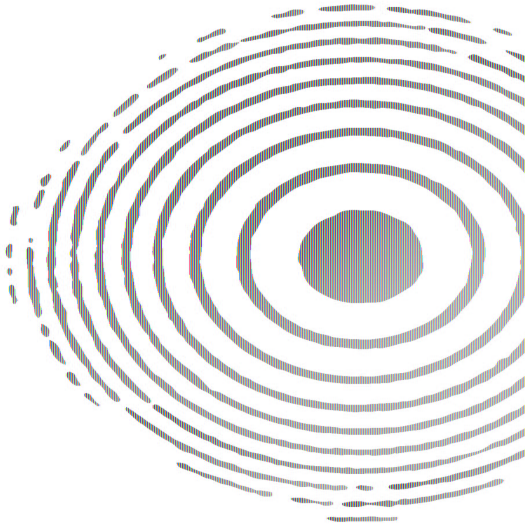
Cultural Collisions in Canada

by: ORIGIN

@OriginPhysics

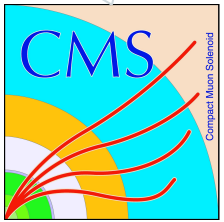
ORIGIN is a **network** involving several astrophysics and high energy physics experiments and research centres.



ORIGIN

ORIGIN's **purpose** is to set up national Cultural Collisions learning and research experiences, in close **partnership** with local institutes, educators and decision makers.

Inaugural Experiments and Research Centres



Participating Artists

Brigitte Tessier

Mark-David Hosale

Consensus

Robin Kingsburgh

Michael Hoch

David Griffin

Cultural Collisions

an interdisciplinary **exhibition**, **lecture** and **workshop series** based on the art@CMS methodology

Cultural Collision in Canada

a learning experience for students and teachers to **integrate** science and the arts

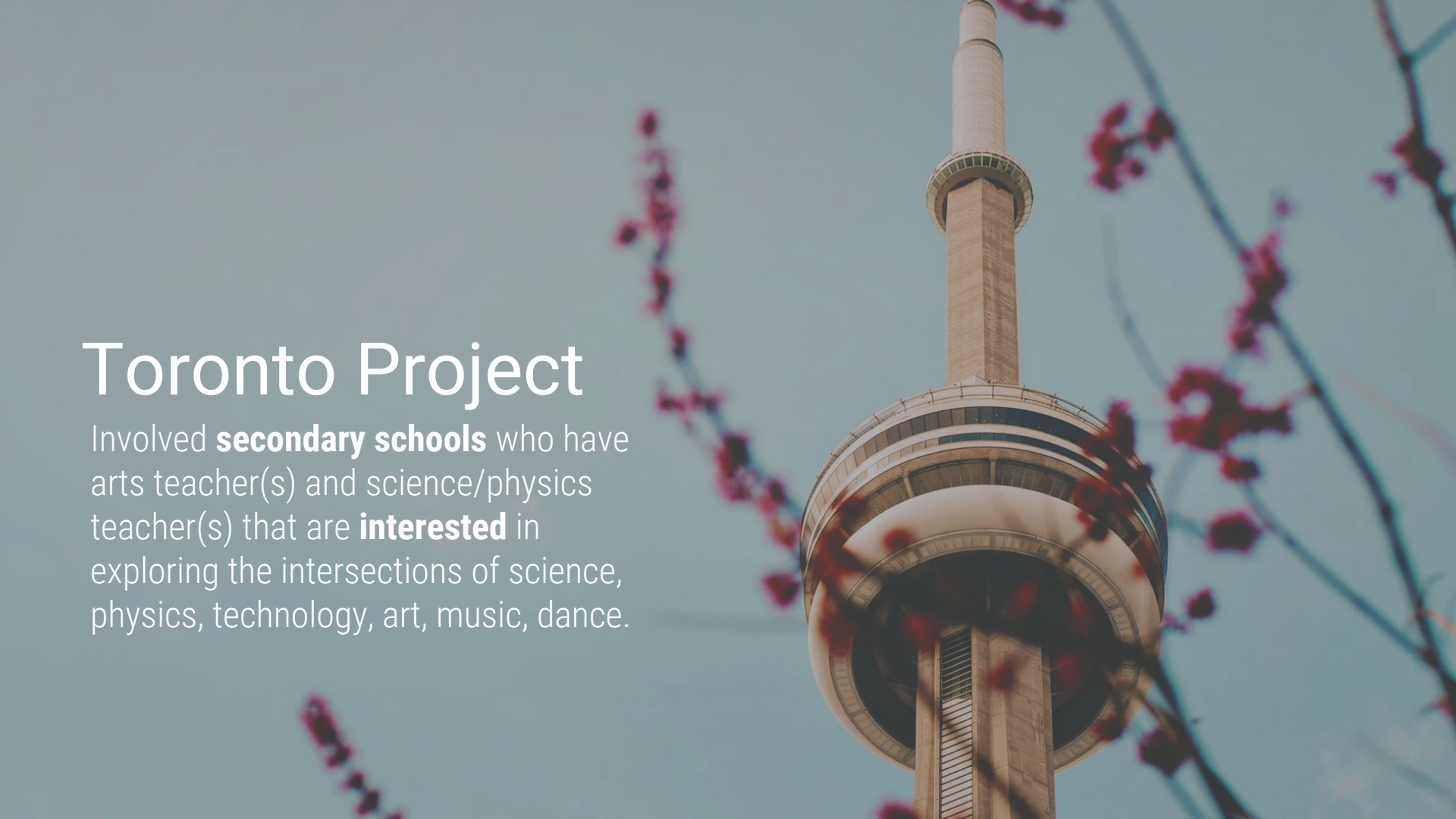
Purpose

Create an environment where **learning is about** infusing a variety of **perspectives**, **strategies**, **tools** and **skills** to create new ways to **conceptualize** and **communicate** ideas

In order to encourage students to **consider STEM/STEAM career pathways** and help foster a more STEM/STEAM adept society, it is important to provide opportunities for learning that demystifies STEM/STEAM subjects and provides **experiences** that are **authentic** and **connected** to the universe around them.

Students must:

- be **inspired** to wonder and ask questions
- have the **ability** to take learning from a variety of subjects
- **apply** that learning in new contexts in an integrated way while developing transferable skills that will enable students to solve complex problems



Toronto Project

Involved **secondary schools** who have arts teacher(s) and science/physics teacher(s) that are **interested** in exploring the intersections of science, physics, technology, art, music, dance.

Toronto Cultural Collision: An Ontario Collaboration

INNOVATION DESIGN & IMPLEMENTATION

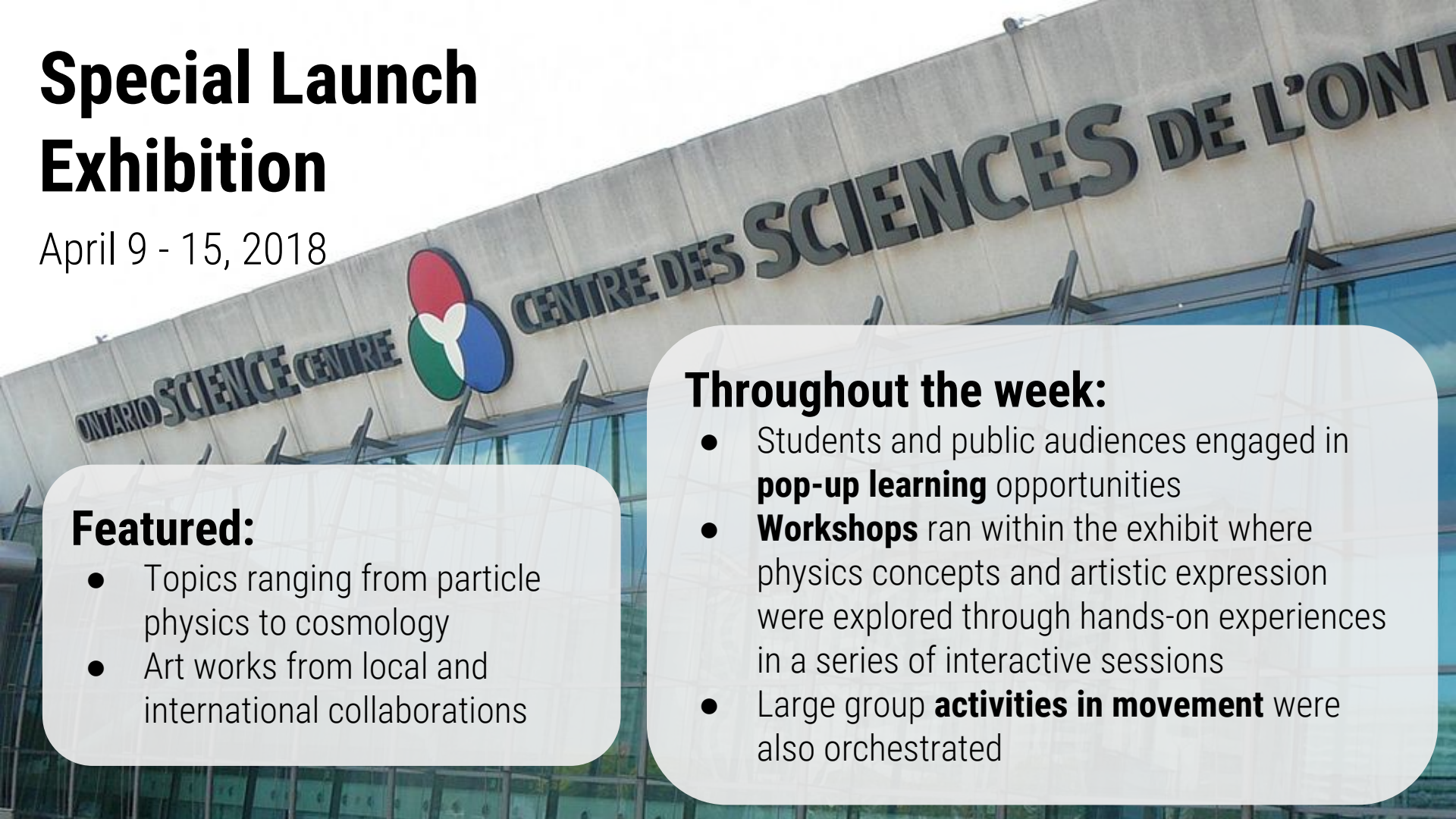
ONTARIO SCIENCE CENTRE | CENTRE DES SCIENCES DE L'ONTARIO

ORIGIN

Ontario MINISTRY OF EDUCATION

Special Launch Exhibition

April 9 - 15, 2018



Featured:

- Topics ranging from particle physics to cosmology
- Art works from local and international collaborations

Throughout the week:

- Students and public audiences engaged in **pop-up learning** opportunities
- **Workshops** ran within the exhibit where physics concepts and artistic expression were explored through hands-on experiences in a series of interactive sessions
- Large group **activities in movement** were also orchestrated

Exhibit Development

The **one week exhibit** was curated through a large Canadian and global collaboration.

Dr. Michael Hoch from CMS-CERN and art@CMS-CERN and **Dr. Peter Kreiger** from the University of Toronto Physics Faculty, coordinated the curation of the content for the exhibit and worked with physicists and artists to develop the workshops and talks.

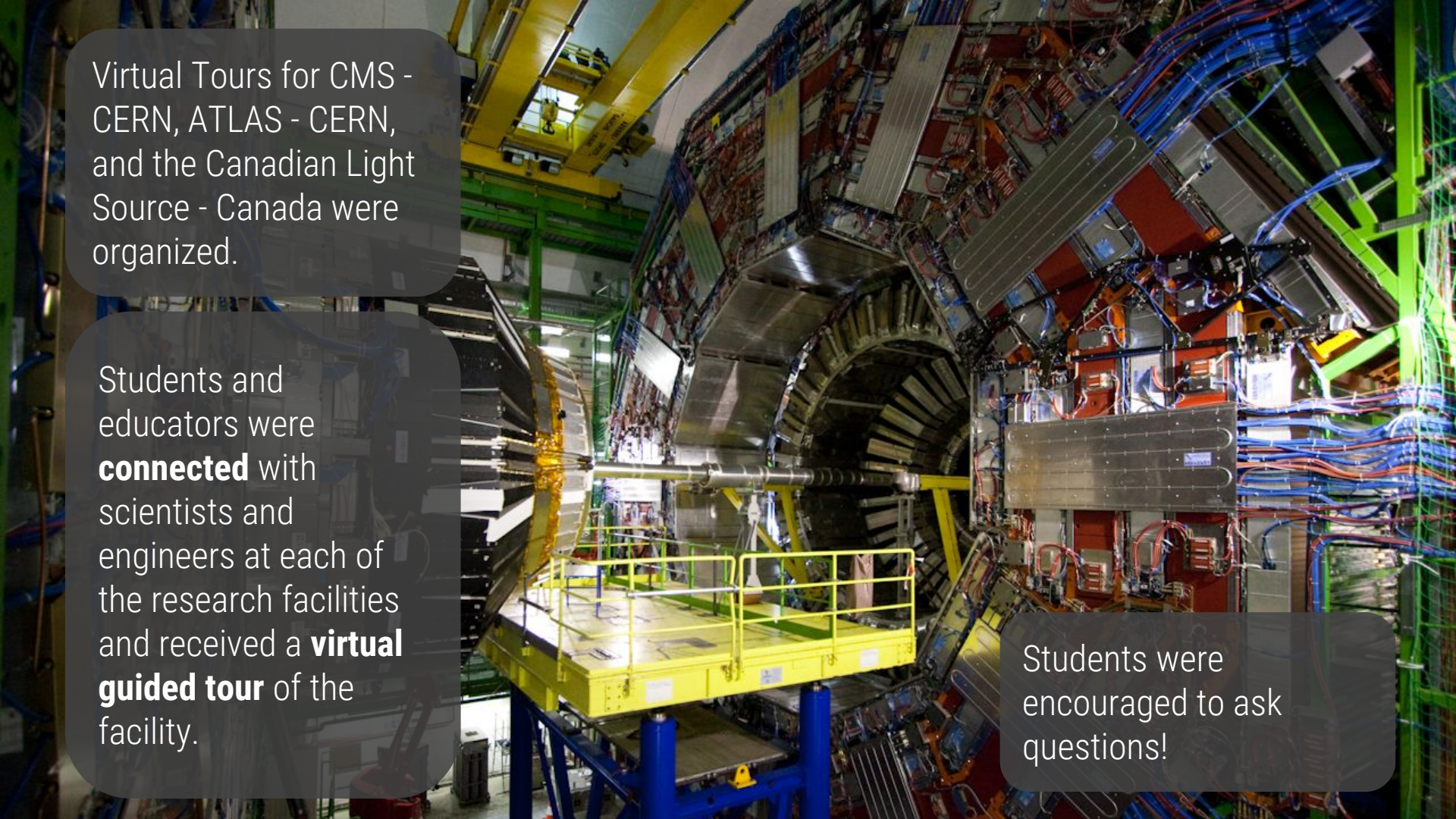
Student Workshops

Workshops were embedded in the exhibit experience for students and educators. They were **created** and **delivered by physicists**, **engineers** and **artists**.

Student Workshops

Students and educators had an opportunity to **meet** and **engage in learning with** the **professionals** who offered workshops.

They were also available for questions and ongoing **mentorship** as the students continued their work in their schools.



Virtual Tours for CMS - CERN, ATLAS - CERN, and the Canadian Light Source - Canada were organized.

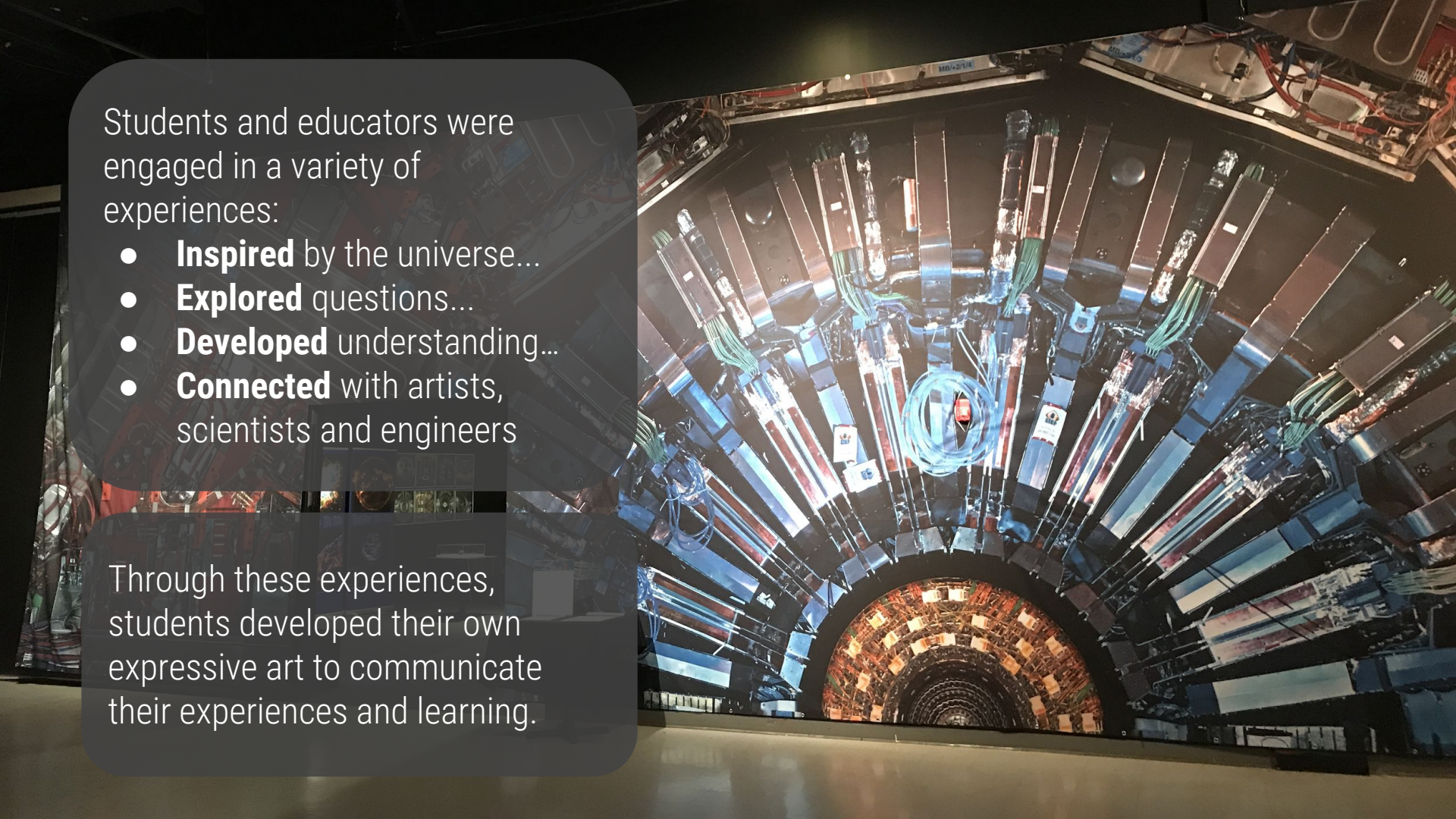
Students and educators were **connected** with scientists and engineers at each of the research facilities and received a **virtual guided tour** of the facility.

Students were encouraged to ask questions!

Students and educators were engaged in a variety of experiences:

- **Inspired** by the universe...
- **Explored** questions...
- **Developed** understanding...
- **Connected** with artists, scientists and engineers

Through these experiences, students developed their own expressive art to communicate their experiences and learning.



The Ontario Science Centre curated and showcased student work in the **first** Cultural Collision - Canada Exhibit.

The arts and Cultural Collisions project has been really good at breaking down barriers for our kids unconscious biases and assumptions they have in their head about what is science and what is art. I think it has been really good at helping them look at scientist as human beings to perform and act in society, just like how they see artists responding to question from society. Seeing that parallel has been really helpful.

- Educator

I think one of the best ways to learn… wasn't just by looking at them [hardware/images/data], but actually interacting with them. That's how I was able to gain insight into how they get this data and how they can turn it into information.

- *Student*

...I thought what was interesting about it, was that they take all of this data they gathered from individual test runs… different collisions… they looked at speed coming off from them… They had interesting data. They took this hardware technology to figure this stuff out, and they turned that into data, and there was this whole process that they laid out.

- Student

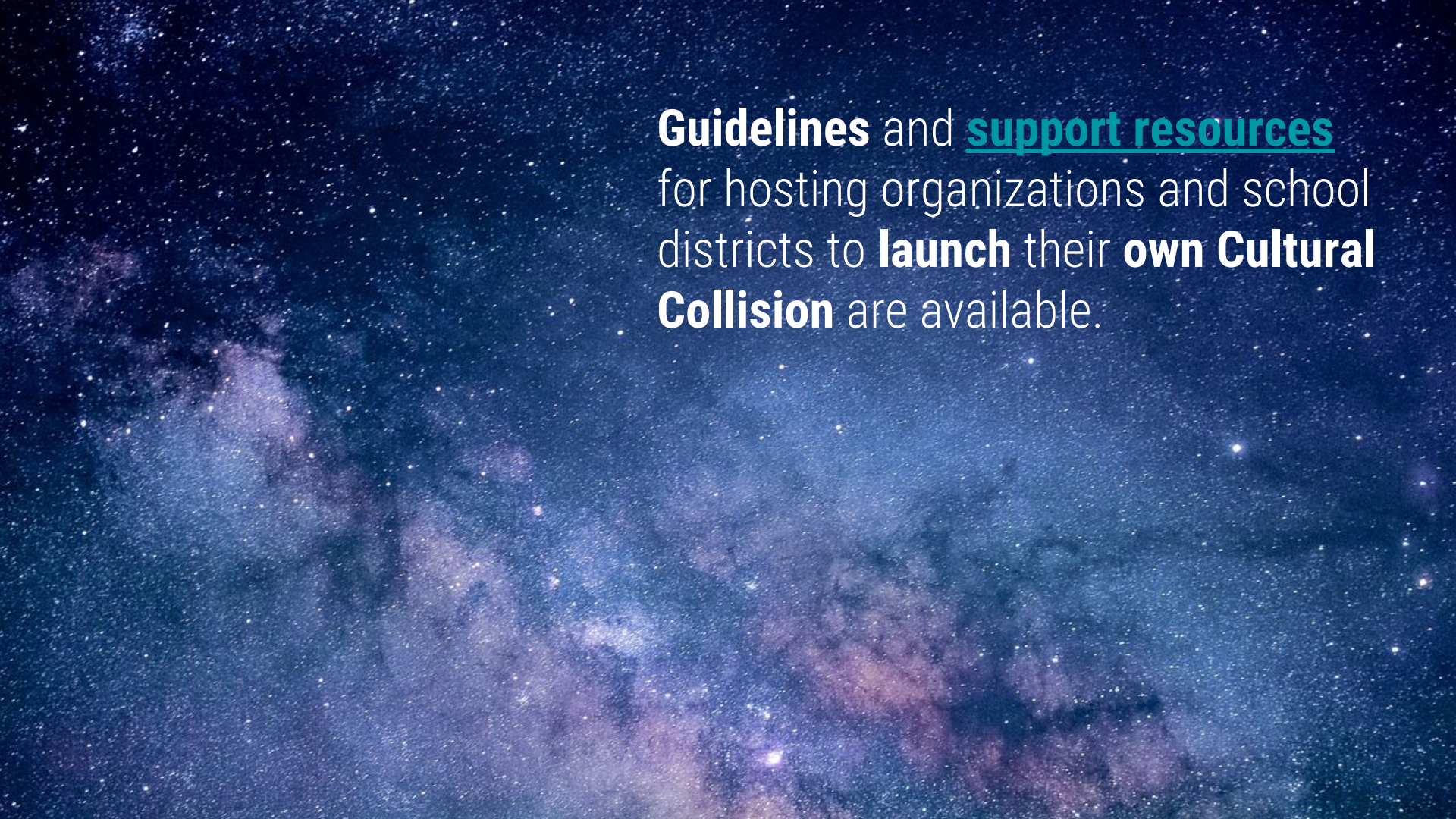
There is a role for cross-curricular integration into science teaching in helping shape student understanding, conceptualization, and communication of concepts. Students were able to demonstrate their knowledge by providing in-depth explanations of concepts using specific terminology and definitions. Making connections to personal experiences and real-world realities, using analogies and engaging in inquiry, students were able to clearly demonstrate their learning. This is important, as students begin to make connections, and are then able to deeply understand and think about why, how and what concepts mean and will then be able to apply this to other STEM areas.

Lastly, student engagement with the Cultural Collisions exhibits and workshops were instrumental in helping inform student learning. Undoubtedly, the findings from this study offer insight into how to innovate for STEM learning and demonstrates the importance of relevant, cross-curricular and integrated STEM education that meets students' interests.

Report Available Here

Next Steps

- Cultural Collisions program will be **revised** and **scaled** into a mobile experience that can be exhibited in other locations across Ontario
- Ongoing **collaboration** will continue with ATLAS-Canada, the Perimeter Institute, and the Ontario Science Centre in consultation with ORIGIN and the art@CMS-CERN program to **curate**, **structure** and **plan** for a mobile **prototype** to test in two locations


Guidelines and **support resources** for hosting organizations and school districts to **launch** their **own Cultural Collision** are available.

There is a need to...

Create a network of **Canadian scientists and engineers** to **mentor** schools, educators and students in collaboration with Canadian research partners.

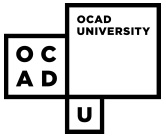
Create a network of **Canadian artists** who work in the **intersections** of science, technology and engineering to **mentor** schools, educators and students in collaboration with Canadian partners.

The Cultural Collisions by Origin - Canada experience involved many organizations and volunteers.

Thank you to:

Michael Hoch Peter Krieger Claire Adam Bourdarios Chiara Mariotti Greg Dick Marie Strickland Consensus Ewin Hill Riccardo Bianchi Sandra Ribeiro Tracy Walker Scott Wilson Tom McCauley Martin Hendry Brigitte Tessier Carl-Johan Haster Katerina Chatziioannou Robin Kingsburgh Mark-David Hosale Lars Tore Roedne David Griffin Wendy Taylor Karola Dette Sana Ketabchi Kelly Foyle Kevin Donkers Heather Fong Catherine Woodford Yifei Han Dave Vrolyk Nathan Chow Dylan Kisliuk David Fish Damian Pope Wen Yi Song Olga Michalopoulos Bianco Ciungu Vincent Pascuzzi Lorie Ann Smith Ken Doyle Cathie Spencer Julie Jones Lisa Cole Jennifer Glass Patrick Miller Kimberley Tavares Moses Velasco Craig Featherstone Mishaal Surti Jinah Kim Talwinder Aheer Shaan Singha Elise Boissonneault Global Origin Collaborators

Global ORIGIN Collaborators



Thank you to our innovative educators willing to create this experience with us:

Danforth Collegiate
Rob Mackinnon
Roberta Tevlin
Grant Wilson

École Secondaire Toronto Ouest
Francis Cronier-Thériault (principal)
Sébastien De Grand'Maison
Nabil El-Kerri
Omar El Ared
Suha Tannous

University of Toronto Schools
Rosemary Evans (Principal)
Anand Mahadevan
Angela Vemic
Vernon Kee
Marisca VanderKamp
Carlie Pullen
Robin Michel
Nancy Dave

Thornhill PS
Scott Richards

Thornhill SS
David McAdam

Thornlea SS
Joe Foti

Westmount CI
Sheri Epstein

Wilshire ES
Mark McTaggart


Future Possibilities