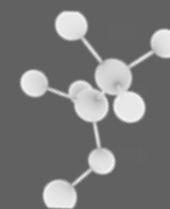


Matter Intelligence

Matter Intelligence's Chemical Intelligence

Closing the Intelligence Gap in Modern ISR



Matter Intelligence Provides Molecular Intelligence



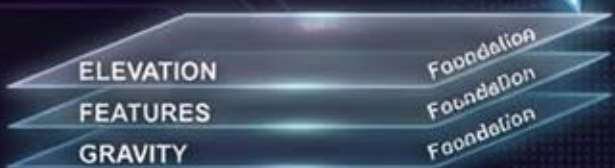
Matter Intelligence



Common Operation Picture (COP)



Matter Intel Molecular Layer



Matter Intelligence adds a molecular layer to ISR, showing what objects are made of and what condition they are in—not just how they look—so analysts can better detect deception, assess activity, and make faster, more confident decisions.



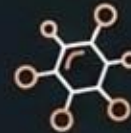
Matter Intelligence for Defence & Intelligence

Matter Intelligence Provide a New Layer in ISA-Chemical Intelligence (Ultraspectral)

Core Shift

From shape/ structure/ emissions-focused ISR to **physics-based intelligence** that infers **composition, state, activity, and likely next actions.** →

What Ultraspectral adds



Material composition



Chemical state and emissions



Thermal status and activity



Multi-modal fusion in one collection pass

Why Ultraspectral Matters in Modern ISR

Closing the intelligence gap left by EO, SAR, SIGINT



Matter Intelligence



Matter Intelligence captures **2,100+ spectral datapoints per pixel** and fuses visible, thermal, ultraspectral, video, and 3D shape into a **co-registered collection event**.

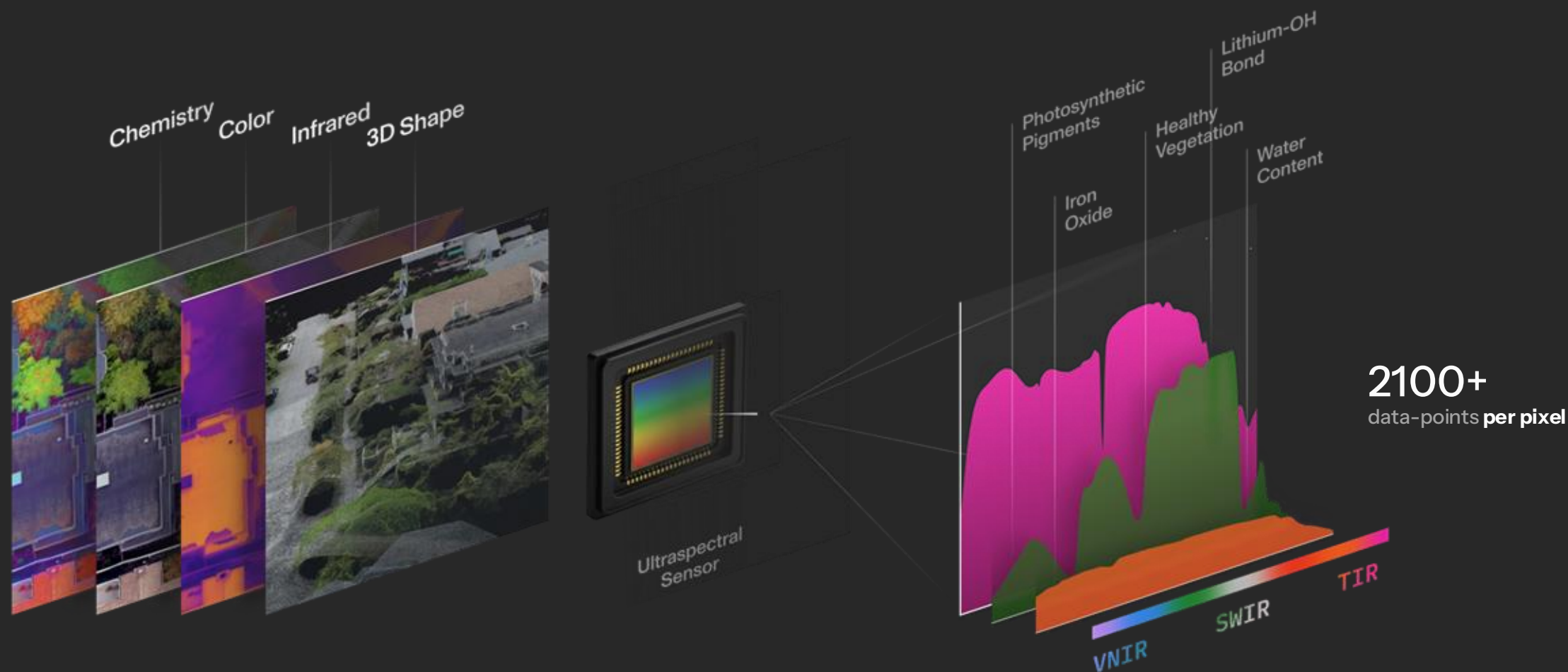
Result: analysts move from “what is present?” to “**what is it actually, what is it doing, what changed, and what is likely next?**”

From *Visual* to *Compositional* Intelligence

Every Pixel Becomes a Lab Test



Matter Intelligence



Superhuman vision for remote sensing and robotics.

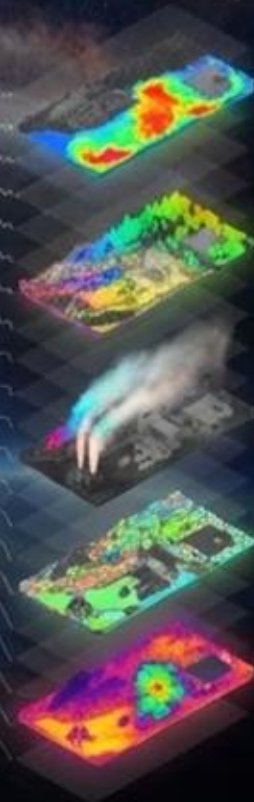
Matter enables Molecular-level measurement on a global scale



Matter Intelligence

Ultraspectral • Visible • Thermal •
Video • 3D Shape

MOLECULAR SIGNATURES



Coastal Anomalies

Ecology and Vegetation

Greenhouse Gases

Natural & Artificial
Materials

Thermal Properties







Operational Workflow and Deployment Concept

How Matter Intelligence is intended to fit into sovereign and operational ISR workflows



Key operating model features

-  AOI requests, to employ the location of Matter ISR identity
-  Search, detection, to notify behaviour more night tolex change
-  Preferred downlink, to enable secure edge solvements and coats
-  Outputs can feed outputs to alrcn, cloud and neuncting networks




Latency target

**15 minutes
to 1 hour**

Supporting home ones 15 minutes to x and operational ISR workflows



Secure ConOps: Onboard Processing and Downlink

 **Latency:** Depends on preferred downlink locations, geometries and constellation size. (15 mins to 1 hour)

Spacecraft compute performs Search, Detection, and Characterization onboard.

Satellite processes and prioritizes captures onboard without need for communication outside the edge.



AOI request is sent directly to spacecraft from edge terminals.






Downlink directly through preferred ground stations for additional processing and inference at the edge.

Secure and Sovereign Environment for:

-  Tasking
-  Downlink
-  Processing
-  Inference
-  Exploitation

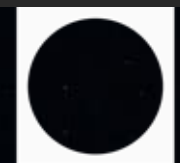
Edge-optimized Spectral ML



Spectral Detection and Classification	Task Description	Speed on AGX Orin [objective speed in (s)]	Use Case Examples
 Spectral Detection and Classification	Classify every pixel based on a repository of reference spectra	<180s for MLP, uncharacterized for autoencoder (<240s)	<ul style="list-style-type: none">• Identify and geolocate hundreds of materials (minerals, vegetation, artificial materials) at pixel-level.
 Spectral Search	Identify and geolocate specific materials based on known spectra	60s (<120s)	<ul style="list-style-type: none">• Find specific materials (e.g., multispectral camouflage nets)
 Spectral Anomaly Detection	Detect and geolocate unusual spectral signatures that deviate from expected patterns	<30s (<60s)	<ul style="list-style-type: none">• Flag unexpected or unusual materials in a scene for further investigation
 Spectral Gas Detection	Detect, localize, and quantify gas emissions using calibrated spectral signatures	<60s (<120s)	<ul style="list-style-type: none">• Identify gas plumes for more than 50 gas species; quantify column density; localize sources
 Spectral Unmixing	Model subpixel abundances by decomposing mixed pixels into constituent endmember spectra	<60s (<120s)	<ul style="list-style-type: none">• Determine fractional abundances of materials within a mixed pixel (e.g., critical mineral resource exploration)








Intelligent Flight Software

Highest Rate-Of-Gain Scheduling For Satellite Constellations







Matter Intelligence

Today's Challenges

-  **Unpredictable scheduling:** Difficulty determining when to schedule collect.
-  **Lack of external information:** Failure to adapt to off-nominal conditions like clouds.
-  **Poor communication:** Limited updates on collection delays.
-  **Inefficiency:** Loss of capacity due to underutilized resources.
-  **Target awareness:** Cannot account for external dependencies.
-  **Prioritization:** Most or all jobs treated equally.
-  **Storage and processing:** Failure to consider storage and onboard process impacts to future collects.

Matter

-  **Storage- and processing-aware scheduling:** Optimize based on future targets, upcoming downlink opportunities, and onboard storage and processing.
-  **Multi-job processing:** Use advanced computing resources to process multiple collects simultaneously.
-  **Real-time scheduling:** Immediate assessment of customer requests with flexible scheduling.
-  **Fleet optimization:** Select best asset for task, including flexibility for disruption.
-  **Automated revisits:** Identify and retask based on cloud coverage.

Priority Defence and Intelligence Use Cases



Counter-deception

Detect camouflage, spoofing, decoys, and concealed assets using material inconsistencies rather than visual appearance.

ATR + target status

Combine shape, composition, and temperature to classify platforms and infer readiness, occupancy, or recent activity.

Battle damage assessment

Identify soot, hydrocarbons, explosive residue, and thermal evidence to improve post-strike assessment.

Pattern-of-life intelligence

Track deviations in emissions, energy use, heat, or surface composition even when movement is limited or absent.

Maritime intelligence

Classify non-cooperative vessels, detect illicit cargo indicators, and support littoral / shallow-water awareness.

CBRNE / WMD monitoring

Detect precursor chemicals, hazardous gases, uranium-bearing ores, and anomalous emissions over wide areas.

Use-case matrix by mission area



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Land ISR

HIGH

Representative use case:	Camouflage defeat, hidden vehicles, battle damage, explosive residue
Primary Chemical signal:	Material signatures, thermal activity, residues
Operational effect:	Higher-confidence detection and status assessment



Air / strategic ISR

HIGH

Representative use case:	Aircraft readiness, plume characterization, facility activity
Primary Chemical signal:	Heat, emissions, spectral composition
Operational effect:	Readiness and intent indicators



Maritime

HIGH

Representative use case:	Dark vessel classification, cargo inference, littoral awareness
Primary Chemical signal:	Hull / coating composition, thermal, bathymetry
Operational effect:	Better MDA and grey-zone visibility



CBRNE

HIGH

Representative use case:	Gas detection, precursor monitoring, uranium-related materials
Primary Chemical signal:	Chemical and mineral spectral matches
Operational effect:	Wide-area early warning and treaty support



Logistics

MEDIUM

Representative use case:	Fuel identification, material degradation, supply monitoring
Primary Chemical signal:	Hydrocarbon and material composition
Operational effect:	Supply-chain transparency and sustainment insight



Infrastructure

MEDIUM

Representative use case:	Corrosion, thermal anomaly, industrial emissions
Primary Chemical signal:	Material change, heat, gas leakage
Operational effect:	Resilience and sabotage warning

Same Stack, Flexible Deployment: **EARTH-A Program**



Matter Intelligence

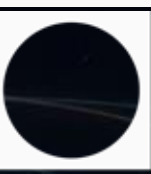


Launching Summer 2026:

- Aerial platform to prove stack and deliver immediate value for regional use cases;
- EARTH-1A airborne flights over USA summer 2026;
- For partners abroad: define relevant AOI types for use case validation ahead of the orbital platform launch

A Flexible Deployment Model

- Same sensor, electronics, and software stack as our orbital platforms;
- Faster deployment and targeted tasking ideal for some use cases;
- Likely possible to get export exemptions if Matter maintains ops.



Matter Intelligence Integrated Timeline

Single-slide consolidation of the three roadmap views

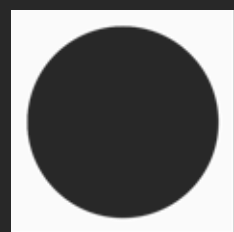
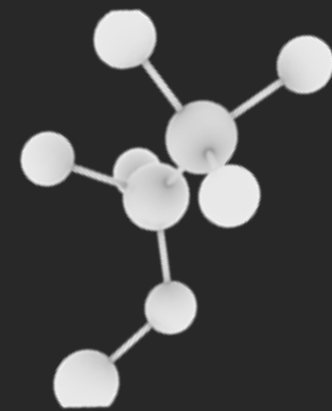
	H1-26	H2-26	H2-27	H1-28	H2-28	2029+
Platforms/ Hardware	<ul style="list-style-type: none"> Orbital entry Data compute 	<ul style="list-style-type: none"> Orbital entry Geospatial compute chips 	<ul style="list-style-type: none"> Orbital entry Ehole validation 	<ul style="list-style-type: none"> Software networks Dost technology 	<ul style="list-style-type: none"> New estential milestones Full-stack evaluation 	<ul style="list-style-type: none"> Large geospatial models Large geospatial models
Models/ Software	<ul style="list-style-type: none"> Foundational models 	<ul style="list-style-type: none"> Foundational models 	<ul style="list-style-type: none"> Foundational models Foundational models 	<ul style="list-style-type: none"> Foundational models 	<ul style="list-style-type: none"> Foundational models Meta data 	<ul style="list-style-type: none"> Foundational models Large geospatial models
Business/ GTM	<ul style="list-style-type: none"> Partnerships 	<ul style="list-style-type: none"> Partnerships mattners 	<ul style="list-style-type: none"> Partnerships Compute physical models 	<ul style="list-style-type: none"> Partnerships Business / GTM procedors 	<ul style="list-style-type: none"> Partnerships Physical world partners 	<ul style="list-style-type: none"> Partnerships benefits Physical worlt's intelligences

Integrated view: airborne validation → orbital constellation → full-stack physical world intelligence platform

The evolution of geoint

We've rebuilt the stack:
new chips, new models for
compute, **new intelligence**





**Matter
Intelligence**