Enhanced Sensitivity for Imaging and Tracking Applications via Black Silicon

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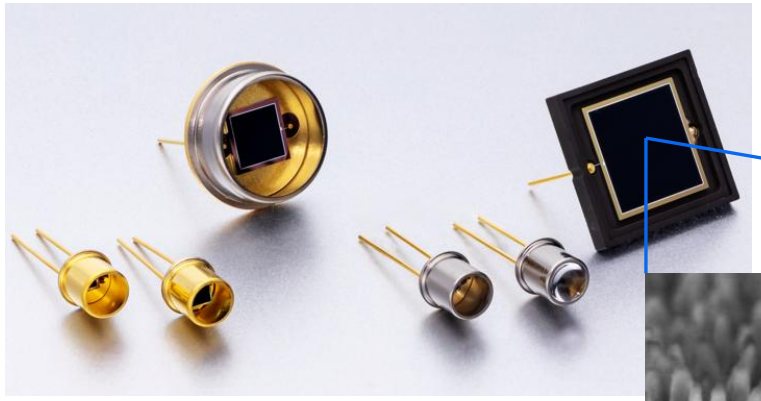
ELFYS

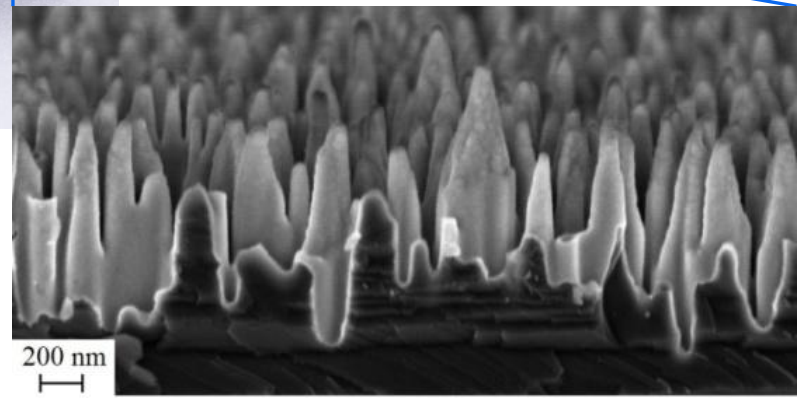
EPIC
EUROPEAN PHOTONICS INDUSTRY CONSORTIUM

CAPTURING EVERY RAY OF LIGHT

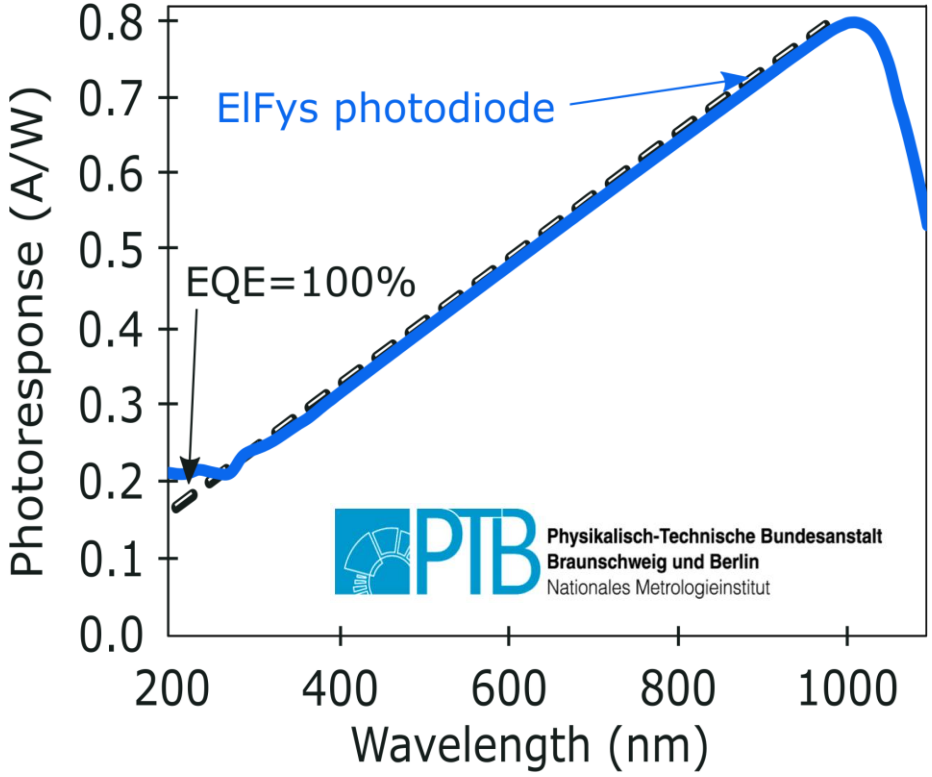
Innovation: Black-silicon photodiode

ElFys produces light detectors with superior sensitivity by utilizing advanced nanotechnology & atomic layer deposition technique





Nanostructure traps and absorbs all light photons

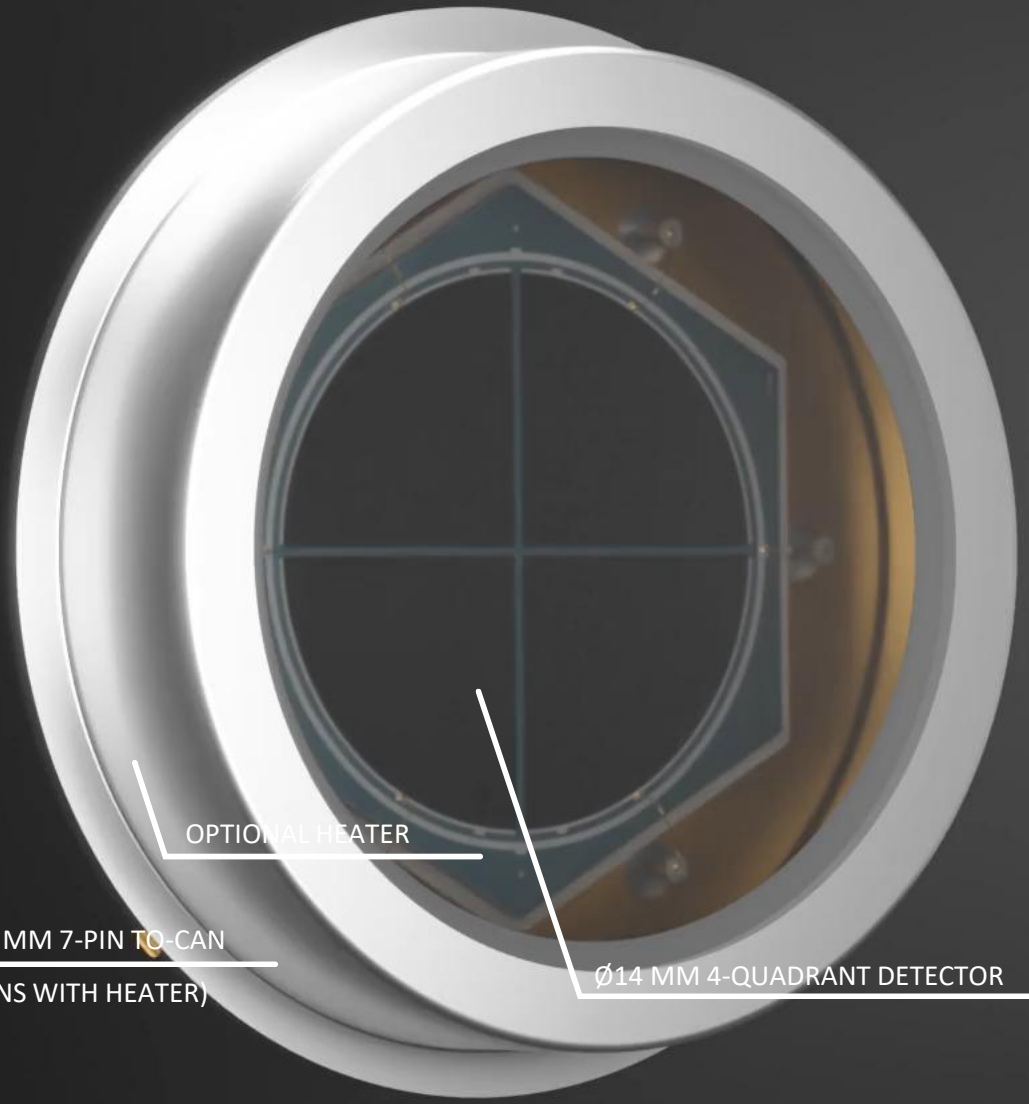


~100 % quantum efficiency

Ideal broadband response

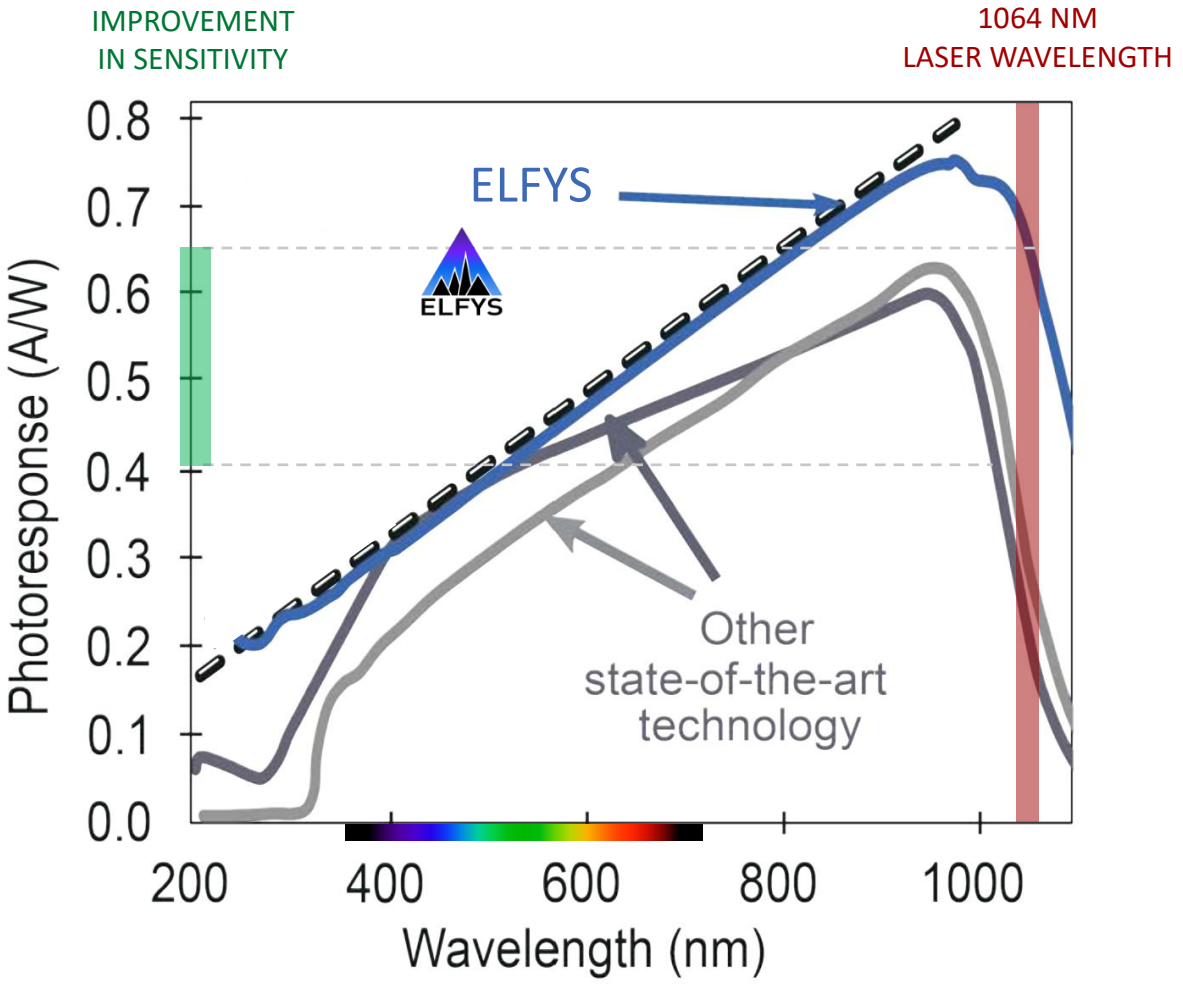
Wide detection angle

Introducing Black Silicon 4-Quadrant Detector



CAPTURING EVERY RAY OF LIGHT

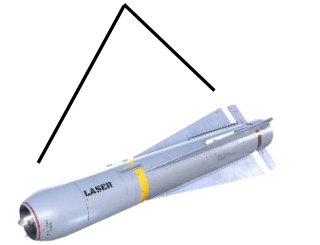
ElFys Black Silicon 4-quadrant detector



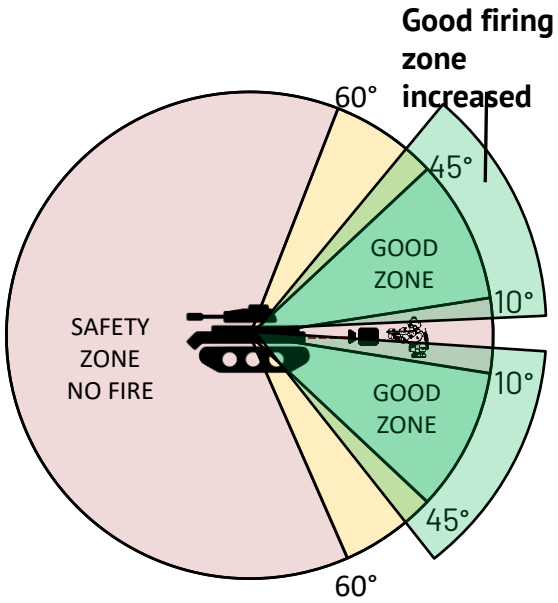
0.64 A/W responsivity and <15 ns rise time for 1064 nm

Application example: Guided munition

Weapons platform



Missile with seeker head



ElFys 4-quadrant detector

- **Missile lock-on distance can be increased by up to 30 % compared to state-of-the-art.**
- **Weapon system becomes more reliable and robust against air disturbances like smoke, dust etc.**

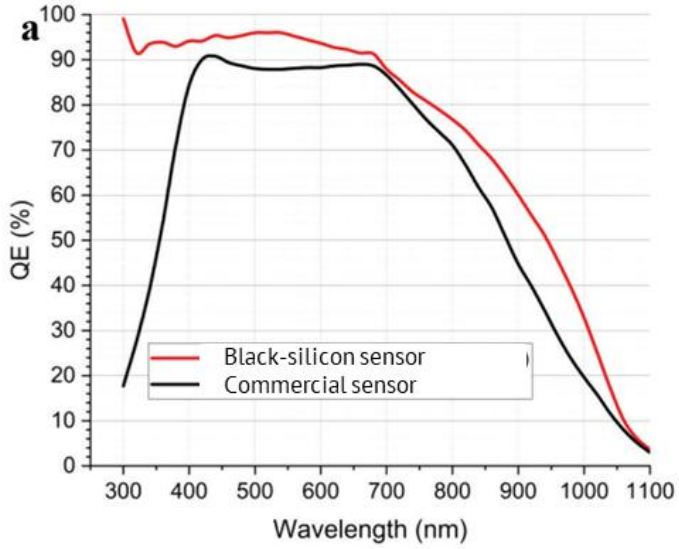
Application example: Image sensors

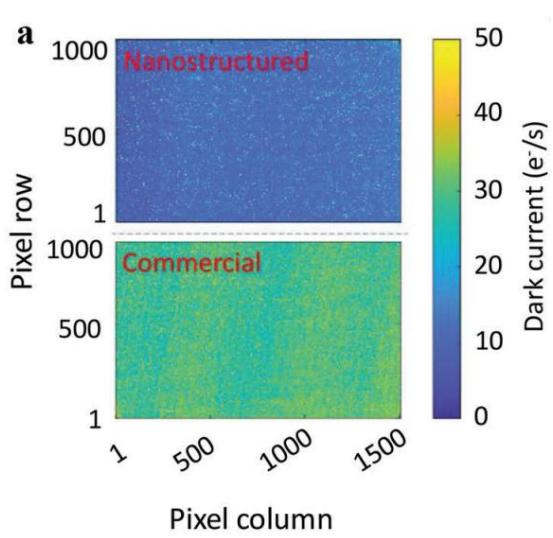
Moon light or low level NIR illumination

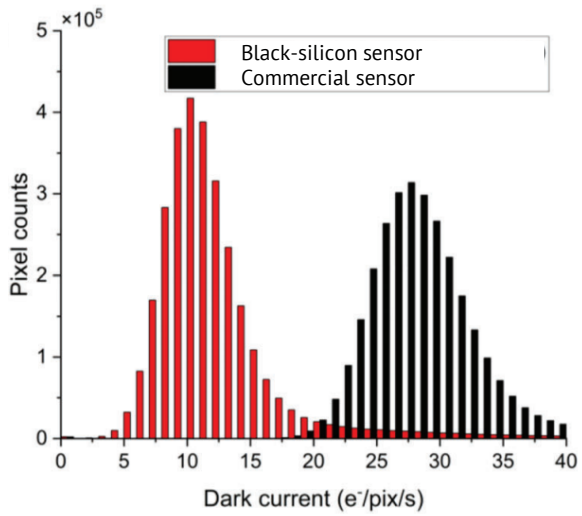
Getting good pictures with today's image sensors in low-light conditions is still challenging.

ElFys nanostructured photodetector technology can greatly enhance image quality and low-light performance of camera sensors.

Application example: Image sensors







1. Higher quantum efficiency over a very wide wavelength range

2. Better dark current uniformity througout the sensor

3. Lower dark noise

Greatly improved signal-to-noise ratio enables better pictures in low-light conditions

O. Setälä et al. "CMOS Image Sensor for Broad Spectral Range with >90% Quantum Efficiency", Small, 2023

17th November, 2025 15:00 - 15:30 EET (UTC +2)
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