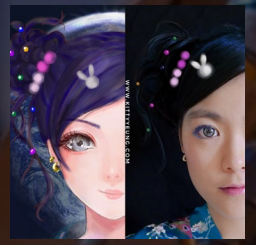
Introduction to Quantum Computing



Kitty Yeung, Ph.D. in Applied Physics

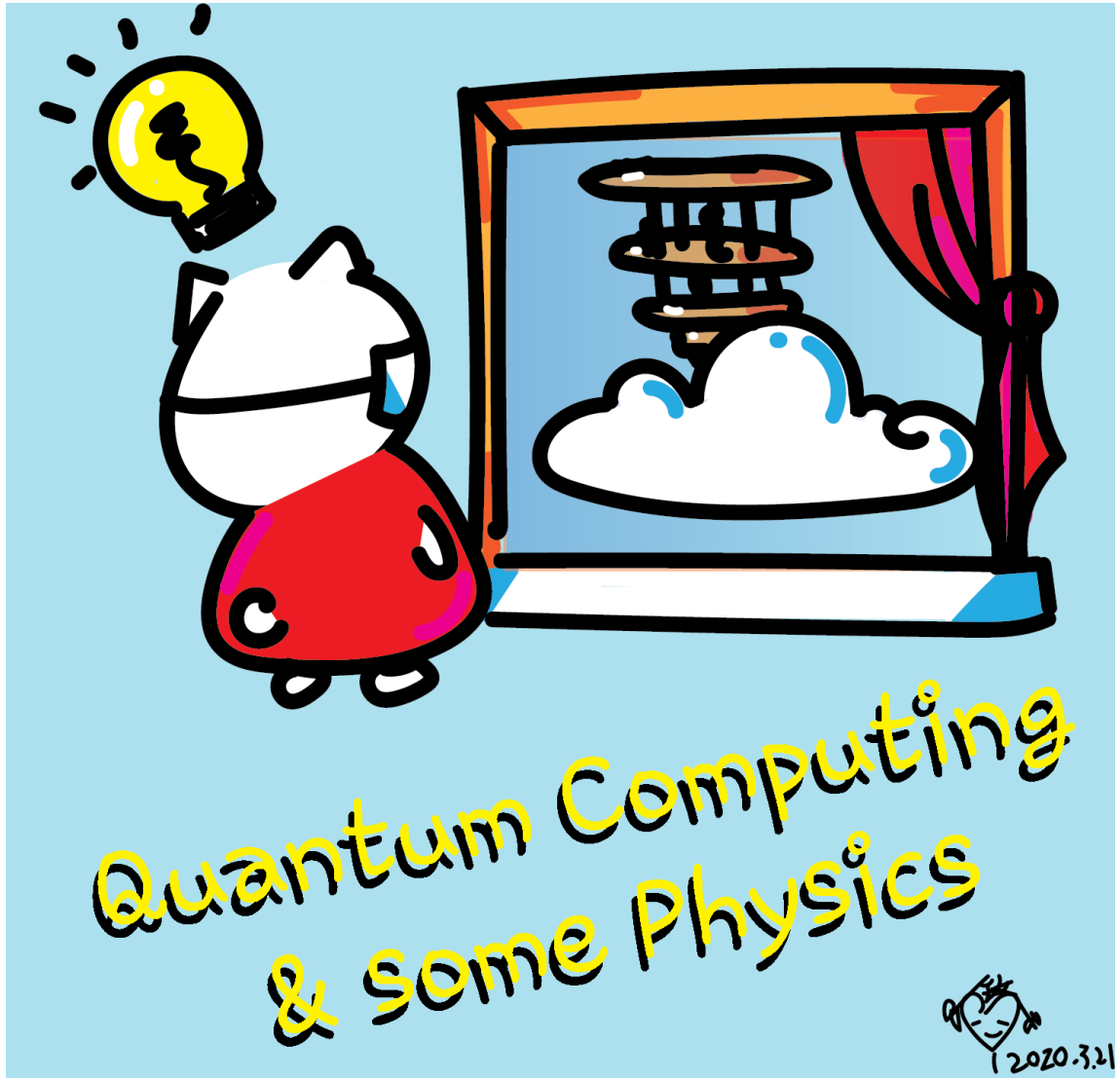
Creative Technologist + Sr. PM
Microsoft

www.artbyphysicistkittyyeung.com
@KittyArtPhysics
@artbyphysicistkittyyeung

Oct 18, 2020
Hackaday, session 24
Guest lecture 4

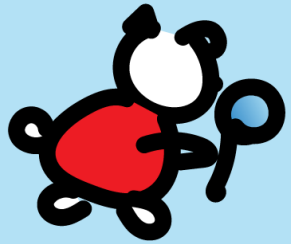
Class structure

- Comics on Hackaday – Quantum Computing through Comics every Sun
- 30 mins – 1 hour every Sun, one concept (theory, hardware, programming), Q&A
- Contribute to Q# documentation http://docs.microsoft.com/quantum
- Coding through Quantum Katas https://github.com/Microsoft/QuantumKatas/
- Discuss in Hackaday project comments throughout the week
- Take notes



THE SUNDAY SPECIALS

September 13
Prof. Terrill Frantz
Quantum Cryptography



~~September 20~~ October 18
Prof. Chris Ferrie
Quantum Tomography

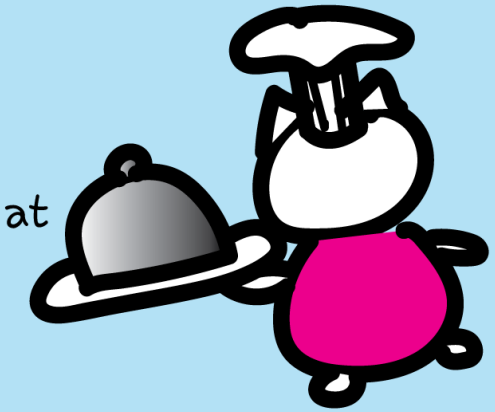
September 27
Rolf Huisman
Introducing the open source
Q# Community project qTRIL

October 11
Dr. Maria Schuld
Quantum Machine Learning

November 2
~~October 18~~
Dr. Michael Beverland
Quantum Error Correction

2020.9.13.

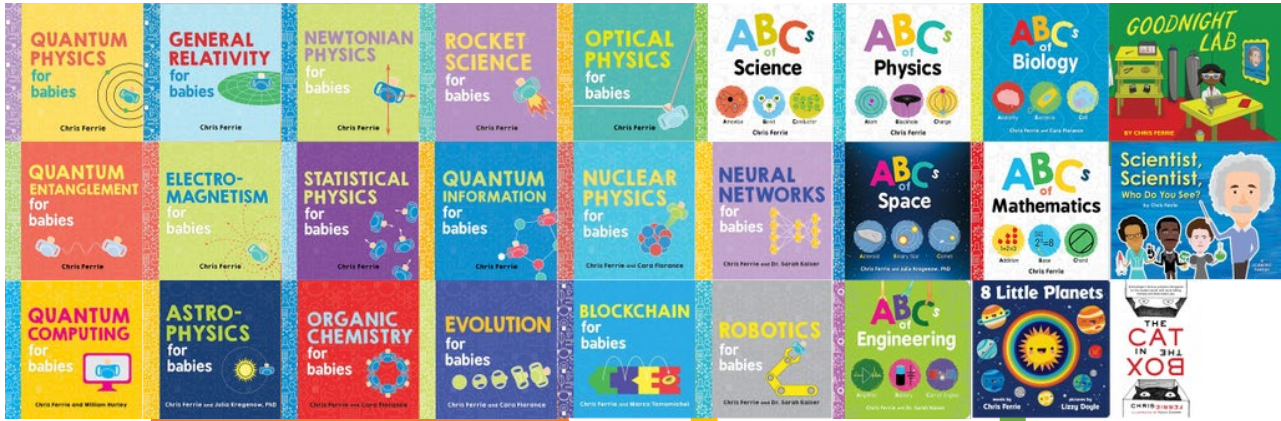
October 3
Kitty speaking at
Zen4Makers



Quantum Tomography

- Quantum tomography defines the problem of characterising an unknown quantum device. Unlike deductively stepping through a quantum algorithm to find out what the output is, quantum tomography gives you the output and asks how it came to be. Since quantum physics is probabilistic, this is an inductive problem — there is no unique solution. That is maybe a bit frustrating because finding out what a device does is important. Let me tell you about it.
- Chris Ferrie is an Associate Professor at the University of Technology Sydney and the Centre for Quantum Software and Information. His research interests include quantum estimation and control, and, in particular, the use of machine learning to solve statistical problems in quantum information science. He obtained his PhD in Applied Mathematics from the Institute for Quantum Computing and University of Waterloo (Canada) in 2012. Chris's passion for communicating science has led from the most esoteric topics of mathematical physics to more recently writing children's books, such as Quantum Physics for Babies, and a whole collection of other titles that make science accessible even for the youngest children.

Prof. Chris Ferrie



Questions

- Post in chat or on Hackaday project https://hackaday.io/project/168554-quantum-computing-through-comics
- FAQ: Past Recordings on Hackaday project or my YouTube https://www.youtube.com/c/DrKittyYeung

Guest lectures

- No class on Oct 25
- Nov. 2, **Dr. Michael Beverland**, Microsoft, **Quantum Error Correction**