

# 密封半導体メモリの可能性

## A Sealed Semiconductor Memory

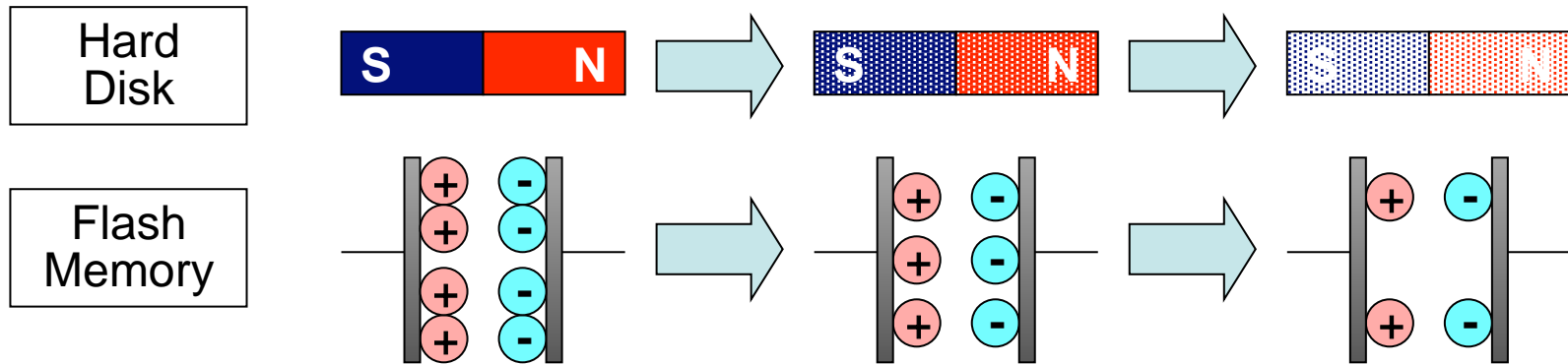
京都大学 越智裕之

Hiroyuki OCHI, Kyoto Univ.

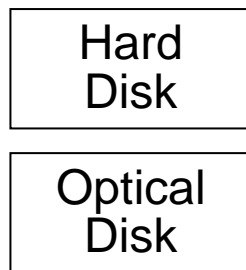
October 24, 2008

# Vulnerability of Conventional Storage Devices

- Magnetism and electric charge fades away

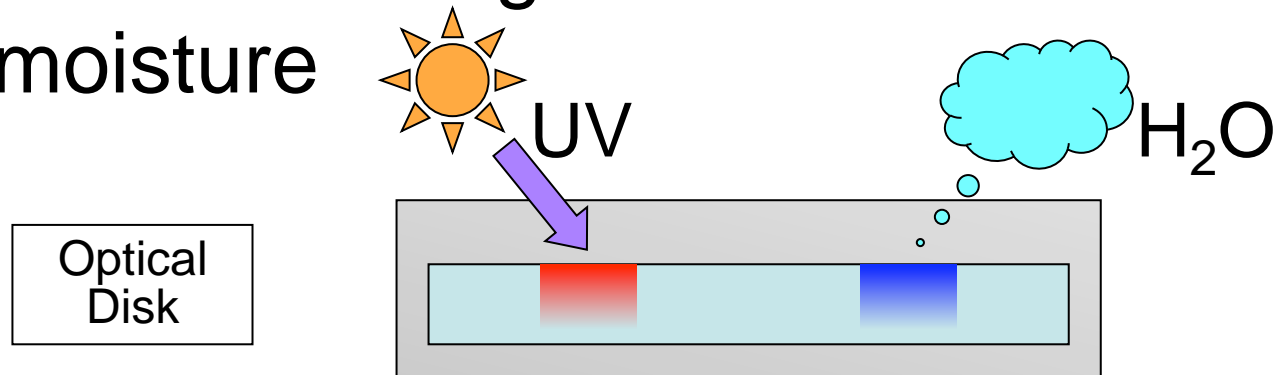


- Spinning disk is at risk of crash

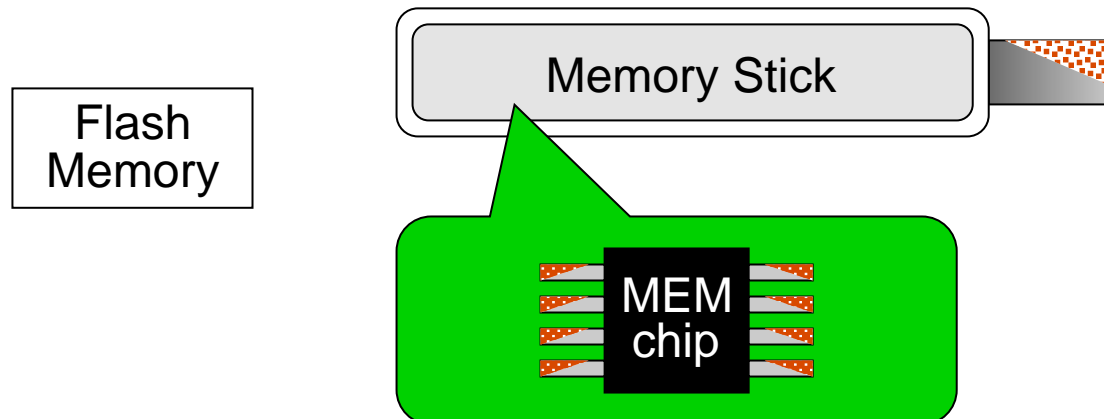


# Vulnerability of Conventional Storage Devices

- Plastic coating does not block UV and moisture

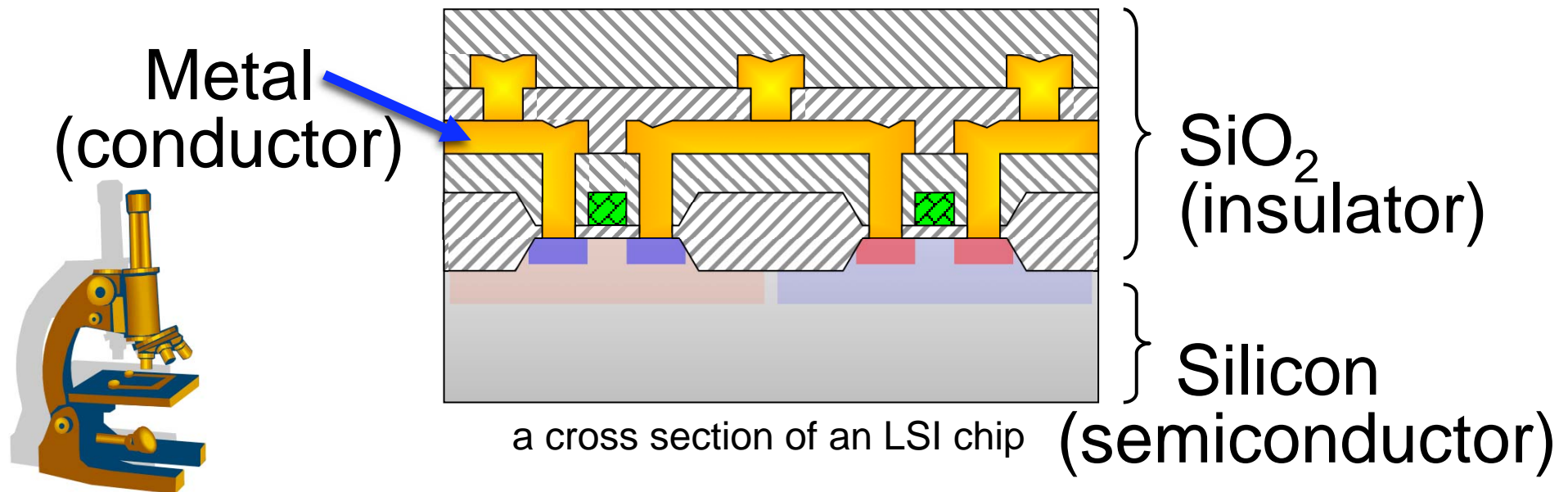


- Metal in open air gets rusty



# Semiconductor Devices

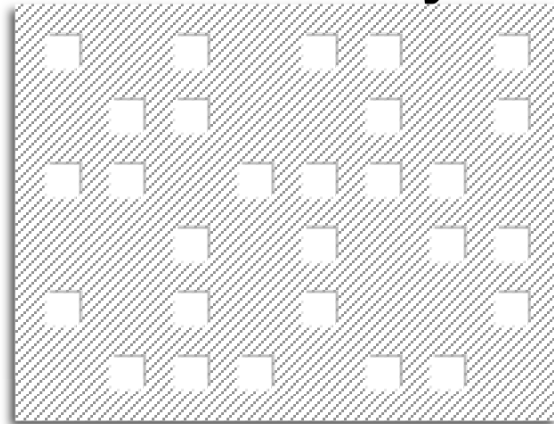
- Made of Silicon and  $\text{SiO}_2$ 
  - most stable materials on the Earth.
- Metals are also used, but completely sealed under the  $\text{SiO}_2$  layer.



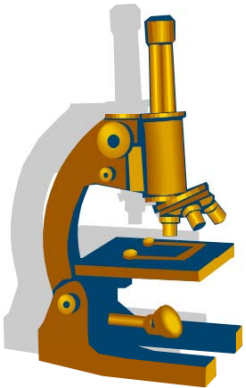
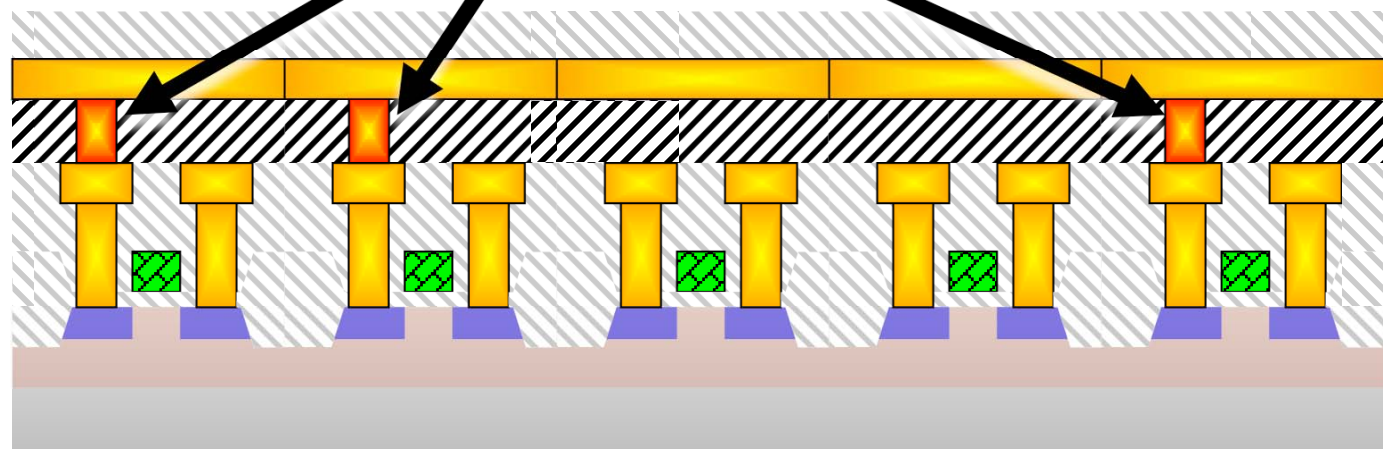
# Mask ROM

- Data is inscribed on an  $\text{SiO}_2$  insulator layer.
  - “0”s and “1”s are written as through hole pattern

insulator layer

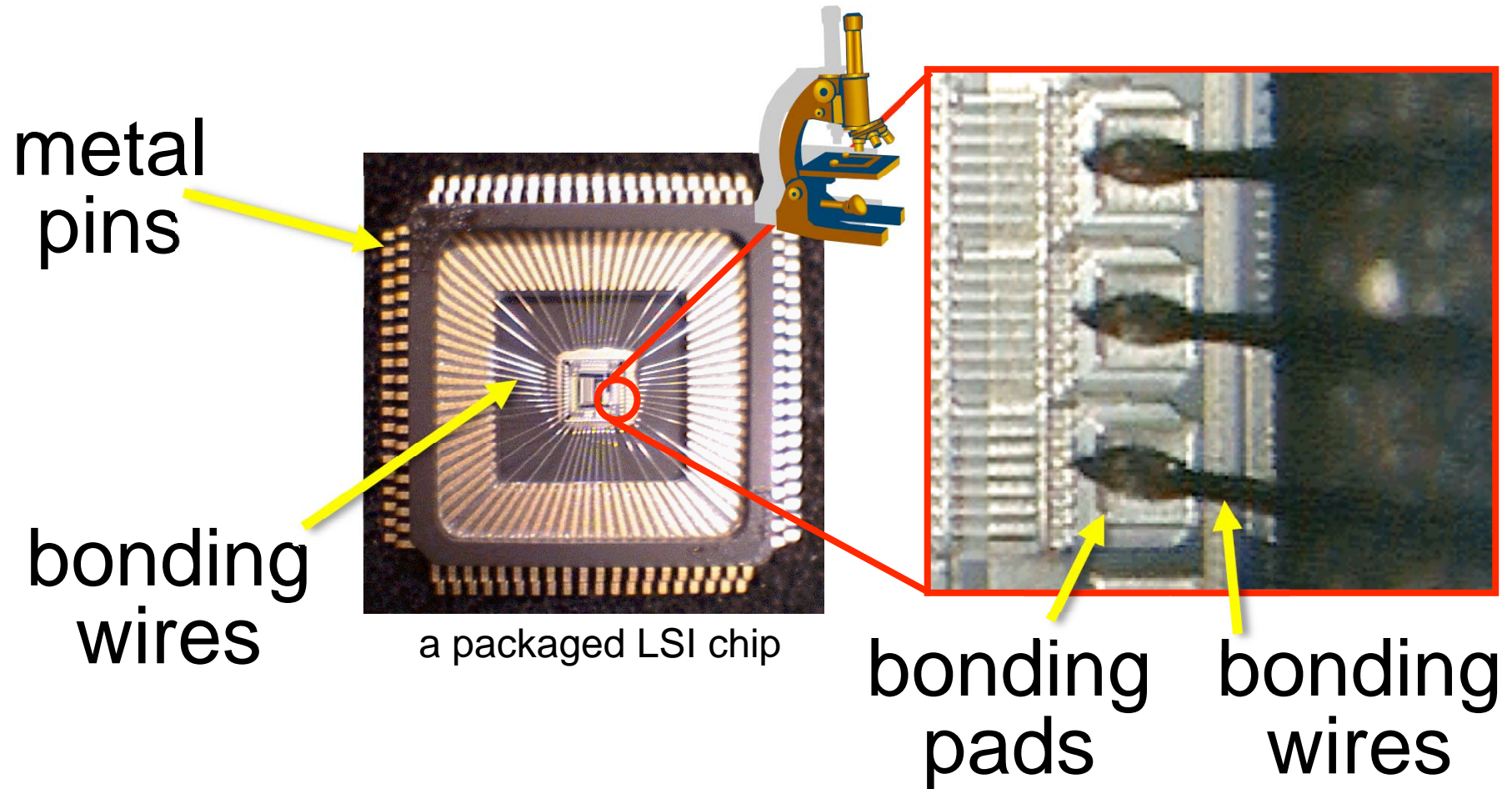


Through hole



# The only weak point of Mask ROMs

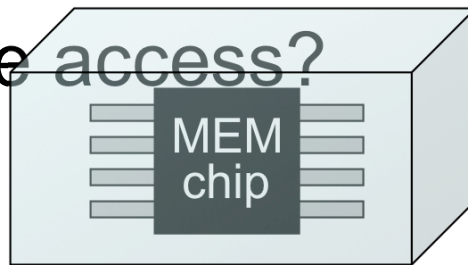
- Metal terminals are at risk of corrosion.



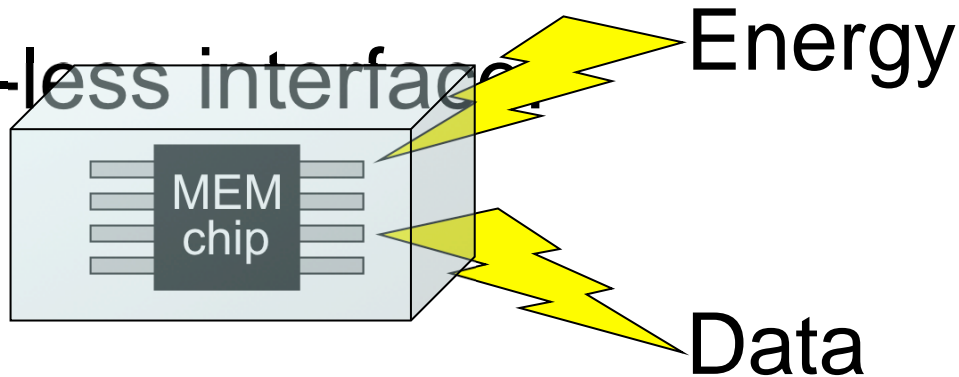
# Contact-less Mask ROM

- The ultimate solution: a sealed mask ROM.

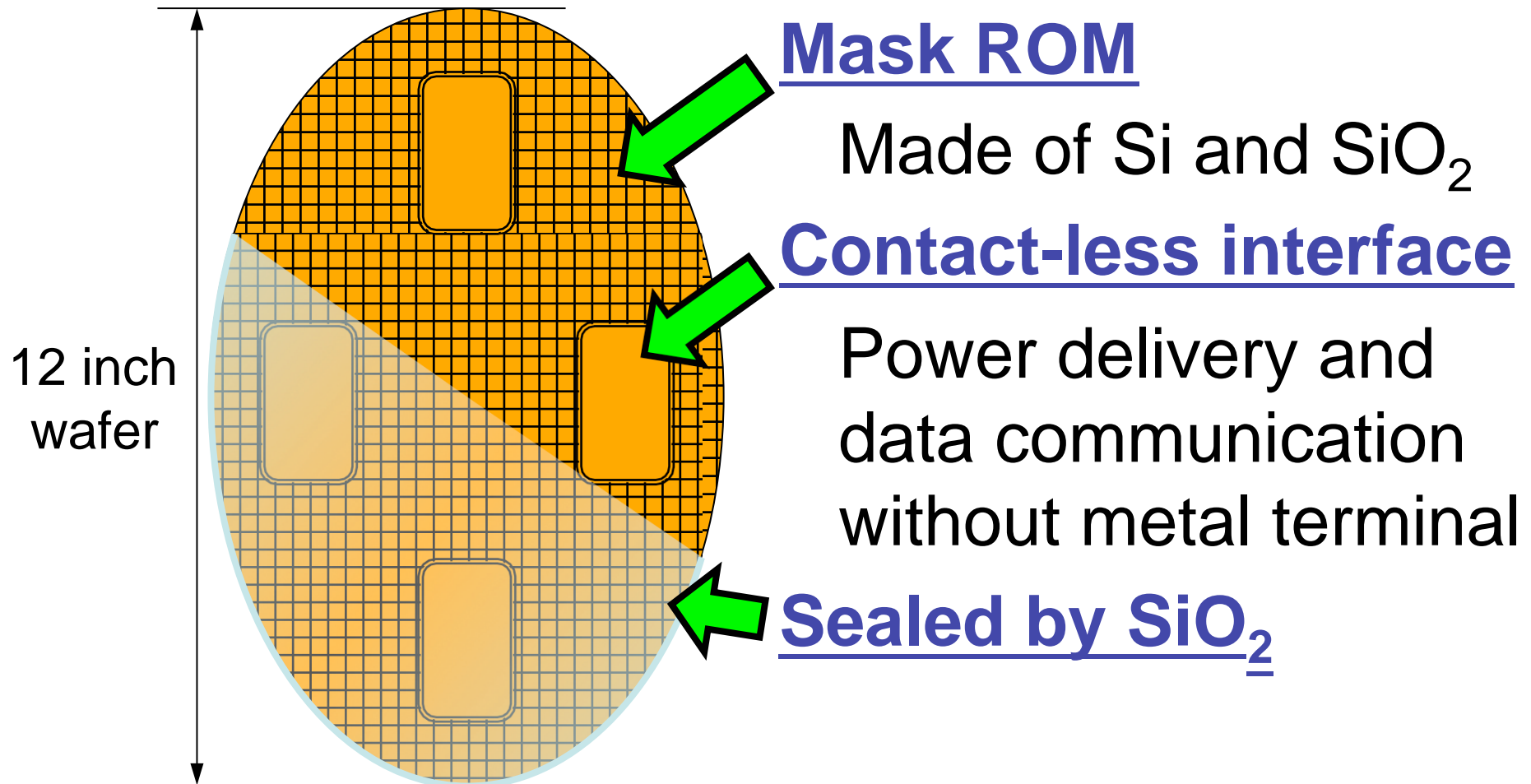
– How can we access?



- Use contact-less interface



# The Concept of our Media — a huge IC card sealed by $\text{SiO}_2$ —



# Sealed Semiconductor Memory — Summary —

- Long-life memory
  - no data loss
- Long-life accessibility
  - no risk of crash
  - no corrosion
- Low running cost
  - no migration necessary
  - “Store and Ignore”

