Cultural Collisions in Canada
by: ORIGIN
@OriginPhysics
ORIGIN is a network involving several astrophysics and high energy physics experiments and research centres.

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

- Michael Hoch
- Brigitte Tessier
- Consensus
- Robin Kingsburgh
- David Griffin
- Mark-David Hosale
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
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
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 Chatzioannou
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
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 McDAdam

**Thornlea SS**
Joe Foti

**Westmount CI**
Sheri Epstein

**Wilshire ES**
Mark McTaggart
Future Possibilities