WORKSHOP STRUCTURE

Intuitive Quantum Networking

qolour

How to share secret information using qubits. Students run BB84 by hand with their own Qubis and try to eavesdrop on each other. Concludes with what actually carries a qubit down a fiber, and why governments are already migrating.

DURATION 2 hours	WITH BREAK 2h 10m
FORMAT Fully hands-on	AUDIENCE Grades 10 to 12+
GROUP SIZE 2 per Qubi pair	PREREQ Fundamentals

0:00 PART 1 BB84 — 45 min

- 0:00 Framing: sharing a secret with a stranger
- 0:08 Bases, hands-on
- 0:18 Exercise · Send a key, no eavesdropper
- 0:30 Exercise · Introduce Eve
- 0:40 Reconciliation and the error rate

0:45 PART 2 Ekert91 — 15 min

- 0:45 Entangled pairs as the key source
- 0:50 Exercise · Shake, decode, shout the animal

Break · 10 minutes

1:10 PART 3 The hardware — 30 min

- 1:10 What actually carries a qubit
- 1:18 Fiber, free space, and loss
- 1:28 Repeaters, and why they are hard

1:40 PART 4 Why it matters now — 30 min

- 1:40 Harvest now, decrypt later
- 1:50 Post-quantum cryptography versus QKD
- 2:00 Where this is deployed today

WHAT PARTICIPANTS LEAVE WITH

BB84 end to end
Run by hand, including sifting and error estimation.

Why eavesdropping shows
Measurement disturbs, and disturbance is measurable.

The physical layer
What a qubit rides on, and why distance is the limit.

The real timeline
Harvest-now-decrypt-later, and what migration involves.

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