

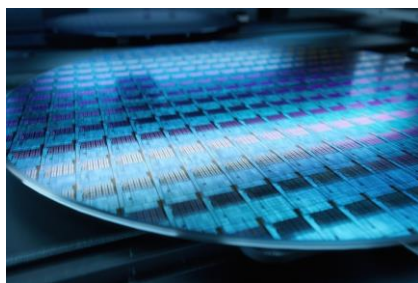
KOHERAS ACOUSTIK

The ideal laser engine for scaling quantum technologies

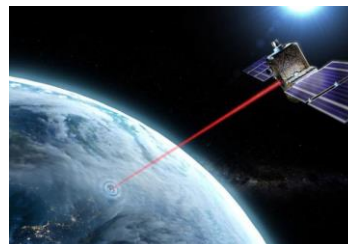
Fiber lasers and their applications



Medical imaging



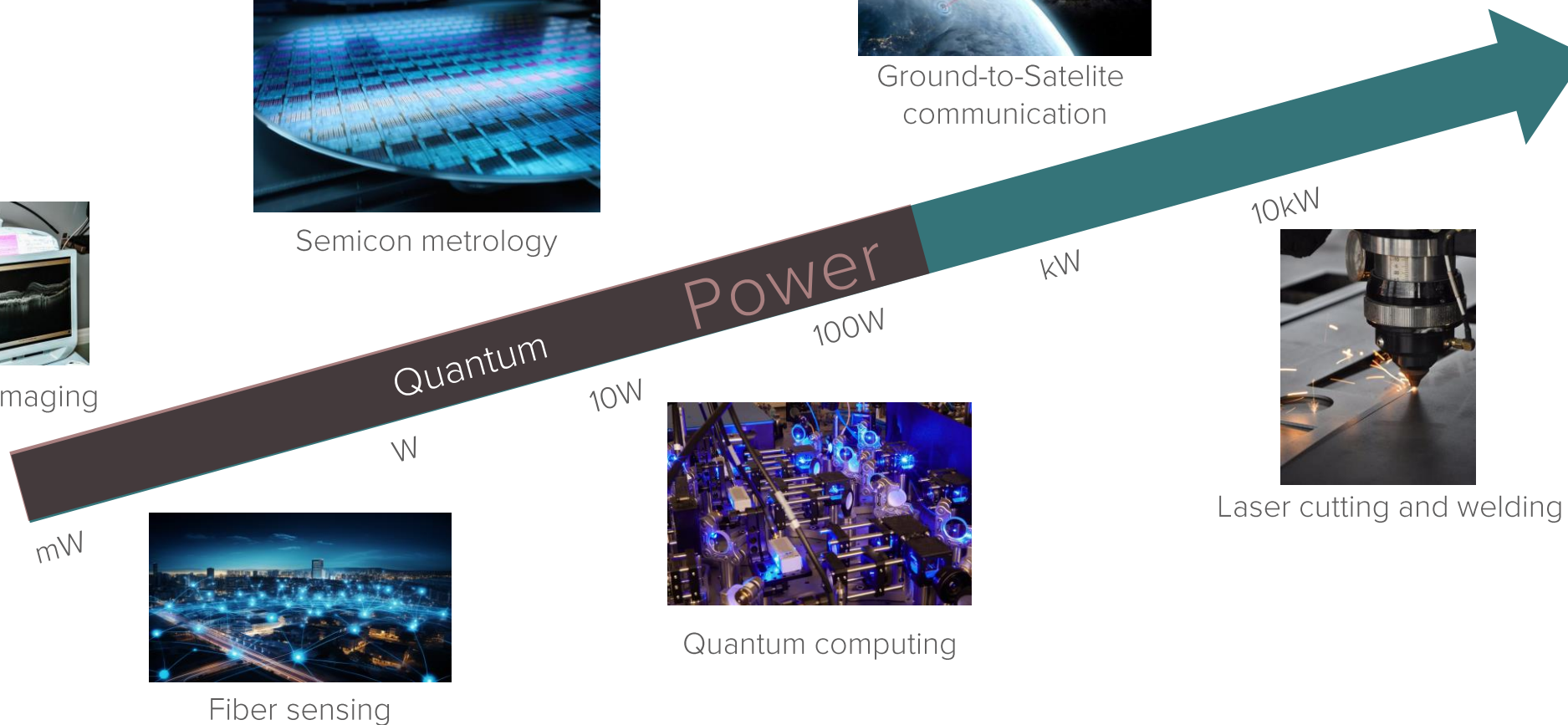
Semicon metrology



Ground-to-Satellite communication



Directed energy weapons



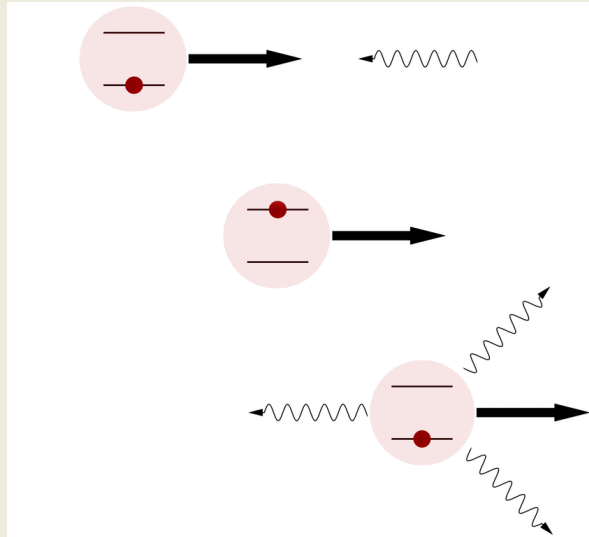
Cold atom laser use examples

Trapping

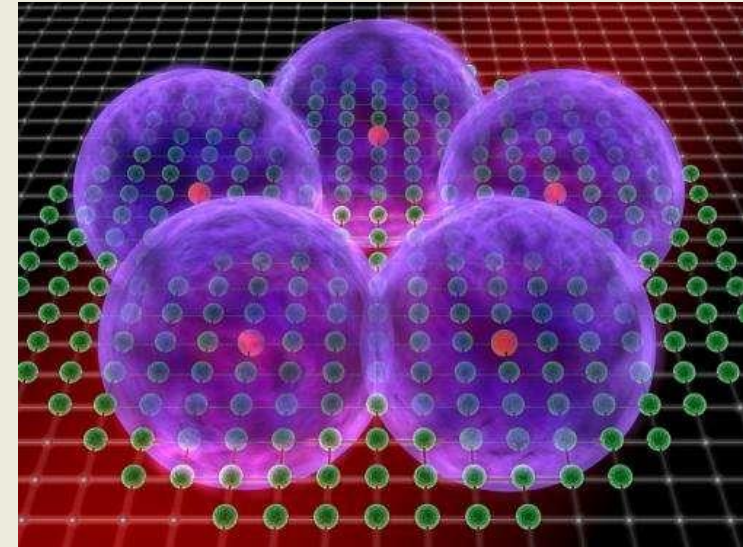


Neutral Sr Atoms, optically trapped in a 2D array

Cooling



Rydberg Atoms

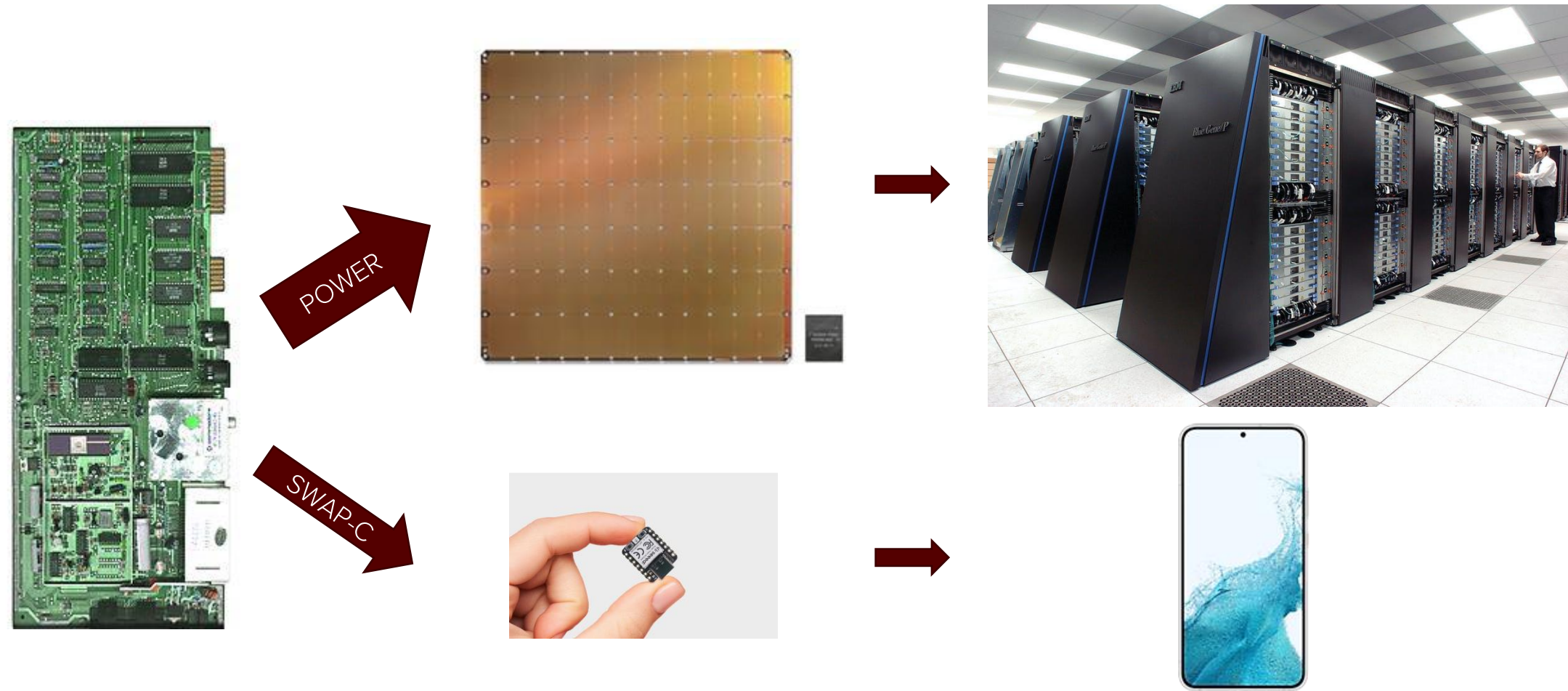


Neutral Sr Atoms, optically trapped in a 2D array

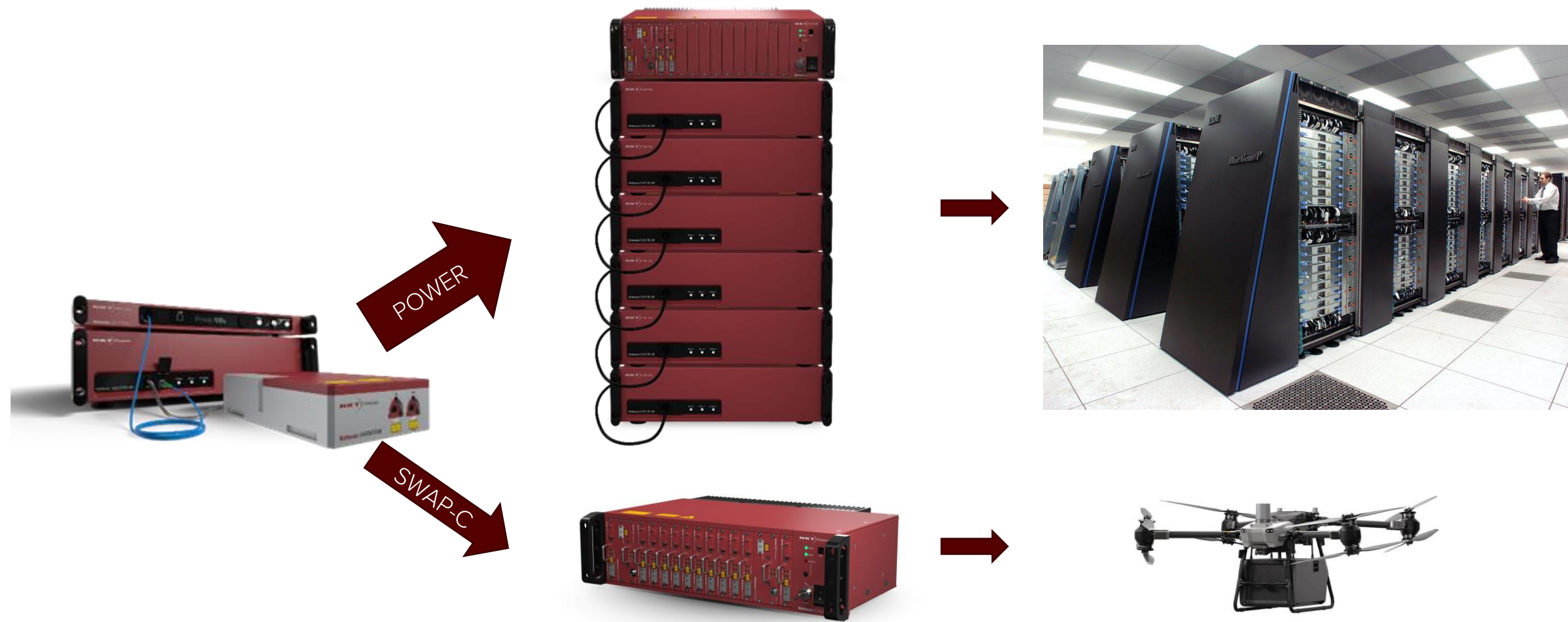
A quantum laser is not
just about the light

Scaling Information Technology Hardware

A 2 track challenge



Scaling Lasers in Quantum



Our philosophy:
The fiber laser cocktail
effect

Fiber laser and frequency conversion cocktail

DFB Fiber Lasers



Pristine spectral purity and
ultra low noise

Fiber Amplifiers



High Power scaling

Frequency Conversion



Converts to right
wavelengths,
Reduces ASE,
Efficiency scales with
power

Fiber Delivery



Enables rack-architecture
and flexible routing

Pristine seed laser light

DFB fiber lasers



Pristine spectral purity and
ultra low noise

- Hz linewidth
- Mode-hop free
- Low noise and very long lifetime.
- Usually found in remote sensing applications in harsh environments.
- Wrong wavelengths, low power. ☹️

High power amplification in fiber

Fiber amplifiers



Power scaling

- Stable.
- Highly efficient.
- Very scalable through PCF technology.
- Adds ASE ☹️

High power frequency conversion

Frequency conversion



Pristine spectral purity and
ultra low noise

- Nonlinear ASE filter.
- Allows IR seeding of VIS wavelengths.
- Reduces high frequency phase noise.
- Adds free space components ☹️

Photonic crystal fibers

Photonic crystal fiber
delivery



Enables rack-architecture
and flexible routing

- Mode clean-up
- High power, single mode at all wavelengths
- Our PCFs provide unrivaled single mode power handling.

Koheras Products for Quantum

HARMONIK Free Space and Fiber Coupled Module

Frequency Conversion



Converts to right wavelengths
Reduces ASE
Efficiency scales with power

Trapping
Cooling
Rydberg
excitation
Clock
transition

	Rubidium	Strontium	Barium	Ytterbium
Trapping	810-840 nm	813 nm	553 nm	532 nm
Cooling	780 nm	461, 689 nm	493, 650 nm	399, 556 nm
Rydberg excitation	420-480 nm	(317 nm)	-	(369, 308 nm)
Clock transition	778 nm	698 nm	1762 nm	-

KEY TAKE AWAYS

- Fiber lasers, fiber amplifiers, frequency conversion together is an attractive cocktail for quantum optics.
- Koheras BASIK lasers are ideal starting point with intrinsic advantages in stability, spectral purity and robust design.
- The ACOUSTIK Platform offers all Koheras functionalities from a single compact unit.

SOLUTIONS FOR INNOVATORS

A HAMAMATSU COMPANY

