



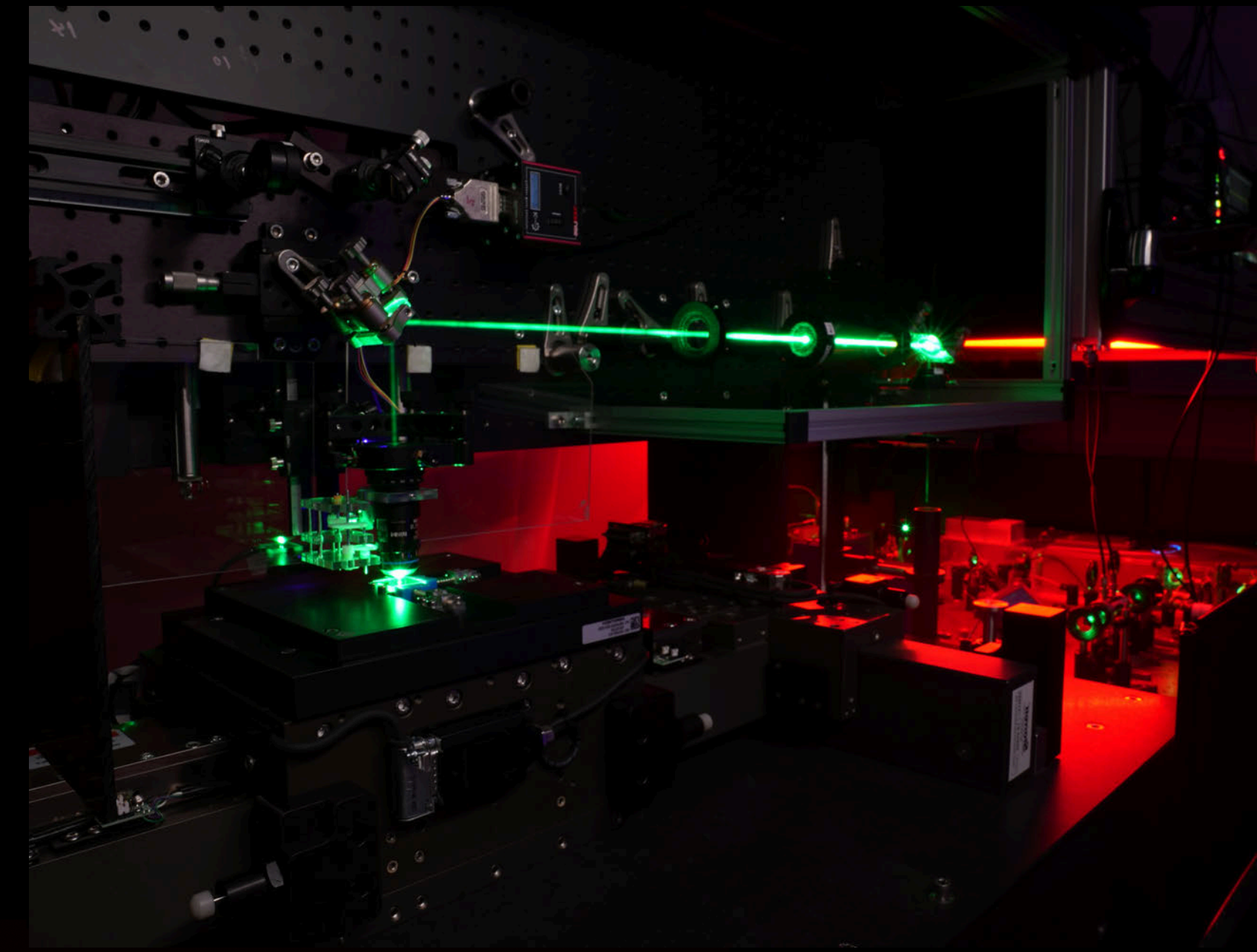
Pioneering the Future of Data Storage
and Optical Innovation

Advancing 5D Optical Data

LIBRARY
LIBRARY
OF CONGRESS

Ilya Kazansky, CEO

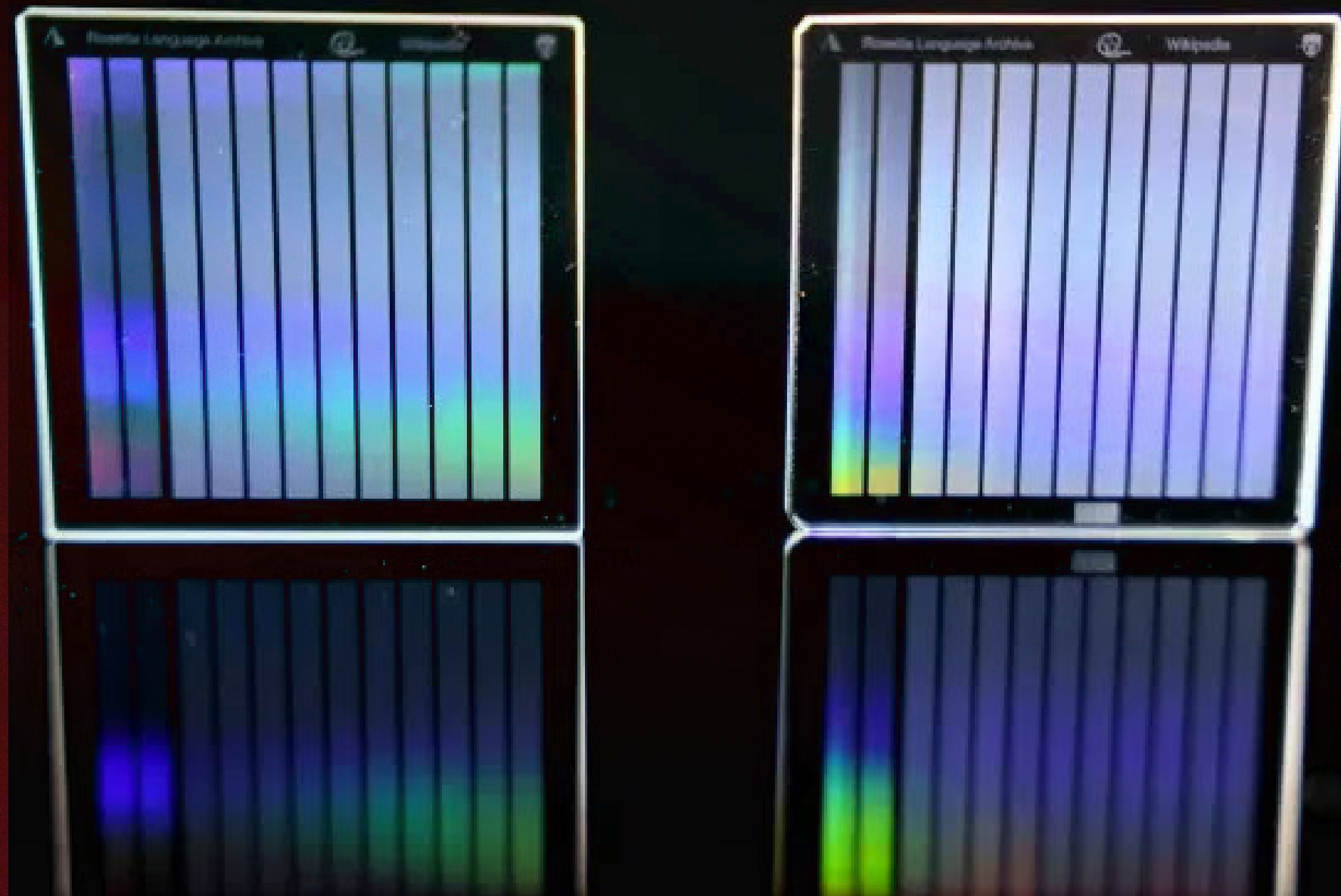
OUR MISSION



To make data storage durable, scalable
and sustainable for **the next generations**
growing data storage needs

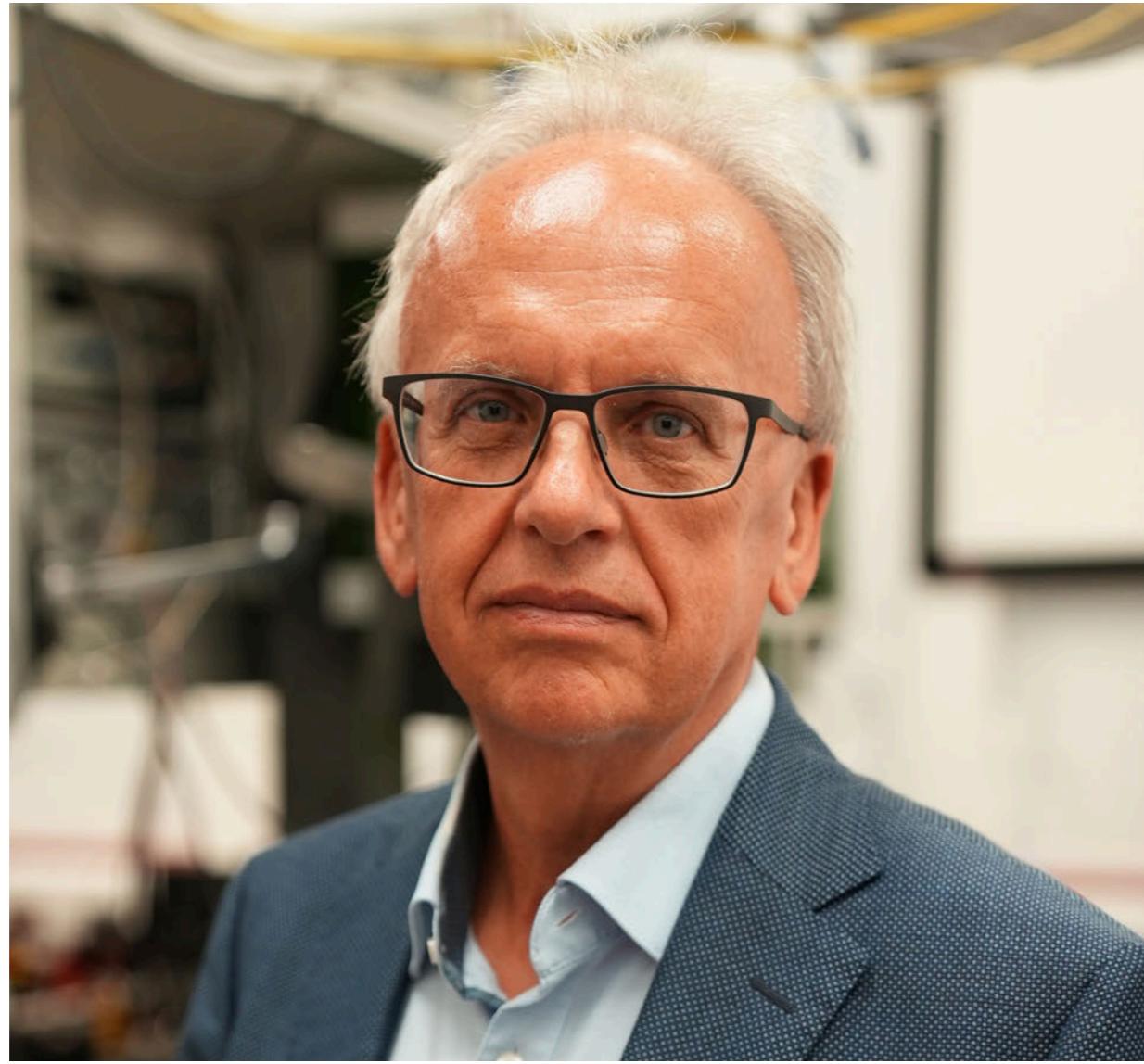
OUR MISSION

Revolutionizing **data** and **optics** through
the power of laser-written glass.



250TB Data Storage @ \$35 for 1000 years

FOUNDING ENGINEERS



Prof. Peter Kazansky

World-renowned inventor of **5D Memory Crystal** technology, a collaboration in 2017 between Microsoft Research and the Physical Optics Research Group, led by Peter, was the genesis of Microsoft's Project Silica. Peter continued breakthroughs on the optical recording physics



Dr Masaaki Sakakura

World-renowned inventor of **5D Memory Crystal** technology, Masaaki went onto to become a principle researcher at Microsoft Project Silica, focusing on recording physics. And subsequently joined SPhotonix to finalise performance and production readiness.

Surging AI demand for HDDs means that you may have to wait up to a year for 32+ TB hard disk drives, warns research - and yes, prices are also going up

News By Efosa Udimwen published September 18, 2025

32TB and larger HDDs now face nearly year-long wait times

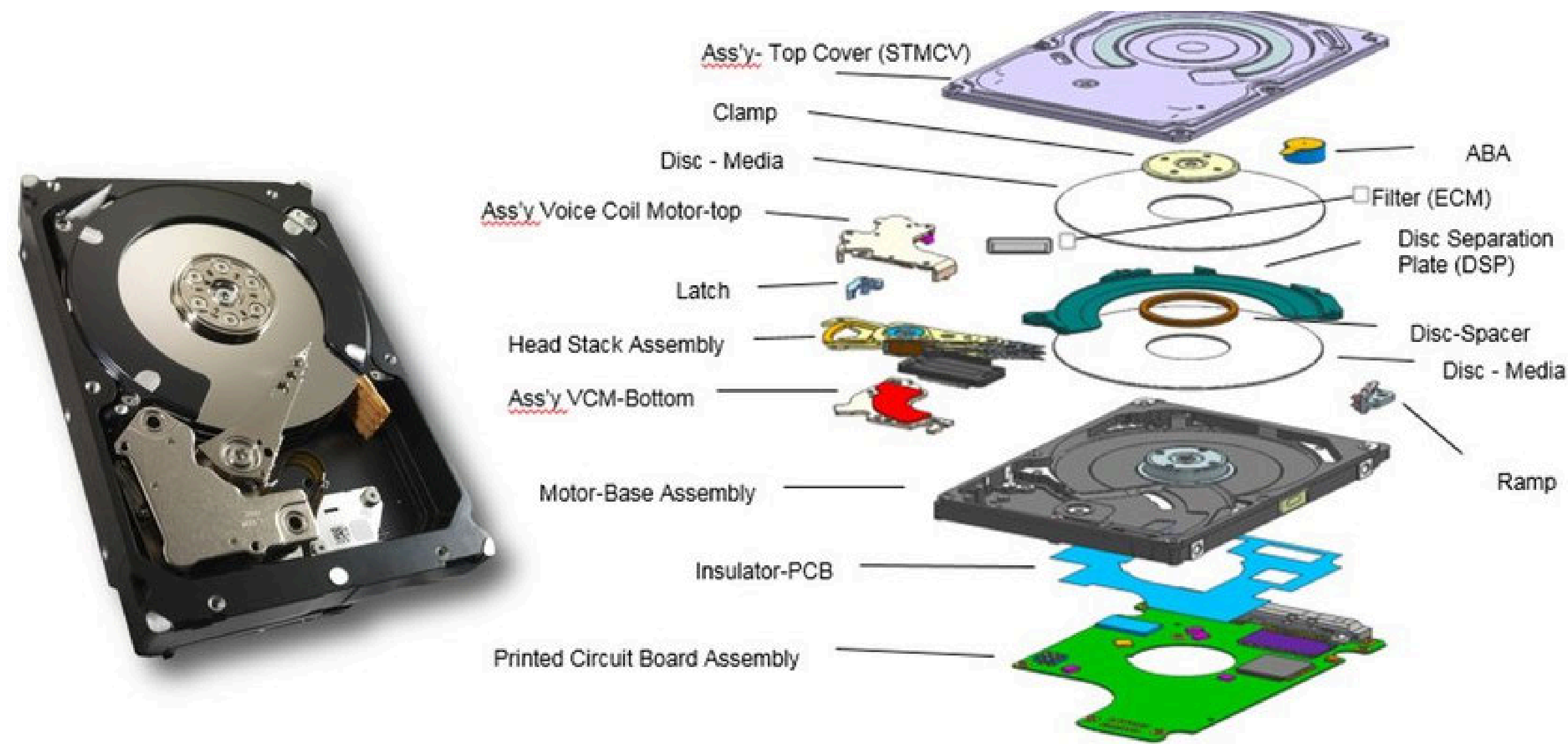
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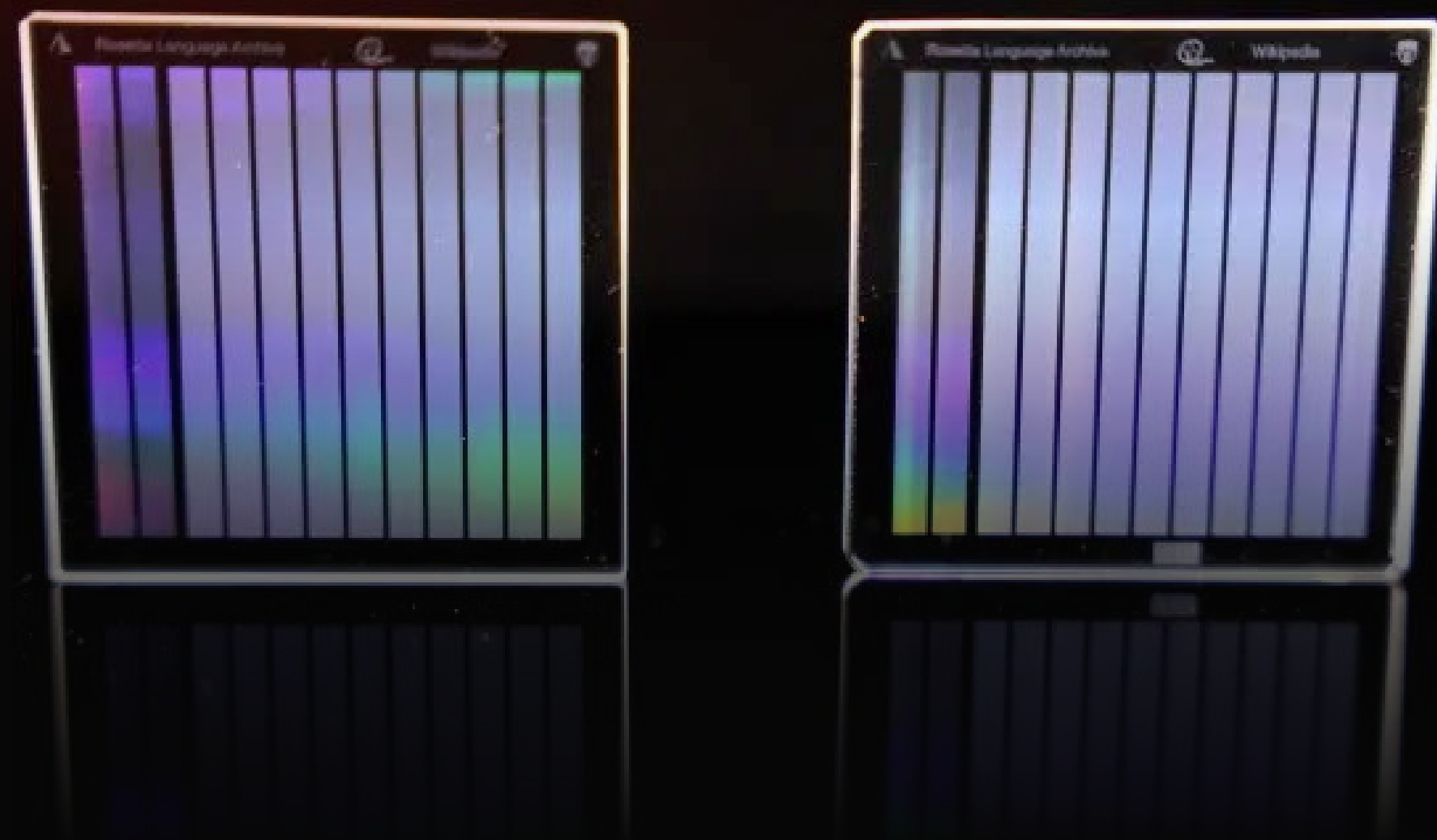


[#morecredit](#) [Future](#)

HDD/TAPE COMPLEXITY



5D Memory Crystal



Longevity/Durability/Security

Data written inside Quartz – the most durable material for data storage, data persists for thousands of years leading **Immutable WORM storage technology**.

Energy & maintenance cost of long term data storage

Once written, **no energy or maintenance required** to maintain, ever. **No need to copy data** from old discs as 5D Quartz Glass does not degrade.

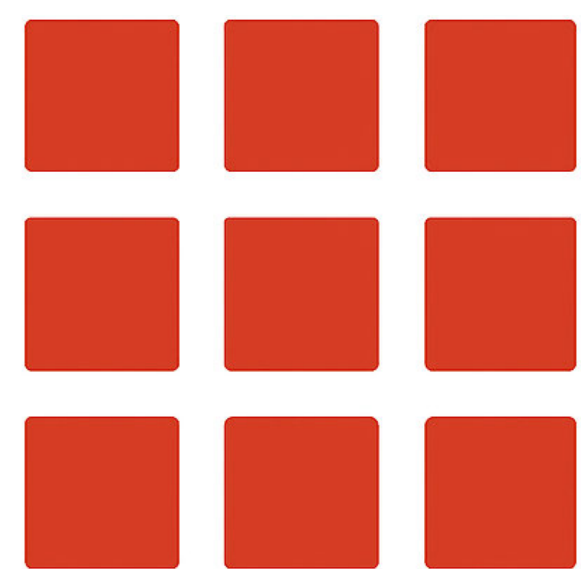
Density / Disc cost

Fused silica Quartz is effectively sand, although energy required to produce, **material cost significantly lower** than competition. One of the **leading densities, up to 10 GB/mm³**

LIBRARY SYSTEM



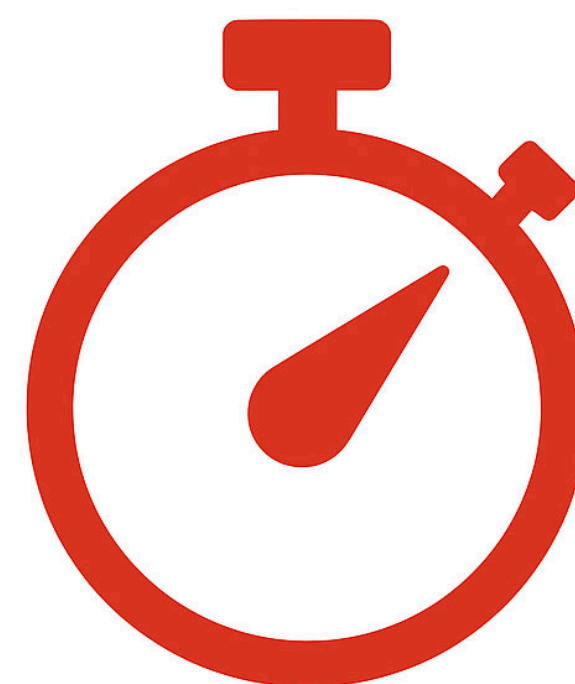
SPhotonix Breakthrough focus



Density



Durability

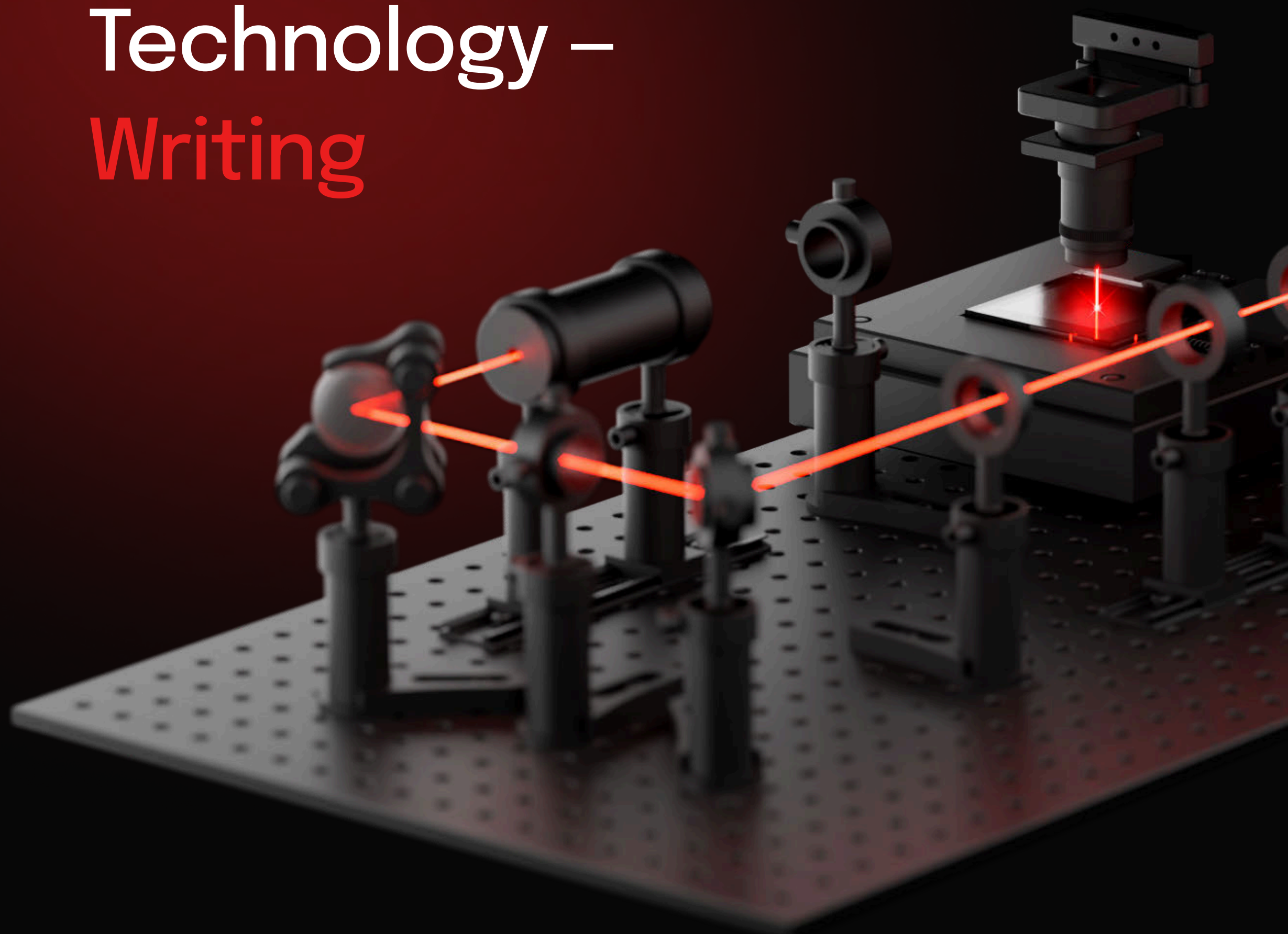


Speed



Cost

Data Storage Technology – Writing



Femtosecond laser-based optical system

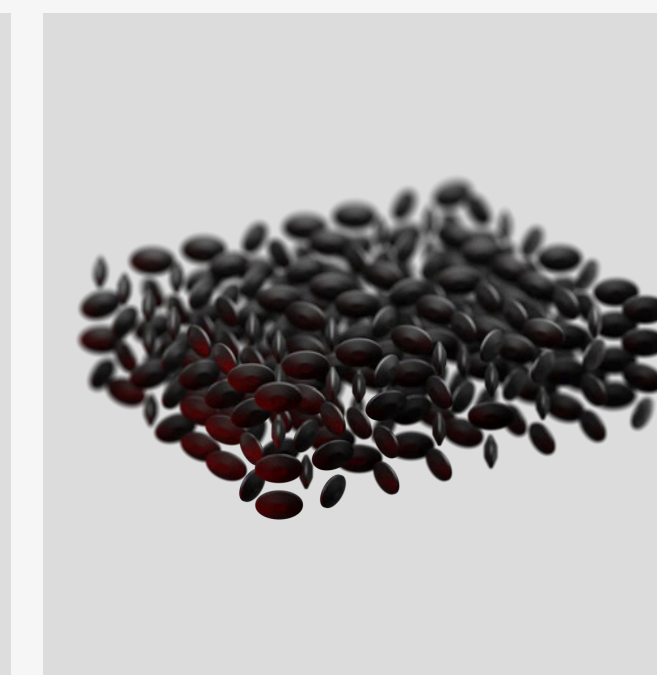
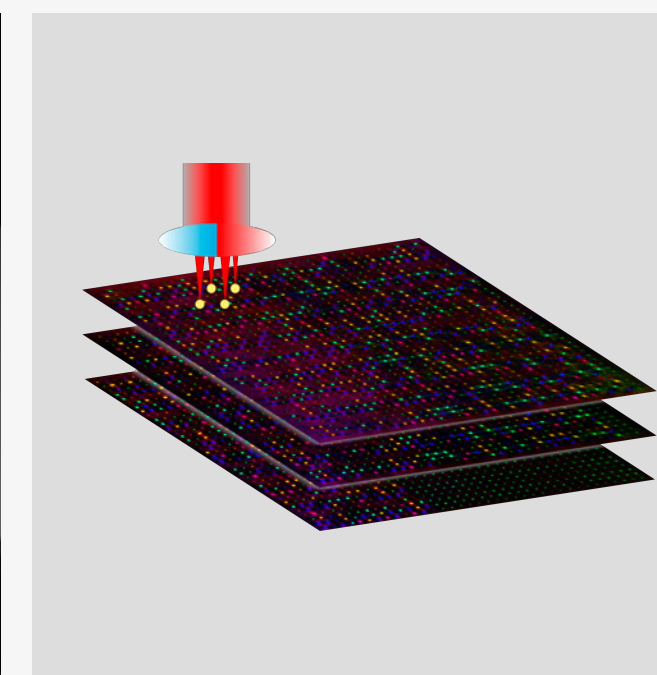
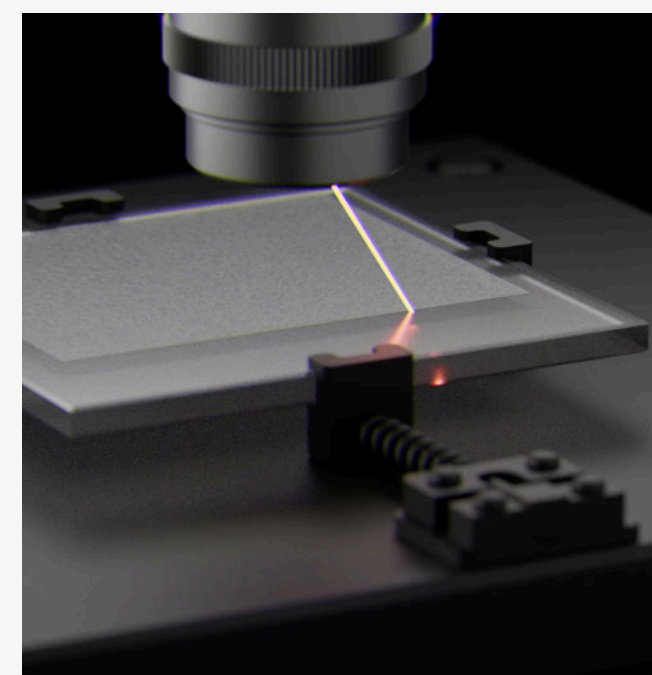
Delivers precision energy bursts into quartz glass, creating billions of nanostructures with unmatched accuracy

Software-driven optics

Precisely control nanostructure properties, including polarization and birefringence, enabling storage of 4 binary bits per nanostructure

Five dimensions

Enabling ultra-dense data storage medium include width, height, depth, polarization, and birefringence



Data Storage Technology – Reading

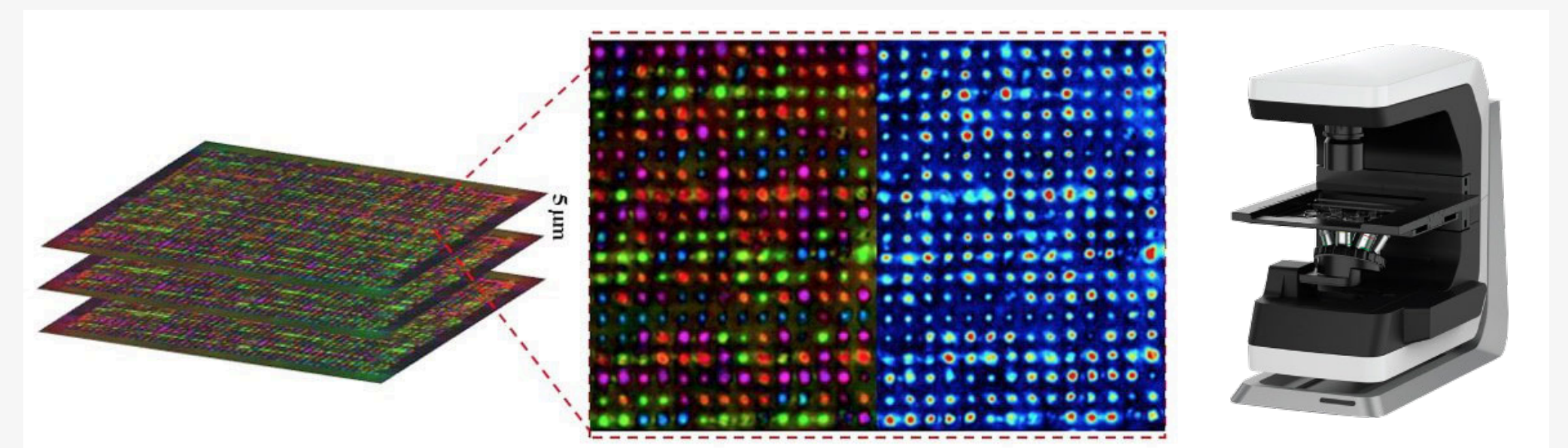
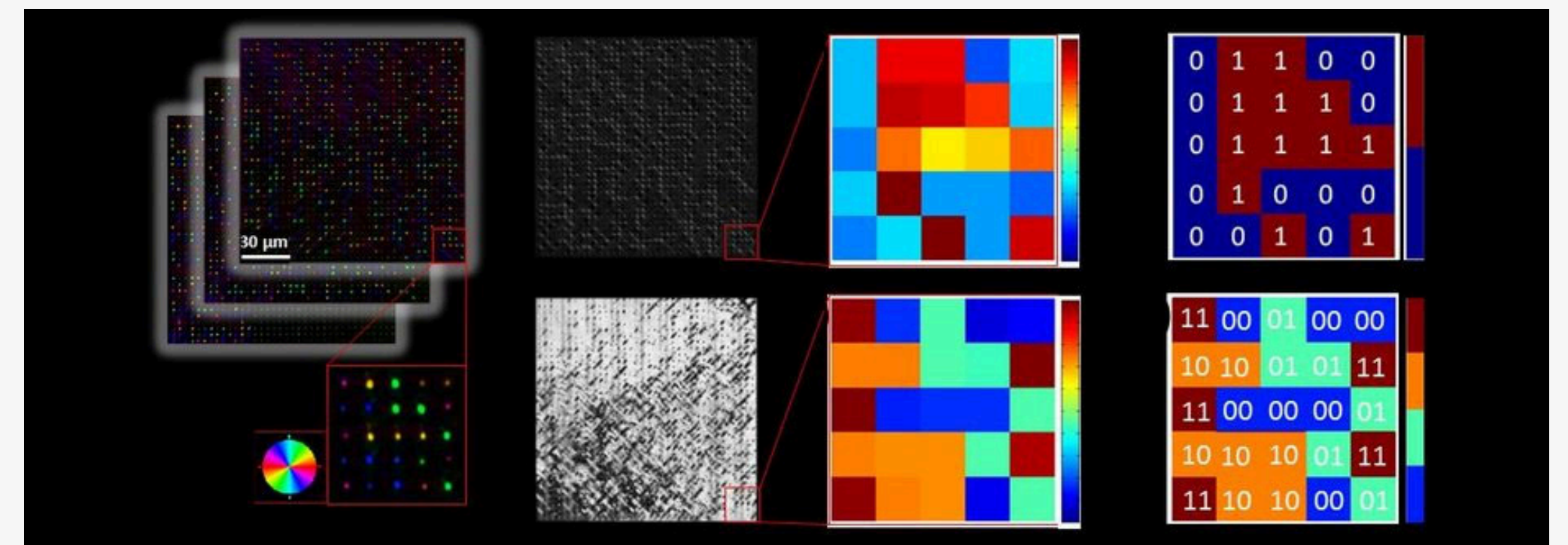


High-magnification polarization imaging system

Rapidly captures images of nanostructure rows and their optical properties with precision

Proprietary image processing software

Decodes nanostructure properties and patterns into digital binary data



Ultra Durable Material – Quartz Glass

- Remains stable at temperatures up to 1000C for extended periods
- Tolerates rapid temperature changes
- Chemically inert, zero water absorption rate
- Tensile strength 50MPa
- Compressive strength 1100MPa
- Mechanical wear resistant
- Resistant to UV and ionizing radiation (Space/Nuclear)
- Inert to Electromagnetic radiation (EMP)
- Scratch and abrasion resistant
- Can store data securely even in extreme conditions, such as high heat, deep ocean environments, or outer space.

Phased Adoption of Data Storage Technology built upon strategic partnerships

Industry Players

Hyperscalers

OEM's

Data storage Manufacturers

Media Vendors

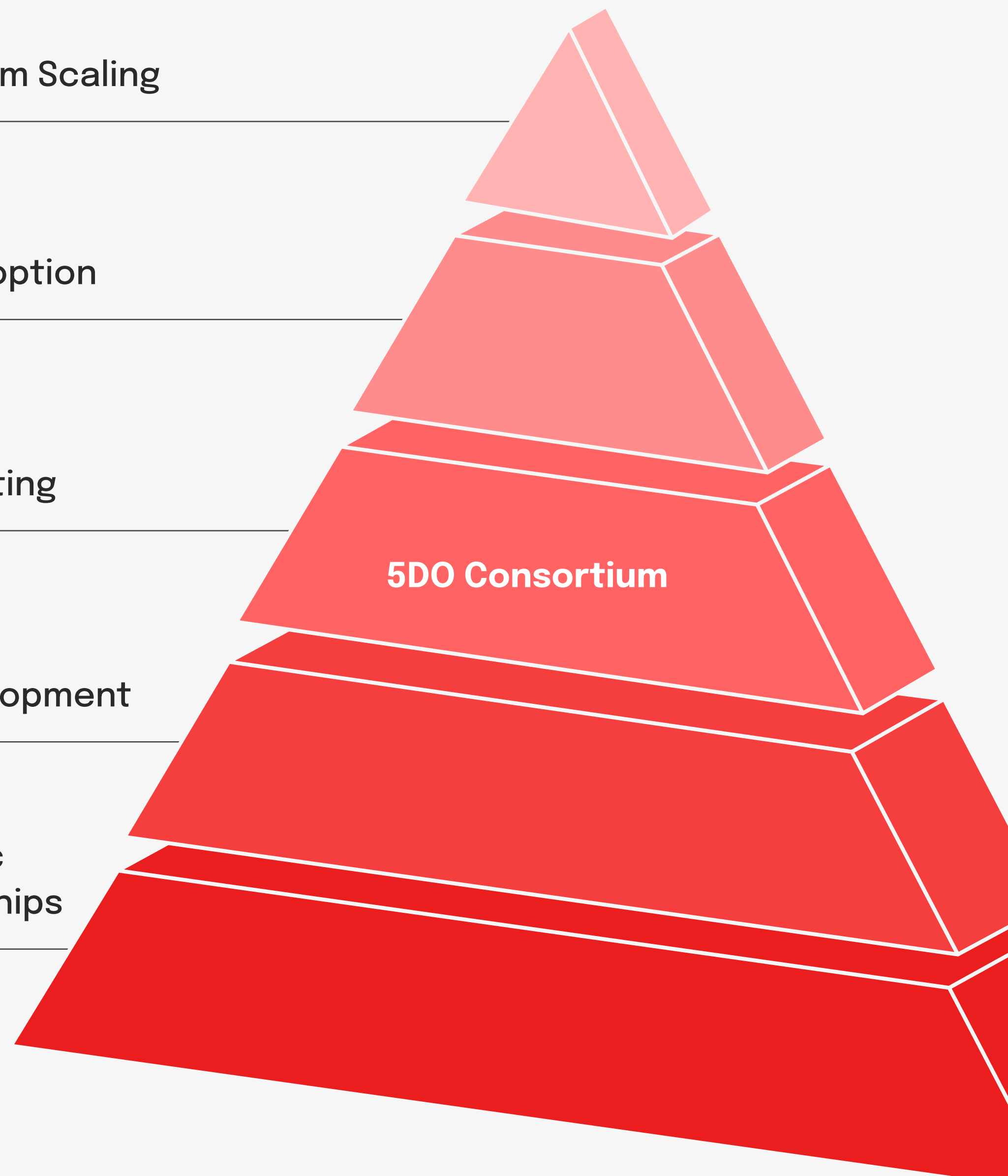
Ecosystem Scaling

Mass Adoption

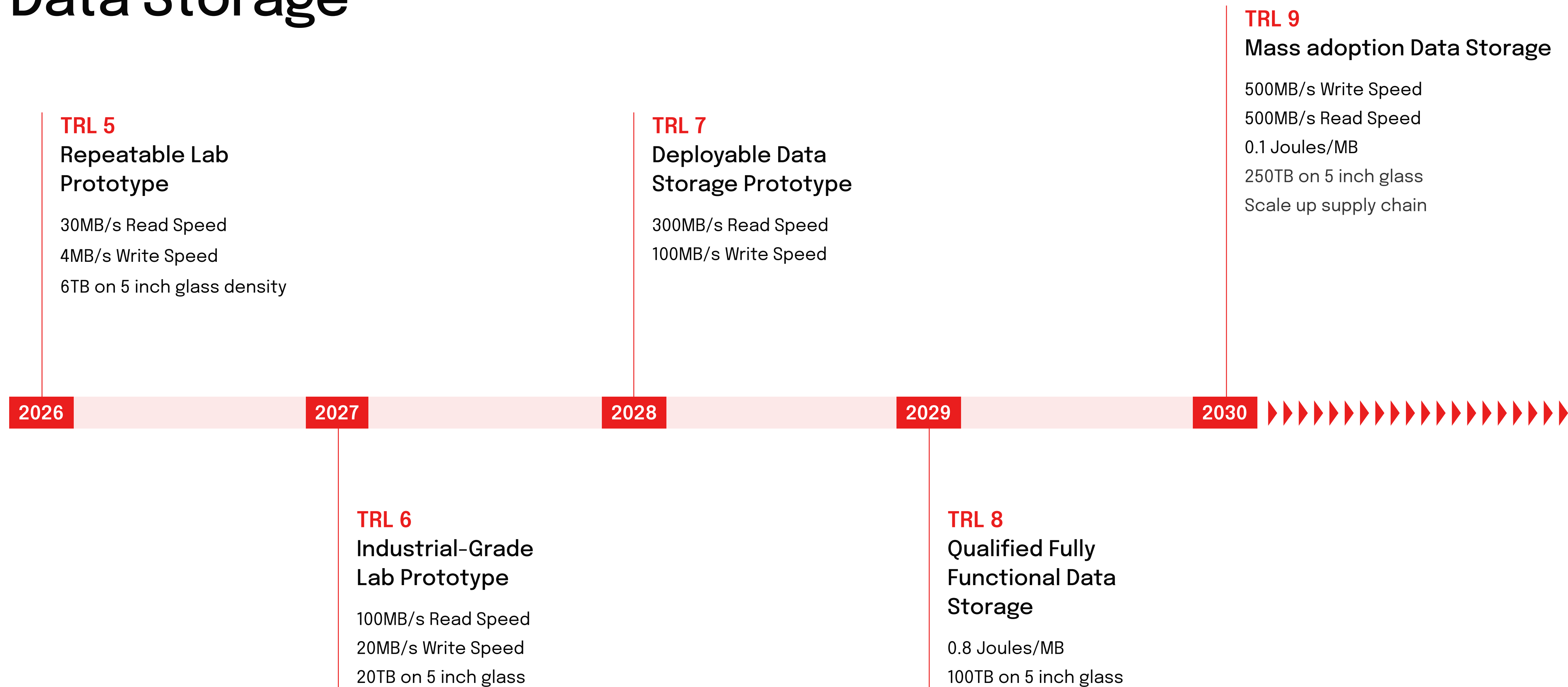
Beta Testing

Co-Development

Strategic Partnerships



Data Storage



Thank You!

To make data storage durable, scalable
and sustainable for **the next generations**
growing data storage needs

<https://sphotonix.com>