

POST

# It's gonna be wild . . .

May 24, 2021

Artificial Intelligence running directly on Nature's Data

## Nature Data



Nature  $\neq$  0 or 1 (binary, bit)

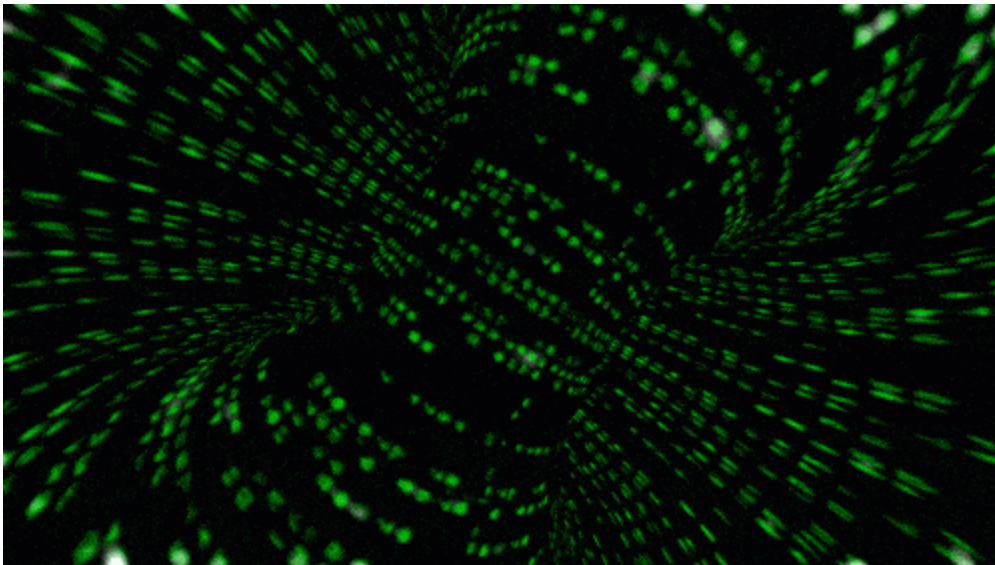
Nature = 0/1(quantum, qubit)

---"Nature is quantum." - Richard Feynman



Richard Feynman said it memorable words,: “Nature isn’t classical, dammit, and if you want to make a simulation of nature, you’d better make it quantum mechanical, and by golly it’s a wonderful problem, because it doesn’t look so easy.”

---“Nature isn’t classical, dammit,’ and if you want to really understand and protect her, you’d better collect, process, and communicate data as she does---quantum mechanically.” - Jed Anderson, Creator, EnviroAI



3 aspects to this capability:

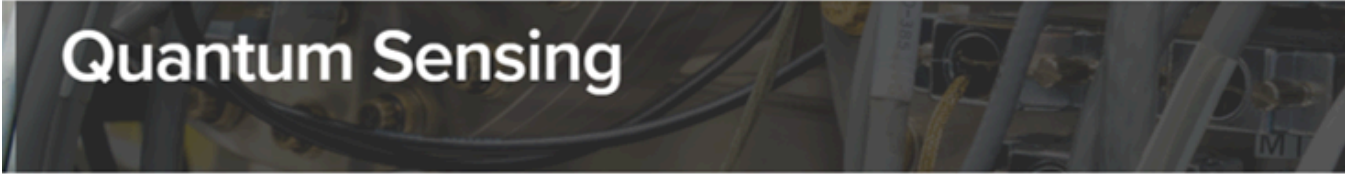
1. Quantum Sensing - collecting quantum data
2. Quantum Computing - processing quantum data
3. Quantum Networking - communicating quantum data

I've highlighted quantum computing in several past emails (<https://r20.rs6.net/tn.jsp?f=001aueaMM6FFOSLQnlU7ogKSc5PjxHebNGp4qHRkr-KgfgPshV5AVA2JxlgaXV8NJAeG6Z6CBv9J7KObpfUY-oot1ZvUrH6GJIJZHNog9dhk1zagOpbeGwhwUVyM8KVTtiQxfylWLwLHH42cGhRYZmDNA==&c=&ch=>). Let me quickly highlight below a few links on developments in quantum sensing and networking.

—“Right now we’re performing environmental machine-learning on digital data (binary—bits---zeros and ones). What really excites us is the ability to perform machine-learning on quantum data (qubits—0/1) ... nature’s more direct data.” - Jed Anderson, Creator, EnviroAI



# Quantum Sensing



In this area, Argonne is harnessing various quantum mechanical features to perform highly sensitive measurements. Potential applications include imaging brain function, searching for gravitational waves, and hunting for dark matter.

In this area, Argonne is exploiting a variety of quantum mechanical features — such as quantized energy levels, quantum state squeezing, superposition, interference, and entanglement — to perform highly sensitive measurements, sometimes in ways that can effectively evade the Heisenberg uncertainty principle.

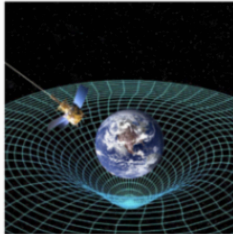
Argonne's projects in this area include developing superconducting detectors for particle and nuclear physics applications, quantum-enhanced metrology for dark matter detection, and the sensing of magnetic fields with quantum defect qubits.





#### Quantum Communications

Optical communication links are indispensable to future space missions. The quantum mechanical nature of light waves can be explored to achieve ultimate capacity. Quantum key distribution can provide unconditionally secure cryptographic communication channels. This technology employs dedicated communication satellites to establish space-space, ground-ground, or space-ground crypto channels to ensure the safety and reliability of spacecraft command and control.




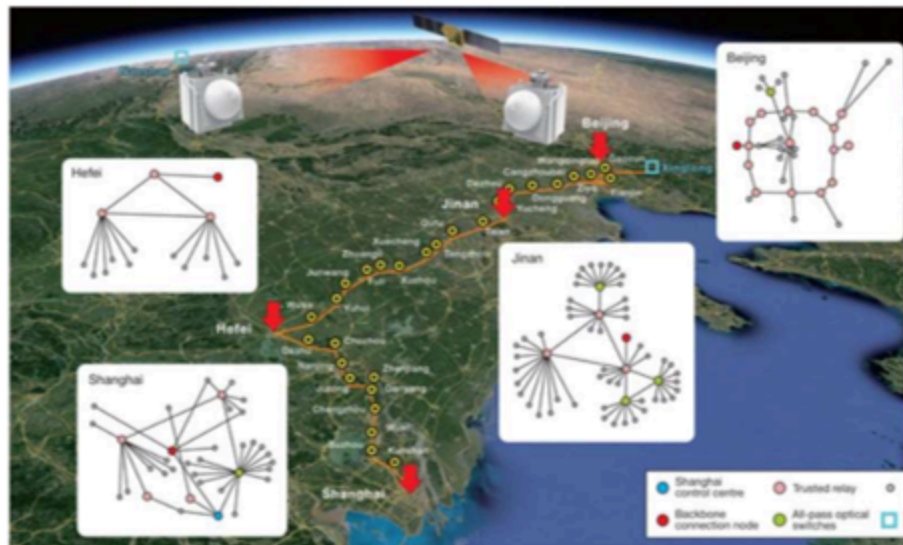
#### Quantum Measurements and Remote Sensing

Light wave-based interferometric measurement, imaging, and sensing capabilities can be greatly enhanced by novel measurement techniques that take into account the quantum nature of electromagnetic radiation. Quantum schemes of squeezed lights, entangled photon sources, and weak value principles can help achieve measurement precisions not obtainable with classical methods. Long-distance quantum links can also explore fundamental quantum effects under gravity.

JANUARY 6, 2021

# The world's first integrated quantum communication network

by University of Science and Technology of China

 6.7K 236 Share Email

... and here's a helpful shot video on quantum networking ([https://r2o.rs6.net/tn.jsp?f=001aueaMM6FFOSLQnlU7ogKSc5PjxHebNGp4qHRkr-KgfgPshV5AVA2J5op71xJh9NmWDsfT6\\_RSDMUWxtJfresMF15C5heKvYQp2HJZJ7T2wyswW2FG\\_SJRCBnIJue19RQdlBNSdyJvoqMiSLiDLSSuQ==&c=&ch=](https://r2o.rs6.net/tn.jsp?f=001aueaMM6FFOSLQnlU7ogKSc5PjxHebNGp4qHRkr-KgfgPshV5AVA2J5op71xJh9NmWDsfT6_RSDMUWxtJfresMF15C5heKvYQp2HJZJ7T2wyswW2FG_SJRCBnIJue19RQdlBNSdyJvoqMiSLiDLSSuQ==&c=&ch=)).

---“Collecting digital data is essentially collecting data after the probability wave function has already collapsed. We want to start collecting data before the wave function collapses—while some of the data is still in superposition and other quantum states. We also want to be able to analyze and communicate this data while

its still in superposition. Dealing with quantum information directly will make understanding and communicating with nature much faster and simpler.” - Jed Anderson, Creator, EnviroAI

Contact us for More Information on EnviroAI's Building of a Quantum AI Environmental Protection System

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