of Education and Ontario Science Centre;*

## Final **evaluation** report of the Cultural Collisions Canada

- Exploring the Nexus for Student Learning when the Arts and Science Collide

<https://originnetwork.web.cern.ch/sites/originnetwork.web.cern.ch/files/CC%20Public%20Report%20Final.pdf>

## Final **presentation** Cultural Collisions Canada

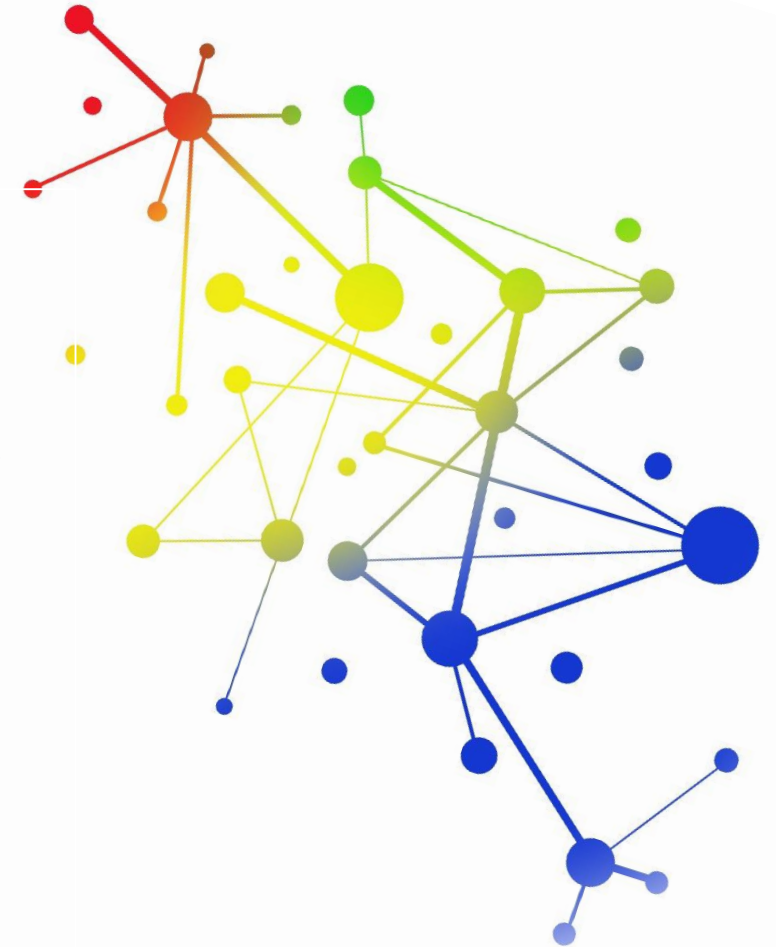
– by Toronto Science Centre & Co

<https://originnetwork.web.cern.ch/sites/originnetwork.web.cern.ch/files/OriginCanadaSlides.pdf>

## video **walk** through the exhibition

-- Ontario Science Centre

<https://www.youtube.com/watch?v=4Hkrr1mCz7o&t=184s>



<http://originnetwork.web.cern.ch>

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

by HEPHY Institute OeAW & ORIGIN;

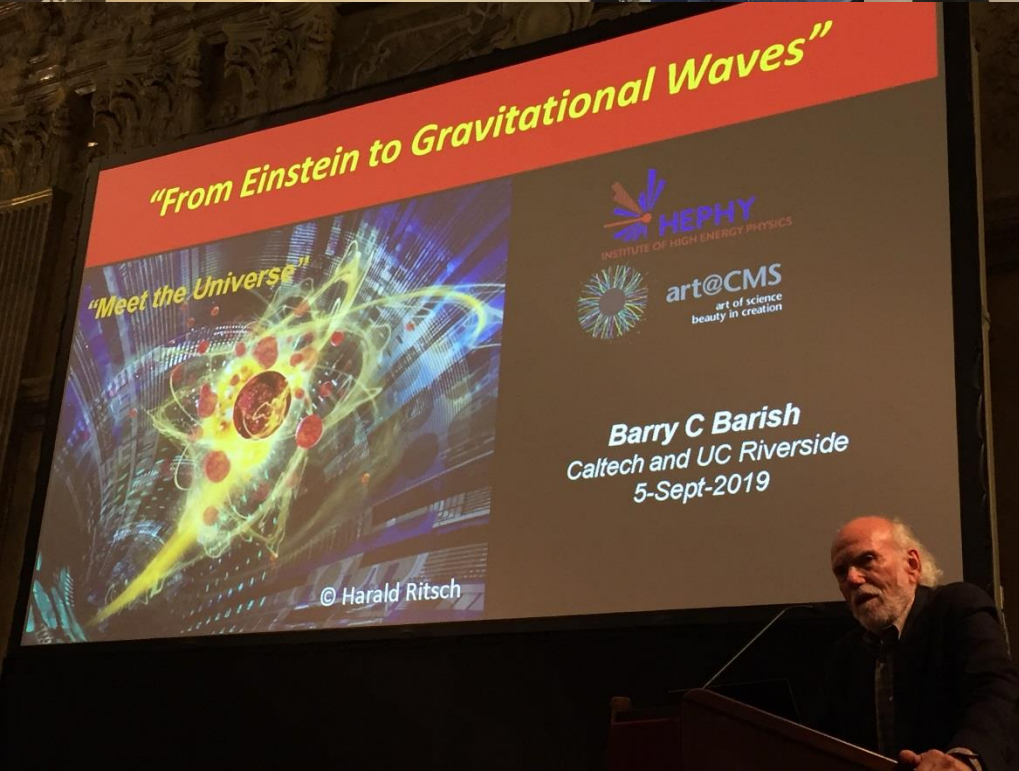
science & art exhibition [Univ. Applied Arts Vienna], cross disciplinary workshops for schools  
exhibition September 2019; Cultural Collisions September 2019 – June 2020











# Cultural Collisions Vienna outlook 2020/ 2021

## **Sustainable Collaboration established for the following years with:**

- 1) HEPHY – High Energy Physics Institute – Austrian Academy of Science
- 2) MUMOK – Museum for Modern Culture
- 3) Bildungsdirektion Wien BDW - Vienna City School Council

## **Program Schedule:**

End February final presentation exhibition at MUMOK

March 2020 start next Cycle Cultural Collisions at MUMOK and HEPHY schools organized by BDW

June 2020 final presentation exhibition at MUMOK

September 2020 start next Cycle Cultural Collisions at MUMOK and HEPHY schools organized by BDW

February 2021 final presentation exhibition at MUMOK

March 2021 start next Cycle Cultural Collisions at MUMOK and HEPHY schools organized by BDW

June 2021 final presentation exhibition at MUMOK



# “20 years Bulgaria @ CERN”

21<sup>st</sup> – 28<sup>th</sup> November 2019

artworks of our art@CMS/ ORIGIN collaboration with Central Saint Martins college of Arts London enhanced the CERN exhibition and inspired the audience.



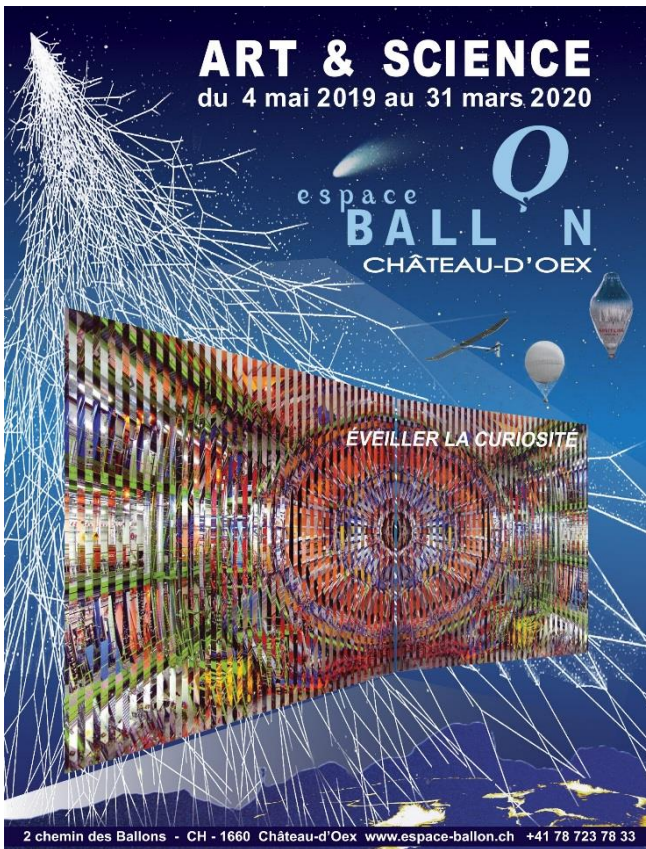


# "Art&Science" Balloon Museum Chateau d'Oex/ CH

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 25<sup>th</sup> – February 1<sup>st</sup> 2020



### Pioneers of Cosmic Rays

weather balloon 30 000m

ISS - AMS experiment 400 000m, 2011 - ongoing

Bertrand Piccard World Tour 11 700m

Air plane traveling altitude 10 000m

Werner Kolhörster 9300m 1914

Victor Hess 5300m 1911

Albert Gockel 4500m 1909

### Entdecker der kosmischen Strahlung

Albert Gockel 1860 - 1927  
Professor at University of Freiburg (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

Electrometer around 1909

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



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

## Through the opening of the exhibition:

Guided tours

lectures

Junior Scientist booklet





# 42e Festival International de Ballons

## 25<sup>th</sup> January – 2<sup>nd</sup> February

Scientific Contributions by Swiss and ORIGIN partners to the festival:

### 25<sup>th</sup> 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

### 26<sup>th</sup> January Sunday

- Lecture and Workshop program from 11h30 till 19h

### 29<sup>th</sup> January Wednesday – Children Day

- Lecture and Workshop program from 11h30 till 19h

### 1<sup>th</sup> February Saturday

- Lecture and Workshop program from 11h30 till 19h

### 2<sup>nd</sup> February Sunday Closing Day

- Lecture and Workshop program from 11h30 till 19h



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

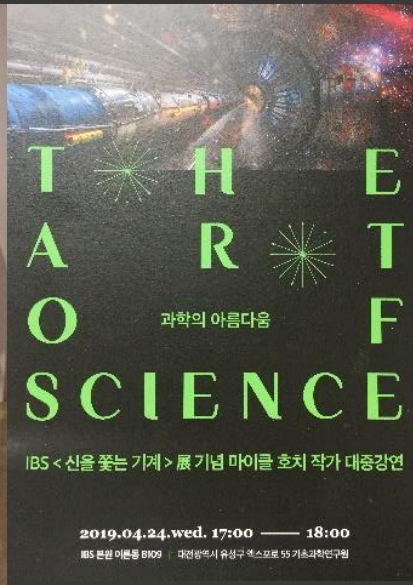






# IBS cultural centre, Daejeon/ Korea

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







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

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





# Contact with Oman Education Ministry and Geneva Mission since 2015

2017, Invitation to the Oman Science Festival – Michael Hoch 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 Daejeon, Korea 2019 <https://www.youtube.com/watch?v=8I7V6pY0lml&t=241s>



Floor plan OSF2019

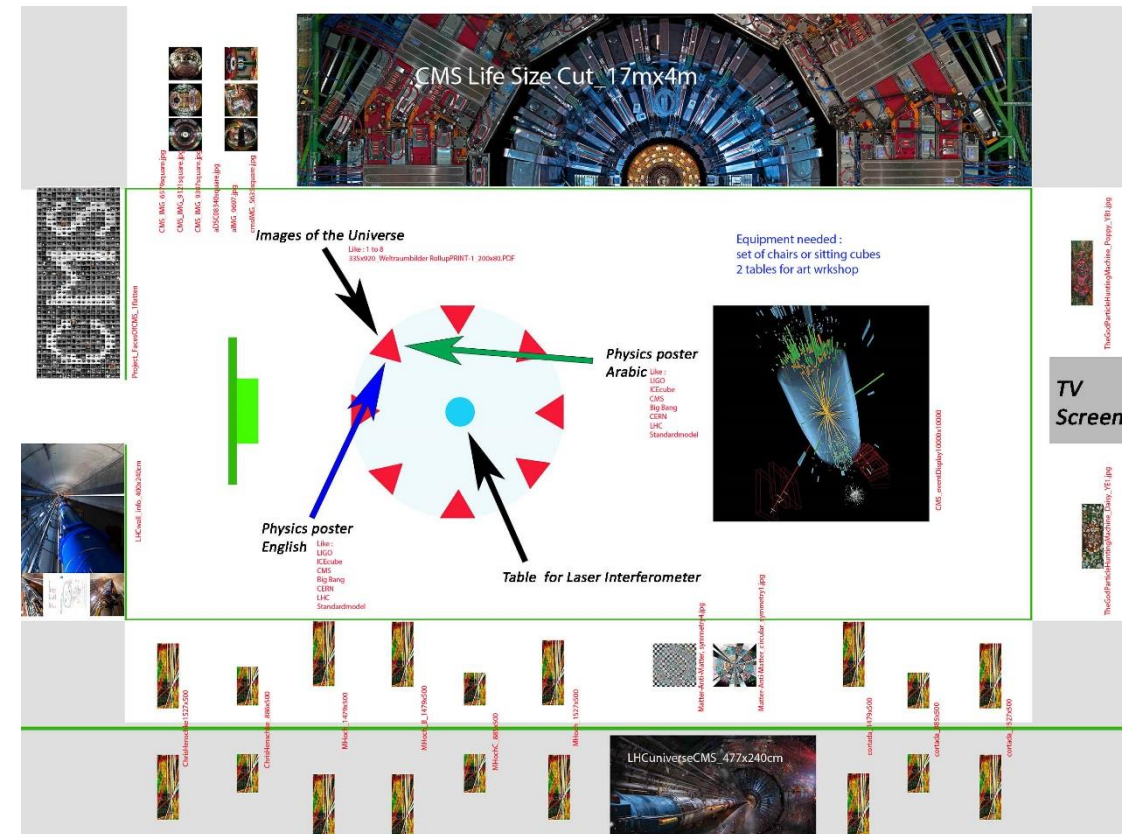
- *Requested Educational program: lectures and workshops on science & art*

## 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 event 2021]

<https://www.youtube.com/watch?v=8l7V6pY0lml&t=241s>

- Exhibition venue:

Convention Centre Muscat

'Meet the Universe' exhibition 210m<sup>2</sup>

- 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







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

Dr Martin Hendry LIGO  
Gravitational waves &  
Astrophysics

Dr Michael Hoch CMS  
Particle Physics /CERN &  
Educational Formats







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





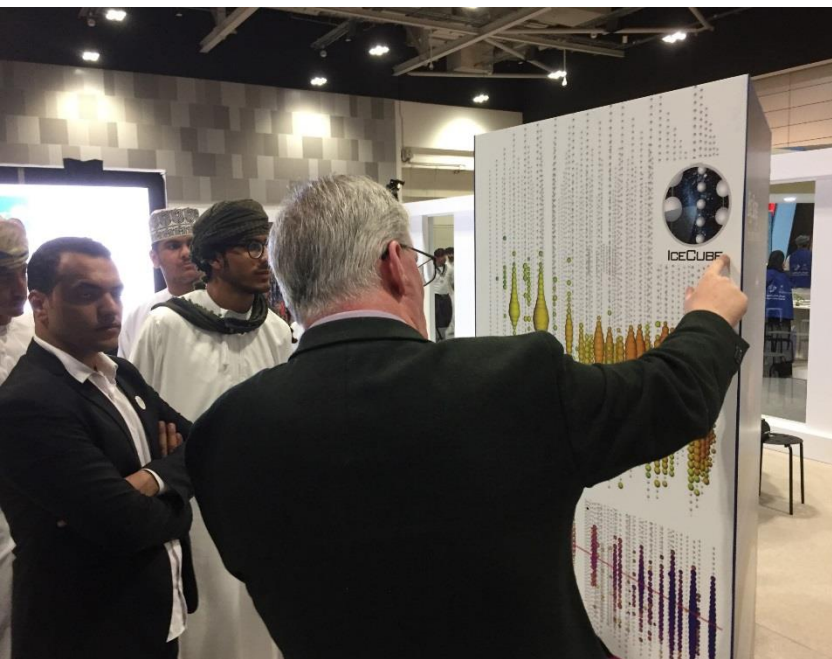
Particle Physics- masterclass  
Neutrino Physics - ICEcube



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  
introduction

children workshops

astrophysics



Public engagement by local SQU University staff



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 \_



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FIRST  
CREATION SPACE  
BY SURATÓMICA  
AT CERN

Images: Reverberations of a Topological Daydream. Artist Santiago Tavera. Pix. Abraham Mercado.  
/ Distiller of the Self. Artist Natalia Rivera / Vi Creation - Art & Science Encounter. District  
Cinemathèque. / 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 Rora.





# “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



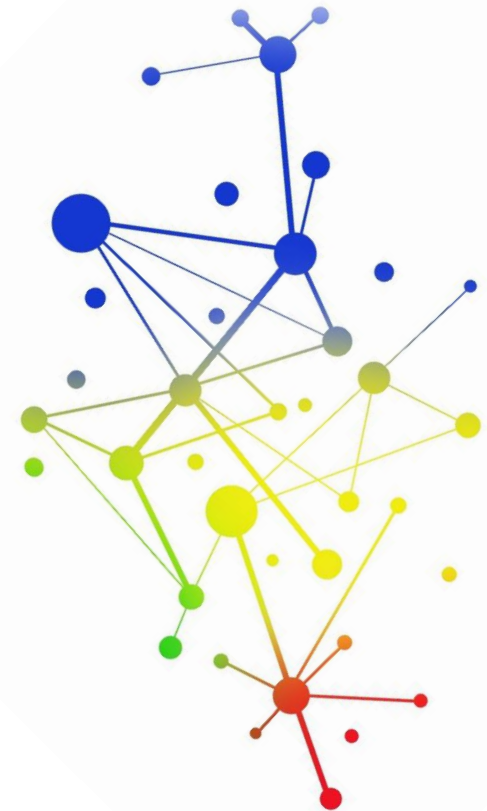


# CERN – JRC

## *Presented to the CERN Council :*

*Under the umbrella of the CERN-JRC Letter of Intent, collaboration has been pursued in several diverse areas such as knowledge transfer, big data, medical isotopes, neutron data and **arts and science programmes**.*

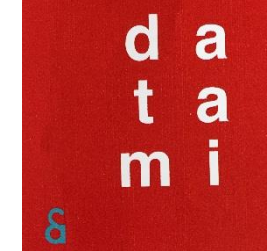
*JRC is very much interested to create similar strong impact to society with their art&science program, like the art@CMS/ORIGIN program at CERN demonstrates recent years, by having an additional educational aim*







# CERN – JRC



## **Cooperation on Arts and Science Programmes summary 2018 – 2019:**

A first discussion between CERN and the JRC took place during the 2018 edition of the Montenegro Science Festival. Subsequent exchanges took place to share experience on different types of Arts and Science programmes developed by scientific institutions, notably artists in residence programmes such as Arts at CERN, and cross-disciplinary collaboration programmes such as art@CMS/ORIGIN, as well as the sciART project developed by the JRC.

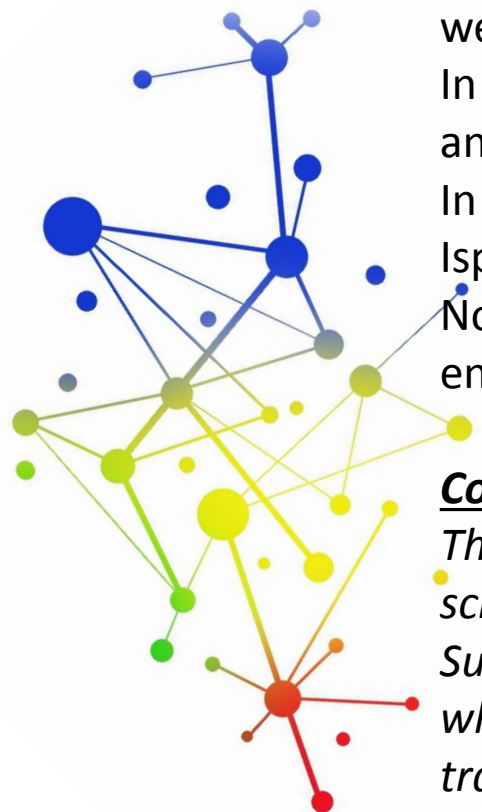
In April 2019, a delegation from the JRC visited CERN to investigate opportunities for collaboration and testing the art@CMS/ORIGIN and sciART cross-disciplinary education format for schools.

In October 2019 the founder of art@CMS/ ORIGIN gave a talk in the RESONANCY III Festival in JRC Ispra and discussed further strategies. A Videoconference with the EU Schools in Varese followed in November to define scopes and schedules for 2020 collaboration for cross-disciplinary education and engagement under the Cultural Collisions and science&art@school formats.

## **Cooperation on Arts and Science Programmes outlook 2020:**

*The founder of the art@CMS/ORIGIN program will give an introduction workshop in Ispra to JRC scientists and teachers of the local school end January or beginning February 2020.*

*Subsequently a group of teachers and possibly JRC scientists will be selected to join a trip to CERN where a cross-disciplinary workshop will be organized. The scope of this workshop is to engage and train the participating teachers with the novel format and start a Science&Art@School cycle in collaboration with CERN for the following school year starting in September 2020.*







# “South East European cross disciplinary science education, engagement and networking Initiative”

- Time scale to initiate 3-4 years: 2018 – 2022 (once program disseminated -> self-sustained by local community)
- Midterm or long-term aim: Create sustainable network who may run interdisciplinary activities on science with art.

[http://mhoch.web.cern.ch/mhoch/Art@CMS/Science4Peace\\_interdisciplinaryScienceEducationEngagementNetworkingTour\\_art@CMS.pdf](http://mhoch.web.cern.ch/mhoch/Art@CMS/Science4Peace_interdisciplinaryScienceEducationEngagementNetworkingTour_art@CMS.pdf)

## Kick off events delivered 2018:

Split/ Croatia (17<sup>th</sup> – 23<sup>th</sup> September)  
Cetinje/ Montenegro (October 9<sup>th</sup> – 11<sup>th</sup>)  
Tirana/ Albania (October 10<sup>th</sup> -12<sup>th</sup>)  
Sarajevo/ Bosnia (October 15<sup>th</sup> – 19<sup>th</sup>)  
Imotski/ Croatia (October 27<sup>th</sup>)

## Possible scenario and cities 2020 and 2021:

Ljubljana (*Slovenia*), Zagreb [Osijek#, Rijeka#] (*Croatia*),  
Belgrade [Novi Sad#, Niš#] (*Serbia*), Sarajevo [Banja  
Luka#, Mostar#] (*Bosnia and Herzegovina*), Podgorica  
(*Montenegro*), Tirana (*Albania*), Pristina (Kosovo \*),  
Skopje (*FYR Macedonia*)

This project will mutually Create dialogue, cross boarder networking and exchange, as well as engagement on common topics based on scientific methodology and culture. The nature of this program supports to work with mixed teams of different regions for mutual presentations and common engagement.





# 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 Mileti, 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@jesb.hr ili Ivica.Puljak@jesb.hr



walk through exhibition **Split** - > <https://youtu.be/XYlDehGg4Xs>







# 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).





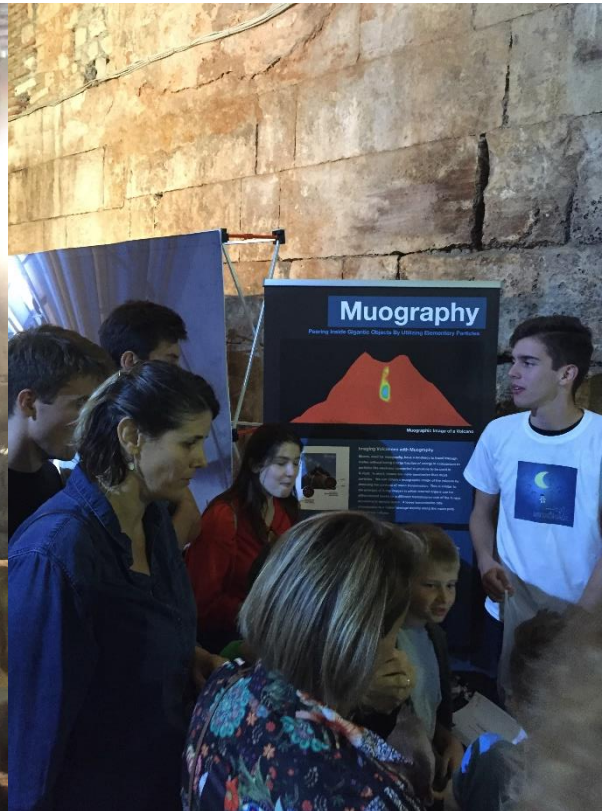


# Cultural Collisions – Split /Croatia by ORIGIN

## 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





# Cultural Collisions – Split /Croatia

by ORIGIN

Four secondary schools – one 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 – Split /Croatia

Visiting primary school – October 2<sup>nd</sup>

**Format:** exhibition & lectures, one day

Audience: about 100 primary school students





# Cultural Collisions – Split /Croatia by ORIGIN

Primary school visit – October 29<sup>th</sup>

**Format:** lectures with trained student, training & participation







# Cultural Collisions, Imotski / Croatia by ORIGIN

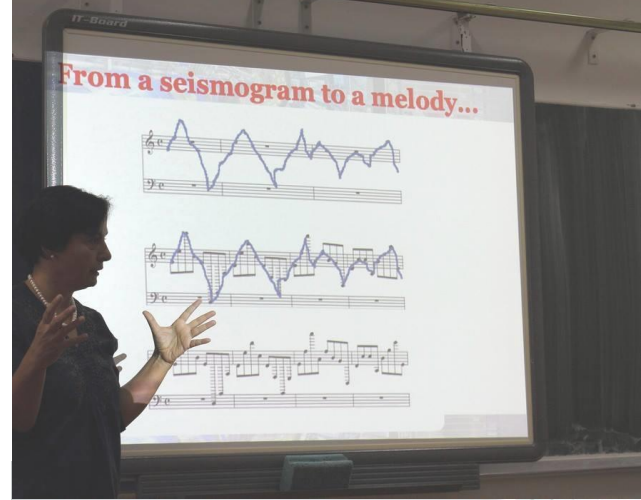
Exhibition and Concert, October 27<sup>th</sup> 2018

**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







# art@CMS – Art University Collaboration

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>







# Science & Art, Sarajevo /Bosnia

by ORIGIN - Fine Art Academy,  
15<sup>th</sup> -22<sup>nd</sup> 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





# LHC workshop & cross disciplinary exhibition

Akademia Shkencave Tirana / Albania October 2018

Format: 2 day science workshop enhances by “light art exhibition”, aim: inspire students and general public and build up interest in our science community

Audience: 3 guided tours with High School students + general public conference







# Science & Innovation Festival 2018 by ORIGIN

September 22<sup>nd</sup> – 31<sup>st</sup> Tbilisi / Georgia

**Format:** ORIGIN exhibition, lectures

Audience: festival visitors, general public, University students, and organized school students

Lectures by CMS and ATLAS colleagues to about **400 students** organized by the **Teachers House** collaborator

art@CMS collaborative artists presented: Xavier Cortada, Michael Hoch, Anastasia, Chris Henschke, Peter Bellamy, Paul Schuster,



- Walk through the exhibition <https://youtu.be/wAYkB5fgyVo>







# Science & Innovation Festival 2018 by ORIGIN

## Tbilisi State University TSU - September 22<sup>nd</sup> – 31<sup>st</sup> Tbilisi / Georgia

ATLAS and CMS were represented at Tbilisi State University (TSU) at the request of, and **sponsored by, the Georgian Ministry of Science and Education.**

The occasion was a **Science and Innovation Festival** organised in the context of the **100<sup>th</sup> anniversary of the university** attended by general public, university and school students with their teachers.

ATLAS and CMS combined forces to present an exhibition based on the recently developed ORIGINS format in a large central hall that would have just accommodated CMS (but not ATLAS).

Small displays of Muongrapher and LIGO were included, alongside ATLAS, CMS, and art@CMS posters and hardware.

Georgian ATLAS and CMS colleagues supported the exhibition acting as guides and interpreters.

Special presentations on CERN, particle physics, ATLAS and CMS were organized each afternoon for school students and teachers. In total about **400 students ranging in age from 9 to 18 years from 15 schools attended.**

The **Deputy Minister for Science and Education and the Rector of the TSU University** thanked everyone involved and expressed the desire to continue this very successful educational and outreach collaboration.







# CERN Cognitive Festival in Georgia, 22-25 October, 2018

- IPPOG Masterclasses — 3 Days; 96 schoolkids from 9 schools; ~70 guests



Junior Scientist Diary awarded to each participant



## Conclusion