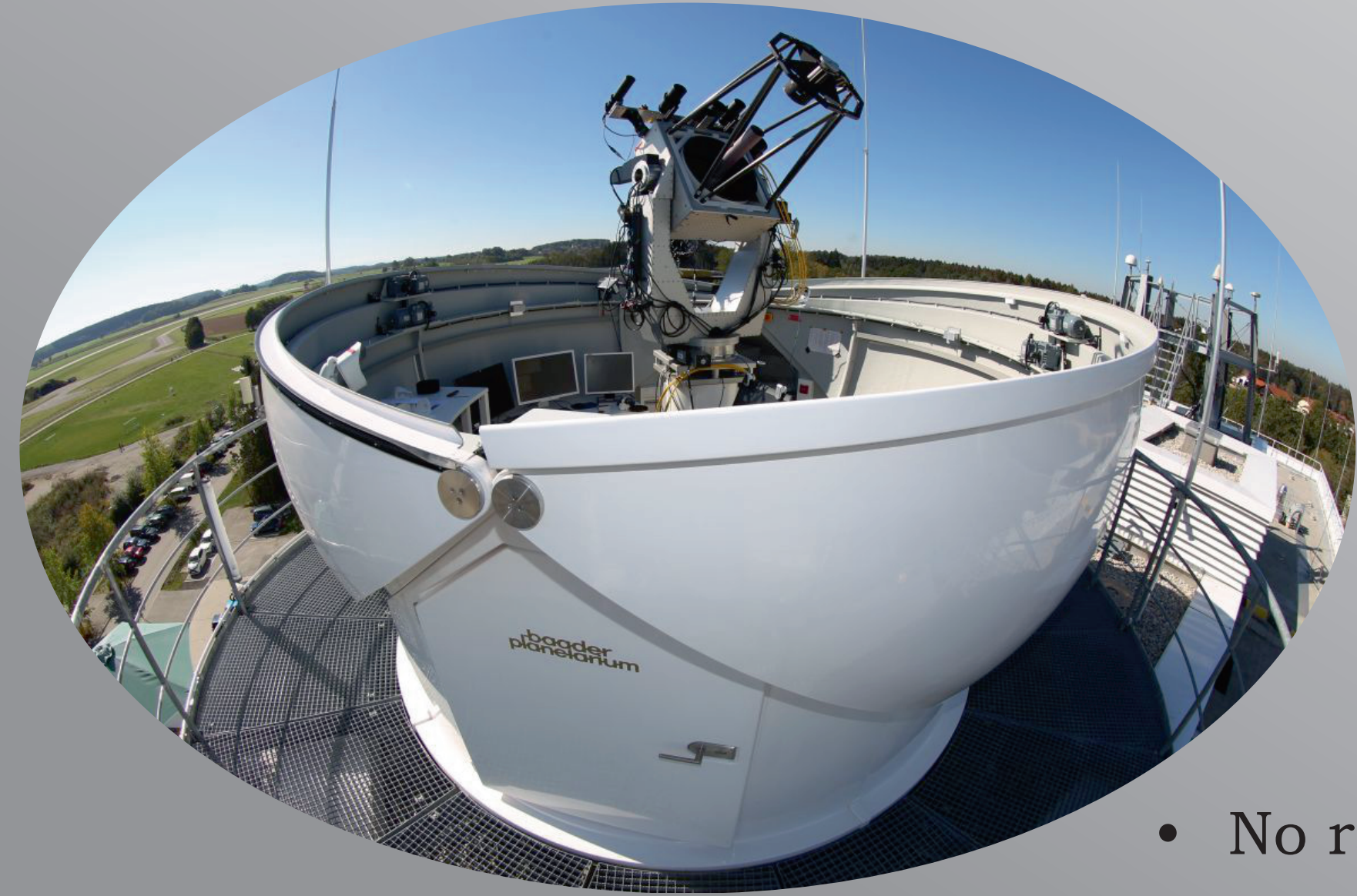


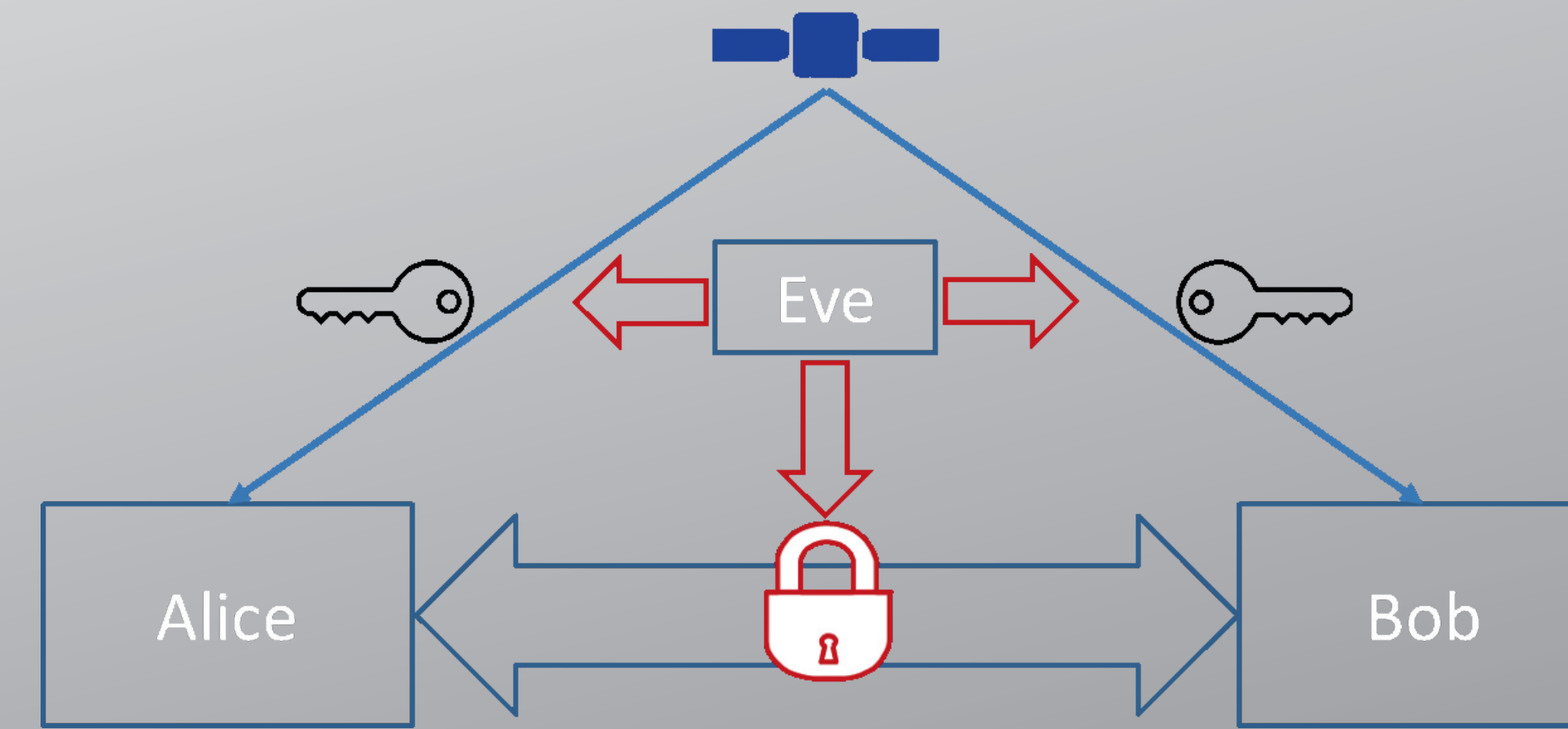
Optical Communication



- Increased data security
- No radio frequency coordination

- Much higher data rates possible

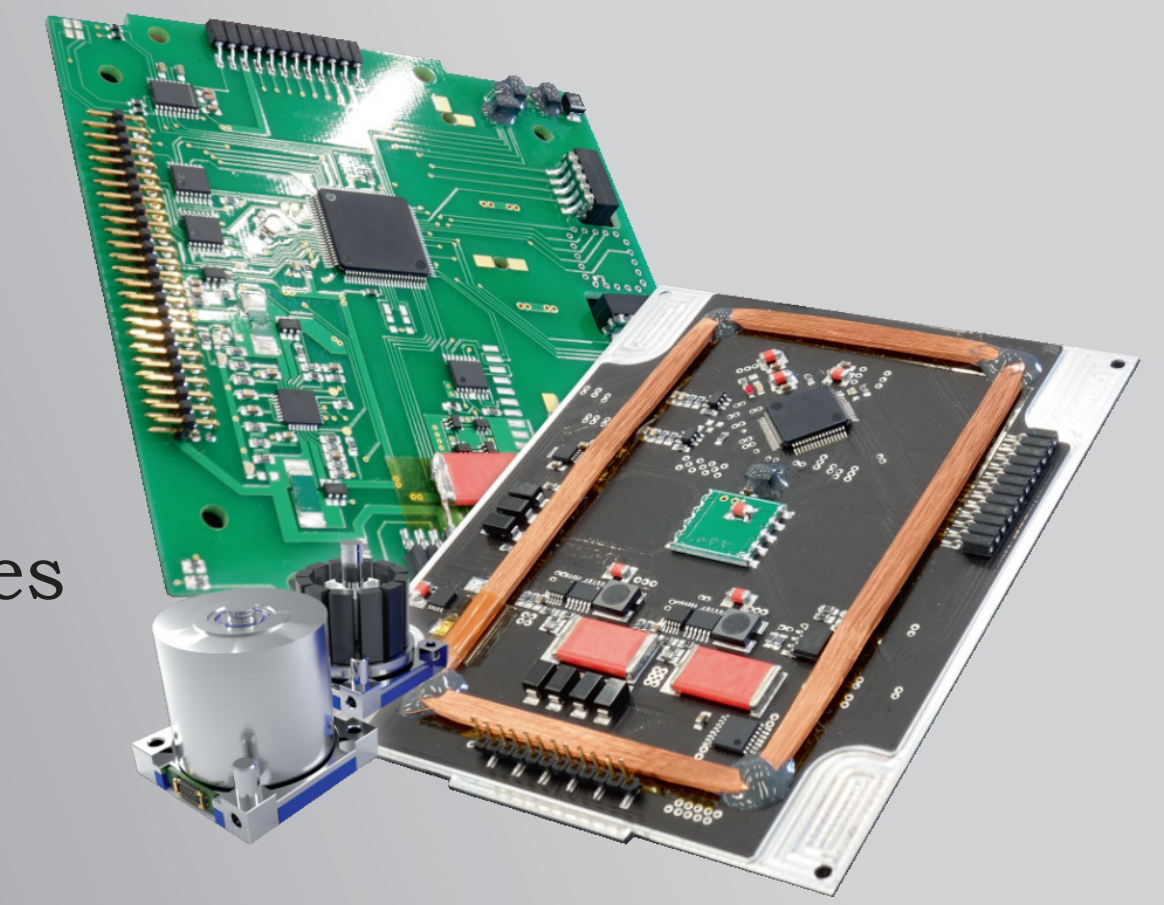
Quantum Key Distribution



- Crucial technology for the interconnected world of the future
- Making eavesdropping impossible on a fundamental physical level

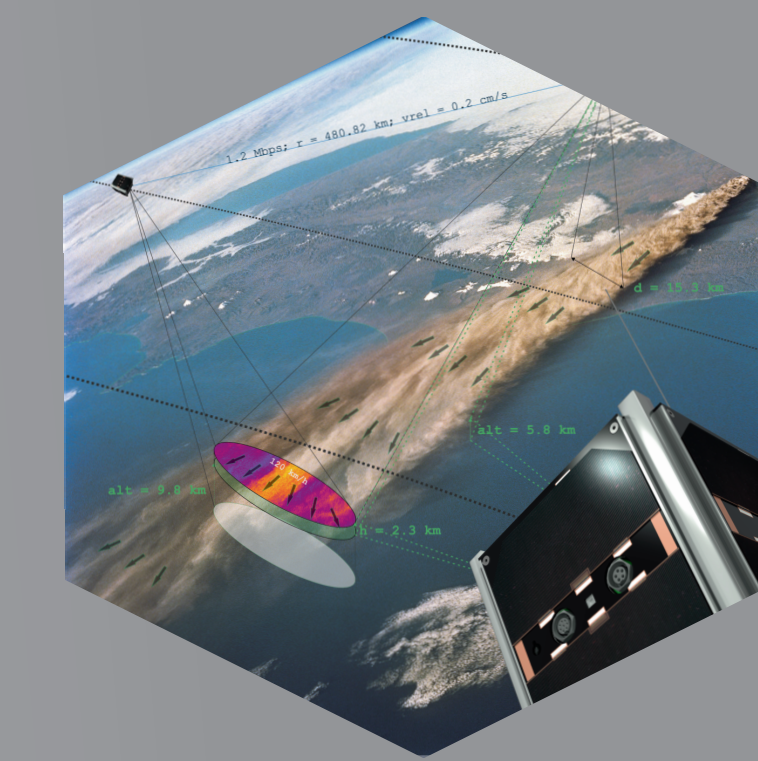
Precision Orbit/Attitude Control

- Directional ISL
- High gain downlink/uplink
- Optical communication
- Prevention of polarization losses
- Link security



TOM & TIM

- Telematics Earth Observation Mission (TOM)
- Cameras on three satellites
- Photogrammetric imagery
- Complemented by 15 international partners: Telematics International Mission (TIM)
- Inter-satellite link for feature exchange
- OSIRIS optical downlink system



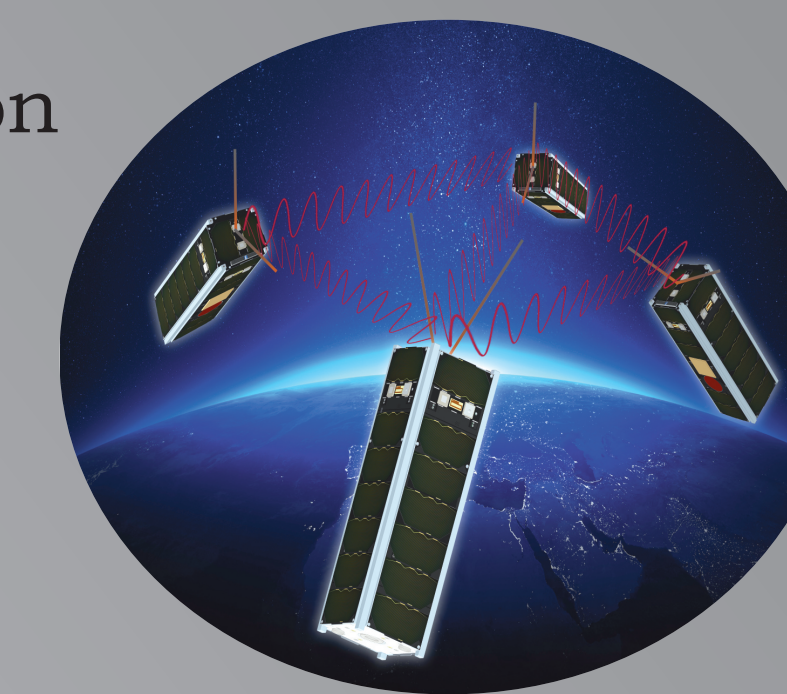
QUBE

- Quantum key distribution experiments
- 3U satellite based on UNISEC standard
- Advanced reaction wheels
- UHF TM/TC
- OSIRIS optical downlink system
- Testing of components required for QKD



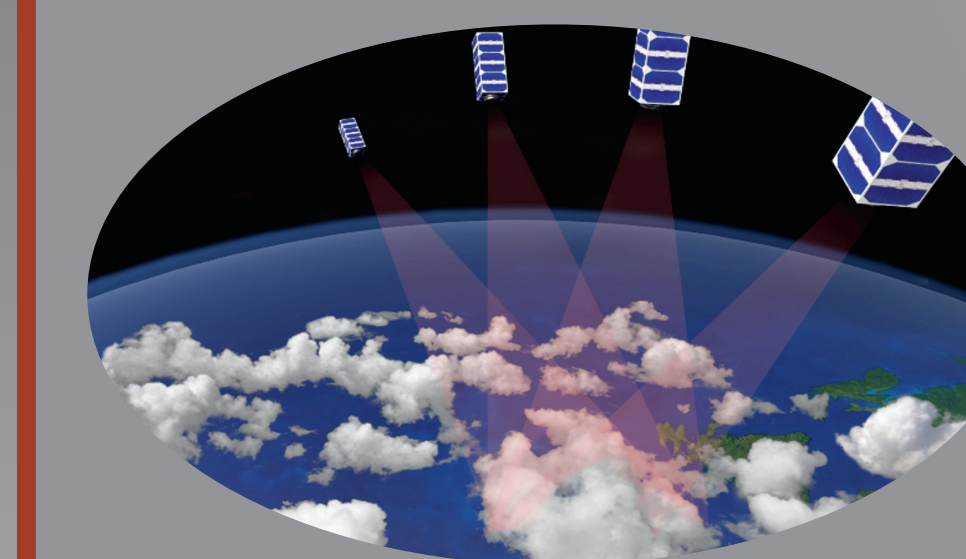
The Future of Small Satellite Communications – Quantum Cryptography, Inter-Satellite Links, and High Data Rates

- Formation of four nano-satellites
- Demonstration of inter-satellite communication
- Low power UHF transceivers
- Two redundant $\lambda/2$ dipole antennas
- Precision attitude control
- Electric propulsion with Enpulsion thrusters
- Launch in 2020



NetSat

- Ten cooperating small satellites
- Cloud scattering-tomography
- Simultaneous imaging of cloud fields
- Resolution of 50m
- Multidisciplinary mission
- Advanced in-orbit autonomy
- Distributed computing
- Networked control



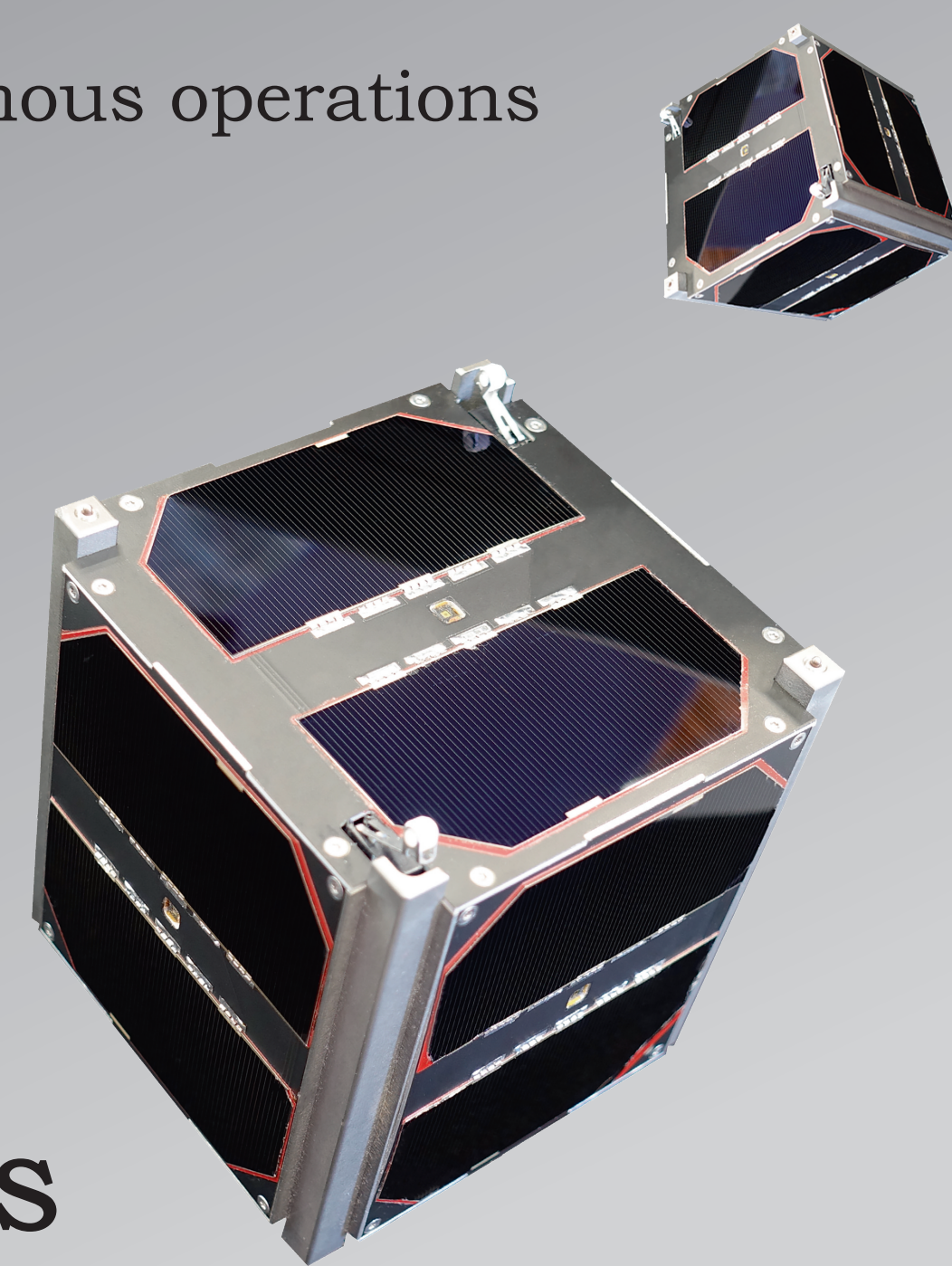
CloudCT

- Increasing number of formations and constellations

- Inter-satellite communication for autonomous operations

- Communication concept dependant on formation topology

- Combination of Sat <-> Sat and Sat <-> Ground communication



Multi-Satellite Systems

- Formation upkeep and payload data exchange
- Small gain antennas and low transmission powers
- Highly integrated circuits and advanced transceiver technologies



Inter-Satellite Communication

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References

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