

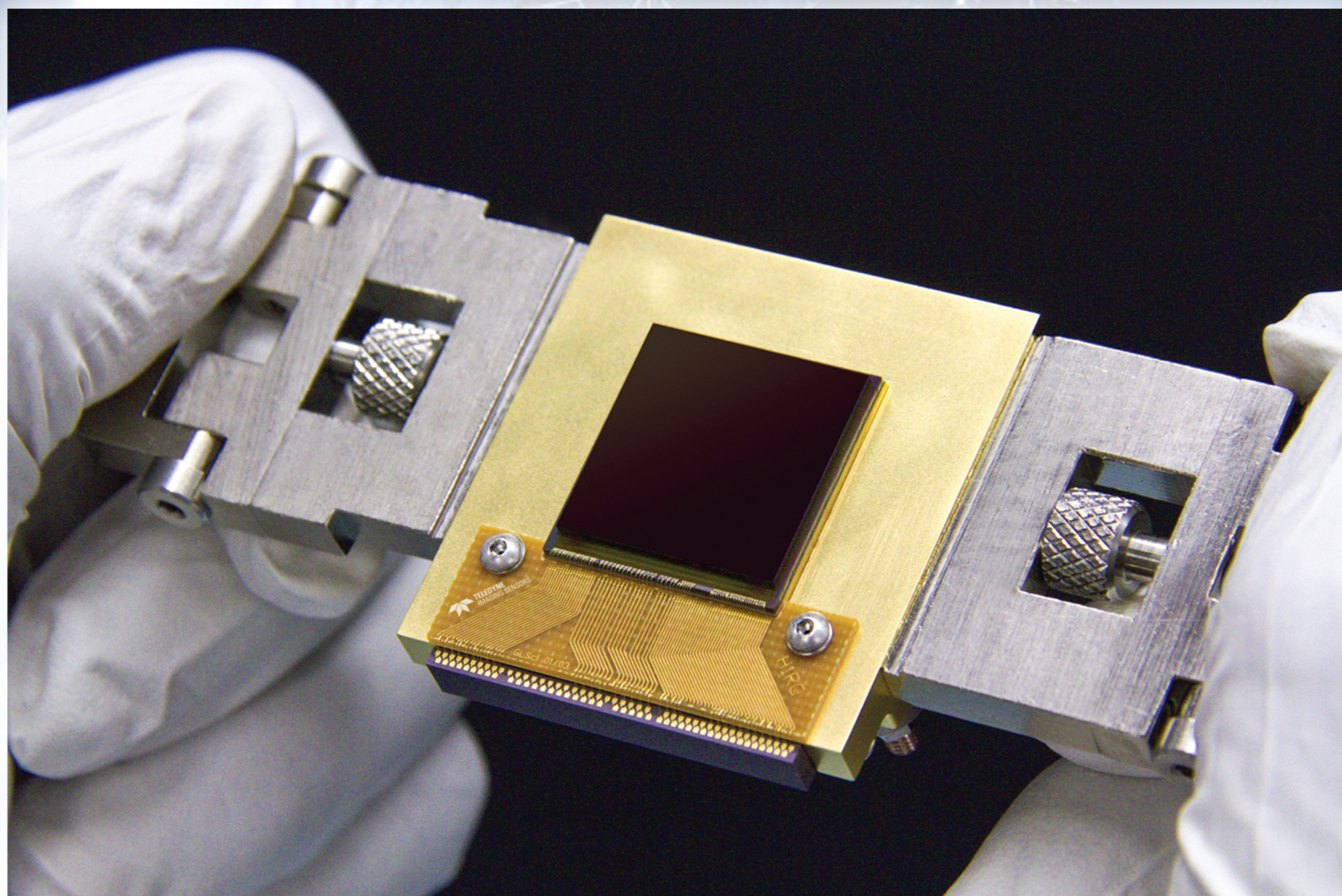
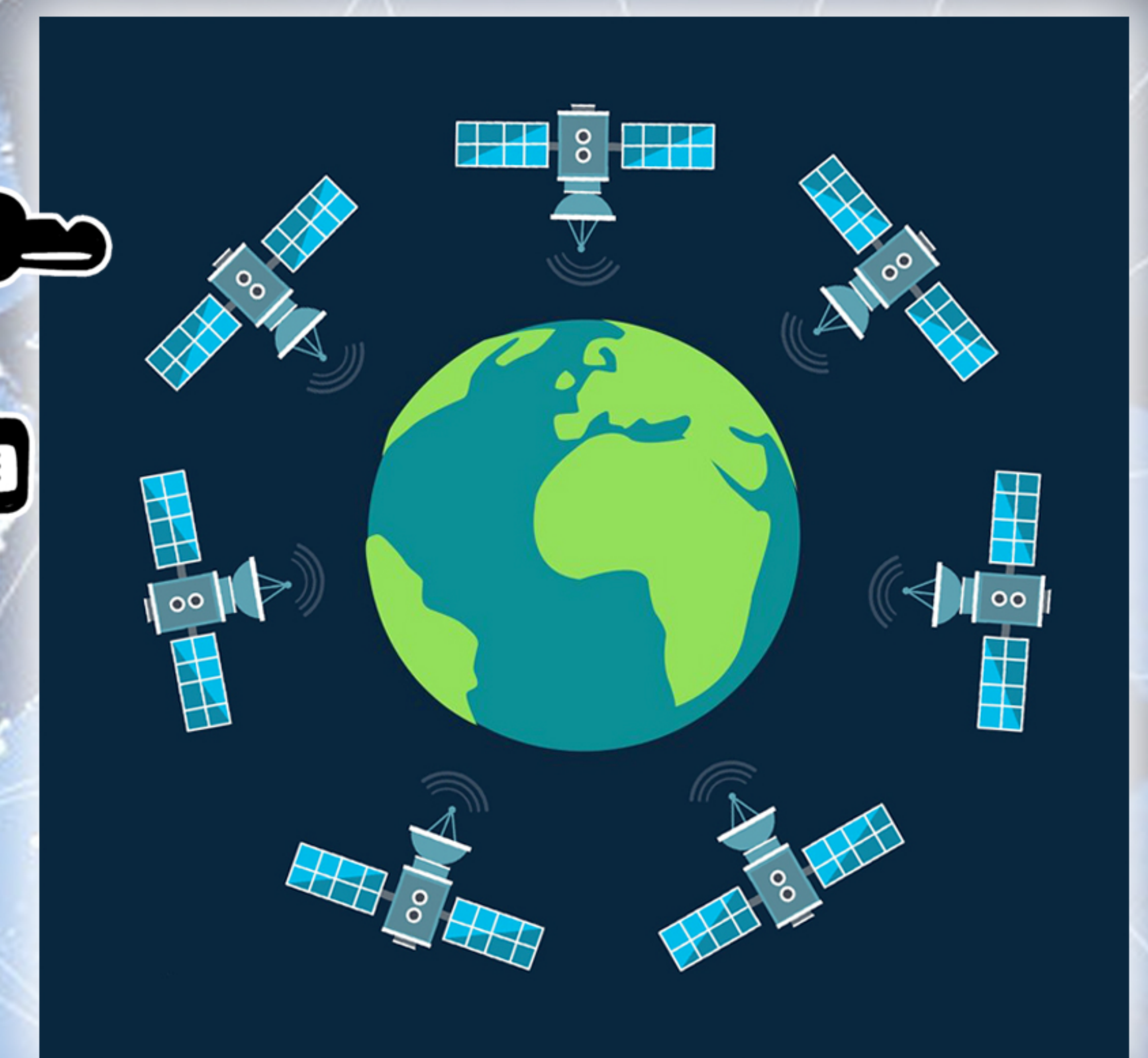
Application of IoT in Planetary Defense

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IoT infrastructure in space

- IoT devices reaching 14.4 billion in 2023 → extend IoT coverage to space
- terrestrial internet unavailable due to limited infrastructure → satellite communication
- new communication standard and capable sensors needed → LPWA (Low Power Wide Area) network allows long-range communications at low bitrate
- Iridium Messaging Transport provides IP data transport service designed for small-to-moderate-sized messages supporting satellite IoT applications



Asteroid detection with IoT

- NEO detection difficult from Earth → satellites provide less disturbed vantage point
- Earth-orbiting devices can allow for more frequent monitoring
- increasing number of LEO satellites → more active deep-space observation terminals
- extending Starlink (or other constellation) functionality → install NEOCam asteroid detector camera modules
- frequently performed deep-space scans → AI data analysis
- real-time monitoring → NEO characterization

Solar sail with IoT

- difficulty attaching large solar sail → many small sensors could be spread
- motion on NEO surface → hopping by internal flywheel
- positioning on asteroid → local LoRaWAN (Long Range Wide Area Network)
- deflection enhanced with solar pumped lasers

