Do you want to make a QUANTUM leap?

NSF is Making a Quantum Leap - *How Can Science Museums and Science Educators Keep Up?*

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We're in the midst of a new Quantum Revolution…

A hundred years ago, **quantum physics** began to revolutionize our understanding of matter and energy. Now, in a **second quantum revolution**, we are learning how to harness certain fundamental quantum properties of **matter and energy** at the atomic and sub-atomic level to create powerful **new quantum materials and technologies with the potential to transform computing, sensing, and communications.** In 2016, the U.S. National Science Foundation designated the ***Quantum Leap*** as one of its "10 Big Ideas for Future Investment." Worldwide, funding is pouring into the development of new quantum materials and technologies. Nations are racing to be the first to use **quantum entanglement** to secure communications. Companies are competing to build the first **quantum computers** harnessing **superposition and entanglement** to crunch reams of big data and solve complex computational problems currently beyond reach.

Quantum mechanics is startling, complex, counter-intuitive, and probabilistic, and yet it undergirds the known laws of matter and energy in our physical universe. New quantum technologies may transform how we live and work. Science educators and museums have a unique opportunity to partner with quantum researchers to produce pioneering exhibits, activities, and media, engaging students along with the broader community.

NSE ATTENDEES: This is a poster we made to spark discussion at the 2017 Meeting of the Association of Science-Technology Centers. We plan to initiate a workshop to stimulate a greater sharing of ideas and practices in Quantum Education & Outreach.
PLEASE FLAG YOUR INTERESTS AND LEAVE A CARD OR A NOTE IN THE ENVELOPE.

Let's build an International Quantum Education & Outreach Community

Interested? Involved? Seen something cool? Add a pin; leave a note!

Quantum: The Exhibition
An exhibition developed by Waterloo's Institute for Quantum Computing is currently touring science museums across Canada.

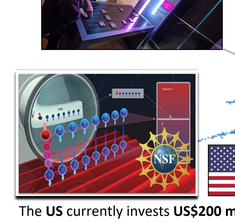
Canada has invested $1 billion in the last 10 yrs. Waterloo's Institute for Quantum Computing is one of the leaders in the field.

QuantumMadeSimple.com & **PhysicsReimagined.com**
Julien Bobroff at Université Paris-Sud teams up with fellow physicists and design students for a variety of multimedia art and education projects.

The Delft University of Technology is a major quantum research hub in the Netherlands.

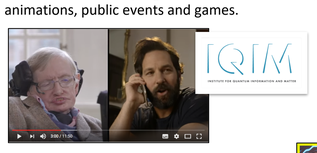
European Commission launched €1 billion 10-year flagship project in Quantum Technologies.

I and/or others have interest in developing quantum education at my institution, here.
I know about some cool quantum education activities happening here.
We're already involved in quantum education here.
Quantum Research Hub



The **US** currently invests **US$200 million/**year, and the **"Quantum Leap"** is one of the National Science Foundation's "10 Big Ideas for Future NSF Investments."

Caltech's Institute for Quantum Information and Matters's outreach program includes short films, animations, public events and games.



Cosmic Bell: Exploring Quantum Weirdness
An exhibition & play developed by MIT researchers and graduate students, is currently on display at the MIT Museum in Cambridge, MA.

NOVA – The premier PBS science show tackled quantum physics in *Fabric of the Cosmos,* with Brian Greene. A new NOVA tackling entanglement is in development.

Joint Quantum Institute (University of Maryland) produces hands-on demos and activities for outreach.

Museum of Science, Boston partners with CIQM's Harvard, MIT and Howard researchers to…

…brainstorm new quantum education & visualization strategies with artists and filmmakers

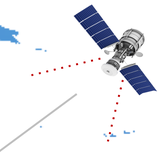
… provide science communication coaching and **connect scientists with public audiences**

…develop fun **presentations** and **hands-on activities**

…post **podcasts** and **videos**

…inspire the **next generation of quantum scientists** and **engineers…**

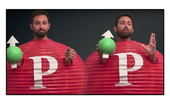
UK invested £300 million in the National Quantum Technologies Programme.



A satellite launched by **China's $100 million** Quantum Experiments at Space Scale program in 2016 demonstrates entanglement and teleportation between space and multiple ground stations, paving the way "to ultrasecure communication networks and, eventually, a space-based quantum internet."

Singapore invested S$219 million
The Centre for Quantum Technologies holds outreach events and the international *Quantum Shorts* competition to engage the public in quantum physics research.

Quantum on YouTube…



…Veritasium

…Minute Physics

…Physics Girl

…Quantum Computing Concepts w/Prof. Andrea Morello UNSWTV and CQC2T

Australia invested A$100 million in the Center for Quantum Computation & Communication Technology (CQC2T).

…and now, we'd like to learn more about what others are doing, brainstorm new ideas, and call together
an International Quantum Education Workshop

Museum of Science

CIQM CENTER for INTEGRATED QUANTUM MATERIALS

Produced by MOS with support from the National Science Foundation through the Center for Integrated Quantum Materials (CIQM) at Harvard, University, Howard University, MIT, and the Museum of Science. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

DMR-121319