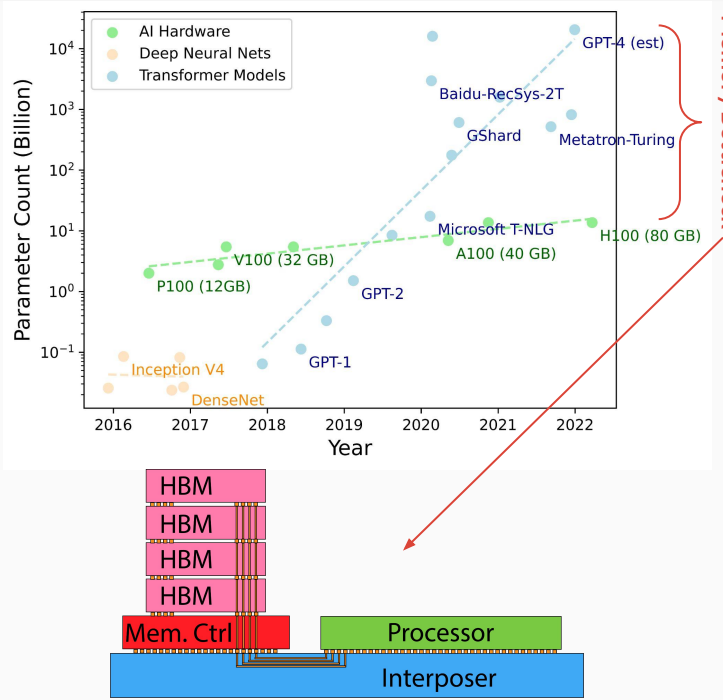
NTessimal

Bottom-up Nanofabrication Tools

AI Compute Demands Outpace Hardware Development

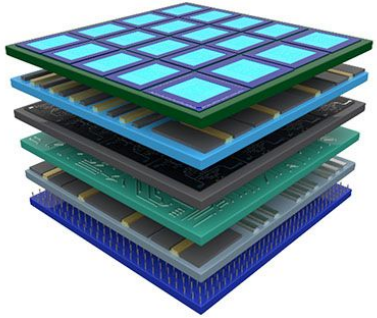
- Larger AI models offer significant potential to revolutionize most economic sectors
- Current hardware approaches have struggled to keep pace with mathematical advances
  - Increasing die size
  - Increasing integration with packaging
  - Fine tuning architecture

A ***faster rate*** of hardware improvement is necessary



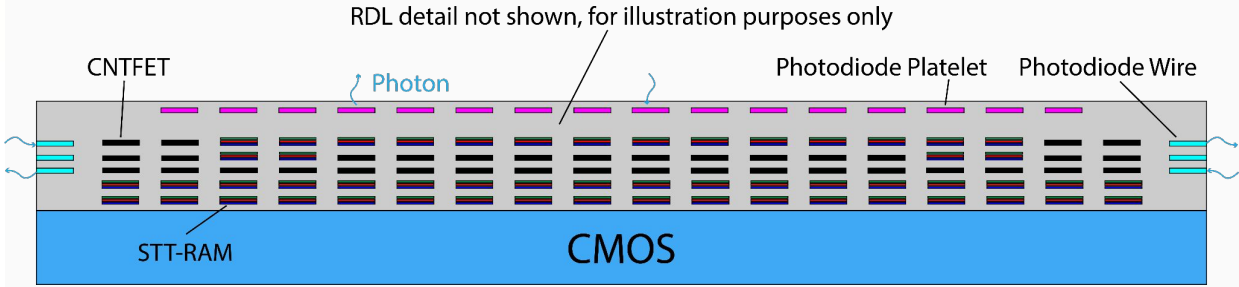
Bottom-Up Integration for 3DHI-VLSI

3DHI (µScale)



(DARPA rendering, 2023)

3DHI-VLSI (nanoscale)

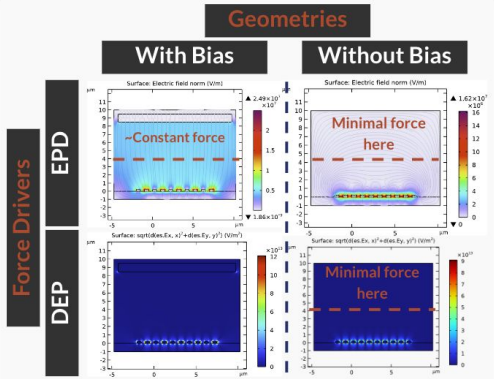


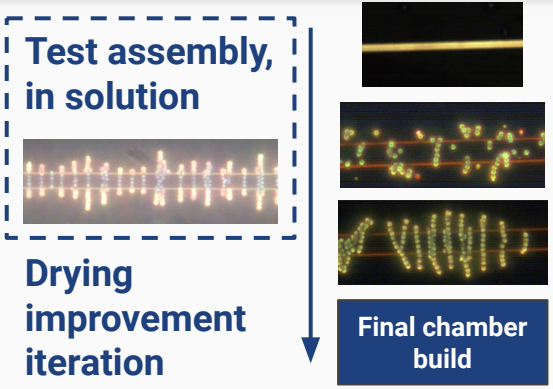
Conceptual drawing

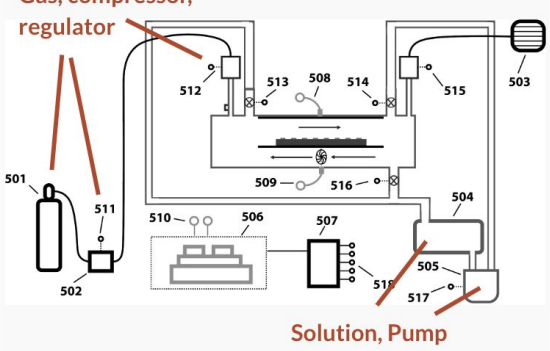
- ❏ Nanoscale high density interconnects
- ❏ Larger materials set, fabricated off substrate
- ❏ Multi-functional die - logic, memory, optical
- ❏ True 3D topology

Lithography defined integration allows for a potential ***>1,000x improvement*** over traditional packaging

Multi-Physics Nanoparticle Assembly







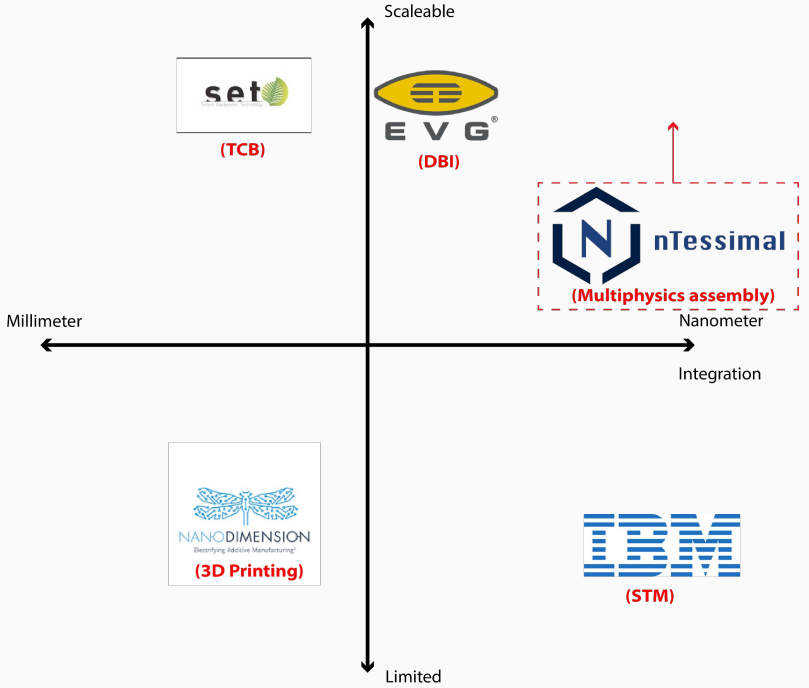
- nTessimal's patent pending chamber for assembly of nano-particles/wires/platelets
  - Replaces microfluidics with DC electric field forces to decrease contamination and allow throughput required for manufacturing
  - Utilizes supercritical drying maintains yield
  - Packaged with process expertise

Full wafer patterning, reduced surface tension

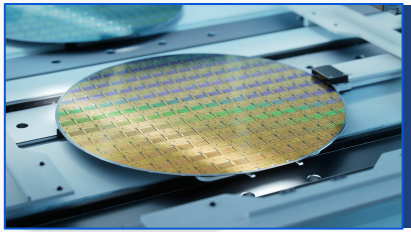
Competetive Landscape

- Our technology will enable the tightest integration level and has the potential for the greatest performance improvement
- We are not directly competing with any option listed here as ***all levels of integration should be leveraged***
  - Direct bond interconnects
  - Thermocompression bonding
  - Printed circuit boards

We offer the unique potential for scaleable nanoscale 3D integration



Traction & Additional Applications

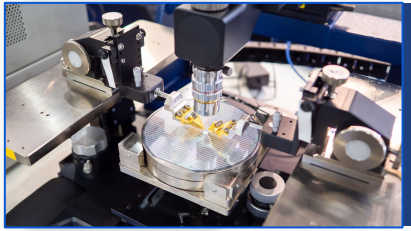


Pure Play Semiconductor Foundries

We recieved a NSF grant support letter from a semiconductor foundry who understands the value of patterning high purity CNFETs

Biotechnology

We recieved a NSF grant support letter from a company to increase manufacturability of microparticle based monitoring antenna and lab-on-chip solutions



Advanced Substrates

We’re working with a glass substrate manufacturer on high aspect ratio via fill including novel materials

Learn more about how nanoparticle assembly technology can help you!

- Website: https://ntessimal.com/
- LinkedIn: https://www.linkedin.com/company/ntessimal/
- PI Email: Steve.Snyder@nTessimal.com

Compute

3D Logic
Compute Near / In Memory
uTopology 3DHI

Photonics & Sensing

Plasmonic Particle, Multiferroic Nanowire, Piezoelectric Nanowire Assembly

Biomedical

Lab-on-a-Chip Microscale Cell Separation

See us at the EIPBN poster session