

ASTERA TECHNOLOGIES

The Substrate That Makes Photonic Computing Possible

Graphene-Boron Nitride-Sapphire substrates for femtosecond optical switching

Computing Infrastructure Has Hit a Wall

\$100B+

Data center projects blocked

40%

Operating costs to cooling

700W

Per H100 chip — heat blocks 3D

Electronic computing generates heat proportional to switching. This barrier is insurmountable:

- Chips stuck in 2D
- Moore's Law ended
- AI demand: 10x every 18 months

Photonic Computing Needs a New Substrate

TRUE PHOTONIC HAS SOLVED

Femtosecond optical switching — 150-200fs validated at Technion.
5,000-10,000x faster than electrons.

BUT REQUIRES

A substrate that doesn't exist at scale. Silicon can't handle the thermal density or 3D stacking.

Astera Technologies builds this substrate.

The only graphene-boron nitride-sapphire platform designed for photonic computing.

EXCLUSIVE PARTNER

True Photonic Inc.

MW-PECVD: Graphene Growth in Under 3 Minutes

Direct growth on sapphire eliminates defect-prone transfer steps.

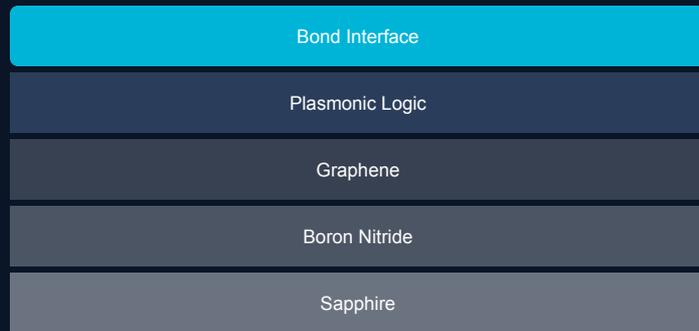
1 Feedstock Intake
Waste plastics to carbon materials

2 Flash Joule Graphitization
High-purity graphene conversion

3 MW-PECVD Deposition
Direct growth with BN buffer

4 Defect Healing
Photonic-grade monolayers

SUBSTRATE STACK



<3m

vs hours

2000+

W/m-K

Exclusive Substrate Partner to True Photonic

True Photonic Inc.

Core IP. 600+ patent claims.

Astera Technologies

Base Substrate IP and manufacturing.

SkyLight Holdings (TP Subsidiary)

Infrastructure deployment.

Relaxed Lithography

90-180nm DUV. 100+ fabs can manufacture. Every one needs our substrate.

Global Licensing

As TPI licenses globally, Astera supplies every licensed fab.

First Deployment

43-story tower Q1 2026. First downtown **Clean Compute Center** ever.

\$300-500M

True Photonic IP Value (Cassidine)

37+

Patent Claims Filed

\$30M

Seed Investment inked

Waste Plastic to Photonic Substrate



ADDRESSABLE MARKET

\$600B

Semiconductor manufacturing TAM. Every fab needs substrates.

VOLUME TRAJECTORY

2026: First tower (proof)

2027: Domestic fab licensing

2028+: Global rollout (100+ fabs)

The margin story is extraordinary. Input costs approach zero. Output commands premium pricing. Processing in minutes, not hours. **First to market at scale.**

Why Astera Wins

Metric	Traditional CVD	Transfer Methods	Astera
Growth Time	2-6 hours	4-8 hours	<3 min
Transfer Steps Post Growth	3-5	5-8	0
Thermal W/m·K	1,000-1,500	500-800	2,000+
Photonic Optimized	No	No	Yes

Process IP

Multiple provisionals on feedstock, graphitization, deposition.

Exclusive Partnership

Co-owner of substrate patent with True Photonic.

First-Mover

18-24 month lead. No competitor at scale.

Others make graphene. Astera Technologies makes the substrate that enables photonic computing.

Validated Today, De-Risked Tomorrow

✓ Validated Today

- 150-200fs switching (Technion)
- Sub-3-min graphene growth
- \$30M SkyLight Deal Inked (First, Clean Compute Center)
- 600+ claims, 14 patents pending, 4 patents granted

→ De-Risked by Partnership

- Guaranteed customer base
- 100+ fabs can manufacture
- Tower proves economics 2026
- Patent co-ownership

DEVELOPMENT TIMELINE

Q1 2026	Q2 2026	Q4 2026	Q2 2027	2028+
Tower Closes	Prototype Val	Patent Grants	First Revenue	Global Scale

Honest assessment: Lab to scale introduces uncertainties. Partnership and first-tower deployment provide validation milestones that progressively de-risk execution.

Partner With Astera Technologies

Astera Technologies is the substrate supplier to the photonic computing transition. We provide the critical component — graphene-BN-sapphire wafers — that enables True Photonic's architecture to scale globally.

WHAT WE BRING

- Sub-3-min MW-PECVD process
- Exclusive True Photonic partnership
- Substrate patent co-ownership
- First-mover at scale

PARTNERS WE SEEK

- Semiconductor expertise
- Materials science capability
- Fab network relationships
- Patient infrastructure capital

Ecosystem Raise

\$80M at \$1B

TPI IP Value

\$300-500M

First Deployment

Q3 2026

This is an allocation. We select partners who bring strategic value.

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THE THESIS

**"Every fab that builds
photonic chips needs our
substrate."**

100+

Fabs ready today

\$600B

Semiconductor TAM

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Supplier at scale

Astera Technologies

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