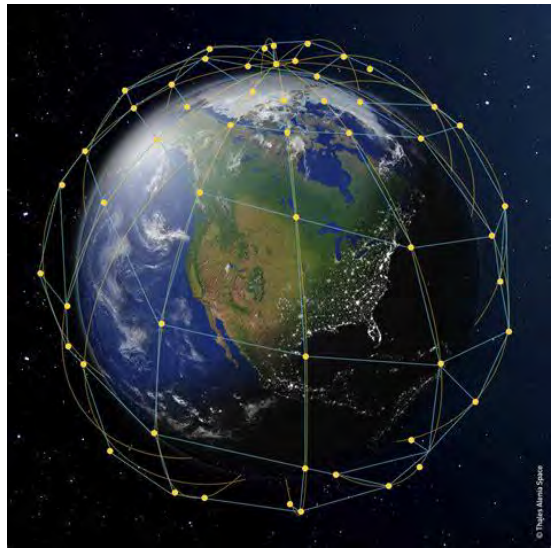


# Global LEOSat WG

Mark Wolff (CANARIE)
Andrew Wiedlea (ESnet)
Erik-Jan Bos (NORDUnet)

GNA-G Community VCs
21 & 22 October 2025

*“As fiber is our currency, should R&E Networks be interested in LEOSat?”*

~Someone, from the R&E Network Community

# The Global LEOSat WG

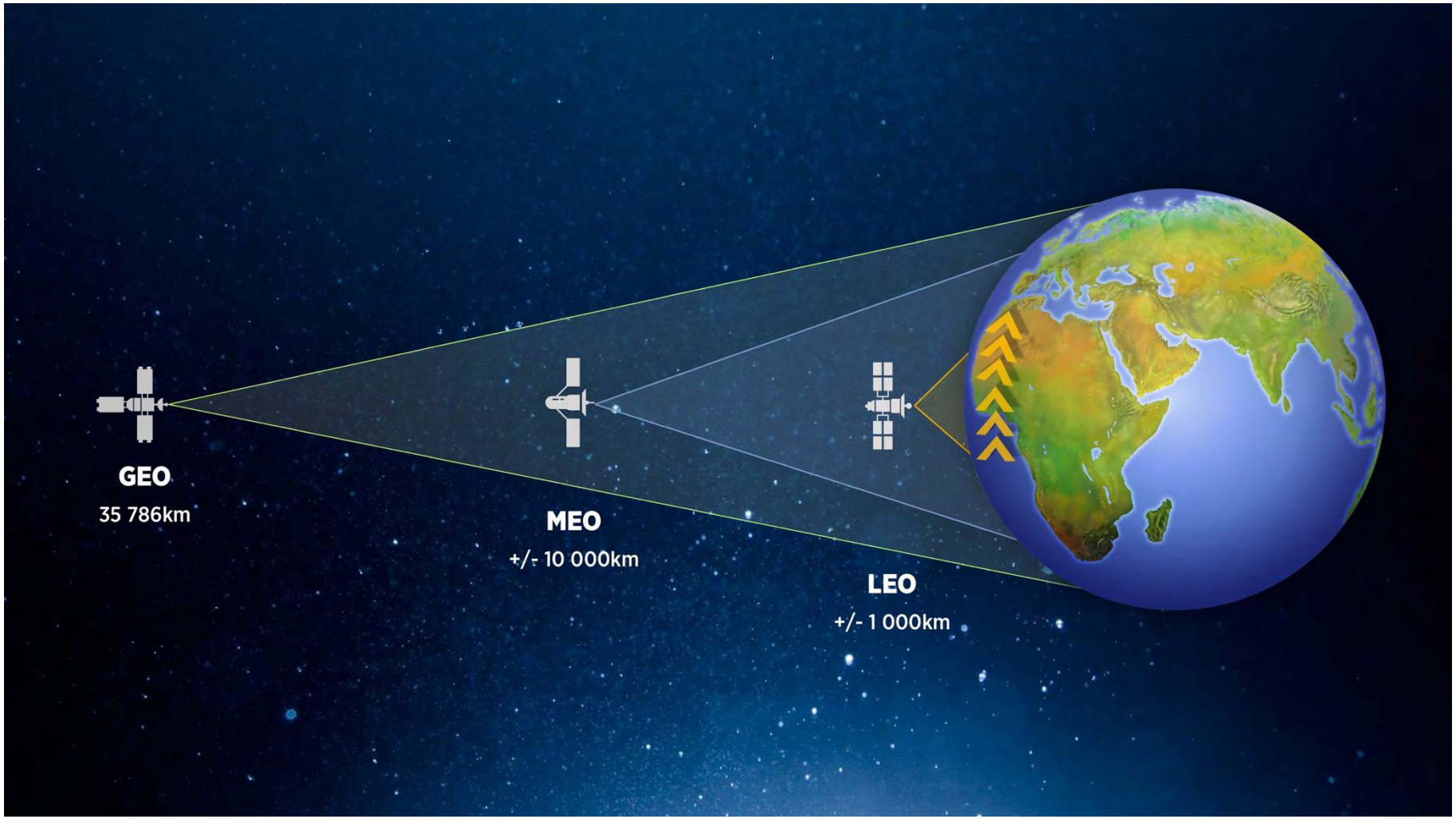
- Under the Global (R&E) Network Advancement Group (GNA-G)
- Webpage: https://www.gna-g.net/join-working-group/global-leosat/
- Co-chairs reachable at: <leosat-wg-co-chairs@lists.gna-g.net>

| Mark Wolff<br>CANARIE, Canada | Andrew Wiedlea<br>ESnet, USA | Erik-Jan Bos<br>NORDUnet, European Nordics |
|---|---|---|
|  |  |  |

# The Global LEOSat WG in more detail

- A platform for discussions on LEOSat developments, in areas of:
  - technology,
  - service delivery,
  - commercial, and
  - legal.
- Discussing:
  - deployments,
  - use cases, and
  - user cases.
- Other topics of interest include:
  - exploring possible mechanisms for joint procurement of LEOSat services, and
  - R&E Networking connectivity to LEOSat providers.

# Satellites 101



# GEO, MEO, LEO: A deeper dive

- Geostationary Earth Orbit (GEO):
  - Simple fixed dishes, only three satellites needed
  - Main use case: Broadcast such as TV
  - Disadvantage: High latency (so less suitable for Internet apps)

- Medium Earth Orbit (MEO):
  - Designed with the Internet in mind
  - Main use case: Two-way communications
  - Disadvantage: Still rather high latency

- Low Earth Orbit (LEO):
  - Main use case: Internet with low latency!
  - Disadvantage: Some service providers do not fully cover all geographies but improving over time.

# The State of Play of LEOSat

- Five LEOSat vendors/initiatives:
  - Eutelsat OneWeb ✓
  - Starlink
  - Telesat ✓
  - Project Kuiper ✓
  - Sateliot ✓

✓ Presented to Global LEOSat WG

- Furthermore, organizations from the United Kingdom, China, Japan, the European Union, etc. are all proposing LEOSat mega constellations

- Analysts project that up to 50,000 LEO satellites could orbit the Earth in the next decade

# EutelSat OneWeb

- Constellation: ~648 Gen-1 LEO satellites at ~1,200 km; world's #2 LEO network and operated by Eutelsat Group after the 2023 merger. Uses a polar orbit
- Go-to-market: B2B/B2G focus (backhaul, enterprise, maritime, aviation); aviation services began in 2025
- Coverage & service: Global service footprint with growing maritime integrations and government traction as an alternative to Starlink
- Financial mix: LEO revenues grew >80% YoY and now ~15% of Group revenue in FY 2024-25
- Next-gen (Gen-2): Airbus contracted to build ~100 new small satellites, with deliveries expected starting ~late 2026

# Starlink

- Scale: ~10,000 satellites launched to date; ~8,600 reported operational (largest constellation by far). Uses multiple orbit shells.
- Users: ~5M+ customers as of March 2025, with strong growth through mid-/late-2025
- Direct-to-Cell (D2C): T-Mobile's "T-Satellite" launched in the U.S. (texts/911/location), with app-based data support expanding in Oct 2025; >650 Starlink D2C sats cited
- Hardware roadmap: New V3 satellites unveiled to deliver gigabit-class service and major capacity boosts (launched via Starship)
- Regulatory/scale plan: Licensed for 12,000 and aiming beyond 30,000 satellites over time

# Telesat Lightspeed

- Program status: Lightspeed fully funded; 198 satellites to be built by MDA; program advanced past spacecraft PDR. Uses a polar orbit
- Manufacturing: MDA expanding high-volume factory capacity in Québec to produce Lightspeed satellites
- Launch & service timeline: First launches targeted for 2026; initial (polar) and then global services expected from 2027
- Market focus: Enterprise/B2G backhaul, mobility, and private networks rather than direct-to-consumer
- Orbit & tech: Ka-band LEO architecture with inter-satellite links planned across a smaller, higher-throughput constellation versus Gen-1 competitors

# Project Kuiper

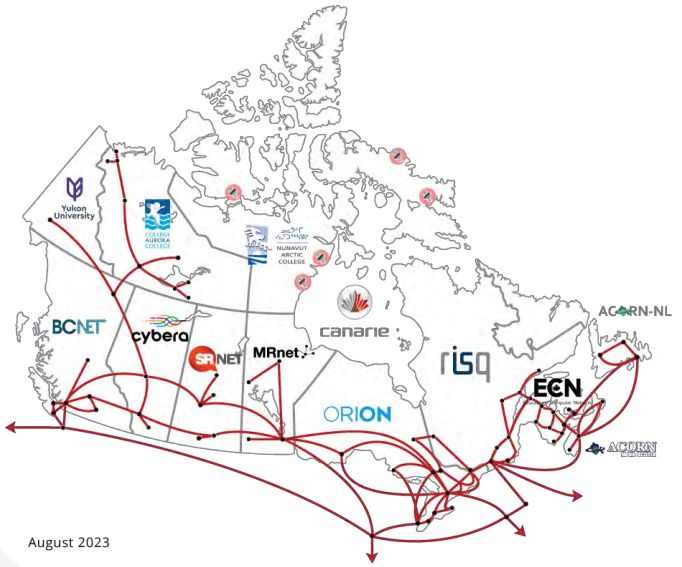
- Constellation plan: 3,236 LEO satellites; full-scale deployment began April 2025 with 27 satellites and multiple follow-on launches. Uses 3 orbit shells, no polar capacity announced yet
- Satellites launched: By mid-Oct 2025, SpaceX launches brought Kuiper's on-orbit total to ~153 spacecraft
- Service timeline: Amazon signals initial service by early–mid 2026 in the U.S., Canada, UK, France, and Germany, expanding thereafter
- User terminals: Three tiers (compact ~100 Mbps; standard ~400 Mbps; enterprise ~1 Gbps) with a target < $400 BOM for the standard unit
- Regulatory cadence: FCC requires ~1,600 satellites by July 2026 and full deployment by 2029; pace is accelerating but under scrutiny

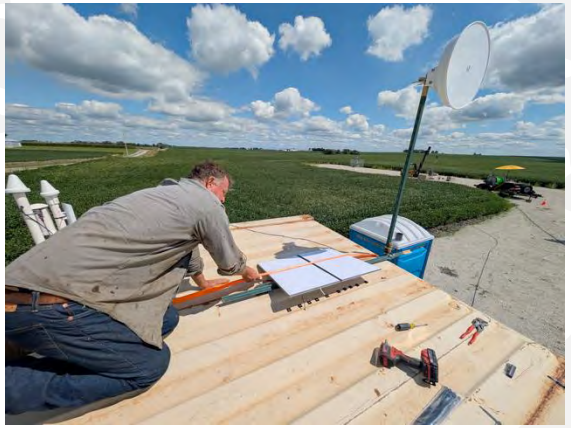
# Sateliot

- Constructing a LEO satellite constellation specifically for IoT connectivity, using standard telecom 5G Narrowband-IoT (NB-IoT) / non-terrestrial network (NTN) technology. Uses a polar orbit
- Act like “cell-towers in space” so that unmodified terrestrial NB-IoT devices (e.g., those used for sensors) can roam via satellites when terrestrial networks aren’t available
- By early 2025, raising ~€70 million, backed by European public/private funds
- Constellation roadmap & service launch: Already launched several nano-satellites (six by some reports) and plan to deploy 100+ satellites by ~2028 to achieve full global IoT coverage, with commercial service ramp-up starting in 2025
- Focused on IoT rather than broadband—to connect devices in remote & underserved regions (agriculture, logistics, mining, maritime)

# R&E Networks using LEOSat services (examples)

- CANARIE (Canada)
  - Connecting Nunavut via Nunavut Arctic College
- ESnet (USA)
  - Connecting remote and field installations
- Sikt (Norway)
  - Providing last resort back to Ny-Ålesund research stations on Svalbard
  - Testing with LEOSat services on Antarctica



# “As fiber is our currency, should R&E Networks be interested in LEOSat?”

- Our answer:
  - There’s a lot happening in LEOSat that is of interest for R&E Networks
  - There’s a lot of innovation and testing in the satellite realm happening

- So, YES, the LEOSat ‘space’ is of interest to the R&E Networks, especially for expanding the ‘wireless edge’ (as ESnet calls this)

- And… Sign up to the Global LEOSat WG, if you’re interested

# Thank You! Questions?

Co-chairs reachable at: <leosat-wg-co-chairs@lists.gna-g.net>