

**EE 494/594**  
**Laser Processed**  
**Electronic Components**

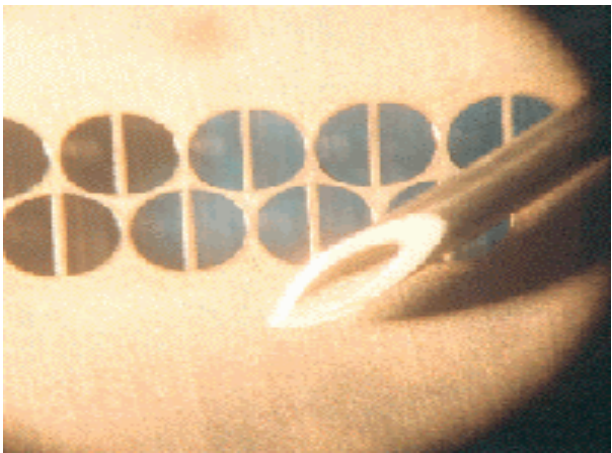
Min Xu

Monday, March 22, 1999

# Outline

- Why do we use Laser?
- Techniques
  - Soldering (Group A)
  - Cutting
  - Drilling
  - Stripping
- Applications
  - Micro-Marking
  - Micro-Component
  - Micro-Machining

# Cutting

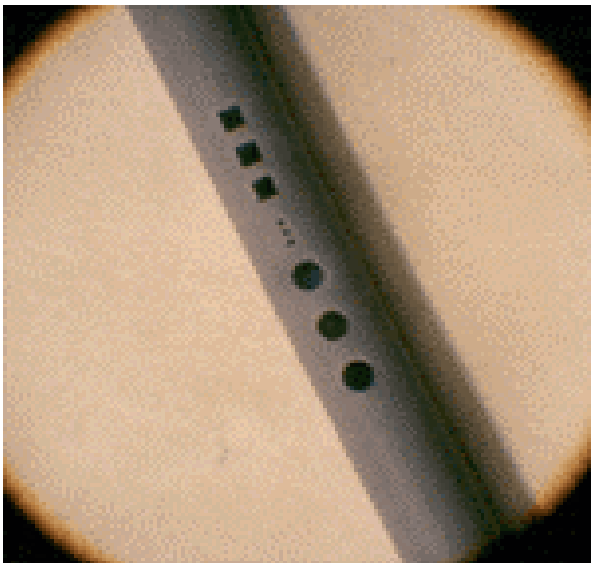


- Clean, Burr free pattern in Stainless Steel
- Clean Pattern
- Minimal Damage to the material (localized)
- depth < 250 microns

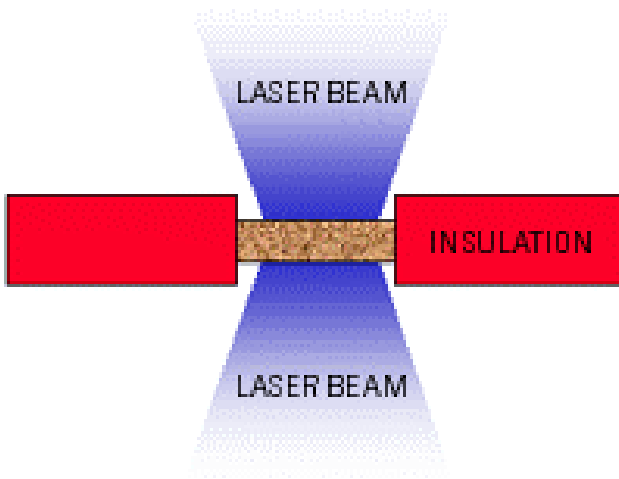
# Drilling



- Holes are finer, no blurry and minimal damage to the material itself
- diameter  $< 100$  microns



# Stripping



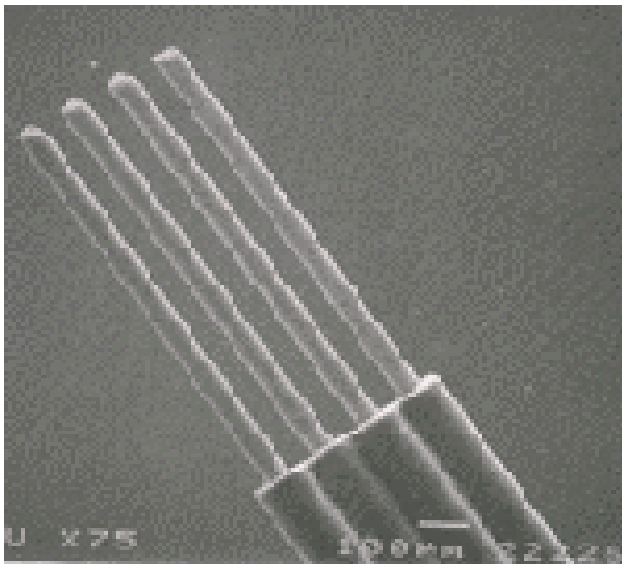
Removable  
Material depends  
on Wavelength and  
Power Density

Ex:

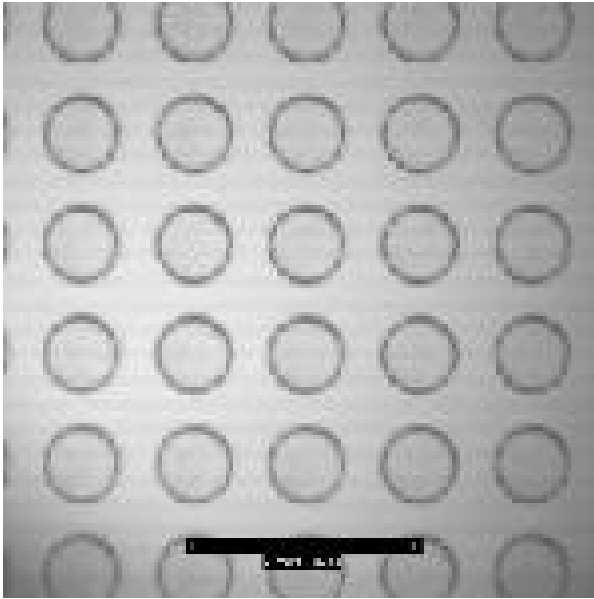
- polyimide
- polyurethane
- parylene

From:

- Copper
- Aluminum
- Steel



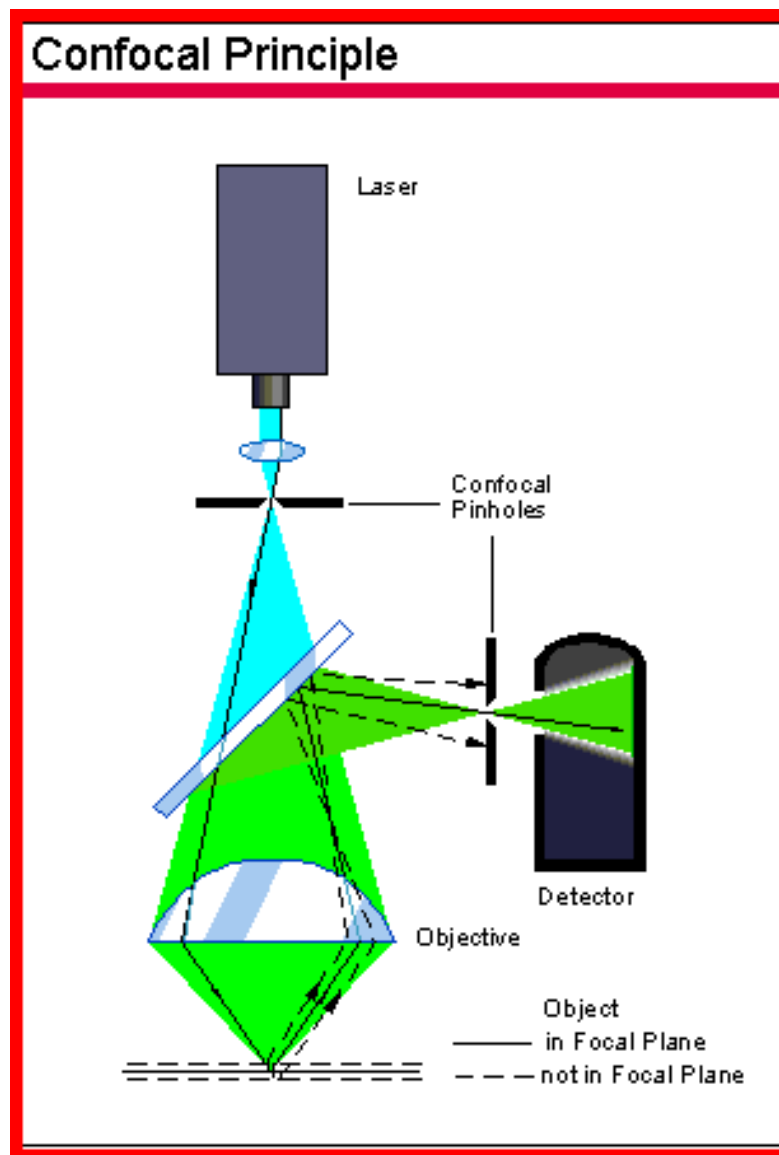
# Micro-Marking



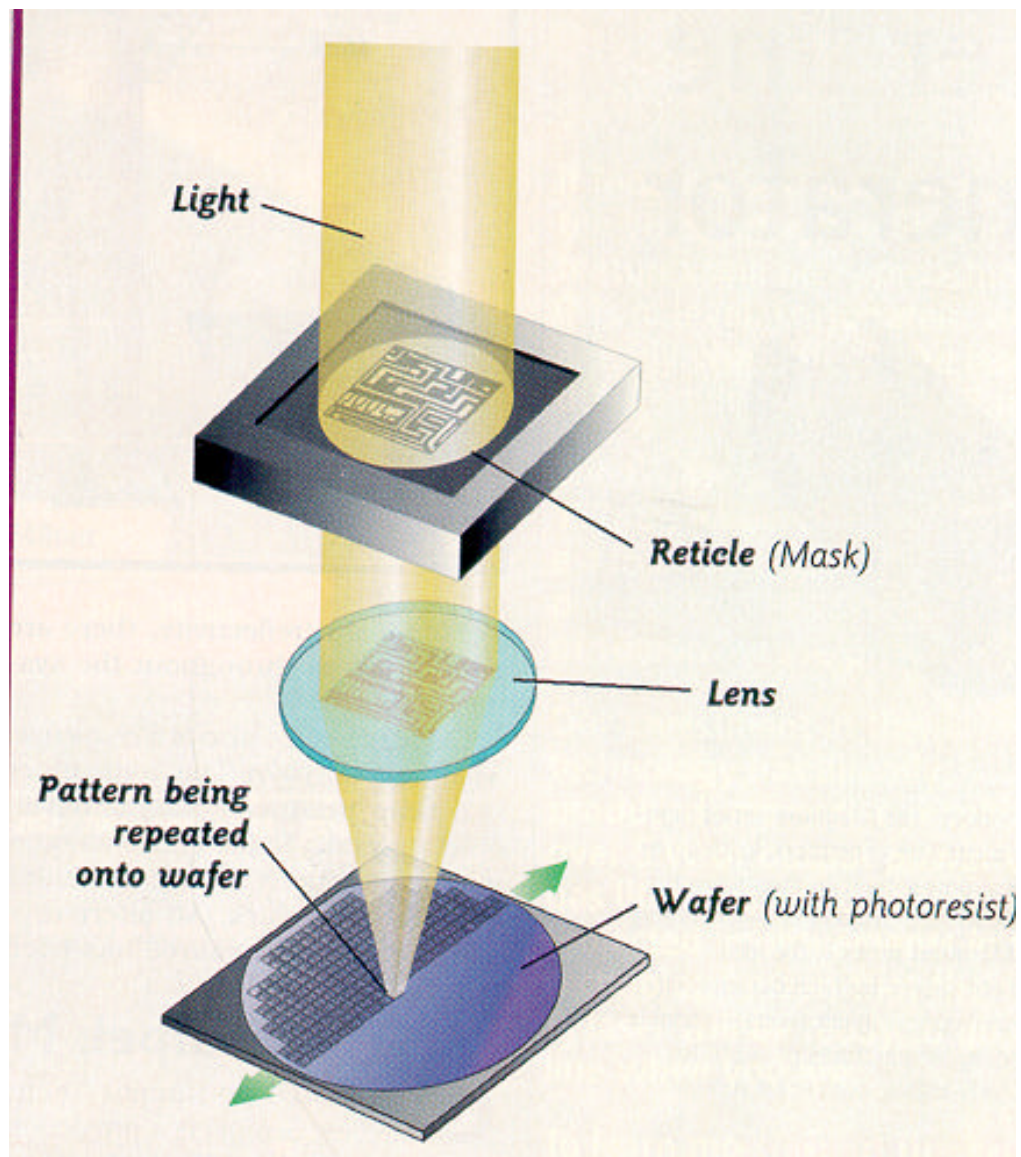
100 micron array on  
glass

- Not readable through naked eye
- Security
- ultraviolet and infrared lasers

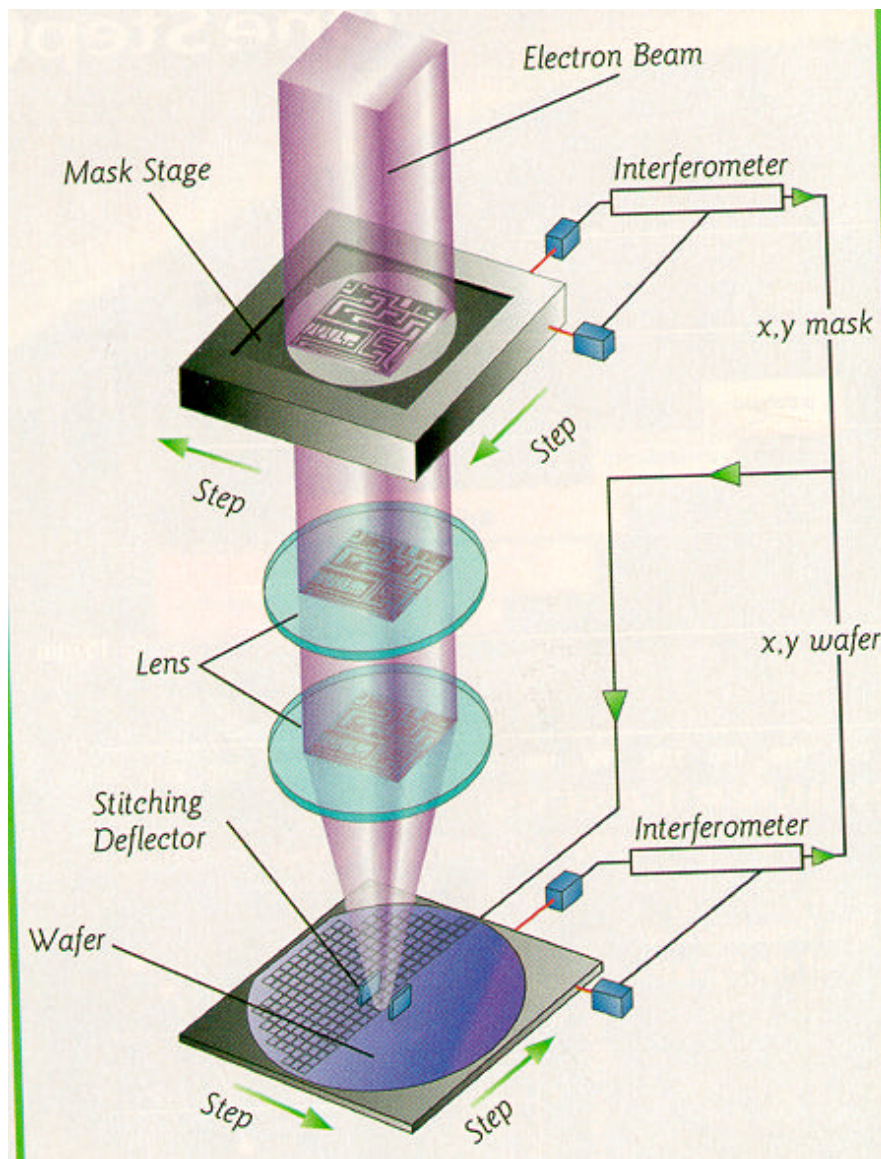
# Micro-Components



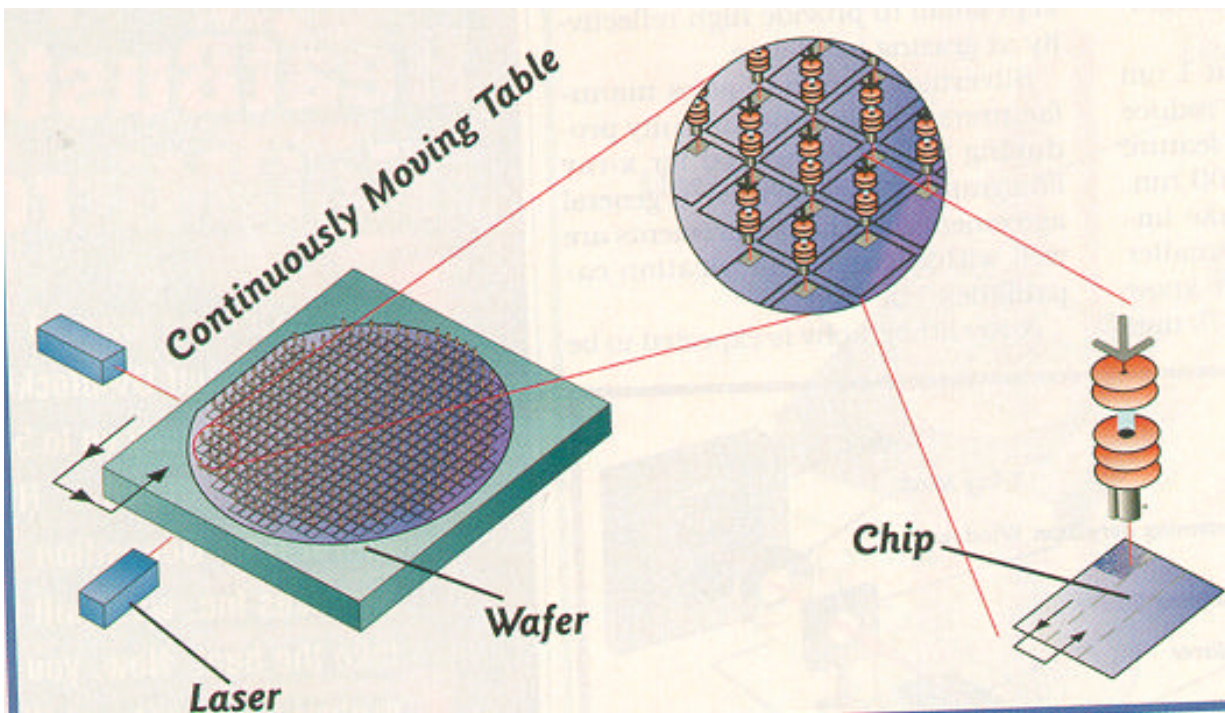
# Optical Lithography



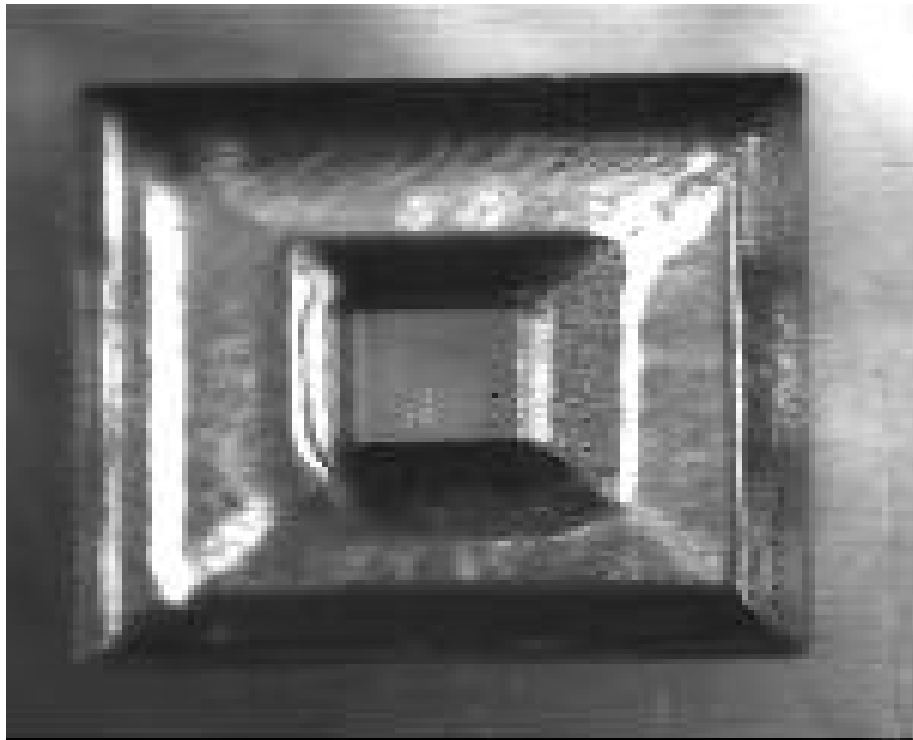
# Dual Lens



# X-Y Movement



# Micro-Machining



3D structure inside of diamond

# Laser Ablation

