



AGANITHA SPACE TECHNOLOGIES PVT LTD

DGGS-native edge AI for Earth Intelligence and orbital operations

Atmanetra

DGGS-Native Edge AI for On-Orbit RSO Detection and Secondary SSA

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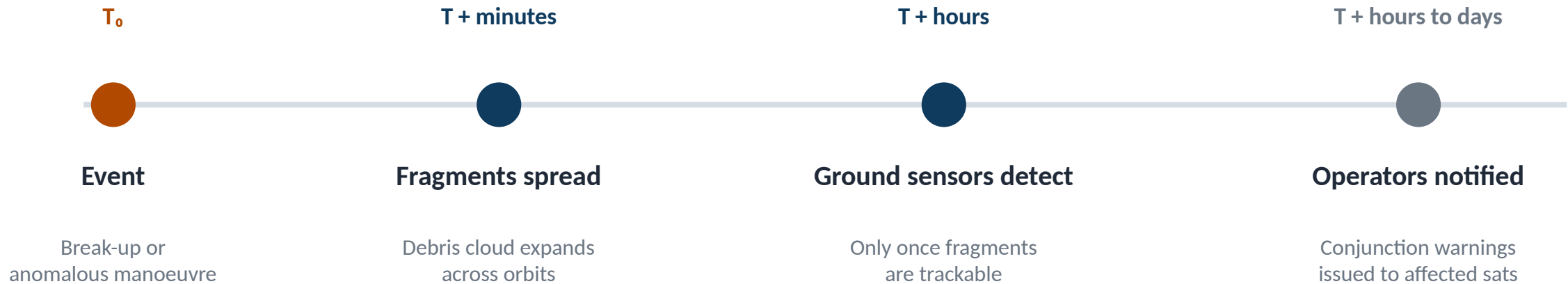
Founder & CEO, Aganitha Space Technologies Pvt Ltd

Zero Debris Charter signatory • PWG-2 Post-Mission Disposal Timelines • Solar Impulse Efficient Solution (Jan 2026)

IEEE P4011 WG • GRSS InGARSS 2026 TPC • OGC Explorer Member • ITU U4SSC WG8 • Moon Village Association

The gap

Ground SSA sees a breakup or proximity event only after fragments have propagated into trackable orbits.



The debris field grows during this window. **Every fragment that spreads before detection is one the operator did not get to react to.**

System architecture — L1 to L5



Every inter-layer interface is a published OGC open standard. Onboard indexing carries through to the ground datacube.

Layer	What happens · Technology	Location	Standard
L1	Acquisition Event-based neuromorphic vision (DAVIS / DVX / EVK4); optical / SAR payload	Onboard	ISO 19101 OGC SensorML
L2	Onboard AI DGGs indexing → CNN feature extraction → cell-level anomaly scoring → KG reasoning (Overture GERS)	Onboard	ISO 19170-1 OGC API-DGGs 2025
L3	Downlink Prioritised ARD and structured observations via FROST-Server / pygeoapi	Space ↔ Ground	OGC STA 1.1 STAC
L4	Datacube Time-series coverage; natural-language querying via MCP agent over Rasdaman	Ground	OGC WCS 2.0 OGC WCPS
L5	Apps Operator dashboards, EDR PubSub alerts, citizen viewer	Ground	OGC API-EDR PubSub

ATMANETRA — The Atmanetra module lives at L2. It closes the ground-loop latency by moving detection and reasoning onboard, while keeping every downstream interface OGC-compliant.

Why DGGS-native

The addressing scheme decides what the onboard AI can do with what it sees.

Discrete Global Grid System

ISO 19170-1 · OGC API-DGGS 2025

Earth partitioned into a hierarchy of equal-area cells. Every cell has a permanent identifier at every resolution.

From the OGC AI-DGGS Pilot 2025:

"DGGS cells are to geospatial AI what tokens are to language models."

1

Onboard indexing

Cells are the unit of inference. Only relevant cells run through the model. Downlink is priority-scored per cell.

2

Interoperability

Same DGGS addressing as ground systems. No reprojection at downlink. Directly consumable by ISRO, NDMA, Copernicus, NOAA.

3

Entity linking

Cells resolve to Overture GERS IDs onboard. An anomaly becomes "which facility, in which jurisdiction" — not "at coordinates X."

Where we are — TRL 4



Atmanetra is the orbital module of Anvikṣaṇa, our DGGs-native Earth Intelligence platform. Event-based RSO detector, flight-target stack on Jetson AGX Orin.

< 1 ms

PER-WINDOW LATENCY

RSO detection on
neuromorphic event stream

Jetson

FLIGHT-TARGET COMPUTE

NVIDIA AGX Orin as
satellite compute surrogate

3

SENSOR FAMILIES

DAVIS, DVX, EVK4
validated in bench

TRL 4

TODAY

Target TRL 6
by M12 (simulated orbital)

DETECTOR

Self-contained event-based RSO detector, validated across DAVIS, DVX, and EVK4 sensor sequences. Sub-millisecond per-window latency.

STACK

DGGs indexing module · Edge AI models (compressed for edge deployment) · Mission reasoning KG (Overture GERS) · Ground stack (STA / STAC / Rasdaman-MCP)

Alignment with the field



Not ahead of the field. In the field, building on foundations the standards community validated in 2025.

OGC Testbed-21 (2025)

Sponsors: CNES, ESA, USGS, NRCan

Threads Atmanetra builds on:

AI for Geoinformatics · Analysis Ready Data · **Space Situational Awareness** · New Space · GEOINT Imagery

OGC OSPD 2026

Open Science Persistent Demonstrator

Aganitha is an in-kind participant on the **D100 Workflow Profiler**. Our reference implementation runs inside the persistent OGC demonstrator that ESA and partners use to evaluate open-science workflows.

The cost argument

SSA is a secondary function of a payload flown for another purpose.

The primary mission — Earth intelligence, disaster response, GHG monitoring — pays for the bus and the payload.

Atmanetra's reasoning engine adds RSO detection at negligible marginal cost.

An emerging space nation can contribute to SSA this way, without waiting a decade for a dedicated tracker constellation.

Path to TRL 6 — and the ask



Where we are going, and who we want to talk to at ZDW to get there.



THE ASK

1 Mission hosts

Satellite operators or platform providers willing to host an edge-AI payload for on-orbit demonstration.

2 SSA data-sharing

ESA / EU SST / national SSA operators willing to define an ingest interface for onboard-generated RSO observations.

3 PMD verification

Collaborators on making post-mission disposal compliance observable and evidenced, not self-declared.

Find me at the B2B session on 11 September nsnarayanam@aganithaspace.com · aganithaspace.com

Credentials, partnerships, standards

The community and standards context behind Atmanetra and Aganitha Space Technologies.

COMPANY



COMMUNITY & RECOGNITION



IN-SPACe



Solar Impulse (Jan 2026)



Moon Village Association



UN CEO Water Mandate



CleanTech Accelerator

STANDARDS BODIES



OGC Explorer Member



W3C WoT WG



ITU U4SSC

CREDITS, TOOLS & ACADEMIC PARTNERS



Google for Startups (credits)



MATLAB (credits)

sarvam.ai

Sarvam AI (credits)



IIT Bombay CSRE