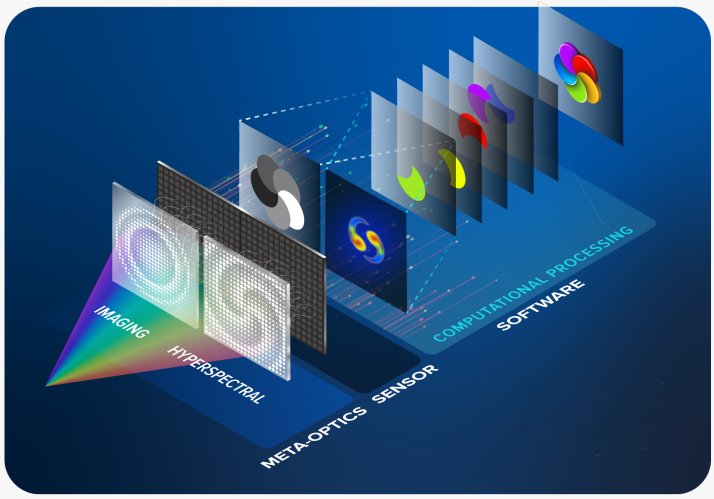
Tunoptix Unveils Breakthrough Meta-Optical Platform for Multi-Billion-Dollar Mobile Spectral Imaging and Sensing Market

Company's ultra-compact hyperspectral imaging modules open new addressable markets in consumer electronics, defense, and industrial automation



Tunoptix Computational Meta-Optics

SEATTLE, WA, UNITED STATES, June 25, 2025 /EINPresswire.com/ -- Tunoptix, a pioneer in computational meta-optics, announced today a breakthrough in mobile-scale spectral imaging. The company's latest meta-optical platform captures high-fidelity spectral signatures across the visible-to-NIR spectrum in a compact form factor smaller than 1 cm³, consuming less than 500 mW, and operating at real-time frame rates. The technology unlocks entirely new applications for spectral intelligence in smartphones, wearables, robotics, and edge devices.

Tunoptix previously enabled compact full-color imaging using its meta-optical platform and is now extending this capability to hyperspectral sensing. The module eliminates the need for bulky dispersive optics or mechanical scanning mechanisms.

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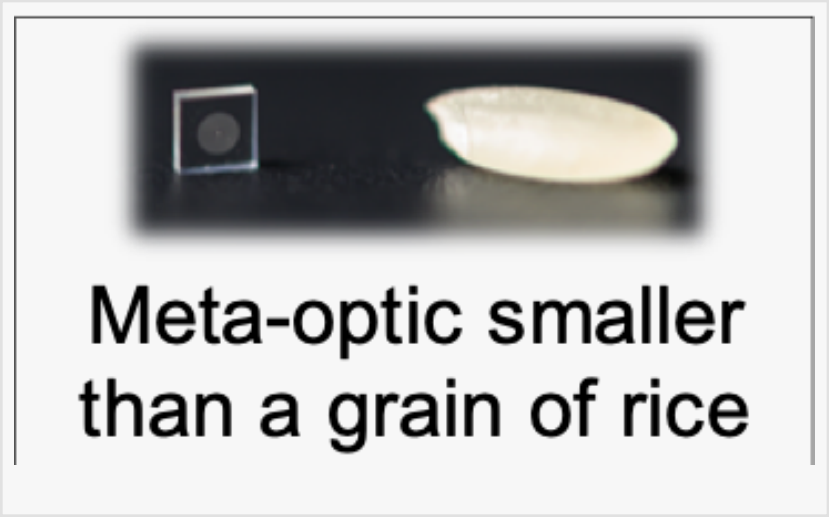
>
> *Naren Yellai, CEO of Tunoptix*

"Advanced spectral imaging unlocks a largely untapped consumer market estimated at over $10 billion, alongside multi-billion-dollar markets in industrial, healthcare, and defense sectors," said Naren Yellai, CEO of Tunoptix. "We've overcome long-standing barriers in size, cost, and

complexity to make spectral intelligence truly scalable. Our technology enables a new class of devices that can perceive and interpret the world in ways conventional cameras cannot."



Transforming the Economics of Spectral Imaging

Tunoptix's meta-optical imaging technology integrates nanoengineered lenses and spectral filters in a compact hardware stack. This end-to-end optics approach, foundational to Tunoptix's multi-aperture architecture, encodes spectral information at the point of capture and delivers it directly from hardware, eliminating the need for bulky optics or mechanical scanning. Historically, hyperspectral imaging has been confined to large, expensive lab-based or industrial systems, limiting its commercial potential. Tunoptix's platform disrupts this paradigm with a wafer-scale, manufacturable solution that delivers real-time snapshot capture of over 30 distinct spectral channels in the VNIR range with sub-20nm spectral resolution and effective per-channel resolution of ~720x480 pixels. This architectural shift replaces expensive, bulky optical stacks with planar, low-power modules, reducing costs by orders of magnitude and enabling deployment at scale.

Enabling New Applications Across Industries

By bringing spectral imaging to mobile scale, Tunoptix enables new applications in:

- Consumer Electronics: Skincare, cardiopulmonary monitoring, food quality, oral health, and material sensing on smartphones, wearables, and other devices.
- Industrial Automation: Real-time defect detection and material classification in high-throughput manufacturing.
- Agriculture & Food Safety: Field-deployable tools for assessing ripeness, spoilage, contamination, and crop monitoring.
- Defense & Security: Situational awareness and chemical detection using lightweight systems on drones and autonomous platforms.

Built for Scalability

Tunoptix follows a fabless manufacturing model, leveraging standard CMOS-compatible processes for high-yield, wafer-level fabrication of its meta-optical elements. The company partners with leading foundries and optomechanical integrators to support scalable production for high volume.

Tunoptix offers a structured OEM engagement program that includes reference designs, SDKs, and support for custom module development and NRE projects, along with roadmap visibility and early access to next-generation capabilities. Wafer-level testing and calibration ensure consistent spectral performance at scale.

Looking Ahead
Future mobile designs will offer higher spatial resolution (greater than 4K), extended SWIR coverage, and application-optimized configurations for wearables, factory vision systems, and defense platforms. Tunoptix is also actively developing extensions for optical and Raman spectroscopy to support mobile chemical and molecular analysis.

"We are seeing strong interest across multiple verticals, including tier-one OEMs in the consumer electronics space," said Yellai. "Our goal is to democratize spectral intelligence by making it a core capability of next-generation devices. We're actively seeking to collaborate with OEMs and system integrators to bring our technology to market at scale."

About Tunoptix
Tunoptix is pioneering a new class of scalable, meta-optical solutions for imaging and sensing – bringing spectral intelligence to mobile, wearable, and edge devices. Founded at the University of Washington, the company is headquartered in Seattle, Washington. For more information, visit www.tunoptix.com.

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