ORIGIN

cross-disciplinary science education engagement & networking

DATAMI – RESONANCES III – festival JRC Ispra October 14th – 18th 2019 Michael.Hoch@cern.ch for art@CMS/ ORIGIN
**ORIGIN**

**Supported by**

- ATLAS, ALICE, CMS, LHCb,
- LIGO, VIRGI, ICEcube, DUNE
- Muography, Perimeter Institute,
- Canadian Light Source, and other international partners

<table>
<thead>
<tr>
<th>Since 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particle Physics</td>
</tr>
<tr>
<td>Astrophysics</td>
</tr>
<tr>
<td>Gravitational Waves</td>
</tr>
<tr>
<td>Neutrino-Physics</td>
</tr>
<tr>
<td>Muography</td>
</tr>
<tr>
<td>Accelerator Technology</td>
</tr>
</tbody>
</table>

**Methodology developed & disseminated since 2012**

By CMS collaboration via art@CMS

Global Cross Disciplinary science engagement & networking program
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
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
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 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=9vfIW-Pf7vg
Athens 2015: https://www.youtube.com/watch?v=tT8MHsCaYks
Science & Art @ School
supporting school curriculum or after school activity

Sofia, Bulgaria 2015, Vienna/ AT 2016
FERMILAB/ US 2015, Athens/ GR 2017

You are cordially invited to
Cultural Collisions
An art exhibition, music and dance performance presented by Austrian and Geneva students

2016: CERN Bldg 40 became a stage for students

2017 and 2018: NHM – National History Museum Vienna Austria
2017: Museum fuer Vorgeschichte Halle / Germany
Venue: Ontario Science Centre, OSC

First exhibition April 9th – 15th 2018
student research and inspiration

Second exhibition: May 29th – June 3rd 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

Art: International art@CMS collaborative artists and local artists
## Cultural Collisions Canada  — week schedule

### Monday, April 29, 2013
- **9:00 AM**
  - **Workshop 1A**
  - **Workshop 1B**
  - **Workshop 1C**
  - **Workshop 1D**
  - **Workshop 1E**
  - **Workshop 1F**
  - **Workshop 1G**
  - **Workshop 1H**
- **10:00 AM**
  - **Session 2A**
  - **Session 2B**
  - **Session 2C**
  - **Session 2D**
  - **Session 2E**
  - **Session 2F**
  - **Session 2G**
  - **Session 2H**
- **11:00 AM**
  - **Session 3A**
  - **Session 3B**
  - **Session 3C**
  - **Session 3D**
  - **Session 3E**
  - **Session 3F**
  - **Session 3G**
  - **Session 3H**

### Tuesday, April 30, 2013
- **9:00 AM**
  - **Workshop 2A**
  - **Workshop 2B**
  - **Workshop 2C**
  - **Workshop 2D**
  - **Workshop 2E**
  - **Workshop 2F**
  - **Workshop 2G**
  - **Workshop 2H**
- **10:00 AM**
  - **Session 4A**
  - **Session 4B**
  - **Session 4C**
  - **Session 4D**
  - **Session 4E**
  - **Session 4F**
  - **Session 4G**
  - **Session 4H**
- **11:00 AM**
  - **Session 5A**
  - **Session 5B**
  - **Session 5C**
  - **Session 5D**
  - **Session 5E**
  - **Session 5F**
  - **Session 5G**
  - **Session 5H**

### Wednesday, May 1, 2013
- **9:00 AM**
  - **Workshop 3A**
  - **Workshop 3B**
  - **Workshop 3C**
  - **Workshop 3D**
  - **Workshop 3E**
  - **Workshop 3F**
  - **Workshop 3G**
  - **Workshop 3H**
- **10:00 AM**
  - **Session 6A**
  - **Session 6B**
  - **Session 6C**
  - **Session 6D**
  - **Session 6E**
  - **Session 6F**
  - **Session 6G**
  - **Session 6H**
- **11:00 AM**
  - **Session 7A**
  - **Session 7B**
  - **Session 7C**
  - **Session 7D**
  - **Session 7E**
  - **Session 7F**
  - **Session 7G**
  - **Session 7H**

### Thursday, May 2, 2013
- **9:00 AM**
  - **Workshop 4A**
  - **Workshop 4B**
  - **Workshop 4C**
  - **Workshop 4D**
  - **Workshop 4E**
  - **Workshop 4F**
  - **Workshop 4G**
  - **Workshop 4H**
- **10:00 AM**
  - **Session 8A**
  - **Session 8B**
  - **Session 8C**
  - **Session 8D**
  - **Session 8E**
  - **Session 8F**
  - **Session 8G**
  - **Session 8H**
- **11:00 AM**
  - **Session 9A**
  - **Session 9B**
  - **Session 9C**
  - **Session 9D**
  - **Session 9E**
  - **Session 9F**
  - **Session 9G**
  - **Session 9H**

### Friday, May 3, 2013
- **9:00 AM**
  - **Workshop 5A**
  - **Workshop 5B**
  - **Workshop 5C**
  - **Workshop 5D**
  - **Workshop 5E**
  - **Workshop 5F**
  - **Workshop 5G**
  - **Workshop 5H**
- **10:00 AM**
  - **Session 10A**
  - **Session 10B**
  - **Session 10C**
  - **Session 10D**
  - **Session 10E**
  - **Session 10F**
  - **Session 10G**
  - **Session 10H**
- **11:00 AM**
  - **Session 11A**
  - **Session 11B**
  - **Session 11C**
  - **Session 11D**
  - **Session 11E**
  - **Session 11F**
  - **Session 11G**
  - **Session 11H**

Note: The schedule includes workshops, sessions, and activities spread throughout the week. Each event is followed by a time slot for continuation or related activities.
IBS cultural centre, Daejong / Korea

April 24th – July 26th 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=8I7V6pY0ml
IBS cultural centre, Daejong / Korea  April 24th – July 26th 2019
“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 25th – February 1st 2020
“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=8l7V6pY0ImI&t=241s](https://www.youtube.com/watch?v=8l7V6pY0ImI&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](https://www.youtube.com/watch?v=4Hkrr1mCz7o)
Exhibition venue 210m²

Topics:
- particle physics: CERN & ATLAS, ALICE, CMS, LHCb
- Gravitational waves: LIGO, VIRGO
- Neutrino physics: ICEcube
Oman Government in the exhibition “Meet the Universe”
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
Cultural Collisions – Split /Croatia by ORIGIN
Old City Hall – Sept. 17th -22nd 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:

walk through exhibition Split - > https://youtu.be/XYIDehGg4Xs
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 28th

**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 Exhibition Daejeon/ Korea Opening 24th April - 31st 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 4th May – March 2020
Kunsthaus Vienna/ Austria exhibition 25th 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 60th anniversary Austria CERN member, cultural collisions Vienna/ Austria
CERN open Day CERN PS 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 25th – 30th
ICHEP by ICHEP Prag July 30th – August 5th
Request for collaboration with Perimeter Institute, Ontario/ Canada