ATLANT 3D®

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AUTONOMOUS MATERIALS FOUNDRY

A-HUB

Providing a Physical AI platform and infrastructure for materials discovery, device prototyping, and scalable manufacturing for advanced industries.

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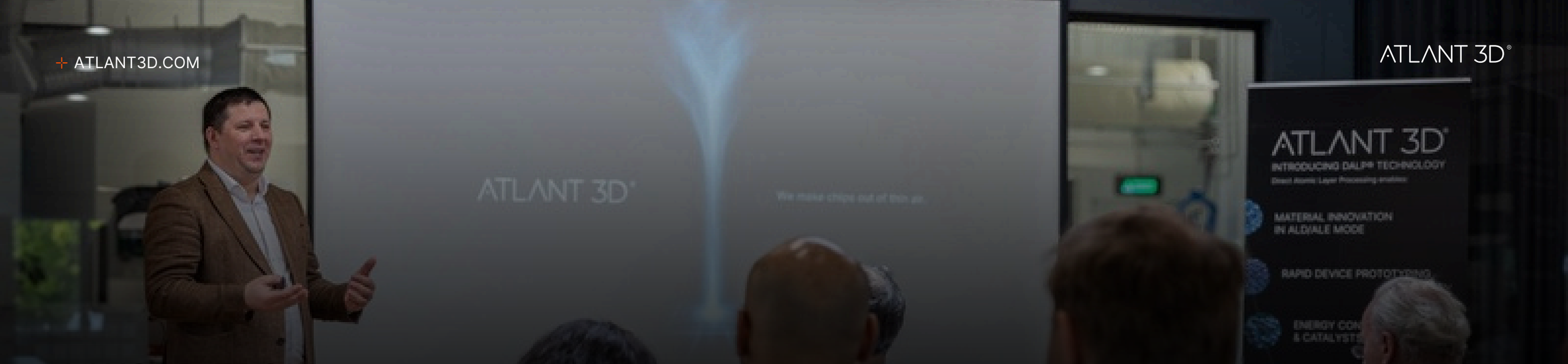


A WORD FROM OUR FOUNDER AND CEO

At ATLANT 3D, we believe the next industrial era will be defined not only by what AI can design, but by what humanity can physically create from those designs. We are connecting AI with the physical world at the atomic scale to enable the next leap in materials and technology innovation.

AI is generating new materials and device concepts at extraordinary speed, yet physical fabrication, validation, and industrial scale-up remain slow and fragmented. A-HUB was created to close this gap.

A-HUB combines ATLANT 3D's proprietary DALP® technology, NANOFABRICATOR® systems, integrated metrology, process intelligence, secure data infrastructure, and expertise in one connected environment. It enables researchers, companies, and nations to move from AI-generated concepts to validated materials, functional devices, and transferable manufacturing processes.

More than an advanced facility, A-HUB is a collaborative innovation ecosystem and deployable sovereign capability, enabling partners to develop and protect critical materials, process knowledge, data, and IP locally while benefiting from a broader network of expertise and learning.

Our mission is to revolutionize materials discovery, with the ultimate goal of enabling humanity to accelerate new technologies for a better life on Earth and beyond.

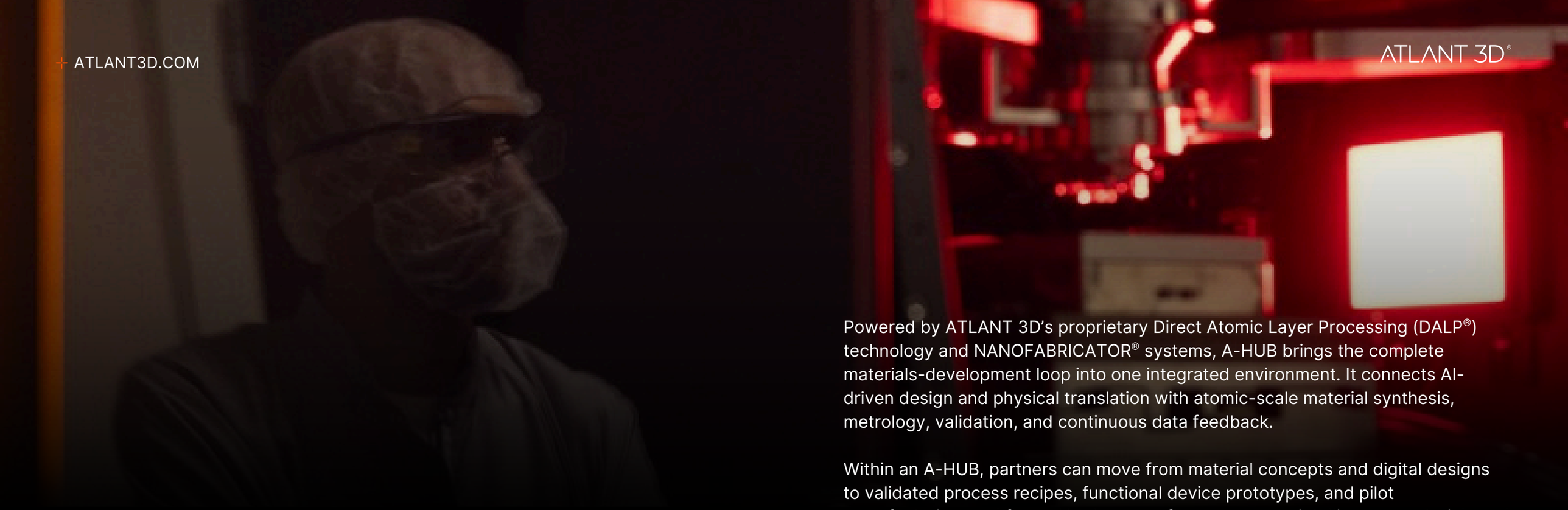
Our vision is to create a world transformed by limitless materials and technology innovation.

A-HUB is a strategic part of delivering our mission and vision, enabling new opportunities and breakthroughs across semiconductors, photonics, quantum technologies, energy, sensing, aerospace, and other critical industries.

The future of AI cannot remain only digital. It must be able to make, test, learn, and improve in the physical world.

A-HUB is where that future becomes real. Atom by Atom®.

Dr. Maksym Plakhotnyuk
CEO & Founder



A-HUB: SOVEREIGN AI-TO-MATTER INFRASTRUCTURE

Deployable Physical AI infrastructure for materials discovery, device development, and advanced manufacturing.

A-HUB is ATLANT 3D's deployable sovereign infrastructure for Physical AI, the physical execution and verification layer that transforms AI-designed materials into validated processes, functional devices, and industrial capabilities.

Powered by ATLANT 3D's proprietary Direct Atomic Layer Processing (DALP®) technology and NANOFABRICATOR® systems, A-HUB brings the complete materials-development loop into one integrated environment. It connects AI-driven design and physical translation with atomic-scale material synthesis, metrology, validation, and continuous data feedback.

Within an A-HUB, partners can move from material concepts and digital designs to validated process recipes, functional device prototypes, and pilot manufacturing workflows. Hardware, software, process intelligence, materials and process IP, characterization, and expert foundry capabilities operate as one coordinated platform, accelerating the journey from discovery to industrial deployment.

Designed for governments, research institutions, and industrial ecosystems, A-HUB enables locally controlled development of critical materials, processes, devices, data, and intellectual property. Each A-HUB can be configured around strategic priorities while strengthening domestic manufacturing capability, supply-chain resilience, and technological sovereignty.

From AI design to sovereign industrial capability, within one integrated platform.

PARTNERS & CUSTOMERS

SONY · NASA · MERCK · esa · SAL Silicon Austria Labs · FAU Friedrich-Alexander-Universität Erlangen-Nürnberg · ThalesAlenia Space · SIEMENS · University of Vermont · NUS National University of Singapore · Slovenská akadémia vied

OUR PROPRIETARY TECHNOLOGY

Bridging digital intelligence and industrial fabrication to enable AI-driven materials discovery, process development and integration into scalable production.

DALP® Technology

DALP® enables direct, localized atomic-scale material processing by positioning a micronozzle at a controlled working distance above a moving substrate.

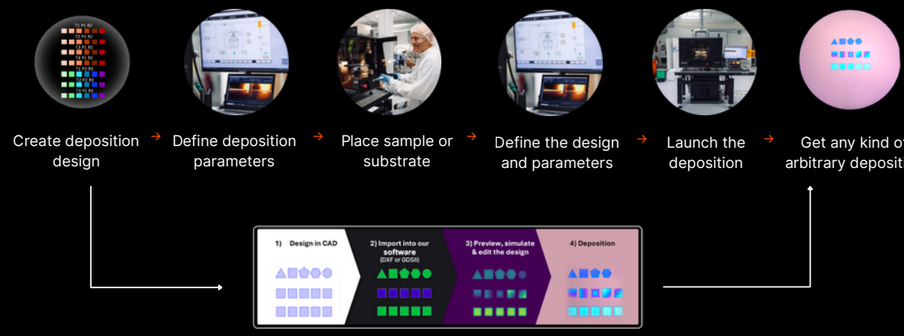
ATLANT 3D's proprietary Direct Atomic Layer Processing (DALP®) platform technology supports precise deposition and etching of multiple materials, reducing reliance on conventional batch-based fabrication workflows and enabling software-defined manufacturing at the atomic scale.

> "As a scientist, I believe the future of innovation depends on our ability to discover, develop, and manufacture new materials faster and more precisely than ever before. At ATLANT 3D, we are building the platform that allows researchers and engineers to develop advanced materials and devices with atomic-scale precision, accelerating the transition from R&D to industrial impact.

Dr. Mira Baraket
Chief Technology Officer

End-to-End Material Workflow

A seamless process from digital design to physical fabrication, enabling rapid iteration and scalable production.



Why it Matters

- Accelerates materials innovation **from years to days**
- Accelerates device prototyping and industrial integration
- Enables a direct transition from **lab to fab**
- Reduces reliance on complex global supply chains
- Supports more **sustainable** and l**ocalized manufacturing**

Key Advantages

- ✓ Direct-write patterning at micron scale
- ✓ Localized ALD, ALE, and MLD processes
- ✓ No photoresist, masks or etching
- ✓ Multi-material deposition in a single workflow
- ✓ Reduced process steps and tool transfers

OUR PLATFORM

Lab-to-fab and fab-in-lab: one platform for materials discovery, process development, and device solutions.

ACCELERATE MATERIALS & PROCESS INNOVATION

MATERIALS
- Test 450+ Materials
- Discover New Materials
- Material Development

PROCESS
- Material Stack Optimization
- Process Development

ENABLE RAPID DEVICE PROTOTYPING

STRUCTURES
- Localized Coatings
- Flexible, Lithography-free Pattern and Structure Prototyping
- AI-driven Geometry Development and Optimization

DEVICES
- Rapid Device Prototyping
- Multi-material / Multi-stack Devices
- Sensitive Materials and Substrates

SCALABLE WITH OUR DIGITAL MANUFACTURING PLATFORM

SYSTEMS
- Cross-integrated devices and arrays
- AI-driven Device Processing
- Chip Surgery

APPLICATIONS
- Enables Versatile and Scalable Applications
- Cross-platform Integration
- Compatible with Industry Standards and Reduces Manufacturing Costs

NANOFABRICATOR® ZERO-G

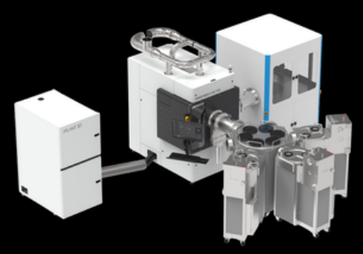
Our DALP®-enabled platform for in-space microfabrication and advanced prototyping.

NANOFABRICATOR® LITE

Our benchtop DALP®-enabled platform for material, process, and device R&D.

NANOFABRICATOR® PRO

Our DALP®-enabled platform for industrial R&D and pilot production.



NANOFABRICATOR® PRO: CLUSTER-INTEGRATED

Our DALP®-enabled platform for industrial fabrication, process lines and high-throughput production.

INTRODUCING A-HUB

A-HUB is ATLANT 3D's integrated materials innovation foundry—combining AI-driven discovery, programmable fabrication, metrology, process intelligence, and pilot capabilities in one environment.

It provides the physical and digital infrastructure to move from material concepts to validated materials, devices, and manufacturing processes, without requiring partners to build the complete capability themselves.

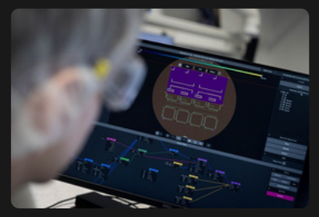
A-HUB'S INTEGRATED AI-TO-MATTER PLATFORM

01

AI/ML MATERIALS INTELLIGENCE

Model-agnostic platform defining target properties, constraints, and success criteria

02



A-COMPILER

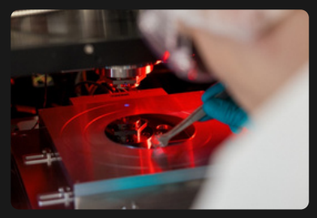
Material and device objectives are translated into executable workflows (recipes, machine state, patterns)

03

NANOFABRICATOR® SYSTEMS

Deployable platform from materials innovation to industrial integration powered by DALP® technology

04



METROLOGY & TESTING

Experimental validation and measurement of structures, properties, and device outcomes

A MATERIALS INNOVATION FOUNDRY: FROM DISCOVERY TO SCALE

DISCOVER

- Explore new material compositions
- AI-guided materials development
- Rapid experimental screening

DEVELOP

- Develop and optimize material stacks
- Programmable atomic-scale processing
- Capture reproducible process recipes

PROTOTYPE

- Fabricate functional structures and devices
- Multi-material and multi-stack integration
- Rapid design–build–test iteration

PILOT & SCALE

- Validate processes in relevant environments
- Transfer manufacturing know-how
- Prepare for pilot production and scale-up

THE A-HUB CLOSED-LOOP INNOVATION FLYWHEEL

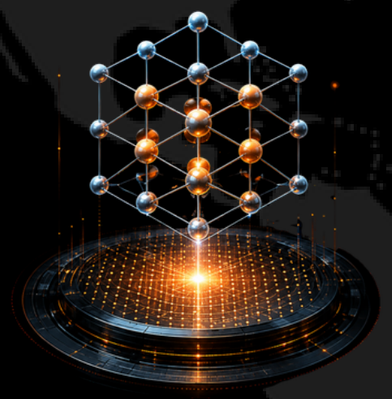
A-HUB connects AI-driven design, programmable fabrication, metrology, and experimental data in a continuous learning loop, accelerating the development of materials, devices, and manufacturing processes.

AI Designs

- Generate candidate materials and compositions
- Define device architectures and design spaces
- Set target properties and performance criteria

Learning

- Feed experimental results back into the development loop
- Use physical data to refine models and process decisions
- Inform the next material, device, or experimental design



Physical Translation

- Translate designs into fabrication recipes
- Define process parameters and machine instructions
- Orchestrate executable workflows through A-COMPILER

Validation

- Integrate metrology and testing into the workflow
- Characterize material, structural, and device performance
- Generate validated experimental data for each iteration

Material Synthesis

- Fabricate materials from defined digital recipes
- Execute programmable processing with NANOFABRICATOR®
- Develop structures across materials and process conditions

FROM CLOSED-LOOP LEARNING TO NETWORK VALUE

01 MATERIAL LOOP

Compounding data advantage
Every experiment adds proprietary process and outcome data that competitors cannot buy

02 DEVICE LOOP

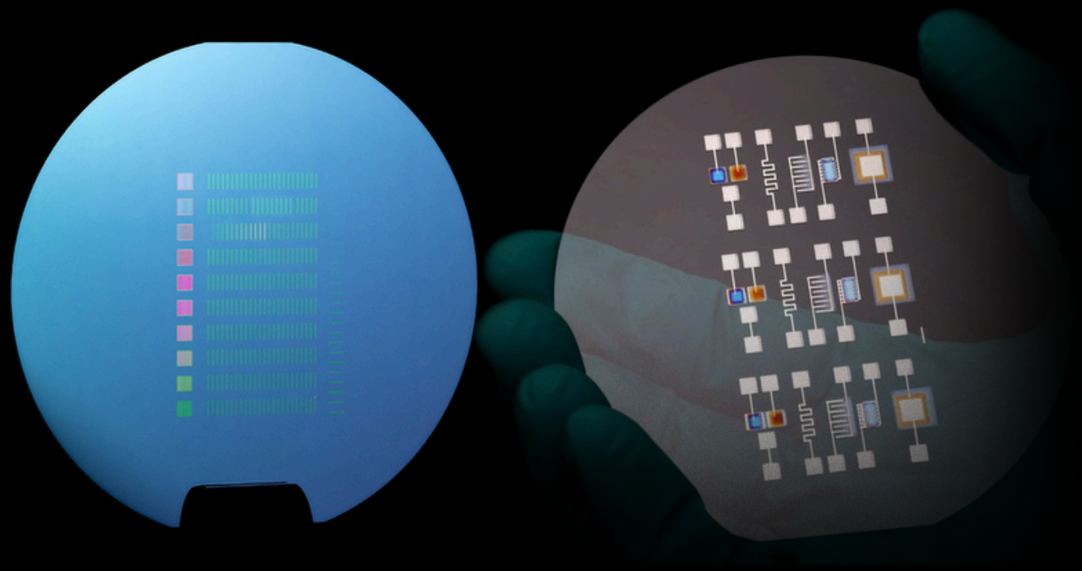
Improving AI performance
More real-world data → better candidate generation & higher hit rates each cycle

03 FOUNDRY LOOP

Increasing customer lock-in
Recipes, process data, validation workflows & process IP accumulate in the platform

04 NETWORK LOOP

Expanding recurring revenue
Software, process data, services, consumables & IP licensing layered on system sales



A-HUB: INTEGRATED MATERIALS INNOVATION CAPABILITY

A-HUB brings together the infrastructure, technology, expertise, and process intelligence required to turn materials innovation into validated, transferable outcomes.

MATERIALS & PROCESS DEVELOPMENT

Develop and optimize materials, thin films, interfaces, and process recipes.

PROTOTYPING & VALIDATION

Translate materials concepts into experimentally validated structures and devices.

FOUNDRY & INFRASTRUCTURE ACCESS

Execute advanced development using integrated fabrication, metrology, and process capabilities.

JOINT DEVELOPMENT & STRATEGIC PROGRAMS

Combine ATLANT 3D technology and expertise with partner applications and strategic priorities.

FROM LOCAL CAPABILITY TO REGIONAL INFRASTRUCTURE

A-HUB packages advanced fabrication, metrology, AI-driven workflows, materials and device development, and secure process knowledge into a deployable infrastructure that can scale with regional priorities and demand.

THE A-HUB STACK

ADVANCED FABRICATION
- NANOFABRICATOR® systems
- DALP® atomic-scale processing
- Multi-material & area-selective fabrication

METROLOGY & VALIDATION
- Integrated characterization
- Automated testing & validation
- Process and device performance analysis

AI & WORKFLOW ORCHESTRATION
- Automated process workflows
- AI-driven experiment orchestration
- Closed-loop process optimization

MATERIALS & DEVICE DEVELOPMENT
- Materials discovery & development
- Device prototyping
- Pilot process development

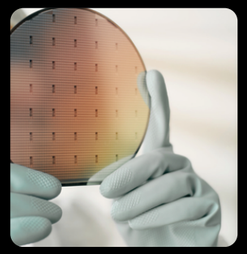
SECURE KNOWLEDGE INFRASTRUCTURE
- Materials & process libraries
- Secure data & IP management
- Transferable manufacturing know-how

A-HUB ENABLES INNOVATION ACROSS STRATEGIC INDUSTRIES

From materials discovery to advanced manufacturing, DALP® empowers next-generation innovation across semiconductors, MEMS, energy, photonics, aerospace, and beyond.

ADVANCED MATERIALS & DISCOVERY

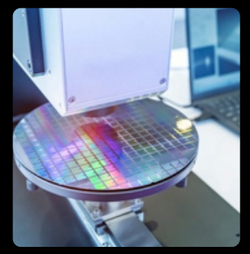
01



- Combinatorial materials screening
- AI-driven materials development
- Custom material stacks

SEMICONDUCTORS & ADVANCED PACKAGING

02



- Camera bonding & surface engineering
- Edge passivation & defect repair
- Chiplet & heterogeneous integration

MEMS & SENSORS

03

- Multi-gas and electrochemical sensors
- MEMS functionalization & hybrid integration
- Multi-material sensor arrays

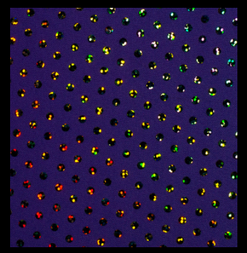
ENERGY & ELECTROCHEMICAL SYSTEMS

04

- Battery interface engineering
- Hydrogen catalysts & electrolysis
- Solar cell passivation

PHOTONICS & OPTOELECTRONICS

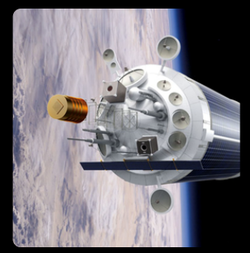
05



- Optical coatings & waveguides
- Metasurfaces & flat optics
- AR/VR and photonic components

AEROSPACE, DEFENSE & SECURE SYSTEMS

06



- In-space fabrication & repair
- Microgravity materials discovery
- On-demand manufacturing

THE A-HUB NETWORK

A-HUB Copenhagen is the first operational implementation of ATLANT 3D's distributed materials innovation model.

Operating since 2022, the hub integrates infrastructure, NANOFABRICATOR® systems, materials and process expertise, and partner programs within a single materials development environment.

First A-HUB — Copenhagen

2022 LIVE SINCE
First operational A-HUB

3,000 m²+
Facility Size

25
Engineers & scientists

5 ON-SITE
NANOFABRICATOR® systems

25+
Programs delivered

20+
Materials developed

Selected A-HUB Copenhagen Partners

DTU Technical University of Denmark · Aarhus University · esa · SAL Silicon Austria Labs · SONY · Danish Technological Institute · ThalesAlenia Space · FAU Friedrich-Alexander-Universität Erlangen-Nürnberg · ST · AIR Automated Industrial Robotics · SIEMENS · Prima Electro · LAB14 · Leonardo Technology for a safer future · NAMIC SG National Additive Manufacturing Innovation Cluster · NUS National University of Singapore · A*STAR Agency for Science, Technology and Research Singapore

FROM COPENHAGEN TO A GLOBAL NETWORK

Copenhagen demonstrates the A-HUB model in operation.

The same architecture is designed to be deployed in strategic regions, combining local infrastructure and expertise with shared technology and process intelligence.

- **PROVEN LOCALLY** — Infrastructure, systems, expertise, and programs operating in Copenhagen.
- **DESIGNED TO SCALE** — A replicable model for building regional materials innovation capability.

SCALING THROUGH A-HUB

A-HUB enables regions and strategic partners to establish advanced materials development capability closer to where innovation, manufacturing, and critical demand occur.

LOCAL CAPABILITY

Establish advanced materials development close to strategic industries and research ecosystems.

MODULAR SCALE-UP

Expand infrastructure, systems, applications, and production capacity as demand grows.

STRATEGIC ALIGNMENT

Connect industry, research, and public-sector priorities through shared development programs.

MATERIALS SOVEREIGNTY

Retain critical process knowledge, expertise, and manufacturing capability within regional ecosystems.

A-CLOUD: DATA & AI ORCHESTRATION

A-Cloud connects workflows, recipes, experimental data, and validated process knowledge across A-HUB capabilities, creating the digital foundation for orchestration, learning, and distributed collaboration.

CONNECTED WORKFLOWS

Connect design, fabrication, characterization, and validation into integrated development loops.

STRUCTURED PROCESS KNOWLEDGE

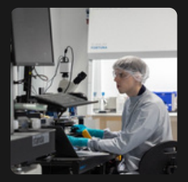
Transform recipes, measurements, and experimental outcomes into reusable process intelligence.

CONNECTED A-HUBS

Enable distributed A-HUBs to learn and collaborate through a shared digital architecture.

CONNECTING A-HUBS THROUGH FEDERATED INTELLIGENCE

Through A-Cloud, validated process knowledge and physical intelligence can be connected across A-HUBs while sensitive data, IP, and critical workflows remain locally governed.

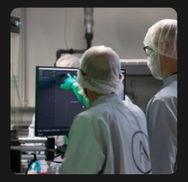


DATA SOVEREIGNTY

Sensitive data, process knowledge, and intellectual property remain under local control while participating in the broader A-HUB network.

FEDERATED INTELLIGENCE

A-HUBs benefit from shared intelligence without requiring sensitive raw data to leave local environments.



CONTINUOUS LEARNING

Every validated experiment strengthens the collective process intelligence of the network.

POWERING THE A-HUB NETWORK

The A-HUB network combines three reinforcing foundations that connect physical infrastructure with knowledge, expertise, and ecosystem collaboration.

Technology

DALP®, NANOFABRICATOR® systems, A-Cloud, and autonomous workflows.

- Atomic-scale materials processing
- Autonomous workflows and characterization
- Connected process intelligence through A-Cloud

Expertise

Expertise in materials, processes, and applications transforms infrastructure into validated outcomes.

- Materials and process development
- Rapid prototyping and validation
- Application-specific know-how

Partnerships

Industry, research, government, and ecosystem collaboration.

- Strategic industry collaborations
- Research and academic partnerships
- Public-private innovation programs

PARTNER WITH US

ATLANT 3D works with industry, research institutions, and public-sector partners through three engagement models—from accessing existing A-HUB capabilities to building strategic programs and deploying localized infrastructure.

ACCESS A-HUB

Accelerate your development

Access ATLANT 3D's infrastructure and expertise to accelerate development.

- Materials & process development
- Device prototyping & validation
- Pilot production & scale-up

COLLABORATE

Build innovation programs together

Combine ATLANT 3D technology and expertise with your application needs.

- Joint R&D and development programs
- Industry & academic collaborations
- Strategic materials and device innovation

DEPLOY AN A-HUB

Build local capability

Establish an A-HUB to create localized materials innovation and manufacturing capabilities.

- Localized infrastructure
- Technology & expertise transfer
- Capability development and scale-up

LET'S BUILD THE FUTURE OF MATERIALS INNOVATION TOGETHER.

Explore how A-HUB can support your materials innovation strategy.

EXECUTIVE & STRATEGIC PARTNERSHIPS

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