The quantum revolution is transforming the way we measure, communicate, and process information, with a strong impact in the space sector.

At Gradiant, we develop advanced solutions based on quantum principles to enhance the accuracy, security, and efficiency of next-generation technological systems.
Currently, working on several quantum technology projects for space applications.

gradiant
Connectivity · Intelligence · Security

gradiant@gradiant.org

R&D in quantum sensing, communications, and computing

for NewSpace

by gradiant

Quantum Sensing and Metrology

Capabilities

- Rydberg atomic sensors: RF quantum sensing (MHz to THz channels).
- NV centers in diamond: Quantum magnetometers and RF analyzers.
- Photonic integrated circuits (PICs) for quantum sensors SWaP reduction.
- Physical modelling and AI-assisted processing and optimization.

Applications:

- PNT: AoA, quantum radar, RF/magnetic anomaly localization
- Telecommunications: Quantum RF antennas (MHz to THz), spectral awareness, specific RF receivers (LPD/LPI).
- Earth Observation through quantum radiometry and magnetometry.

Quantum Communications

Capabilities

- QKD subsystem engineering for specific missions (e.g. emitters, processors, PICs).
- Multiuser quantum networks enhanced by quantum memories.

Applications:

- Quantum-secured satellite communications
- Quantum encryption to enhance networks security (i.e. 5G networks)

Quantum Computing

Hardware Capabilities & Applications:

- Enabling technology: Qubit control systems (RF + FGPA + AI; laser systems.
- Quantum control of qubits for different physical platforms

Software Capabilities & Applications:

- Hybrid classical-quantum computing methodologies
- AI-enabled error mitigation and correction
- Optimization of telecommunication networks and resource management use cases