



**HAL**  
open science

# Progress and Challenges on Quantum Computer-Aided Design

Aida Todri-Sanial

► **To cite this version:**

Aida Todri-Sanial. Progress and Challenges on Quantum Computer-Aided Design. IBM Quantum Summit, Sep 2020, Virtual, France. lirmm-03025303

**HAL Id: lirmm-03025303**

**<https://hal-lirmm.ccsd.cnrs.fr/lirmm-03025303>**

Submitted on 8 Jan 2021

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# IBM Quantum Summit 2020

Tuesday - September 15, 2020

## Day 1: Quantum Technology and User Ecosystem

<b>Eastern Time</b>	MC: Anthony Annunziata & Ken Wood (IBM)
<b>9:30am</b>	<b>Welcome &amp; the IBM Q Network Today</b>
<i>Talk</i>	Anthony Annunziata (IBM)
<b>9:45am</b>	<b>IBM Quantum Roadmap</b>
<i>Talk</i>	Jay Gambetta (IBM)
<b>10:10am</b>	<b>Promoting Quantum Science and Applications at DOE</b>
<i>Keynote</i>	Paul Dabbar (US Department Of Energy)
<b>10:30am</b>	<b>Co-Designing Hardware and Algorithms Towards Quantum Advantage</b>
<i>Panel</i>	Jerry Chow (IBM - moderator) Andrew Houck (Princeton University) Travis Humble (OakRidge National Lab) Pri Narang (Harvard University/Aliro) Laurent White (ExxonMobil)
<b>11:00am</b>	<b>Coffee Break</b>
<b>11:10am</b>	<b>Quantum Computing and the Future of Technology for Society</b>
<i>Keynote</i>	President Gonokami (University of Tokyo)
<b>11:30am</b>	<b>Quantum: A New Industry and Ecosystem</b>
<i>Panel</i>	Anthony Annunziata (IBM - moderator) Hiroaki Aihara (University of Tokyo) Torsten Siebert (Fraunhofer Institutes) Jeff Nichols (OakRidge National Lab) Timothy Lawrence (US Air Force Research Lab)
<b>12:05pm</b>	<b>Developing our Energy Future</b>
<i>Keynote</i>	Vijay Swarup (ExxonMobil)
<b>12:20pm</b>	<b>Lunch Break (40min) w/ Byte-Size Wellness</b>
<b>1:00pm</b>	<b>Building a Community with Open Source</b>
<i>Panel</i>	Liz Durst (IBM - moderator) Amira Abbas (University of KwaZulu-Natal) Farai Mazhandu (OneQuantum) Sabrina Maniscalco (University of Turku) Rajiv Krishnakumar (Goldman Sachs) Arman Zaribafiyani (1Qbit)
<b>1:45pm</b>	<b>Coffee Break</b>
<b>2:00pm</b>	<b>The Essential Link Between Academia and Industry</b>
<i>Keynote</i>	Chancellor Woodson (North Carolina State University), intro by Jamie Thomas (IBM)
<b>2:15pm</b>	<b>Quantum Hubs to Advance Education and Research</b>
<i>Panel</i>	Jamie Thomas (IBM - moderator) Dan Stancil (North Carolina State University) Vincent Aimez (University of Sherbrooke) Irene Qualters (Los Alamos National Lab) Dominic O'Brien (Oxford University) Kohei Itoh (Keio University)
<b>3:00pm</b>	<b>END of Day1 scheduled program</b>
<i>On-Demand</i>	On-demand content available

# IBM Quantum Summit 2020

## Wednesday - September 16, 2020

### Day 2: Industry Engagement and Developers

**Eastern Time** MC: Katie Pizzolato (IBM)

**9:30am** **Welcome from IBM**

*Talk* Anthony Annunziata (IBM)

**9:45am** **Quantum Computing: Our Final Frontier in Computing**

*Keynote* Sungwoo Hwang (Samsung Advanced Institute of Technology)

**10:00am** **Effort and Future Expectation for Quantum Computing in Japan**

*Keynote* Yasuhiro Sato (Mizuho Bank, Head of QIIC)

**10:10am** **The Promise of Quantum for Industry**

*Panel* Anthony Annunziata (IBM - moderator)

Amy Herhold (ExxonMobil)

Jay Lowell (Boeing)

Ben Boeser (Daimler)

Jamie Garcia (IBM)

**10:45am** **Coffee Break**

**11:00am** **Technical Updates: Quantum Application Research & Development**

*Series of Talks* Katie Pizzolato (IBM) - Intro to Applications R&D with the Q Network

Qi Gao (Mitsubishi Chemical)

Dimitar Trenev (ExxonMobil)

Gavin Jones (IBM)

Nikitas Stamatopoulos (Goldman Sachs)

Tomoki Tanaka (MUFG)

**12:00pm** **Enabling Quantum Application Developers**

*Series of Talks* Gilad Ben-Shach (IBM) - Intro to Commercial Partner Ecosystem

Bob Coecke (Cambridge Quantum Computing)

William Simon (Zapata Computing)

Iordanis Kerenidis (QWare)

Andre Carvalho (Q-CTRL)

**12:45pm** **Lunch Break (45min) w/ Cooking Demonstration**

*Talks + Panel* **Abstraction Without Trivialization: The Path to Practical Development**

**1:30pm** Blake Johnson (IBM)

**1:45pm** **New Developments in Qiskit Applications Modules**

Stefan Woerner (IBM)

Panos Barkoutsos (IBM) + Dimitar Trenev (ExxonMobil)

Christa Zoufal (IBM)

**2:05pm** **Enabling the Enterprise Developer**

*Panel* Sebastian Hassinger (IBM - moderator)

William Hurley (Strangeworks)

Carl Dukatz (Accenture)

David Maziotti (University of Chicago)

Larry Grace (Amgen)

Will Zeng (Goldman Sachs)

**2:35pm** **Bridge to Quantum Computation: QRNG, HPC, QSC**

*Series of Talks* Chris Schnabel (IBM) - Intro

Florian Curchod (Cambridge Quantum Computing)

Jessie Yu (IBM)

Seetharami Seelam (IBM)

Michael Osborne (IBM)

**3:20pm** **END of Day2 scheduled program**

*On-Demand* On-demand content available

# IBM Quantum Summit 2020

Thursday - September 17, 2020

## Day 3: Science and Education

- Eastern Time** MC: Abe Asfaw (IBM)
- 9:30am** **Welcome from IBM**  
*Talk* Anthony Annunziata (IBM)
- 9:45am** **NSF's Historic Leadership in Quantum Science and Quantum Workforce Development**  
*Interview* France A. Cordova (Former NSF Director) with Scott Crowder (IBM)
- 10:05am** **Educating and Enabling A Diverse Quantum Workforce**  
Panel Discussion - Part I  
*Panel* Olivia Lanes (IBM - moderator)  
 Marina Radulaski (University of California - Davis)  
 Sophia Economou (Virginia Tech)  
 Rod van Meter (Keio University)  
 Hakan Tureci (Princeton University)
- 10:35am** Panel Discussion - Part II  
*Panel* Kayla Lee (IBM - moderator)  
 Thomas Searles (Howard University)  
 Serena Eley (Colorado School of Mines)  
 Christopher Gutiérrez (UCLA)  
 Clarice Aiello (UCLA)

### 11:05am Coffee Break

- 11:15am** **Talks on Research and Education**  
*Series of Talks* Alberto Di Meglio (CERN)  
 Barry Dwolatzky (Wits University)  
 Jelena Vuckovic (Stanford University)  
 Fred Chong (University of Chicago)  
 Aram Harrow (MIT)  
 Patrick Dreher (NC State)  
 Sergey Bravyi (IBM)
- 12:25pm** **Expanding US Leadership in Quantum Information Science**  
*Keynote* Charles Tahan (White House Office of Science and Technology Policy)
- 12:40pm** **Advancing Science and Technology of Quantum**  
*Panel* Zaira Nazario (IBM - moderator)  
 Steve Girvin (Yale University)  
 David Awschalom (University of Chicago)  
 Oliver Ambacher (Fraunhofer Institutes)  
 Michael Cuthbert (National Quantum Computing Center, UK)

### 1:10pm Lunch Break (50min) w/ Musical Entertainment

- 2:00pm** **Talks on Research and Education**  
*Series of Talks* Frank Wilhem-Mauch (Saarland University)  
 Javad Shabani (NYU)  
 Mariya Vyushkova (Notre Dame University)  
 David Gosset (University of Waterloo)  
 Yonatan Cohen (Quantum Machines)  
 Lev Bishop (IBM)  
 Aida Todri-Sanial (University of Montpellier)
- 3:10pm** **Closing of formal portion of Quantum Summit**  
 Anthony Annunziata (IBM)
- 3:20pm** **END of Day3 scheduled program**  
*On-Demand* On-demand content available