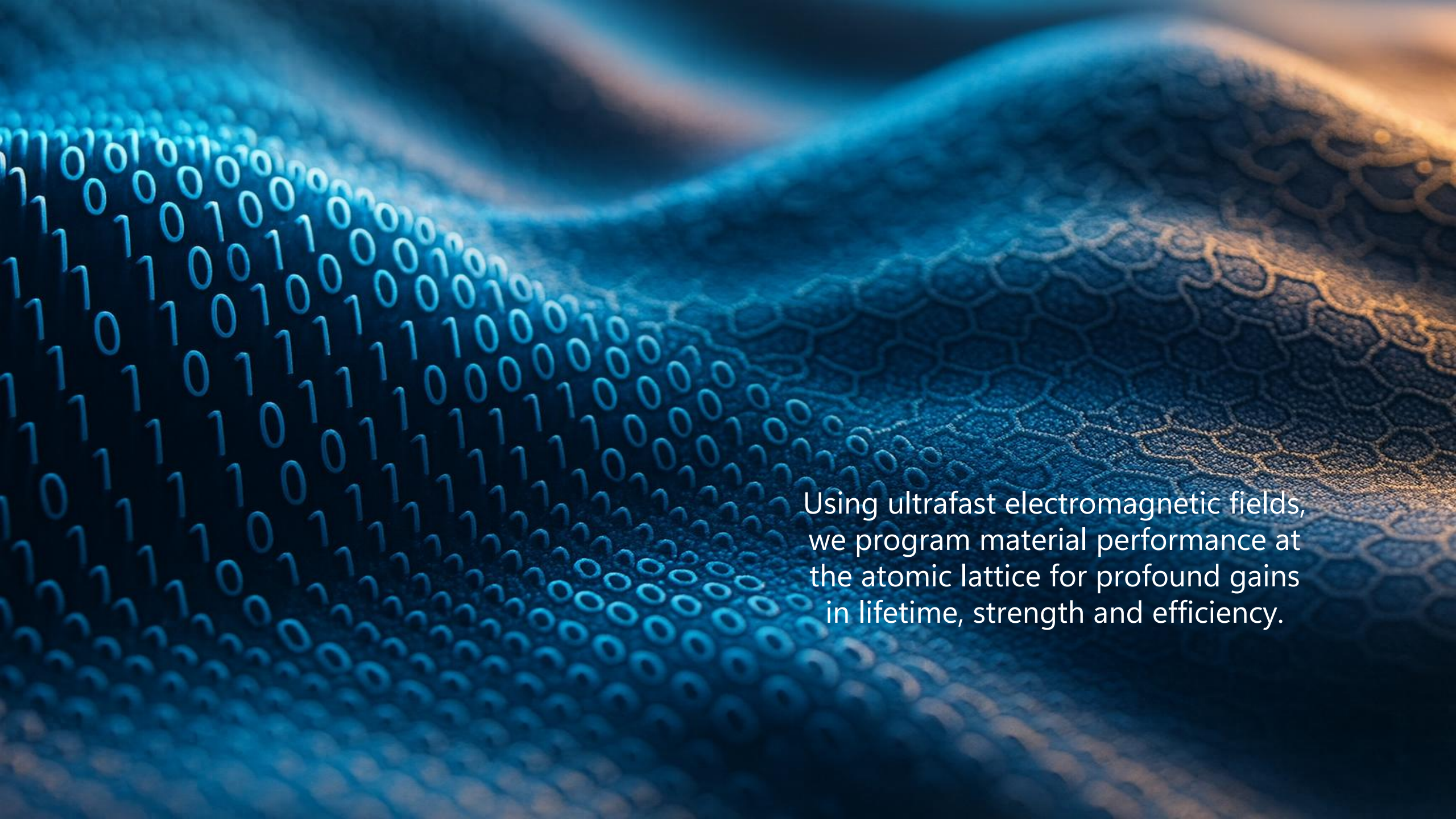
The next materials breakthrough isn’t new materials.

It’s unlocking the full potential of existing ones.

MULTIPHASIC


Using ultrafast electromagnetic fields,
we program material performance at
the atomic lattice for profound gains
in lifetime, strength and efficiency.

Massive, inevitable problem

- Modern technology & infrastructure is hitting a materials performance ceiling
- Up to 80% of material performance is degraded from the manufacturing process

Fundamentally new solution

- First industrial system to apply nonlinear phononics using ultrafast lasers, EM, & acoustics
- Achieves more resilient “metastable” material states beyond conventional heat/force methods
- Order-of-magnitude performance gains based on literature-supported pathways (e.g. fatigue life)

Profound economic impact

- Direct leverage on trillions in infrastructure & manufacturing assets
- ~$191B+ TAM and ~$2.5B SOM complementing or replacing heat/force processing

Platform, not a product

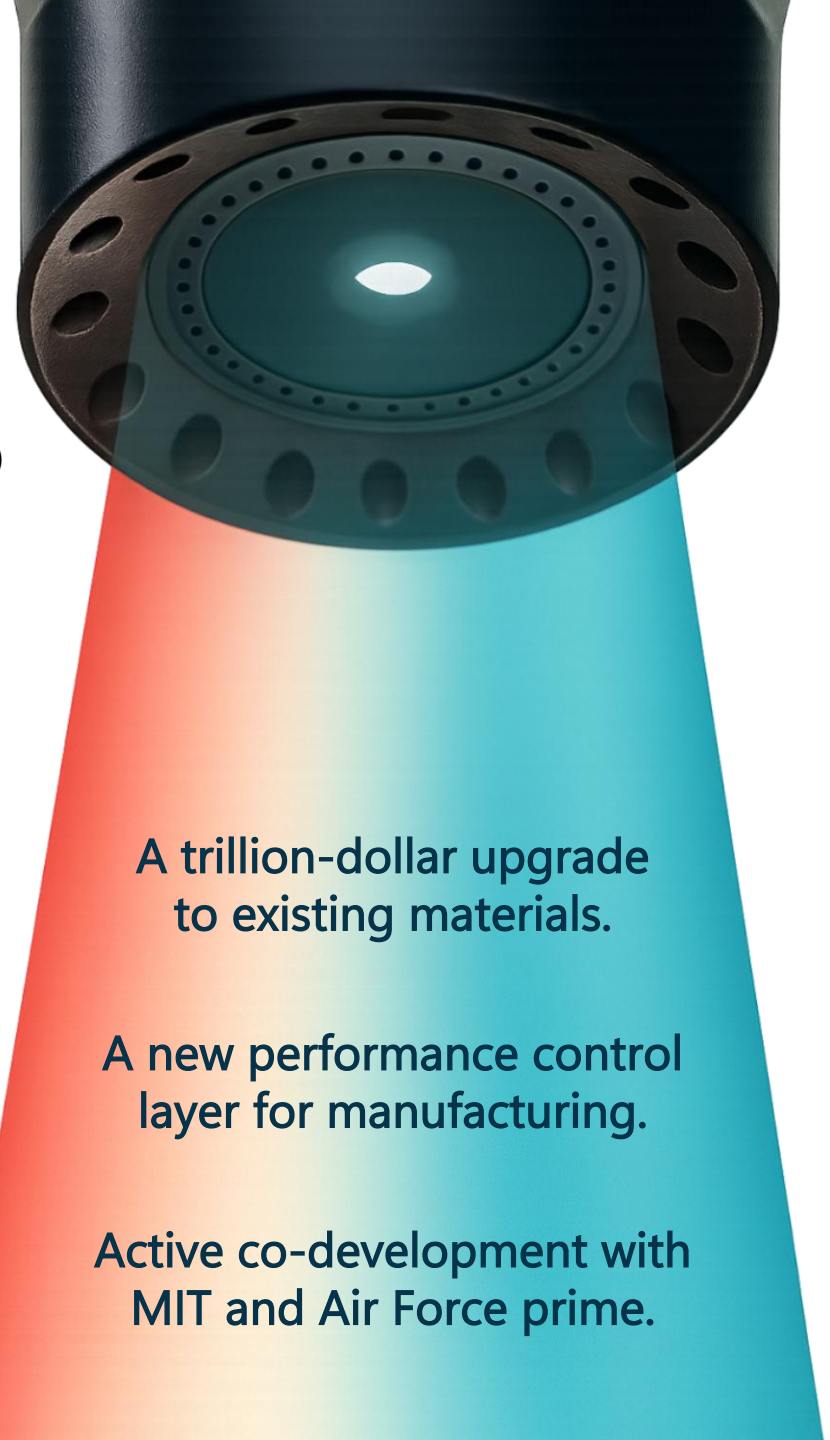
- Application to structural, electronic, and functional materials
- Drop-in to existing factories and alloys without changing composition
- Proven physics, new application to industrial materials, enabled by new tech and cost declines

Defensible wedge

- Built on proven peer-reviewed ultrafast materials physics and industrial metallurgy
- Patents filed across physics, system architecture, and applications
- Compounding data moat (material-specific recipes and verified performance outcomes)

Business model

- Conditioning-as-a-service for raw materials and parts (early revenue)
- “Intel Inside” OEM module integration into mfg equipment & material discovery platforms
- SaaS - outcome intelligence, material treatment recipes, material discovery integration



A trillion-dollar upgrade to existing materials.

A new performance control layer for manufacturing.

Active co-development with MIT and Air Force prime.

Fixing reliability in AI datacenter infrastructure

Problem

2–8M kg of copper busbars under extreme current density

Replacement every 3–5 years

$150M–$600M per event

What We Do

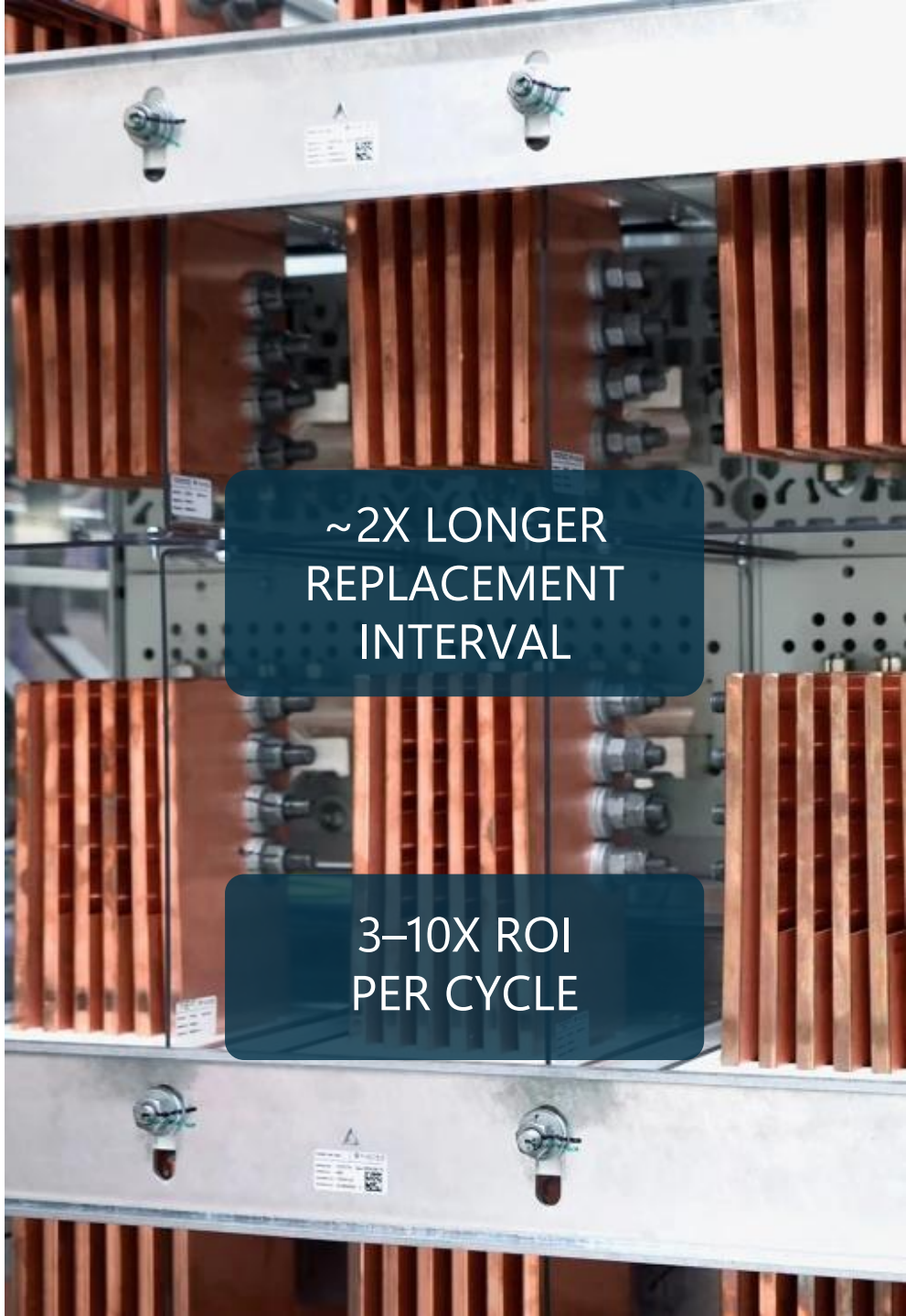
Reduced resistivity drift and ~3X fatigue life

Extending service life (~3X)

Stabilize material performance under load

Customer saves $110M - $440M over 10 years

We make $40M -$160M (@$20kg)



Extending lifetime of aerospace structures

Problem
- High-cycle fatigue in Ti-6Al-4V airframe components (0.25–1.6 million kg)
- Inspection & replacement every 5–8 years
- $200M–$800M lifecycle maintenance cost

What We Do
- Reduce fatigue-initiating defects
- Slow crack growth under cyclic loading
- Improved residual stress distribution

Outcome
- ~2X longer inspection / replacement interval
- 20-30% reduction in lifetime maintenance cost
- 5-12X ROI per cycle

Customer saves $40M – $240M over program lifecycle

We make $10M – $40M per program (@ $25-$40/kg treatment fee)

Extending lifetime of hydrogen electrolyzer catalysts

Problem

- Catalyst degradation (NiFeOOH, Ir-based) limits] performance
- Replacement and decay drive electricity cost and downtime
- Large systems require hundreds to thousands of kg of catalyst

What We Do

- Stabilize active surface structures
- Reduce defect-driven degradation
- Improve electronic transport pathways

Outcome

- 2–3× longer catalyst lifetime
- Higher efficiency and stability
- Reduced replacement frequency and downtime

Customer saves $20M–$120M per installation

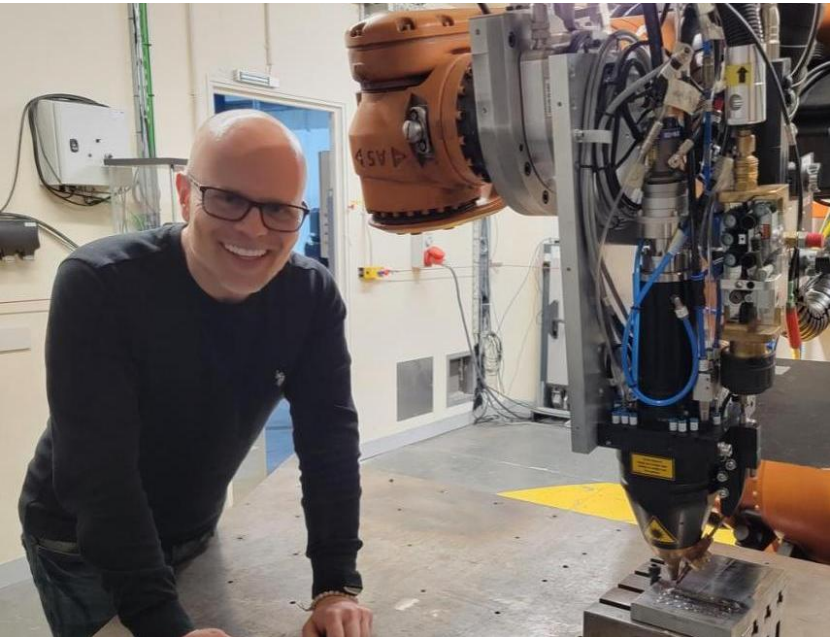
We make $5M–$25M per installation (@ ~$20–40/kg conditioning)

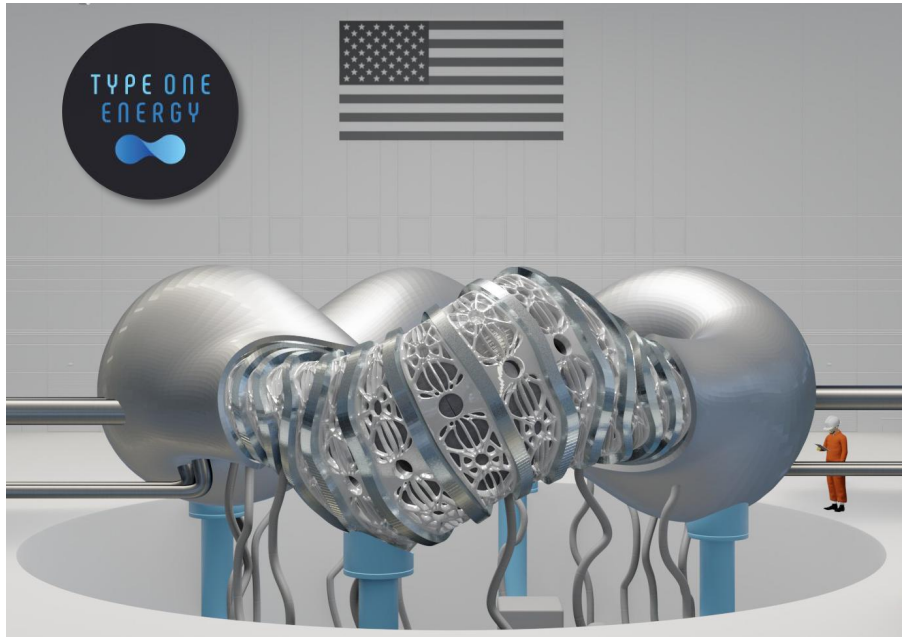
Founder

Deep-tech entrepreneur (25+ yrs) and advanced manufacturing systems engineer.

Led published, DOE-funded advanced materials & manufacturing R&D in collaboration with MIT, Oak Ridge National Laboratory, UWisconsin-Madison, and Commonwealth Fusion Systems.

Co-Founder & former CEO (4 years), Type One Energy – first stellarator fusion startup; led initial VC syndicate close; $175M raised to date. DOE White House Fusion Milestone Program Awardee.





Key industrialization & validation partners

PHYSICS APPLICATION

Massachusetts Institute of Technology

Tech Lead:
Prof. Keith Nelson (Nelson Group)
Prof. Rodrigo Freitas (Freitas Group)

Translating laboratory ultrafast nonlinear phononics & nonequilibrium modeling.

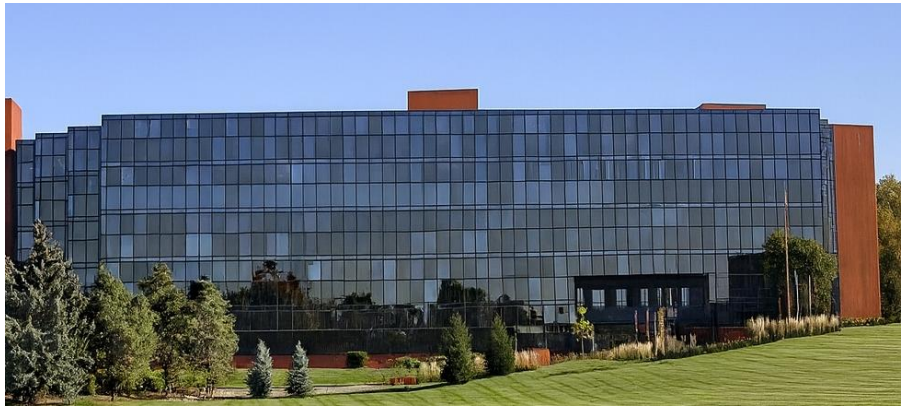
HARDWARE INTEGRATION

Institut National d'Optique

Tech Lead:
Dr Louis Desbiens

Strong industrialization focus with 7,000+ solutions, 78 transfers, 36 spinouts.

INDUSTRIAL ADOPTION



University of Dayton Research Institute & Air Force Research Laboratory

Tech Lead:
Dr. Tim Osborne
Leader of the Advanced Manufacturing Tech Development (AMTD) group

Application validation and early adopter prime contractor for aerospace scale-up.

Next Steps

$1M Pre-seed SAFE for 12-month program designed to produce measurable, independently validated performance improvements in engineering alloys.

Execute Program at MIT

- Build breadboard system
- Treat key engineering materials (Inconel, titanium alloy, copper, tungsten)
- Quarterly milestones: signal → persistence → depth → performance → validation
- Publish results

Continue Building IP Moat

- One PCT patent application in process
- Convert provisional filings to PCT
- File additional foreground IP

Personnel

- Founder-led program mangement
- MIT research teams
- Cultivate key first hires for next round

Start Building the Runway

- Early adopter pilot partnerships
- Materials validation and benchmarking
- Process recipe and parameter database
- Industrial integration pathways
- Strategic industry partnerships
- Certification and standards preparation

Use of Funds

MIT program*	$625K	62.5%
Founder salary	$200K	20%
IP protection	$100K	10%
Admin & misc.	$25K	2.5%
Contingency	$50K	5.0%

*Includes hardware (combination of existing equipment at MIT and new components)

Transition to industrial prototype, first hires, and pilot commercialization. →

Multiphasic brings nonlinear phononics to industry as the modern third pillar of material performance control.

CONTACT
Randall Volberg
randall.volberg@multiphasic.co
(236) 338 0079