Developing the Next Generation of Quantum Cybersecurity Leaders

FRONTIER
TECHNOLOGY INSTITUTE

NIST NICE Conference

June 3, 2026

www.frontier-tech.org

Frontier Technology Institute is a 501(c)(3) dedicated to **preparing the future workforce** with the technical skills for the **future of work**.

AI

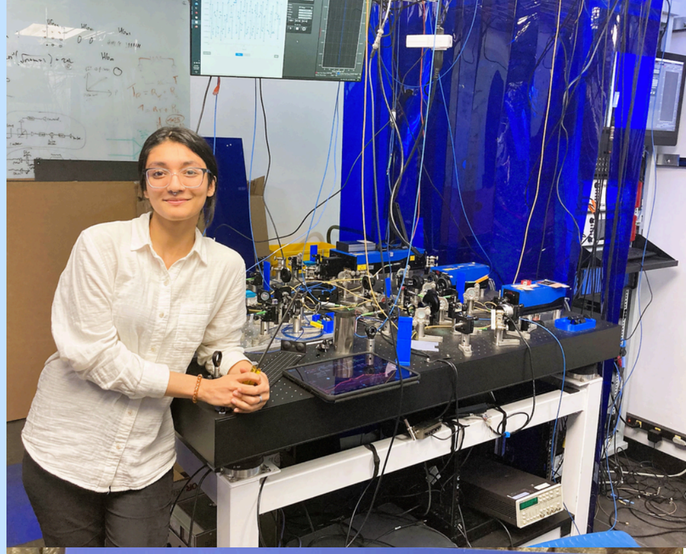
Quantum

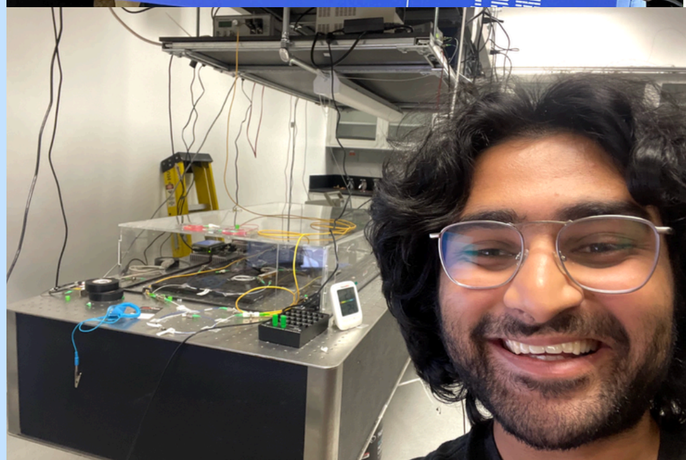
Big Data

Cyber

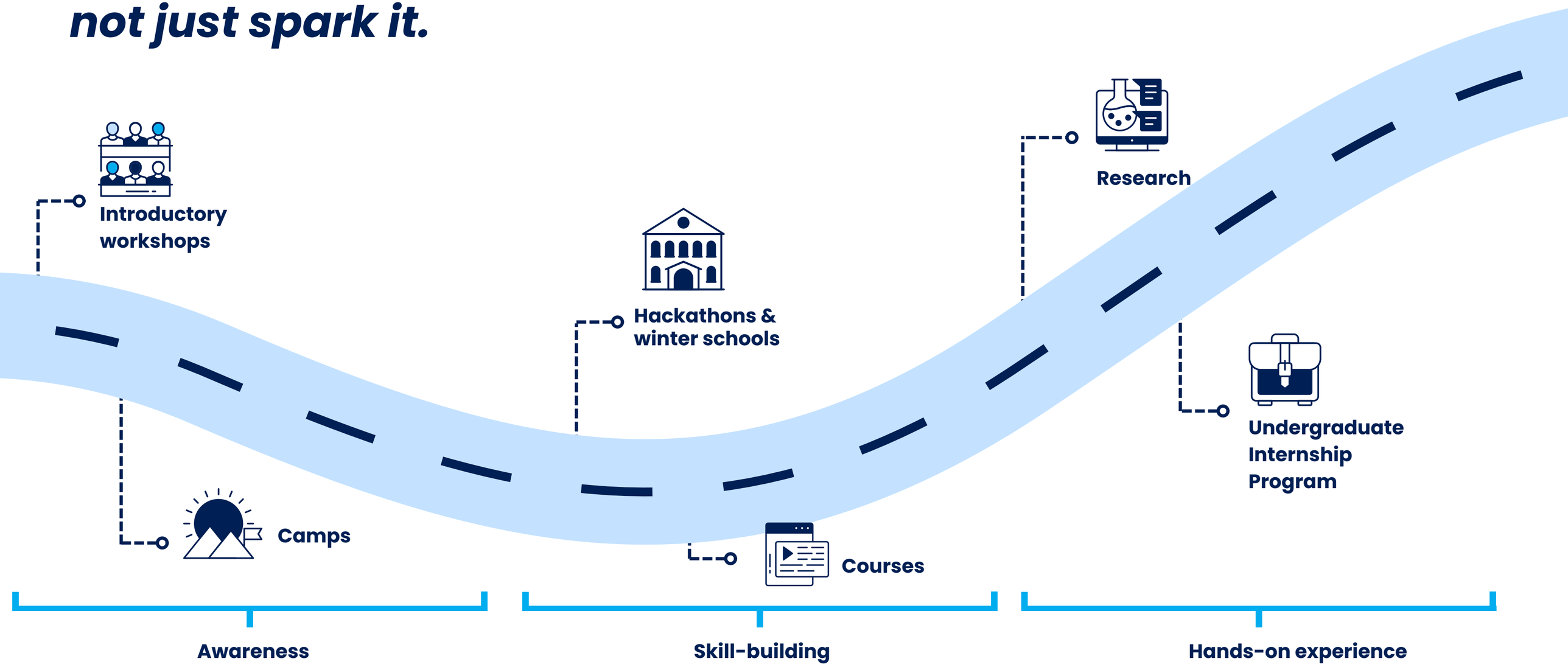
Biotech

Semiconductors





We create complete pathways to sustain student interest – *not just spark it.*



Professional development for educators

QUBIT X QUBIT is our initiative focused on **training the future quantum workforce.**

Provide early access to quantum education

Increase quantum-literate workforce

Train the next generation of quantum leaders

34,000
taught

50
U.S. states

80%
low-income

Our partners

IBM Quantum

Microsoft

Unitary Fund

Qunnect

Error Corp

KEYSIGHT TECHNOLOGIES

Cleveland Clinic

Google Quantum AI

Our advisors

Clarice Aiello,
UCLA

James D. Whitfield,
Dartmouth

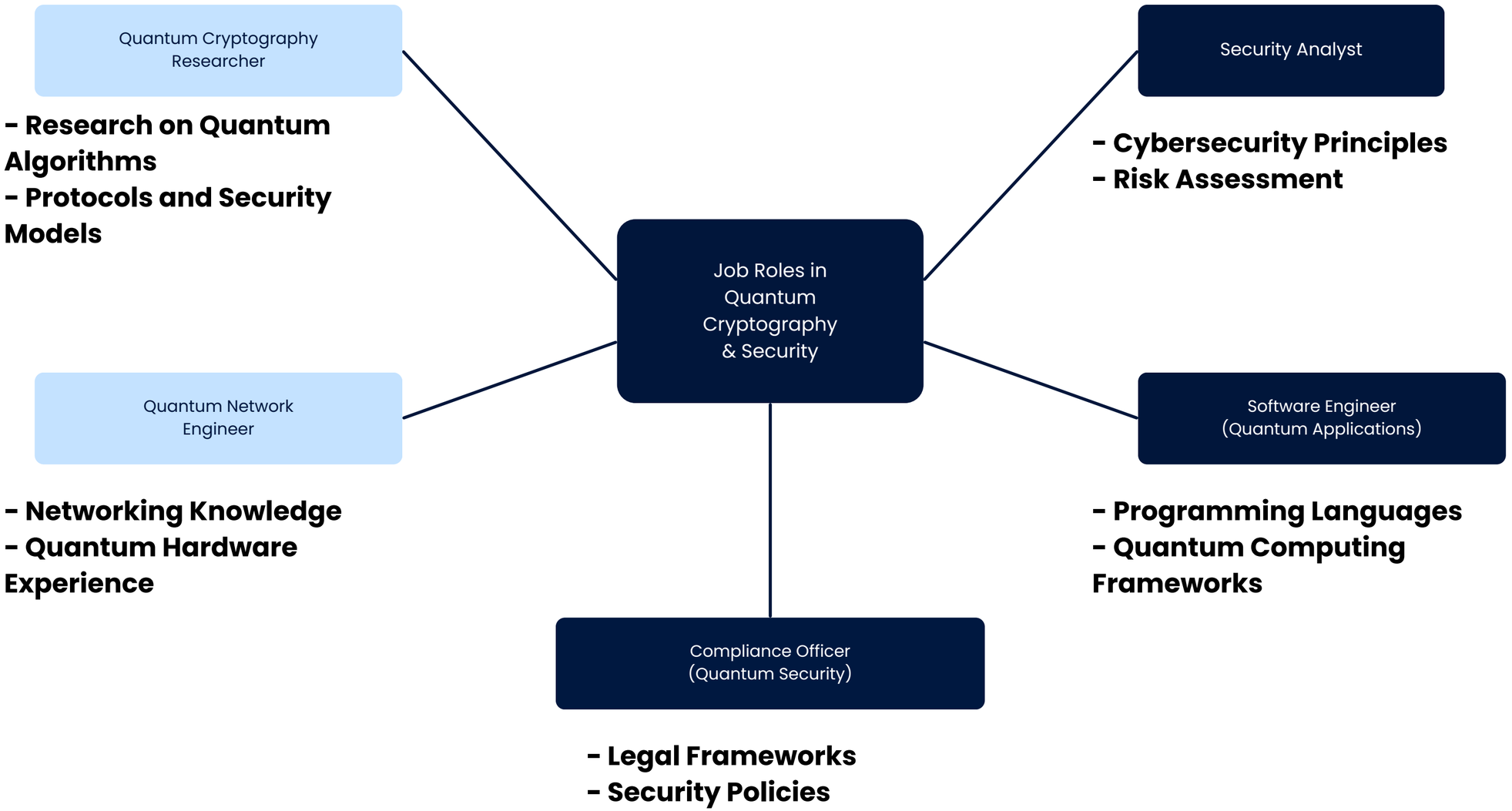
Umesh Vazirani,
UC Berkeley

William Oliver,
MIT

...and many more!

The impact of quantum computing on cyber security

Job Roles in Quantum Cryptography & Security



Early Quantum Career Immersion

A program for community college and university gain in-depth skills and work-based experience in **quantum cybersecurity**

3 weeks of intensive training in quantum and its applications to cyber

3-5 weeks of work-based learning via internships and research

Professional development via mentorship and guest speaker series

QUBIT X QUBIT

Our Training Curriculum

Week 1: Foundations in Quantum Computing

Foundational topics, including quantum mechanics, the quantum stack, and quantum circuit design

Week 2: Advanced Topics in Quantum

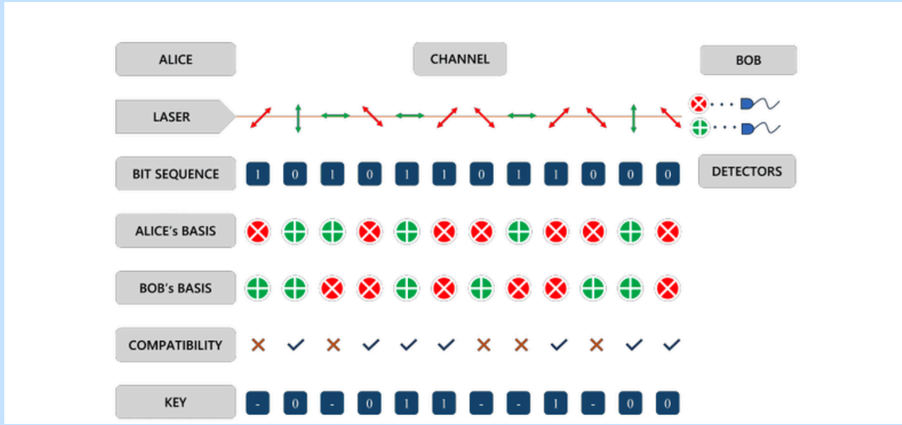
Quantum algorithms and protocols, including Grover's Algorithm and QKD

Week 3: Quantum Communication & Cyber

Exploration of quantum communication applications, like BB84, quantum networking, and post-quantum cryptography

Project spotlight: Quantum Eavesdropper Detection: Evaluating the Threat Landscape of BB84 Attacks

Under ideal conditions, quantum key distribution (QKD) protocols like BB84 provide provable security, but practical implementations are vulnerable to various quantum attacks. This study investigates the integrity and performance of the BB84 protocol under real-world conditions, and identifies which attack strategies pose the greatest threat to BB84's performance.



Impact

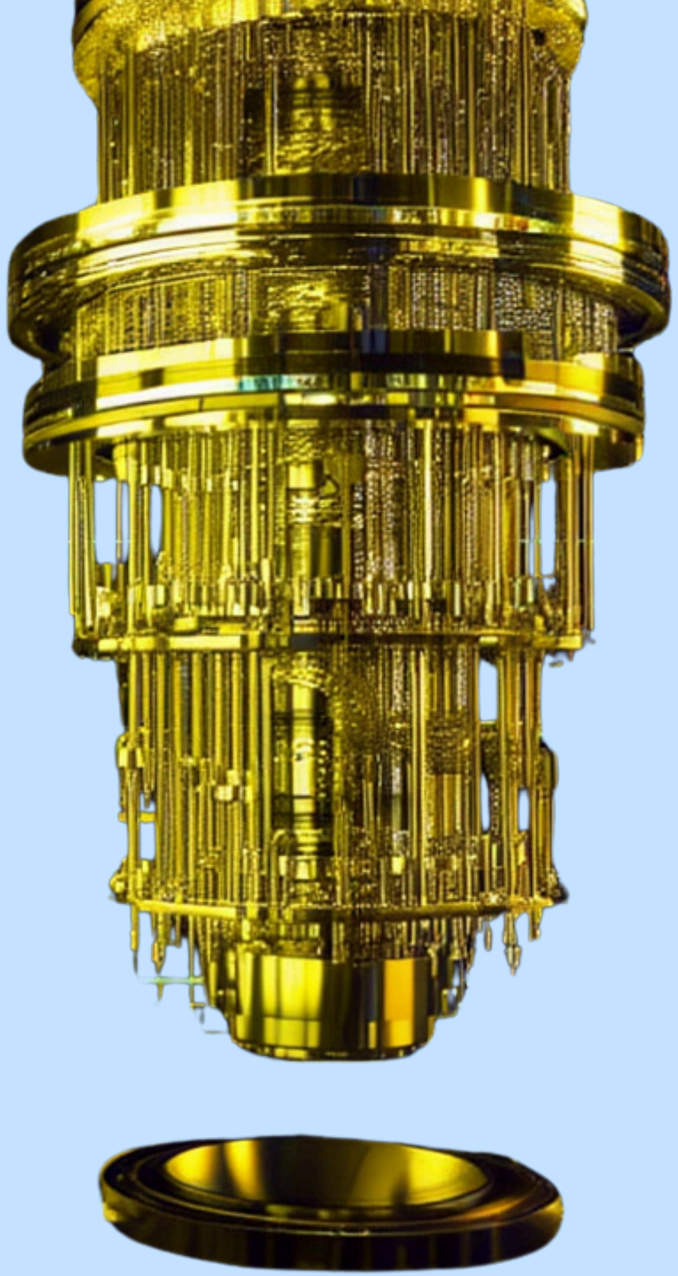
100% of students reported significant expansion of their professional quantum and cyber networks

92% of students felt that their mentors empowered them to continue exploring quantum and cyber

86% of students not initially interested in quantum and cyber careers became highly interested

By the end of the program, students had closed 82% of their initial quantum computing knowledge gap.

QUBIT X QUBIT



Key Findings

AWARENESS: Exposure matters as much as training.

INDUSTRY-ALIGNMENT: There should be more of a focus on post-quantum cryptography. Industry share that this is the key immediate need.

DURABLE VS. TECHNICAL SKILLS: Durable skills mattered just as much as technical training in quantum and cybersecurity.

Interested in learning more?

kiera@frontier-tech.org

www.frontier-tech.org

Follow us on social media

@frontier_tech_institute

Frontier Technology Institute (US)

@qubitbyqubit

Frontier Technology Institute (US)