



ANU Institute for Space

FUTURE OF COMMUNICATIONS: FROM LIGHT TO QUANTUM

Our society is critically reliant on satellite to earth communications for a range of daily activities, from navigation and weather predictions to supporting national security. Current radio frequency systems carry limited data, creating a data downlink bottleneck. Laser communications promises a technology revolution by offering data rates at least 10x faster than existing radio transmission and avoiding spectrum licencing constraints. It is also compatible with quantum communications for enhanced security. This provides a clear path to meet the growing global demand for space-to-ground communications and support the expanding satellite communication market.



**Australian
National
University**



Australian
National
University

INSPACE'S ADVANCED COMMUNICATIONS PROGRAM COMBINES WORLD-LEADING CAPABILITY AT ANU IN:

- **Adaptive optics** – enabling the creation of high-performance optical communication ground stations,
- **Quantum encryption** – providing 100% secure communication,
- **Quantum memories** – critical to allow long-range distribution of quantum encryption keys to many users.

We are bringing these capabilities together to enable optical ground stations and create an integrated quantum laser communications network to transform the way satellites communicate with earth. ANU technology enables communication links in challenging environments for a range of mission scenarios from LEO and GEO to lunar and deep space. This will enhance system-wide resilience by augmenting existing telecommunication infrastructure.

With quantum capability built in, this network will also provide the underlying infrastructure to connect quantum devices and establish a quantum internet for improved computation, sensing accuracy, and provably secure communications.

“

Laser communications promises a technology revolution by offering data rates at least 10x faster than existing radio systems. ”

Are you interested in how secure and how fast optical communications can be for your mission?

PLEASE CONTACT:



Associate Professor Francis Bennet

Mission Specialist

francis.bennet@anu.edu.au

+61 2 6125 8900

Dr Kate Ferguson

Business Development Manager

katherine.ferguson@anu.edu.au

+61 2 6125 0220

