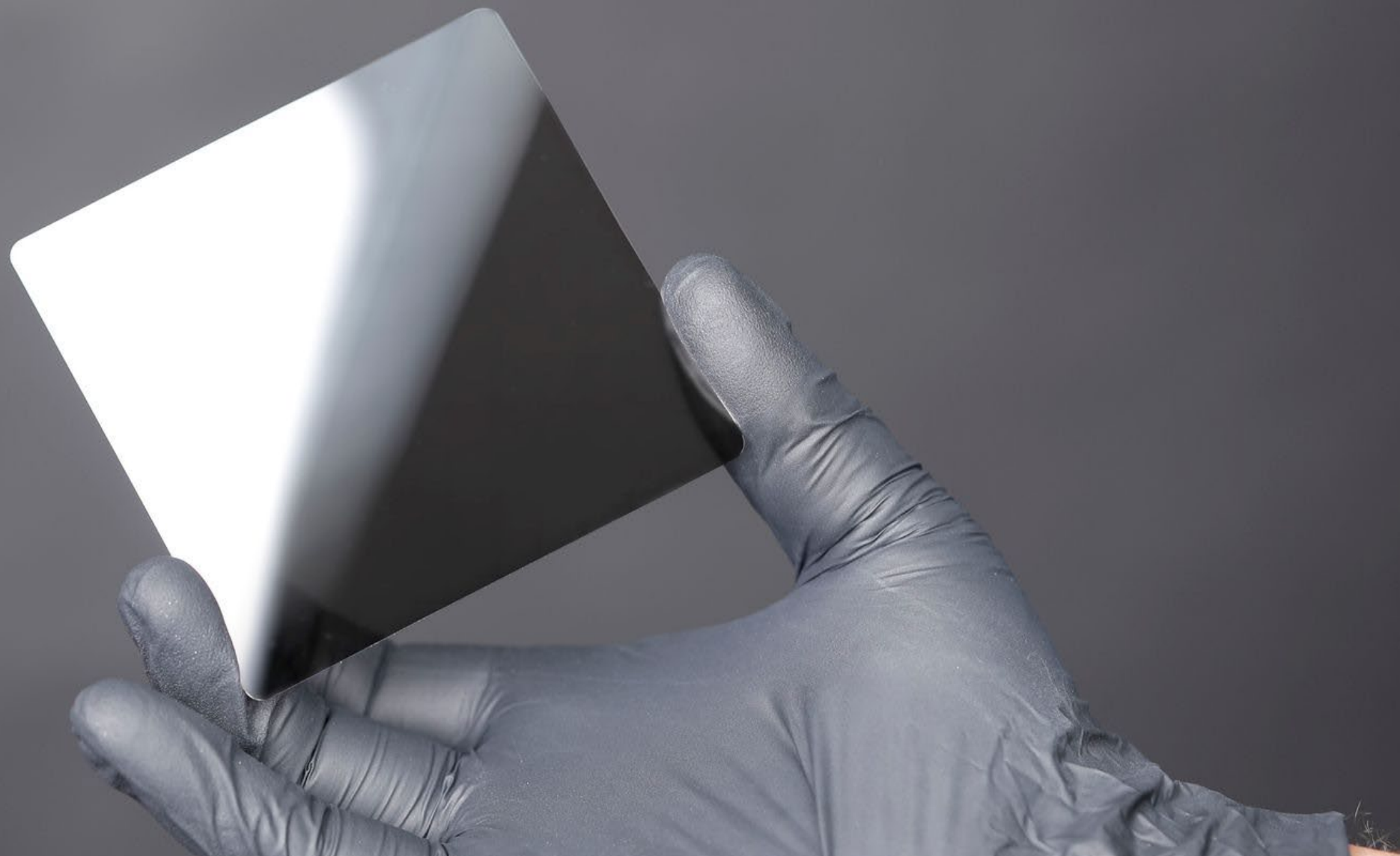




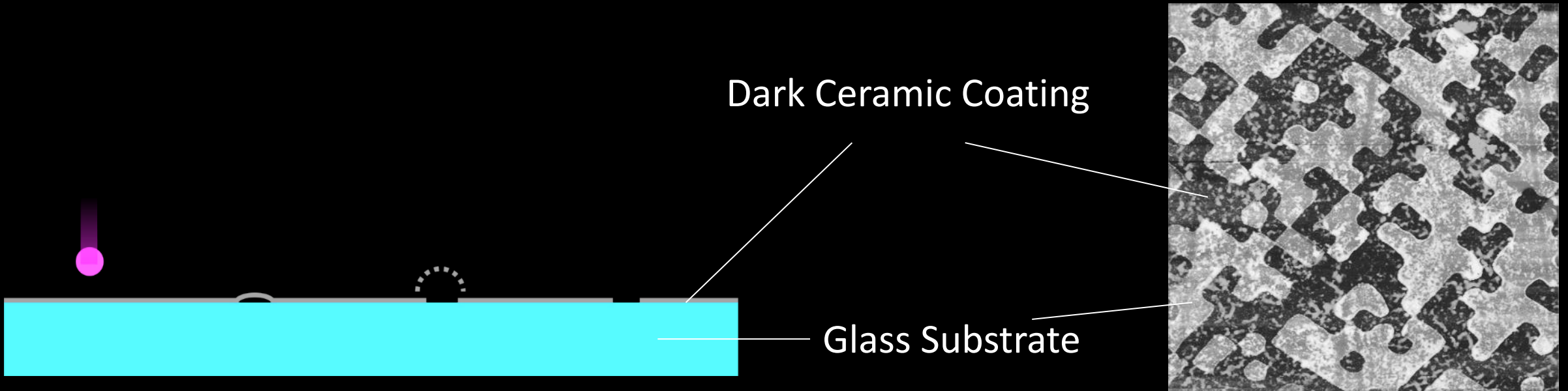
Principles & Prototype

Sebastian Kirsch, CTO Cerabyte

Ceramic-on-Glass Sheets

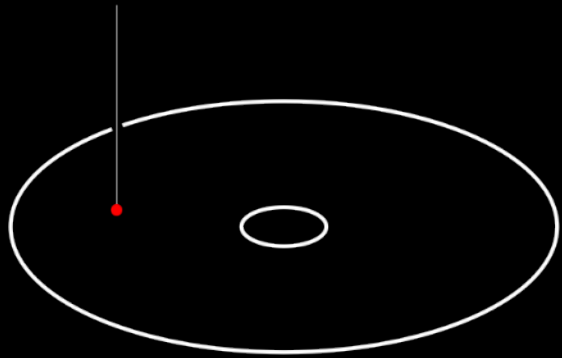


Writing Bits by Ablating the Ceramic Coating

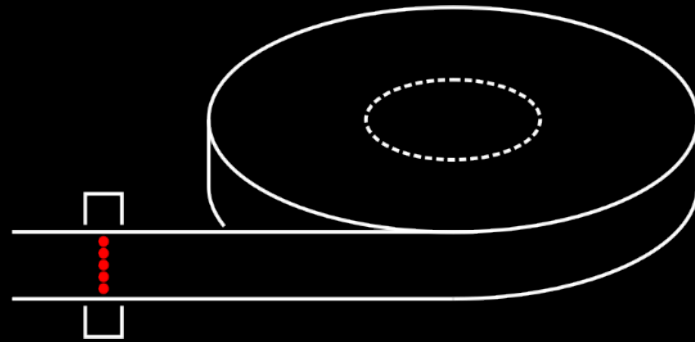


Matrix Enables High-Speed Writing

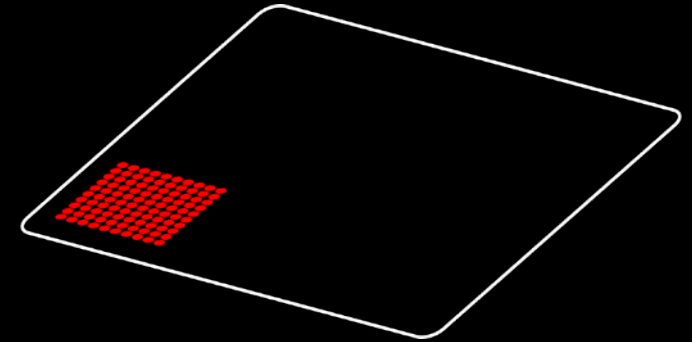
Single Spot



Row of Spots

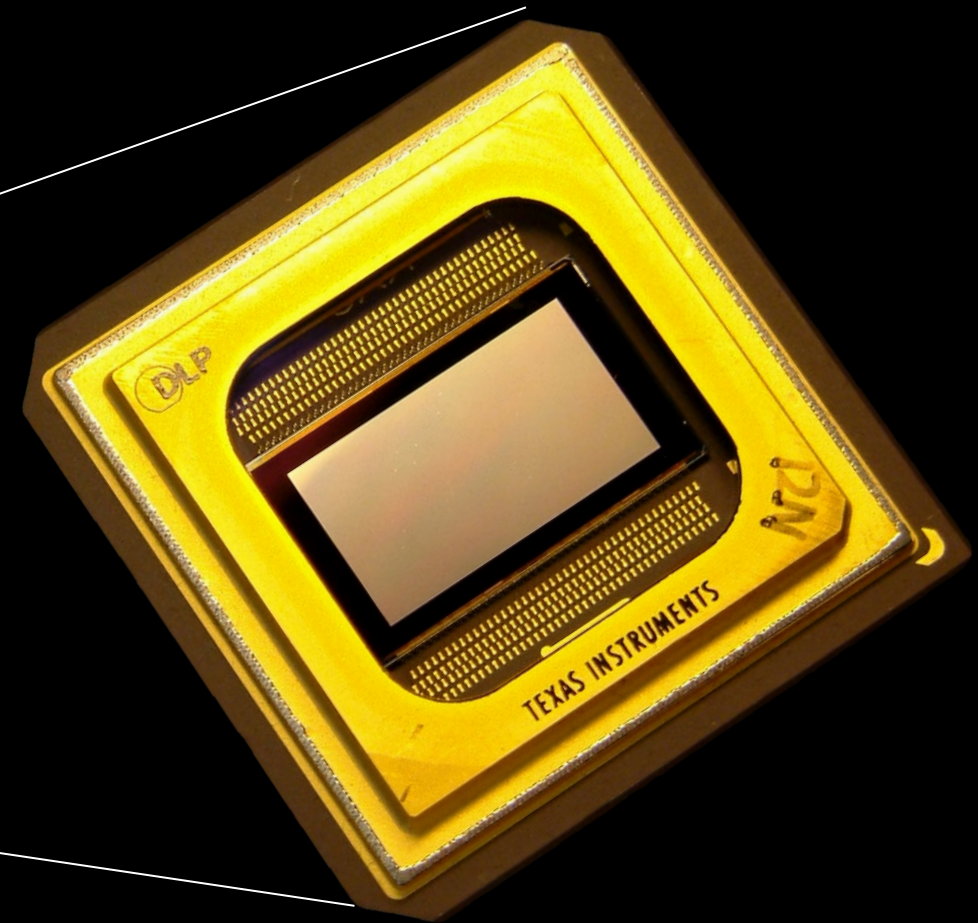


Matrix of Spots

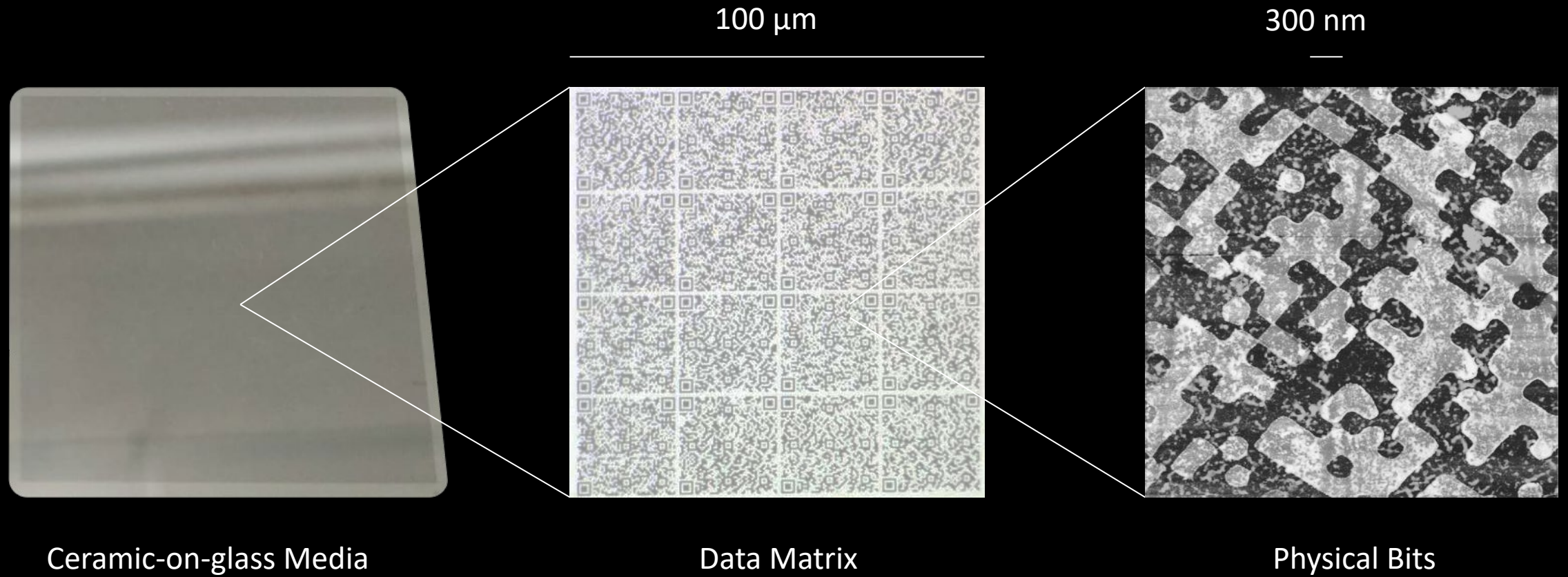


Writing Using a DMD - Digital Mirror Device

2 mio seperately switchable micromirrors



Ceramic Punch Cards at Nanoscale

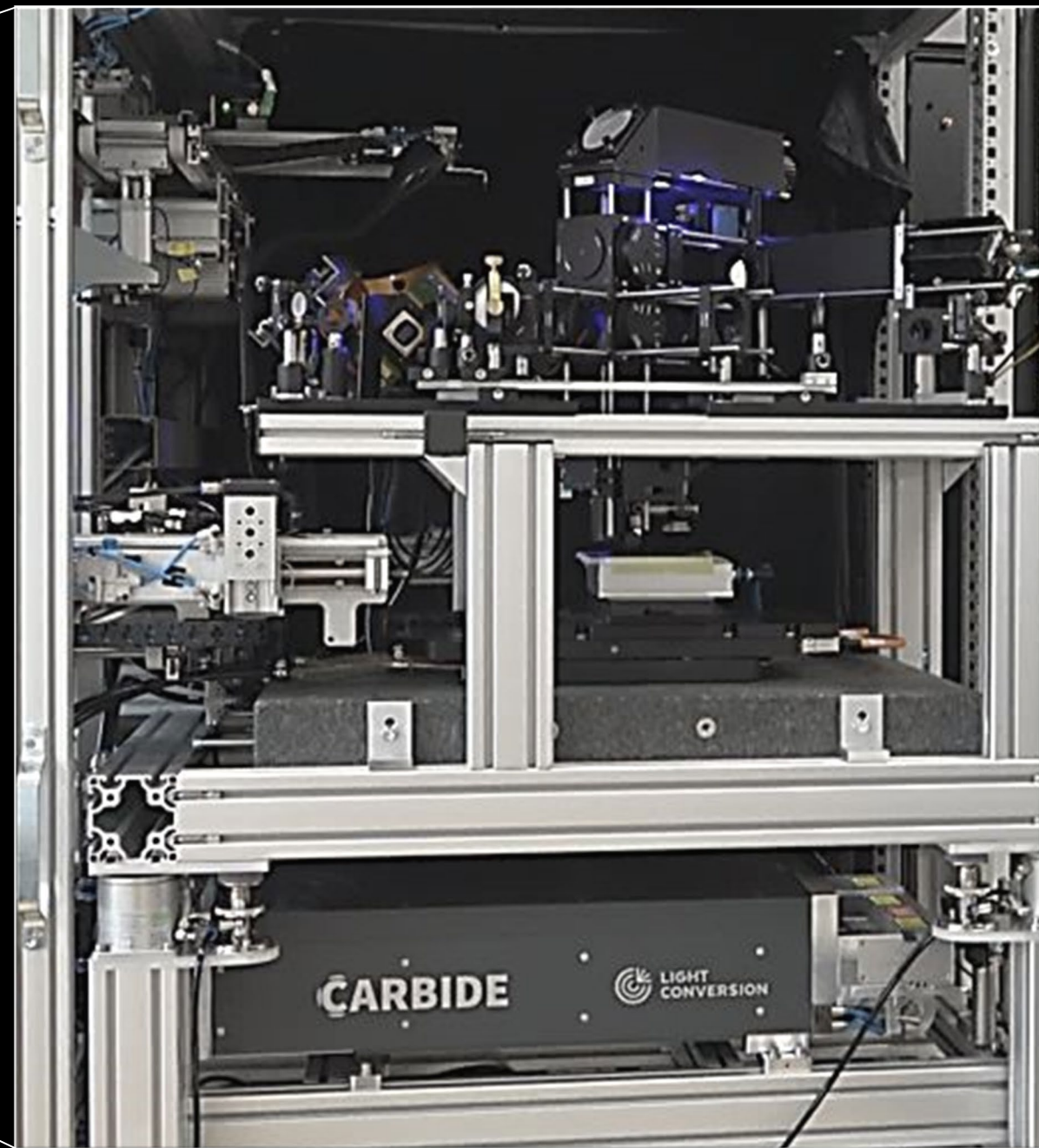




Optics

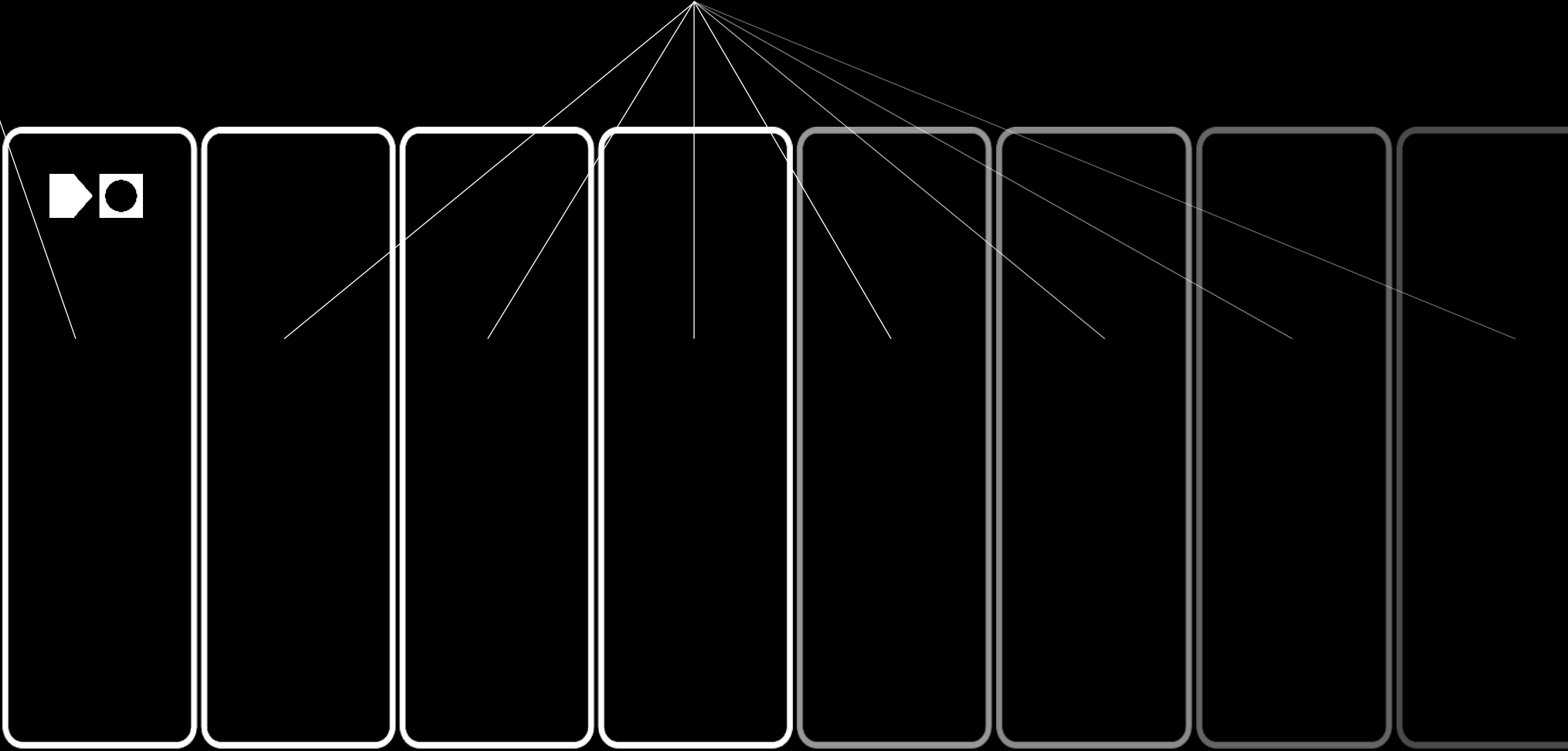
Stage

Laser
Source



Write/Read Rack

Library Racks



Robotic Library & Handling System

LTO-form-factor Cartridges



Storage Architecture

S3 Access

Object Storage Layer

Virtualization Layer (RAID Logic and Filesystem on Rack Level)

Cerabyte File System + Erasure Coding on Local Carrier/Cartridge

Block Storage with Local Error Correction on Local Data Carrier



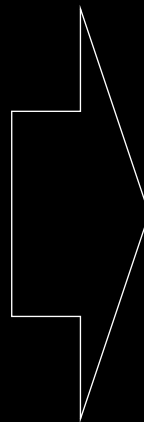
Technology & Roadmap

Steffen Hellmold, Director Cerabyte, Inc.

Inspired by Maskless Lithography

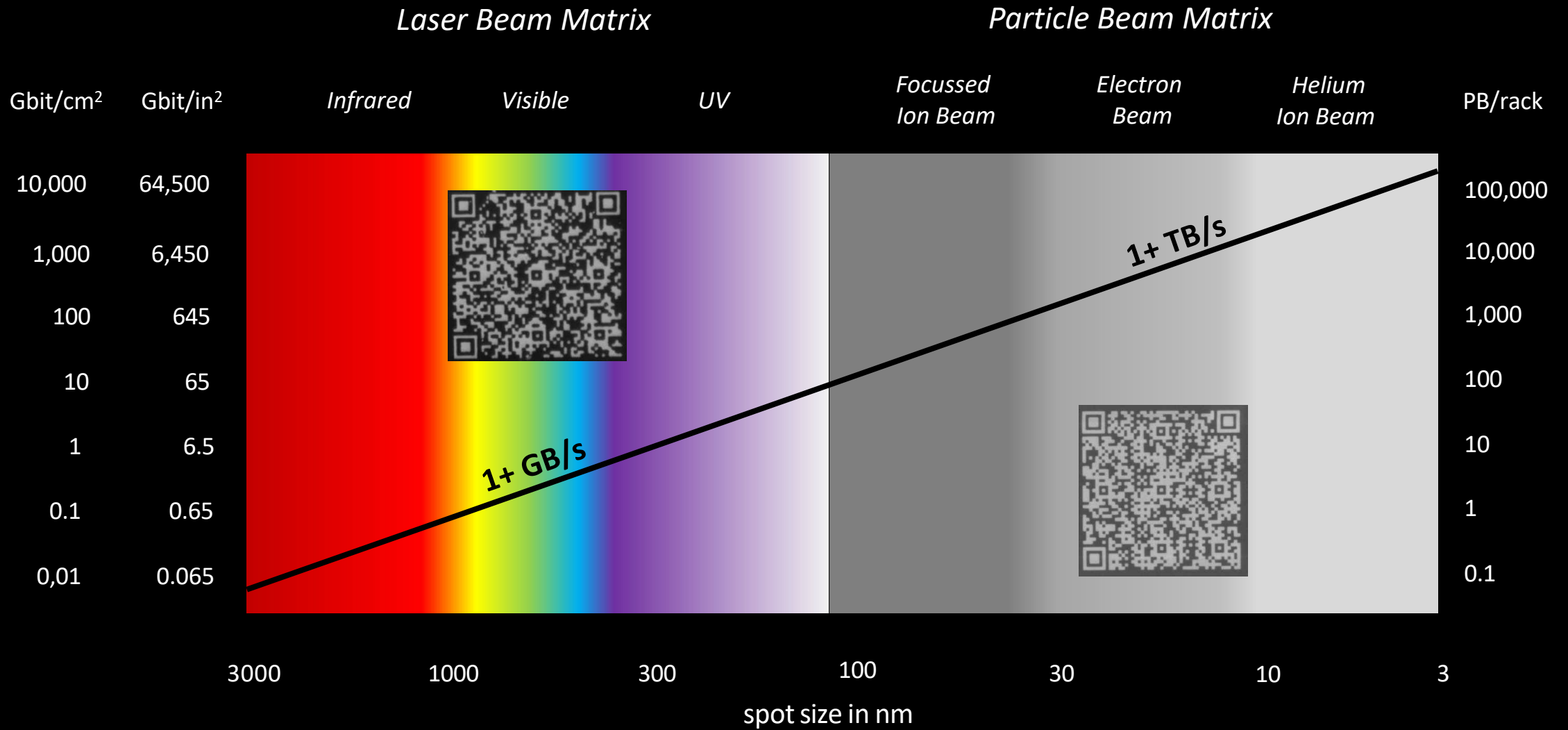


3 x 4 x 2 m 10 x 13 x 7 ft

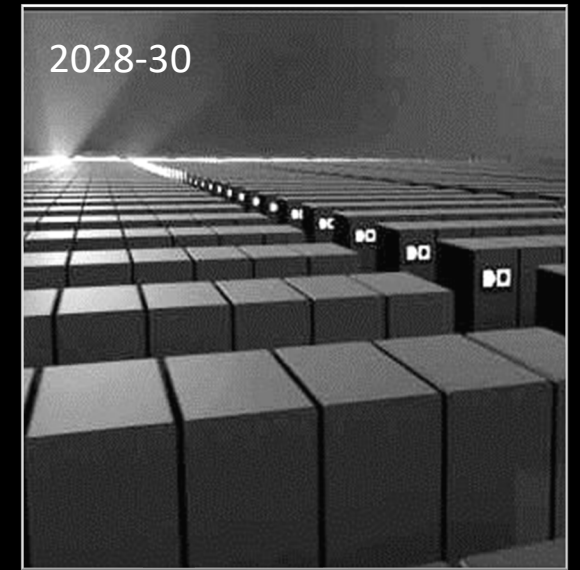
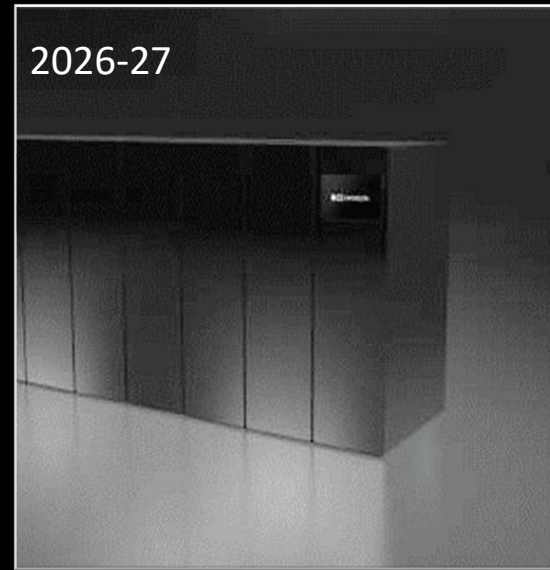
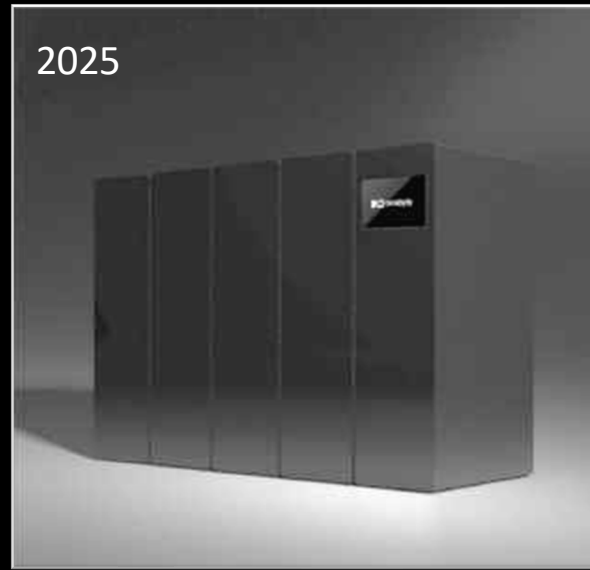
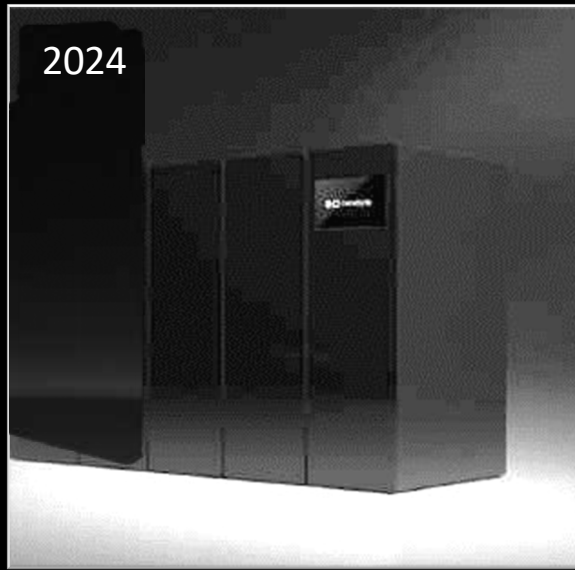


19" data center rack

Leveraging Semiconductor Technology to Scale Density and Speed



Development Roadmap from Demo to Hyperscaler Deployment



Demo Systems

1PB/rack
100 MB/s
<90 sec to first byte

On-Prem Systems

5 PB/rack
500 MB/s
<30 sec to first byte

Cloud Systems

10-30 PB/rack
1+GB/s
<15 sec to first byte

Hyperscaler Systems

60-100 PB/rack
2+ GB/s
<10 sec to first byte

Low Cost & Power, Rugged and Sustainable Data Storage



-272 °C
-459 °F



+500 °C
+930 °F



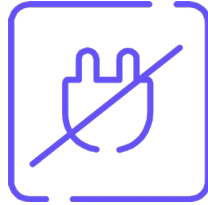
Moisture &
Flood proof



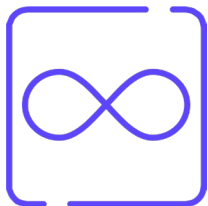
Corrosion
resistant



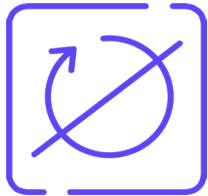
Radiation &
EMP proof



Energy free retention,
no AC for storage



Immutable record
cyber secure / WORM media



No media degradation forcing
periodic replacement



No data migration,
no bit rot nor periodic fixity check



Deletable,
100% recyclable

Reducing Environmental Footprint

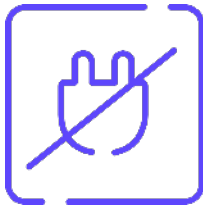
**No replacement
every 5-7 years**



2%

of global electronic waste

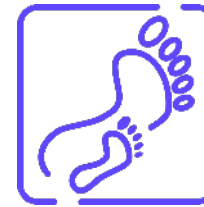
**No electricity
consumption**



2%

of global consumption

**Less carbon
emission**



1%

of global CO₂ emissions

Societal Impact

Digital heritage



100%

to coming generations

Business, Science & Governmental



ZB

securely stored

Personal memories

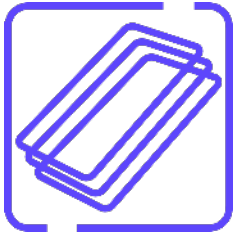


8 bn

affordable memories

Ceramic Nano Memory Enables the AI Storage Dataverse

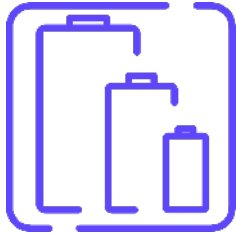
Storage density



100x

Growth

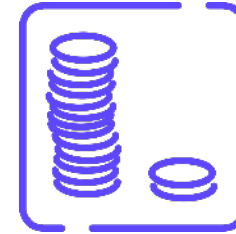
Energy efficiency



100x

Improvement

Cost scaling



\$1/PB

per month



cerabyte



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