ESA BIC Finland and startups

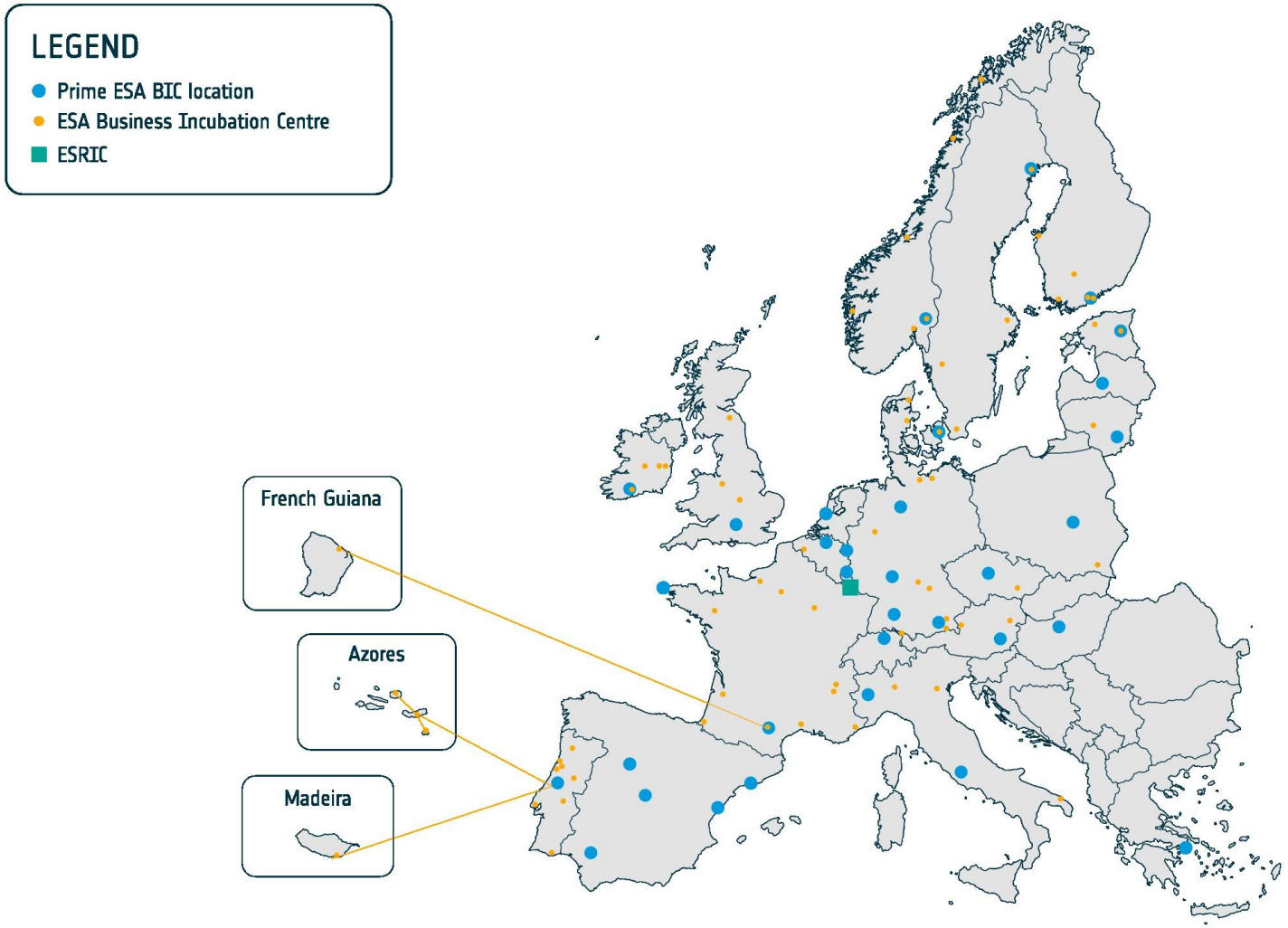
Space Business Forum
24.2.2025

Kaisa Ahonen
esabic.fi

Agenda

- Introduction to ESA BIC Finland, Kaisa Ahonen
- Startup Presentations:
  - KOKO Forest, Aki Snellman
  - Northbase, Tommi Rasila
  - Oinride, Ahmed Abdelazim
  - Sharpnav, Eldrige de Melo
- Q&A

ESA BUSINESS INCUBATION CENTRES MAP



- **32 Incubation centres.**
- **240+ Startups selected annually.**
- **1,800+ Startups selected overall in 20 years.**

SCALEUP

INVEST

SUPPORTING THE SCALEUP OF VENTURES

BUSINESS SUPPORT

Pool of various services to best answer individual acceleration needs

For companies with high business potential with mature technology

ESA MARKETPLACE

Development of industrial players on new upstream & downstream markets aggregating service requests and offers from and for industry

INNOVATE

BOOSTING INNOVATION AND COMMERCIALISATION

Φ-LABNET

Disruptive research innovation projects

ESA BICs NETWORK

Start-up creation & incubation services for entrepreneurs

ESA BROKERS NETWORK

Commercial innovation projects integrating space technologies

CONTRIBUTIONS IN THE COMPANY'S LIFE-CYCLE

CASH FLOW

SCALEUP COMPLEMENTS EXISTING PROGRAMMES

ESA Business Incubation Centres

Prepare for Space

Φ-Lab Network

Technology Transfer

Intellectual Property

ESA R&D Programmes

ScaleUp INVEST

Supporting the development of ScaleUp ventures in new space markets ESA Marketplace

ScaleUp INNOVATE

Boosting innovation and commercialization in the European space sector

INCUBATOR

10 k€ – 1 M€

BUSINESS ANGEL

VENTURE CAPITAL

UP TO 10 M€

GROWTH CAPITAL

> 10 M€

PRIVATE EQUITY/LEVERAGED BUYOUT

TURN AROUNDS

> 10 M€

INSTITUTIONAL INVESTORS

Technology Readiness Level (TRL) 1

TRL 7

TRL 9

TIME/TRL

ESA BIC Finland consortium

Aalto University

Aalto University
partners Espoo and Helsinki.

University of Vaasa
partners Tampere and Turku.

Corporate partners for technical, financial and legal support.

We are searching for startups who

esa space solutions

- Use space-based systems (such as satellite navigation, earth observation, or satellite communication) or;
- Use space technologies in a non-space domain or;
- Develop innovative products and services for the space sector;

and;

- Are no more than 5 years old;
- Are headquartered in Finland;

Aalto University

Our offer

esa space solutions

- Technical and business support
- Office space
- Connections and collaborations
- PR and events
- Equity-free funding up to 90.000 EUR by:

esa

BUSINESS FINLAND

Join us!

- Aalto Startup Center Demo Day
  March 6, 13-17 in A Grid, Espoo
- A Grid Impact series May 7
- Arctic15 June 4-5, Helsinki

- Permanent open call, next cutoff date September 14th, 2025.

Connect with us!

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KOKO FOREST

INTELLIGENT FOREST ANALYTICS

KOKO Forest Oy
Karavaanikatu 4, 00980 Helsinki

KOKO FOREST

KOKO FOREST

PROVIDES SOLUTIONS FOR MONITORING FOREST HEALTH AND INCREASING FOREST RESILIENCE

BUILT ON YEARS OF RESEARCH AND EXPERIENCE IN THE FIELDS OF FOREST ECOLOGY, REMOTE SENSING, COMPUTER VISION AND ARTIFICIAL INTELLIGENCE.

FOUNDED BY FOREST SCIENCE, MACHINE VISION AND SERVICE DESIGN PROFESSIONALS.

KOKO FOREST

INNOVATION PARTNER - FINNISH FOREST CENTRE

KOKO Forest selected to develop a national data solution for remote sensing of forest damages.

Metsäkeskus Forest Centre

EUROPEAN SPACE AGENCY (ESA)

KOKO Forest selected into business incubation programme developing Earth Observation solutions and remote sensing of forests globally.

esa BUSINESS INCUBATION CENTRE

EU HORIZON SINGLE TREE

EU-funded programme for research of forests, individual tree health and biodiversity in many European locations.

European Commission | Horizon 2024 European Union funding for Research & Innovation

NIBIO NORWEGIAN INSTITUTE OF BIOECONOMY RESEARCH

ACADEMIC PARTNERSHIPS

UNIVERSITY OF EASTERN FINLAND

UNITE FOREST-HUMAN-MACHINE INTERPLAY

European Research Council Established by the European Commission

KOKO FOREST

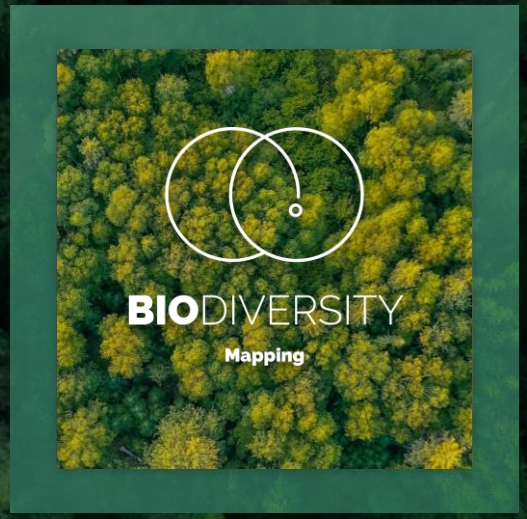
REMOTE SENSING SERVICES

FOREST HEALTH ANALYSIS

KOKO Forest Health Analysis provides near real-time information on the health and condition of forests using Earth observation data and artificial intelligence.

FOREST RISK MANAGEMENT

KOKO Forest Risk Management provides estimates of future climate risks on forests based on different climate scenarios.



BIODIVERSITY MAPPING

KOKO Forest Biodiversity Mapping detects biodiversity indicators such as large aspens and changes in standing dead wood.

KOKO FOREST

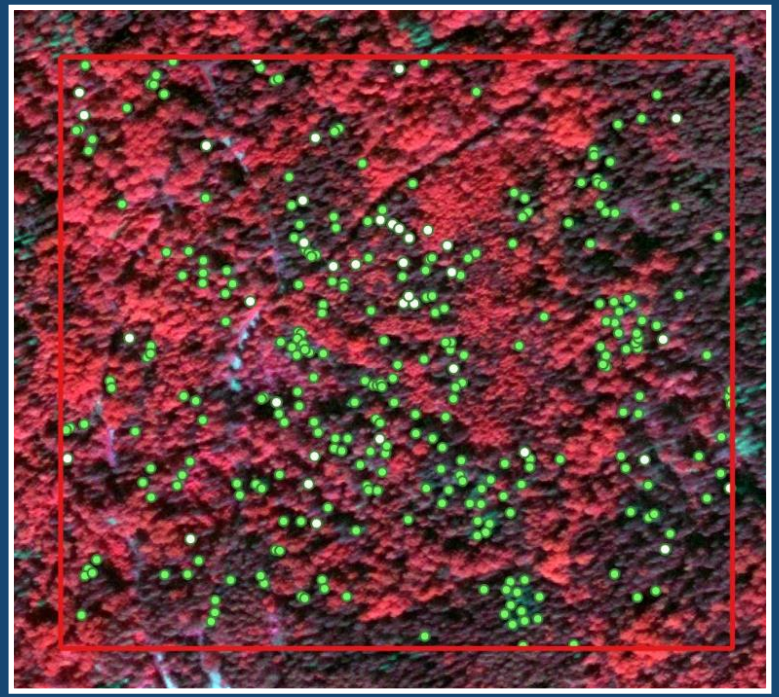
FOREST HEALTH
Analysis

FOREST HEALTH ANALYSIS

KOKO Forest Health Analysis recognizes tree deaths up to 95%+ accuracy* down to an individual tree.

*95% + can be attained by using high-definition satellite images in optimal conditions. Results may vary mostly depending on the season when the satellite images / aerial images have been taken.

High-definition satellite images provide superior results.



Thank you.

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KOKO FOREST

KOKO Forest Oy

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NORTHBASE

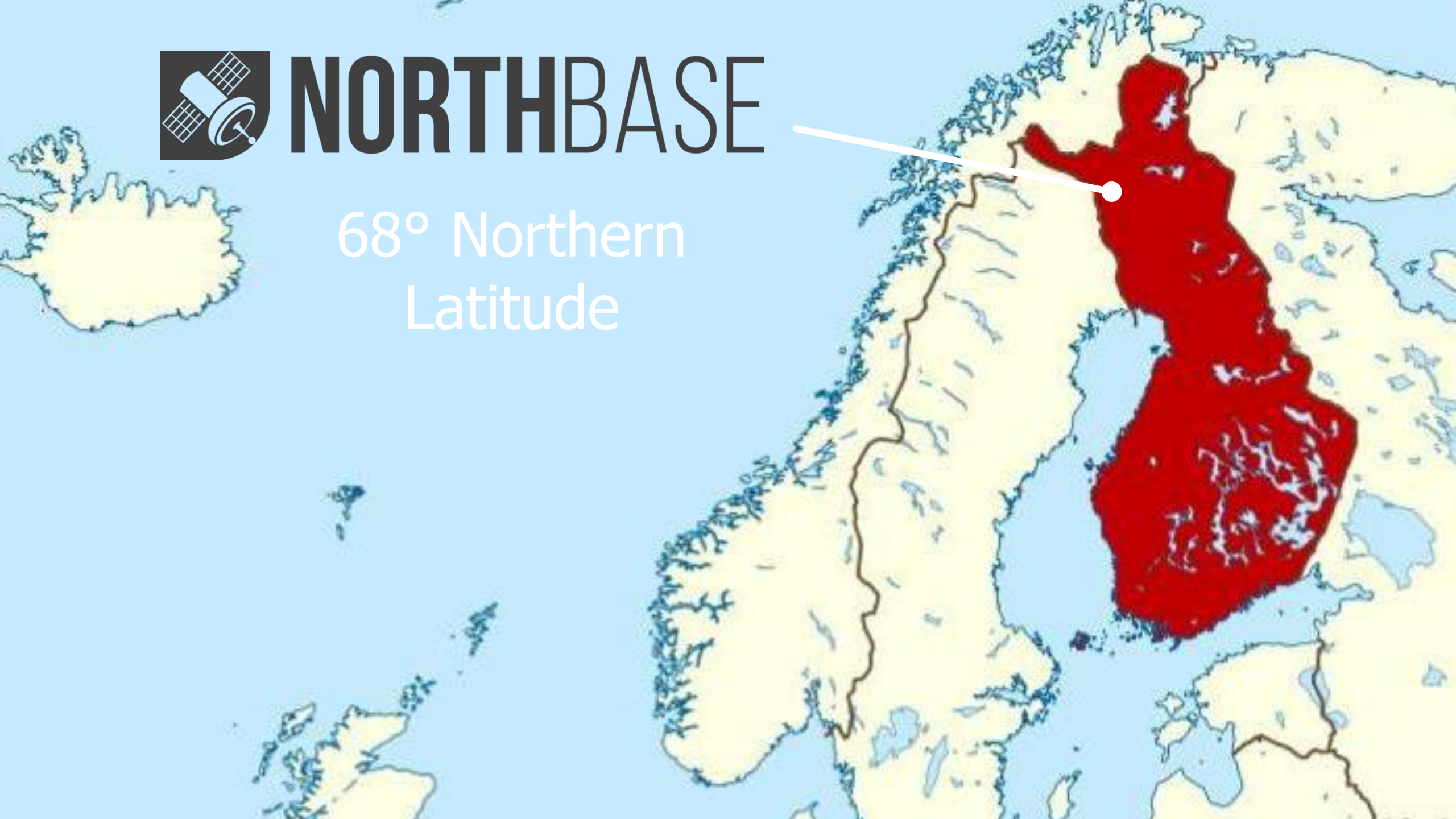
Ground Station Services for Earth-Orbit Satellites

NorthBase-1	Tampere	N61°
NorthBase-2	Muonio	N68°
NAGS Teleport		According to your needs

UHF/VHF
S/X

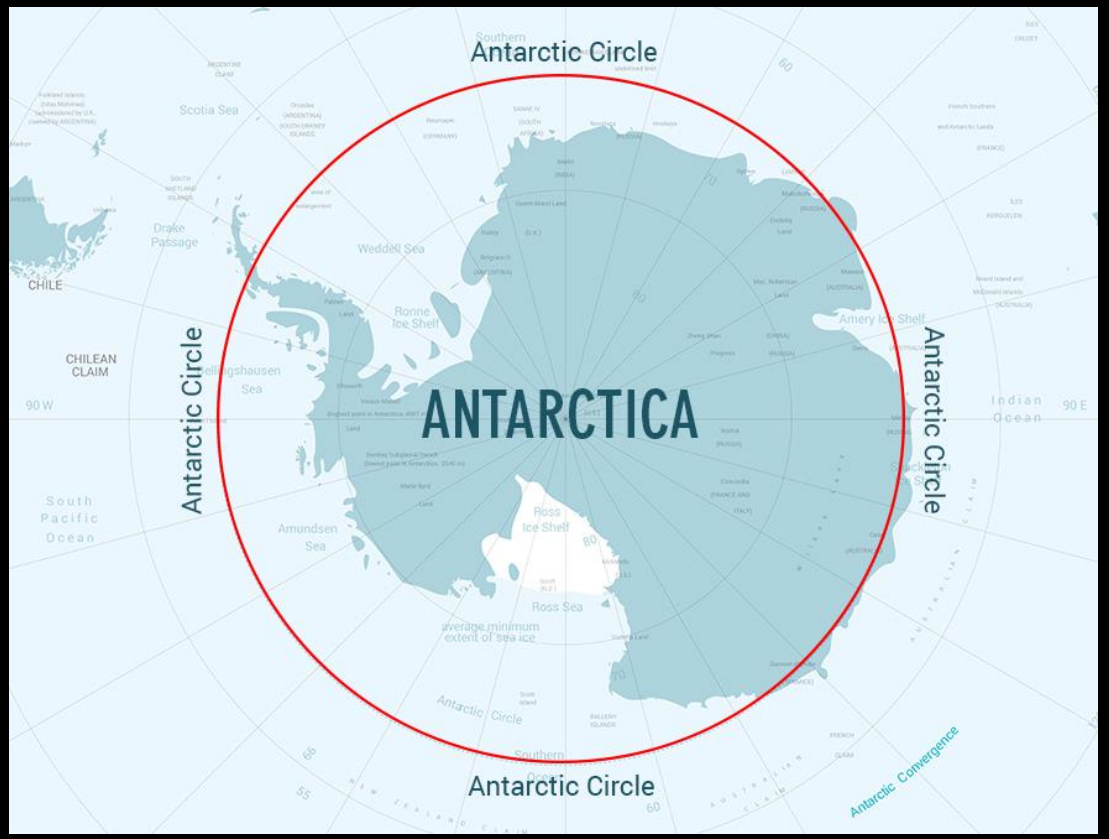
NORTHBASE

68° Northern Latitude



NORTHBASE

ARCTIC REGION AND ANTARCTICA



FINLAND

NORTHBASE OY

OUR SOLUTION

NorthBase provides satellite ground station services from 68 degrees northern latitude in Finnish Lapland. The company provides Ground Station as a Service (GSaaS) on X, S, UHF and VHF bands as well as antenna hosting services in Muonio and Tampere. We have our own assets readily at your disposal, can integrate your equipment to our stations or build a dedicated antenna for you. Connectivity is based on fibre with 5G backup connection. Global coverage is provided by network partners, extending visibility to all continents.

COMPETITIVE ADVANTAGE

- Location in Northern Lapland provides exceptional visibility especially to LEO satellites on polar orbit.
- When using GSaaS services the satellite operator does not need to invest in or maintain an own ground station network
- Finland is a stable country with great infrastructure and NorthBase is not dependent on undersea cables.
- We offer global coverage together with our partner network, from which we are able to tailor the most efficient solution for your needs.
- NorthBase is aiming for a resilient, secure and carbon-free operation independent from the grid when necessary.

COMPANY

NorthBase is a 100% Finnish owned company founded in Tampere in 2019.

Dr. Tommi Rasila, CEO
Tommi.Rasila@northbase.fi, +358 407 508 158
www.northbase.fi

NORTHBASE

NORTHBASE

RBC SIGNALS

ATLAS SPACE OPERATIONS

Infostellar

CONTEC

ITSH SPACE

GROUNDCOM

HOMEPORT

Contact:
Dr. Tech. Tommi Rasila
tommi.rasila@northbase.fi
☎ +358 407 508 158

www.northbase.fi
contact@northbase.fi
NorthBase

Oinride

OINRIDE OY TECHNOLOGIES

Together to make mining more sustainable

THE PAIN

Inaccurate
Visual inspection

Low
Productivity

400km
of tunnels to inspect

Hazardous
Poisonous gas

Limited
air supply

Unsafe
structures

12K
Active Mine globally

3.7M
Miners workforce worldwide

57K km^2
of mining land globally

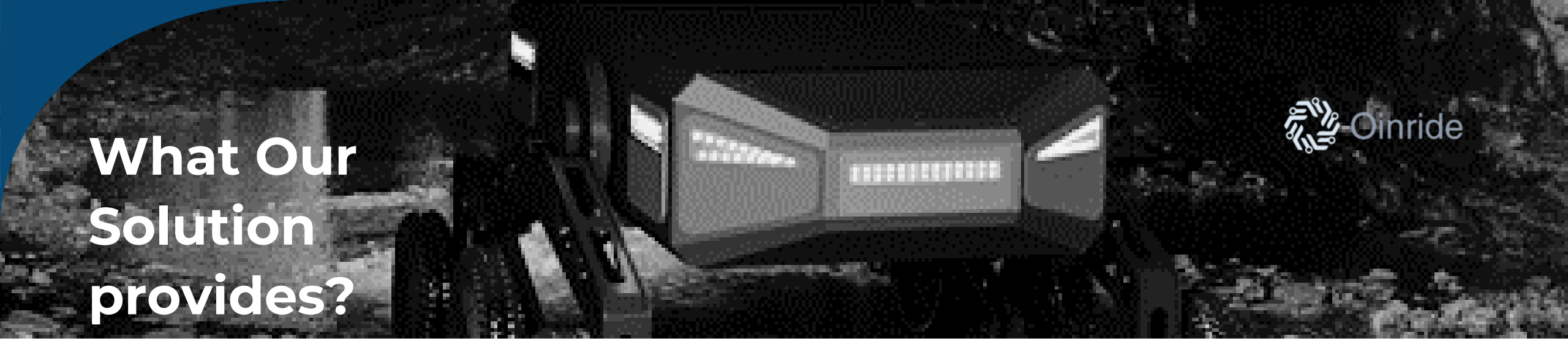
8%
CO_2 emission comes from mining

THE SOLUTION

AutoJoe® Mobile Robots

Wifi/4/5G

ControlWire® Software



What Our Solution provides?

Oinride

Traverse:
AutoJoe navigates challenging terrains, including rocky landscapes and underground environments.

Inspect:
It performs inspections post-blast in tunnels, detecting cracks and ensuring safe conditions.

Survey:
Equipped with a 3D laser scanner, AutoJoe surveys mines and tunnels, providing accurate data for mapping and assessment.

Detect:
AutoJoe identifies hazardous materials and gases, enhancing safety in mining operations.

First mining robot to utilize Galileo High Accuracy Service (HAS) for precise navigation

PRODUCT DEMO

Oinride

AutoJoe with latest Electrical system Mar 2024

Software Expert ready for work April 2024

*AutoJoe® design is patent GRANTED, reg. No 20235835

Bunker Hills Mines
Idaho, USA

I remain very grateful for the proposal you sent through and we, as a team at Bunker Hill, remain both interested and excited to partner with you on this. Fundamentally the terms of the proposed pilot project look good.

Tom Francis
General Manager
Bunker Hill Mines Ltd

Image source: cdapress.com

On November 23, 2023, Oinride c Bunker Hills mine signed a letter of Intent for a paid pilot project in 2024

BUSINESS MODEL

Oinride

€55,000
Robotic System

10%
Recurring revenue

€15,000
SW Integration/
One time fee

Growth verticals

Construction, Security & non-lethal military use, Rough Terrain applications, underground facilities in cities, and confined places, fleet management software

OUR FOUNDERS

Oinride

Ahmed Abdelazim

CEO/Co-Founder

- 20 years if experience in Automation in the US & Europe
- Five years at Sandvik Mining Automation globally
- Sales & Industry insight in Used equipments & mining
- B.Sc Electrical Engineering - Wisconsin

Ryan Beech

CTO/Co-Founder

- An MBA & successful serial entrepreneur with over 20 years of robotics experience
- Previous exit with Ryonic robotics.
- Strong sales and unique customer relations.
- Marketing, financials and team building skills

Hussein Sadek

COO/Co-Founder

- MBA, CSCP Tesla Senior management with 15 years in the Automotive Industry
- Project Management and supply chain expertise, industrial engineering, lean engineering
- Operations & Strategic analysis
- B.Sc Electrical Engineering - Mississippi

Hend Hassan

CMO/Co-Founder

- Team Leadership and Marketing Research/ 5 years of experience
- Product Development and Research
- Advertising and Social Media Management
- Translation and Language Skills (8 languages)/ 12 years of Experience
- Two Master’s degree of education Linguistics

Childhood Dreams at the Doorstep of Discovery

Oinride

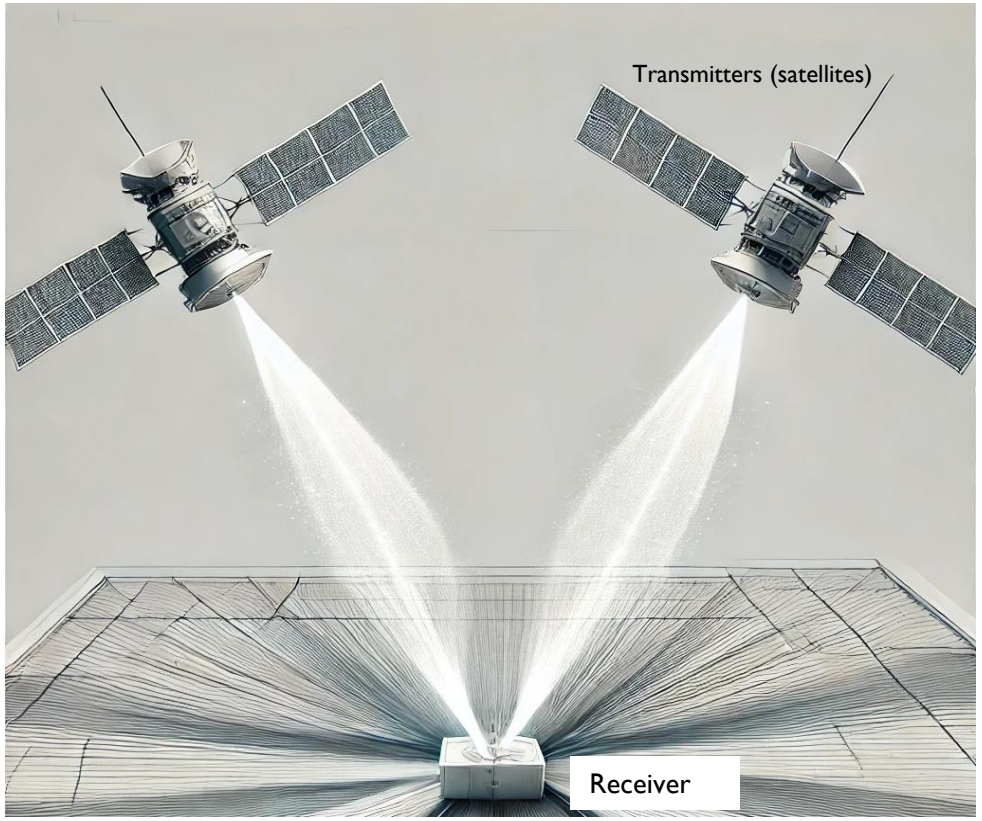
THANK YOU

Space Shuttle Discover -
Virginia Air & Space Science Center

SHARPNAV

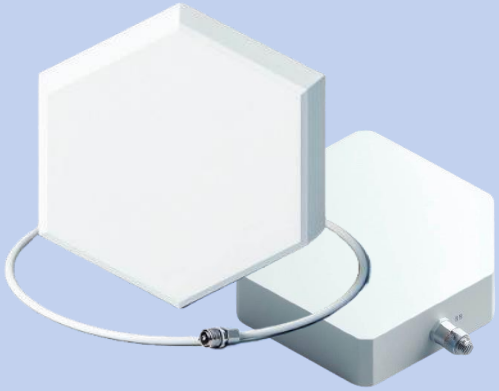
Precise navigation and timing – whatever the conditions

WE PROVIDE PRECISE NAVIGATION AND TIMING IN CONDITIONS WHERE TRADITIONAL APPROACHES FAIL



- All positioning and timing (PNT) systems have two primary components - the transmitters (satellites) and the receiver(s).
- If the signal from the transmitter does not reach the receiver due to interference, jamming or other factors, positioning and timing services become unavailable, as has been seen in Europe lately due to intentional jamming.
- Interference is not only intentional. The weak GNSS signals don't reach indoors or through thick foliage due to natural obstruction.
- **At Sharpnav we're fixing both ends by providing solutions for better reception and transmission.** This allows for precise PNT services in conditions and locations typically out of reach for GNSS or similar solutions.

SHARPNAV TACKLES THE CHALLENGE ON TWO FRONTS, FORMING A COMPLETE PNT ECOSYSTEM



SDR-enabled navigation engine

Better reception & integrability

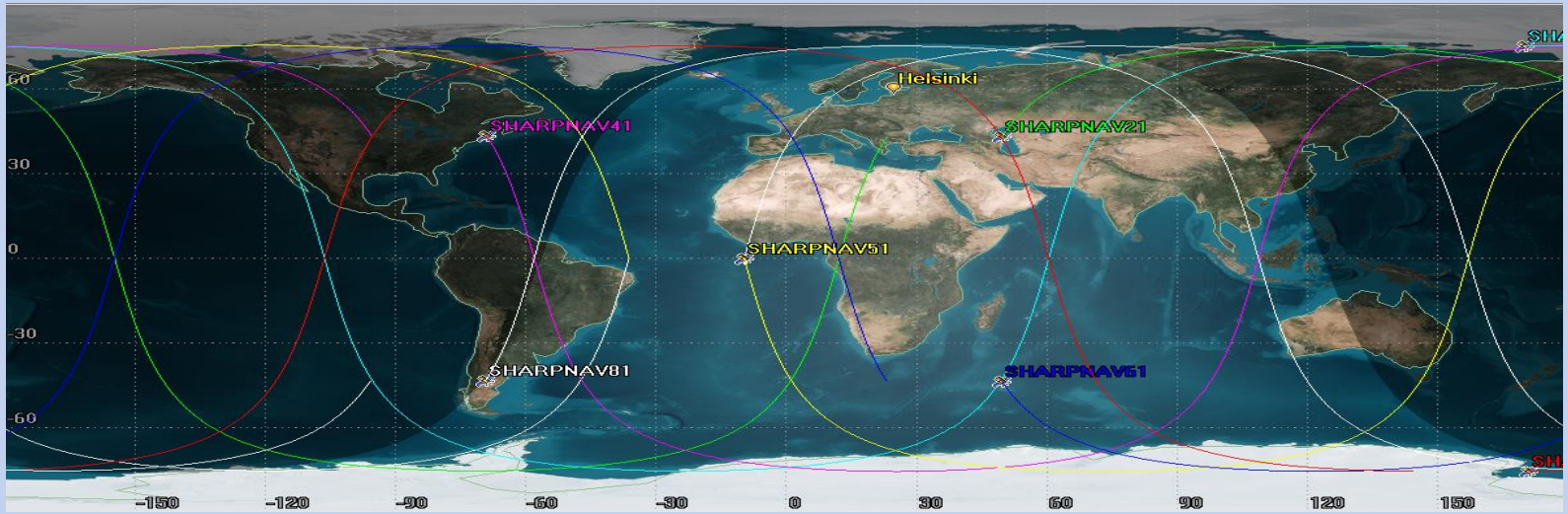
Our SDR-based (software defined radio) navigation engine approach allows for receiving traditional, weak GNSS and other constellation signals (e.g. Galileo, GPS, Starlink, OneWeb, Kuiper) more accurately in challenging conditions, providing accurate PNT services when traditional solutions fail. The solution also provides native support for future, not yet existing low earth orbit (LEO) constellations and terrestrial based signals. Overall, the solution utilises the existing infrastructure to its full potential, while leaving room for future development.

LEO-PNT constellation

Better transition & PNT ecosystem

Our future LEO-PNT satellite constellation will revolutionise global navigation and timing services. Our 320 dedicated PNT satellites orbiting at a low altitude of 800km will provide global coverage, high precision, low latency and un-matched signal strength for all PNT needs, even in the most challenging conditions. Compared to the current PNT constellations consisting of a few dozen satellites orbiting at an altitude of more than 20 000km, the LEO-PNT approach provides unmatched signal strength, operational reliability and resistance to adverse effects.

OUR LEO-PNT CONSTELLATION WILL PROVIDE ACCURATE, INTERFERENCE-FREE PNT SIGNALS FOR ALL NEEDS



Core Technology

- LEO-based PNT constellation for high-precision, jam-resistant navigation
- Multi-frequency, multi-constellation compatibility (GPS, Galileo, BeiDou, GLONASS, QZSS)
- AI-driven anti-spoofing & anti-jamming for secure, resilient positioning
- Inter-satellite laser links (ISL) for fast, accurate orbit-based timing
- AI & cloud Integration: Real-time data fusion & adaptive signal correction

Key Features

- A dedicated PNT constellation on a low earth orbit
- Sub-10 cm positioning accuracy in challenging conditions – enhanced over traditional GNSS
- Resilient in GNSS-denied environments – works in urban canyons, underground & contested zones
- Global secure timing source – precision for e.g. financial & energy sectors
- High-update rate (10-100x GNSS) – low-latency navigation for autonomous systems & defence
- Dual-use capability – commercial & military applications with encryption options

Use Cases

- Defense & security: anti-spoofing PNT for military, UAVS, and secure ops
- autonomous vehicles & drones: reliable navigation in GNSS-challenged areas
- Aerospace & telecom: secure synchronization for 5G, 6G, and satellite networks
- Financial & energy infrastructure: secure timing for trading, power grids, and critical operations

TARGET MARKETS & GO-TO-MARKET STRATEGY

Targeted market segments

Segment	Service Type	Pricing Model	Example Customers
Government (B2G)	Secure PNT Services & Data	Subscription / Contract	Defence ministries, security agencies
Enterprise (B2B)	SaaS-Based LEO-GNSS	Per device/user pricing	Automotive, telecom, drone manufacturers
Enterprise (B2B)	GNSS Licensing	One-time & royalties	Semiconductor firms, IoT integrators
Enterprise (B2B)	Precision GNSS	Pay-per-use	Surveying, agriculture, logistics
Consumer (B2C)	Future Direct GNSS Services	Monthly subscription	High-accuracy navigation users

Go-to-market & timeline

Our go-to-market plan is centered around an **Europea-first approach with a clear roadmap for global expansion**. We are engaged in early-stage discussions with **government agencies, defense forces, telecom firms, and precision agriculture companies** to gain an initial user-base.

Market Entry Plan

Industry Focus:

- 2025–2026: Defense, Aviation and Drones, Agriculture, Forestry.
- 2026–2027: Smart Mobility, Critical Infrastructure.
- 2028+: Consumer Solutions.

Revenue Timeline:

- 2025–2026: Pilot projects generate initial B2G & telecom revenues.
- 2027: Full-scale SaaS & Licensing commercialization.

Regulatory Roadmap:

- 2025–2026: Secure GNSS & Satellite Licensing from EU space agencies & telecom regulators.
- 2026–2027: Obtaining military-grade certifications.
- 2028+: Expand to global regulatory compliance.

SHARPNAV

esa BUSINESS INCUBATION CENTRE Finland

HIGH-LEVEL ROADMAP

2025

- ESA BIC incubation
- SDR Prototype with < 1 m accuracy
- LEO-PNT Design
- Market study
- 4 M€ seed funding

2026

- ESA BIC continues
- SDR Production & ~10 cm accuracy
- LEO-PNT prototype and launch to orbit
- Strategic partnerships
- Series A funding

2027

- Commercialization of SDR solutions
- Satellite production
- Required licences & permits
- Beginning of continuous satellite launches and operations

2028

- Launches continue
- Initial operational capability of the LEO-PNT constellation
- LEO-PNT services available in 3 regions
- Series B funding

2029

- Fully operational global LEO-PNT constellation
- Global leadership in LEO navigation solutions

CORE TEAM

Mikko Punnala

Strategy lead & board chairman

Retired colonel (GS) of the Finnish Air Force and doctoral researcher at the University of Vaasa, bringing over 30 years of expertise in air and space industry procurement and strategic development

Eldrige de Melo

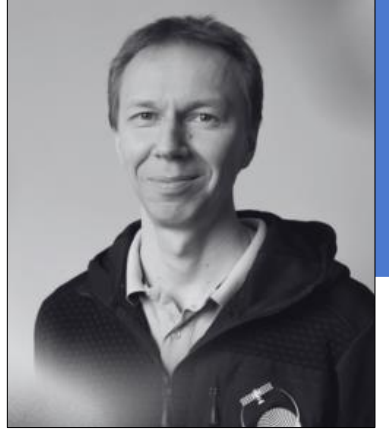
Space lead

Doctoral researcher at the University of Vaasa with over 10 years of work experience in the space industry developing products and making them market fit.

Santeri Punnala

Business & product lead

Background in management consulting and product management.
M.S.c in business administration and a doctoral researcher at the University of Vaasa with a strong focus in economics, finance, AI and data analysis.



Jaakko Yliaho

PNT lead

Lab engineer and doctoral researcher at University of Vaasa with a research focus on opportunistic positioning. Experienced in electronics, cyber security, networks and embedded systems.

Combined over 50 years of experience in aerospace & business

Thank you for your interest

SHARPNAV