



# Science and art for connecting people in south-east Europe

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with special thanks to **Michael Hoch** and the CMS Collaboration  
and very active participation : Daniel Denegri, Ludwik Dobrzynski, Nikola Godinović, Goran Đorđević, Sanja Damjanović, Ilya Doršner, Chiara Mariotti, Tiziano Camporesi, Mick Storr and many other colleagues

LHCP Paris, 29 May 2020

# Driving ideas for cross disciplinary engagement

- ▶ **Educate, engage and motivate** kids, youngsters and adults
- ▶ **Ignite and maintain interest for science**
- ▶ **Create dialog** between different communities
- ▶ **Stimulate exchange** of people and ideas
- ▶ **Create networks and connect people** through science & art
- ▶ **Offer an optimistic look** at the future



**ORIGIN** a network of top science collaborations in the fields of particle physics, astrophysics, gravitational waves, neutrino physics and cosmology.  
ATLAS, ALICE, CMS, LHCb, LIGO, VIRGO, ICEcube, DUNE, Muography, Perimeter Institute, Canadian Light Source, and other international partners



# Cultural Collisions – Split /Croatia by ORIGIN

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

- ▶ Exhibition art & science
- ▶ Lectures
- ▶ Round table discussion
- ▶ Workshops:
  - **Physics and Music** *Arduino Explora*
  - **Gravitational waves** *Torino interferometer*
  - **Playing with data** 'mini masterclass' - *CMS tool developed for Cultural Collisions Canada*



# Cultural Collisions – Split /Croatia by ORIGIN Exhibition



First floor: Science exhibition

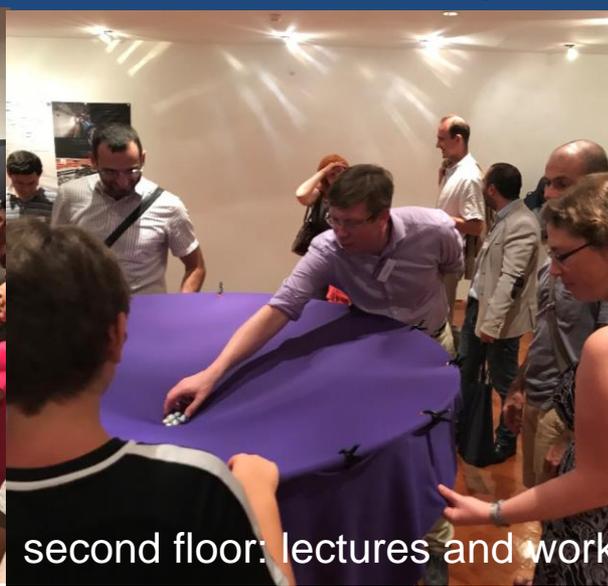


Ground floor: art exhibition

Walk through exhibition Split → <https://youtu.be/XYIDehGg4Xs>

# Train the Trainers

- During the main exhibition



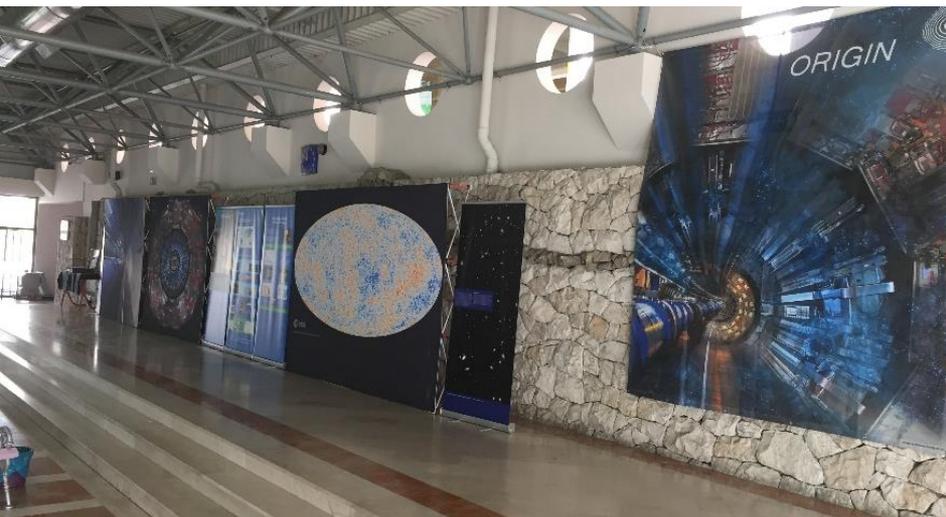
second floor: lectures and workshop room



Researchers Night, September 28<sup>th</sup>

# Exhibitions and lectures in schools

- ▶ **Format:** exhibition and lectures, one day
  - Exhibition presented by **trained students**
  - Lectures given by **CMS scientists**
- ▶ **Audience and participation**
  - **Primary School:** ~100 students
  - **Secondary School :** ~ 500 students



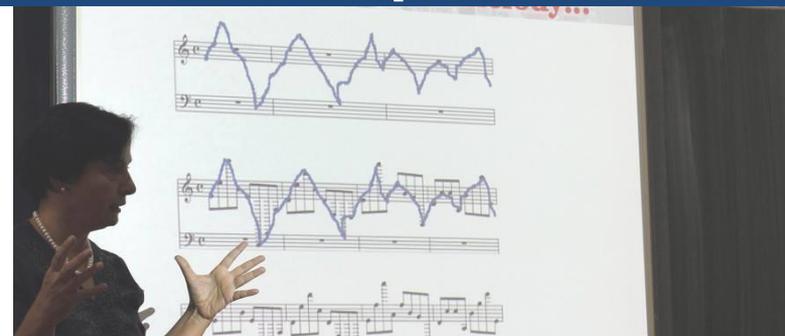
# Exhibition, lectures and workshops

► **Format:** exhibition, lectures, workshops, masterclas

- Including concert of French and local orchestra
- Lectures given by **CMS scientists**

► **Audience and participation**

~ 400 secondary school students



# art@CMS – Art University Collaboration

Gallery National Museum, Cetinje/ Montenegro October 2018

## Program:

- **art exhibition** results of the art University collaboration/ 2 semester course art&science 2017/2018 and art@CMS collaborative artists
- **Public lectures**
- **Cultural Collisions workshop**

Participating schools: 3 schools 85 students

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

Program:

- cross disciplinary exhibition ORIGIN,
- public lectures in the exhibition

Audience:

- General public and
- ~400 high school **students** attending lectures



# LHC workshop & cross disciplinary exhibition

Akademia Shkencave **Tirana** / Albania October 2018

Program over the 2 days

science workshop enhanced by “**light art exhibition**”,

- Inspire students and general public and build up interest in our science

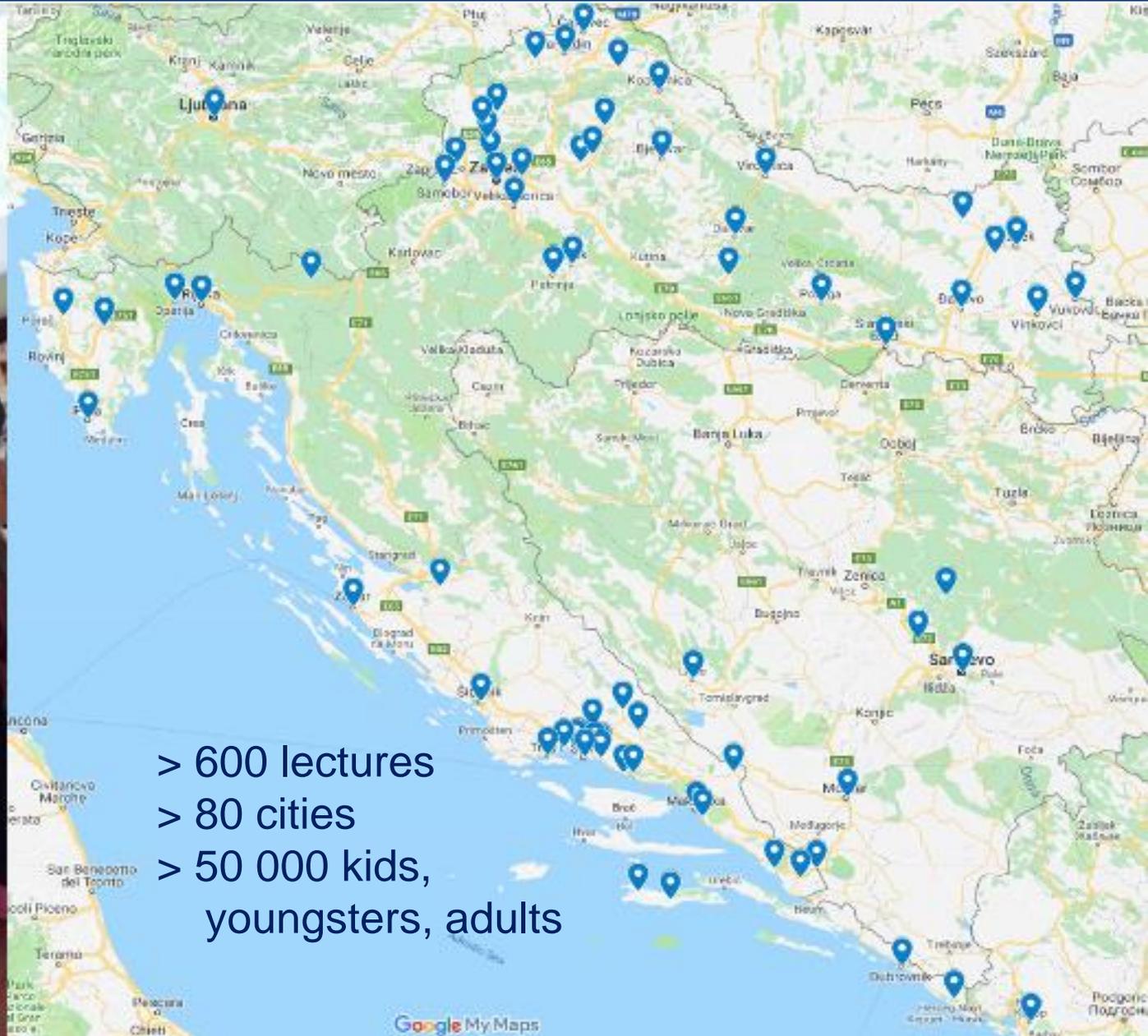
Audience:

- ▶ 3 guided tours with **High School students** & **general public** conference



# Lectures, workshops, seminars

## From small kids to adults



- > 600 lectures
- > 80 cities
- > 50 000 kids, youngsters, adults

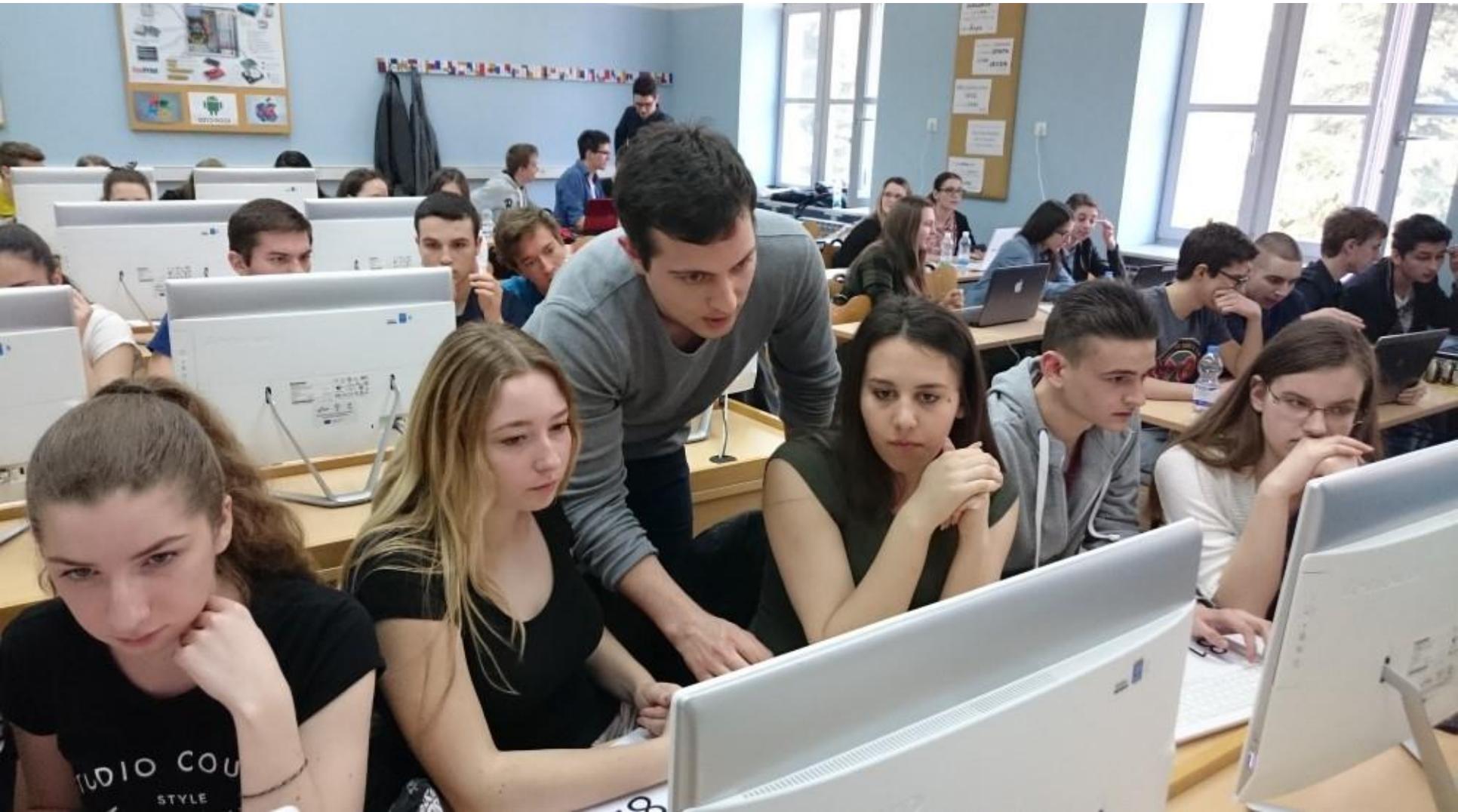
# BOOKS, VIDEOS ... Quarantine activities



<p><b>Znanost u pet S01 E28 - Tri priče iz bliske budućnosti (z...</b> 281 views • 1 day ago</p>	<p><b>Znanost u pet S01 E27 - Umjetna inteligencija-najve...</b> 532 views • 3 days ago</p>	<p><b>Znanost u pet S01 E26 - Znanstveni eksperimenti s...</b> 407 views • 6 days ago</p>	<p><b>Znanost u pet S01 E25 - Kvantno računarstvo...</b> 628 views • 1 week ago</p>	<p><b>Znanost u pet S01 E24 - Kvantna spretnost...</b> 729 views • 1 week ago</p>
<p><b>Znanost u pet S01 E22 - Kvantna fizika za početnike...</b> 1.4K views • 2 weeks ago</p>	<p><b>Znanost u pet S01 E21 - Jesmo li sami u svemiru? (z...</b> 865 views • 2 weeks ago</p>	<p><b>Znanost u pet S01 E20 - Zasto je nebo plavo, trava...</b> 728 views • 2 weeks ago</p>	<p><b>Znanost u pet S01 E19 - Pitanja i odgovori o znanost...</b> 659 views • 3 weeks ago</p>	<p><b>Znanost u pet S01 E18 - Je li moguće putovanje kroz...</b> 1K views • 3 weeks ago</p>
<p><b>Znanost u pet S01 E16 - Sto je zračenje i je li opasno za...</b> 2.7K views • 1 month ago</p>	<p><b>Znanost u pet S01 E15 - Sto je zračenje i je li opasno za...</b> 4.8K views • 1 month ago</p>	<p><b>Znanost u pet S01 E14 - Crne rupe u svemiru (za djecu)</b> 598 views • 1 month ago</p>	<p><b>Draga djeco, čitajte knjige!</b> 194 views • 1 month ago</p>	<p><b>Znanost u pet S01 E13 - Kako otkrivamo tajne svemira? (z...</b> 758 views • 1 month ago</p>
<p><b>Znanost u pet S01 E11 - Postoje li vanzemaljci? (za...</b> 968 views • 1 month ago</p>	<p><b>Znanost u pet S01 E10 - Kako smo pronašli i izmjerili...</b> 786 views • 1 month ago</p>	<p><b>Znanost u pet S01 E09 - Kako i što radi LHC u CERN-u? (z...</b> 912 views • 1 month ago</p>	<p><b>Znanost u pet S01 E08 - Kako je nastao čovjek? (za djecu)</b> 1K views • 1 month ago</p>	<p><b>Znanost u pet S01 E07 - Kako je svemir [vjerojatno] nast...</b> 1.5K views • 1 month ago</p>
<p><b>Znanost u pet S01 E05 - Kako je nastala Zemlja? (za djecu)</b> 1.4K views • 1 month ago</p>	<p><b>Znanost u pet S01 E04 - Tamna materija i tamna...</b> 1.9K views • 1 month ago</p>	<p><b>Znanost u pet S01 E03 - Sto smo i odakle dolazimo? (za...</b> 1.5K views • 1 month ago</p>	<p><b>Znanost u pet S01 E02 - Tajni život zvijezda (za djecu)</b> 2.1K views • 2 months ago</p>	<p><b>Znanost u pet S01 E01 - Temelji ljudskog znanja (za...</b> 5K views • 2 months ago</p>
<p><b>Znanost u pet S01 E23 - Kako napraviti atome i od njih cijele...</b> 486 views • 1 week ago</p>	<p><b>Znanost u pet S01 E17 - Djeca, razgovarajte sa...</b> 437 views • 3 weeks ago</p>	<p><b>Znanost u pet S01 E12 - Crne rupe, neutronske zvijezde i...</b> 992 views • 1 month ago</p>	<p><b>Znanost u pet S01 E06 - Sto je antimaterija? (za mlade i...</b> 1.3K views • 1 month ago</p>	

# Masterclasses

- ▶ South-East Europe is very active in Masterclasses
  - More than 50 of them in the region since 2013



# Teachers trainings



## Bosnian Teacher Programme

4-8 February 2020  
CERN



## Croatian Teacher Programme

14-18 April 2019  
CERN



## Serbian Teacher Programme

10-15 September 2018  
CERN



## Slovenian Teacher Programme

5-9 February 2019  
CERN  
Europe/Zagreb timezone

- Science Fairs and Festivals in **collaboration** with teachers



# New phase

- ▶ **Creating the network of organisations and people**
  - Already involved or interested: UNESCO, Austrian Cultural Forum Sarajevo, Western Balkan Funds, Regional UN Department Montenegro, IRC-ISPRA
  - We may want to involve: COST, RYCO, RCC, Council of Europe, OSCE
- ▶ **Widening the participation**
  - Strengthen participation of all the countries from the SEE region
- ▶ **Structuring activities**
- ▶ **Particular emphasis: schools and teachers!**
- ▶ **Project applications: COST, Erasmus, Citizen Science, WFB ...**
  - Particular thanks to **Manolis Chaniotakis** and **Sofoklis Sotirou**, from Ellinogermaniki Agogi



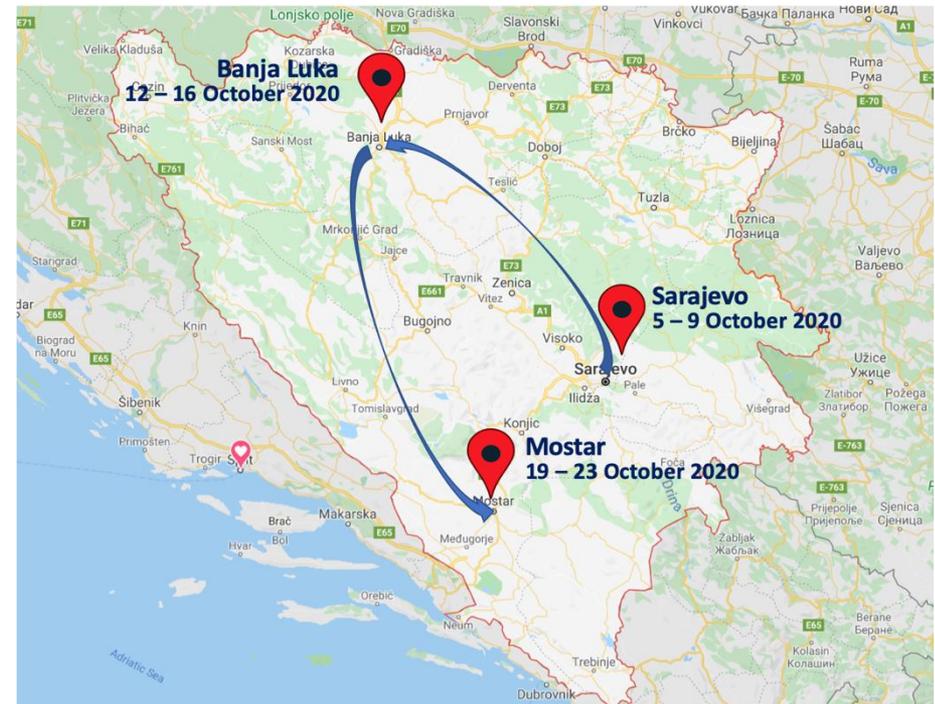
## ORIGIN project in Bosnia & Herzegovina in 2020

Authors: **Daniel Denegri** (Saclay, France), **Michael Hoch** (HEPHY, Austria), **Ivica Puljak** (University of Split, Croatia)



### Objective

- 1) **Connect, engage and motivate young people**, stimulate their **curiosity** and **interest for science**, widen their general interests for **global problems** and **challenges** and orient them toward **future**, using connection and interplay between various forms of **art** and **Big Science** experiments such as those at CERN, gravitational waves interferometers, huge ground and space telescopes, South pole experiments, dark matter and dark energy searches etc.
- 2) Make the project objectives sustainable: perform the project in close **collaboration** with **local teachers, scientists and artists**. **Transfer the knowledge, materials and tools** to them, so that they can **continue** and **widen** all the activities in the **future**.



# Near future

## Augmented Reality Applications for the ORIGIN Projects

Developed by the Georgian ORIGIN team for educational projects.

Demo <http://cadcamge.ch/st/lhc/>



NEC@GTU:

# Conclusions

In collaboration with

**art@CMS, ORIGIN, CERN**

*and many other partners*

we are building a sustainable and integrative system for **promotion of science** in South-East Europe, which will

- **Educate, engage and motivate**
- Create **dialogs** and **networks**, stimulate **exchange** and **connect people** through science & art